

EBERLE THERMOSTAT & RECEIVER

SIMPLIFIED INSTALLATION INSTRUCTIONS:

Carefully connect the wires as on the next page diagram between the electric source and the heater.

Once all is connected/installed, start "learning mode" on the receiver by pressing the ! button. An alarm will sound.

Activate "learning mode" on the thermostat as follows:

1. Activate USER-SETTINGS by holding down the < and > buttons for 3 seconds
2. press button > until option 9 is displayed.
3. press button +, then LErn will be displayed
4. press button >, LErn will blink, ON is visible; Learn-Mode is now active.
5. Wait up to 1 minute. When the wireless connection has been completed successfully, the indicator lamp on the receiver switches off and the alarm sound stops.
6. Press button > on the transmitter to terminate Learn Mode
7. Press buttons < and > simultaneously for 3 seconds in order to activate AUTO.

Now the 2 devices are assigned to work together. The receiver box works as a switch, turning power to the heater on & off.

Turn the temp up & down to test the function of everything.

Response to switch on/of after changing the temp is about 10 secs.

*****SPECIAL NOTE*****

The user should change option 9 in the installer settings to zero because these are electric heaters.

It's normally a summer valve protection/ maintenance feature, so it's unnecessary.

Sequence:

1. Be sure AUTO is active (arrow above it). If not press "<" until it is.
2. Hold "< and +" for 5 secs.
3. You'll see "St00".
4. Press ">" until "09" is displayed.
5. Press "-" until the smaller number at the left is zero "0".
6. Press ">" to confirm it.
7. Hold "< and +" for 5 secs to exit.

FOR MANUAL (UP/DOWN) TEMPERATURE ONLY:

To completely not use any AUTO schedule, and only temp up/down:

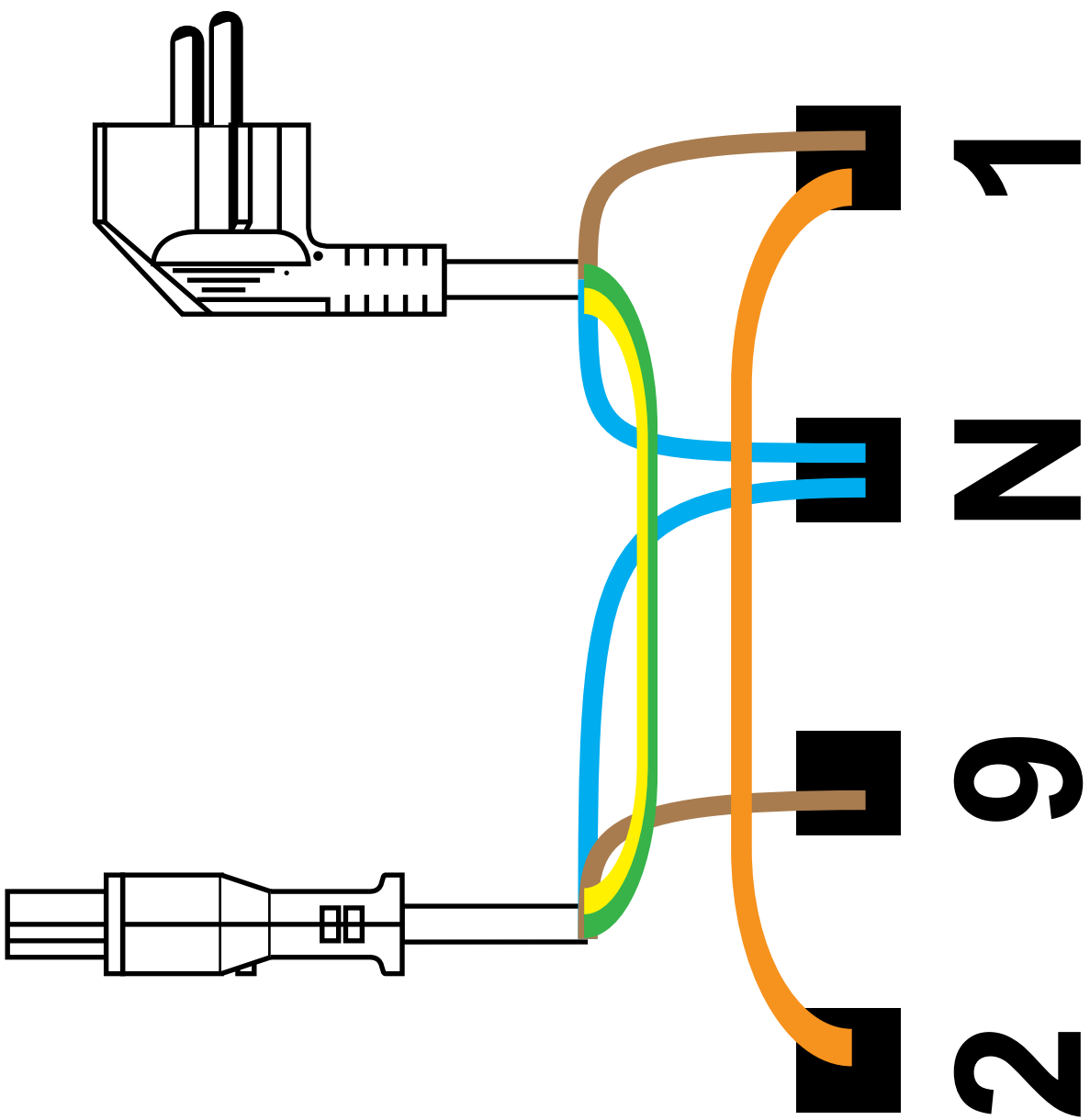
Press < until the arrow is over MAN only, and nothing else..

Afterward, use + or - ONLY for temp up/down!

No time/day, other indicators will be active, it's a more "empty screen"

If the user ever presses > then it it will exit MAN mode.

In that case, just press < again till only MAN is selected, and it's back to normal.



Installation and Operating Instructions

Radio receiver

(IN STAT 868)-a1A



Attention!

The radio receiver may be installed only by a specialist in compliance with the circuit diagram enclosed in the top housing cover or in compliance with these instructions. The current safety regulations must be observed. In order to achieve class of protection II, adequate installation measures must be taken.

This radio receiver which can be installed separately, is designed exclusively for temperature control in dry and closed rooms and standard environments. This electronic device was created according to DIN EN 60730, it operates according to working principle 1C.

Errors possible/Subject to alterations.

Contents:

1. Use
2. Features
3. Function description
 - 3.1 Basic Functions
 - 3.1.1 Function - 1, - Switching mode
 - 3.1.2 Reversing the control action
 - 3.1.3 Testing the radio link range
 - 3.1.4 System demonstration
 - 3.1.5 Signal lamp function
 - 3.1.6 Jumper function
 - 3.2 Enhanced functions
4. Installation
5. Commissioning
 - 5.1 Establishing the radio link
 - 5.2 Valve test
 - 5.3 Quit/Reset
 - 5.4 Power failure
 - 5.5 Faults
 - 5.5.1 Double addressing
 - 5.5.2 Short time losses of the transmission signal
 - 5.5.3 Long time losses of the transmission signal
 - 5.6 Troubleshooting
6. Technical data
7. Dimensions
8. Wiring diagram
9. Examples
10. Short form instructions

1. Use

Receiver for *INSTAT 868-r...* (radio transmitter) for switching:

- actuators of radiator heaters
- heating systems with switching applications
- circulating pumps (decentralised pump control)
- etc.

2. Features

- Volt-free switching of:
 - ⇒ 24 ... 250 V AC loads
- Output functions (optional):
 - ⇒ Heating ON/OFF
 - ⇒ Temperature setback ON/OFF e.g. for boilers or other controllers
 - ⇒ Pump control for up to 6 transmitters, extendable
- Reversing of control action for:
 - ⇒ connecting actuators "currentless open" instead of "currentless closed"
 - ⇒ changing from summer to winter mode (cooling instead of heating)
- Valve test function
- Radio test and system demonstration
- One transmitter can control several receiver modules
- Self-learning address settings through "Learning mode" in the transmitter
- button for setting of functions
- Reset button
- Signal lamp indicates initial state, faults etc.
- Monitoring of valid radio link
- Audible signal in case of faults (can be switched off)
- Emergency operation in case of loss of radio link

3. Function description

The *INSTAT 868-a1* receiver converts radio signals received from a transmitter, e.g. *INSTAT 868-r...* into control signals for loads. The loads are switched by means of a relay.

The switching state of the output is indicated by a signal lamp.

For switching characteristics, see Installation instructions for the transmitter under item "Function description". For controlling the electric loads, the output can be configured in different ways.

3.1 Basic Functions

3.1.1 Function - 1, - switching mode - "One transmitter controls one switching output"

One transmitter controls the output for heating/cooling ON/OFF.

This function is active, if jumper BR 1 is closed.

Note:

For heating systems, which are in stand by mode during summer time (e.g. electric heating), the valve protection has to be switched off (in the transmitter). If the valve protection is not switched off, a daily 3min. heating will take place.

3.1.2 Reversing the control action

The switching characteristics of the output and the signal lamp are reversed in respect of all functions (also pump control). Due to this feature, the following functions can be implemented.

- connecting actuators NO
- changing from summer to winter mode (cooling instead of heating)

For cooling (summer mode) or actuators NO: single-pole plugging of J1 jumper (One-pole plugging prevents loss of jumper)

For heating (winter mode or actuators NC)

(= as delivered condition)
double-pole plugging J1 jumper.

3.1.3 Testing the radio link range

To determine the radio link range, follow this: Set the transmitter to "Learning mode":

1. Press the button and the "Reset" button simultaneously
2. Release the "Reset" button first, then the button
The signal lamp lights up. The signal tone and the output operate in the switching mode, approx. 2 sec. ON, 8 sec. OFF.
3. Now, while holding the transmitter in your hand, walk away from the receiver until you reach the point where the signal tone is no longer audible and the signal lamp stops flashing. This point is the maximum possible radio link range.
4. Always terminate this function by pressing the "Reset" button.
5. Quit the "Learning mode" on the transmitter
As far as a free transmitter is used, existing radio links will not be affected.

3.1.4 System demonstration

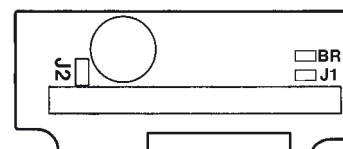
To demonstrate the radio range, see section 3.1.3 "Testing the radio link range". If necessary, a lamp can be connected to the output.

3.1.5 Signal lamp function

The signal lamps provide the following information:

- Output state... ON/OFF in a interval of 10 min. or steady light may be possible
- Faults... Blinking; Duration varies depending on type of fault
- Learning mode... ON until the link is established or the Reset button is pressed
- Valve test... ON as long as the "Reset" is pressed
- Testing the radio link range... Flashing, 10 sec. interval
- Monitoring of channels... after "Reset"

3.1.6 Jumper function



J1: open to reverse control action = cooling

J2: open to switch off the beeper

BR1: closed = only switching mode possible
open = all functions possible

One-pole plugging prevents loss of jumpers

3.2 Enhanced Functions

The functions

- pump logic control
- Time switch (Maser/Slave)
- pilote output

are described in the additional manual „Enhanced functions for 1 channel receiver INSTAT 868-a1, no. 468 931 003 281.

These functions are available by opening Jumper BR1.

4. Installation

Installation: e.g.

- In distribution board on DIN rail (by snap-on mountings SBF 3/6)
- Directly on the wall
- If necessary, on conduit box, by means of ARA 1S pattress.

Electrical connection

To make this connection, follow this:

Attention:

- Danger of electric shock, disconnect device from power supply
- The device is not designed for switching "safety extra low voltage" (SELV)

- Loosen cover fastening screw
- Remove top part of housing
- Make the connection in compliance with the circuit diagram (see top part of housing)
- If necessary, knock out penetration for actuator drive cable (lower right-hand corner)

Make sure that the strain relief for the actuator drive connection fits tight.

5. Commissioning

BR 1 is closed

5.1 Establishing the radio link

On completion of the installation work, a link between the *INSTAT 868-r...* transmitter and the radio receiver must be established. To do this, follow this: (see fig. 1)

- a) Set the transmitter to "Learning mode" (see Operating instructions for transmitter)
- b. For function-1, = **switching mode** = activate "Learning mode" on transmitter (A) to do this: press the button briefly
A signal tone sounds, the signal lamp lights up and the output is switched on briefly. When the transmitter is recognised, the signal tone ceases to sound and the signal lamp extinguishes.
- c. **Terminate the "Learning mode" on the transmitter**
- d. **Test the radio links which have just been established** (see below picture 3 and Table 1))

Commissioning the enhanced functions see manual "Enhanced functions for 1 channel receiver INSTAT 868-a1"

Fig. 1

One transmitter (*INSTAT 868-r*) controls one receiver.

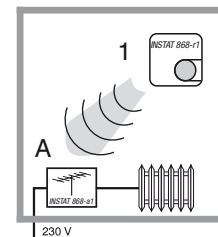


Fig. 2

One transmitter (*INSTAT 868-r*) controls one receiver

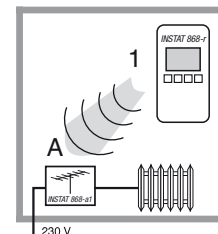
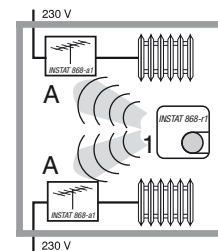


Fig. 3

One transmitter (*INSTAT 868-r*) controls a couple of receivers



Test of the function "switching-mode"

- Receiver: press Reset
the lamp must flash one time only
- Transmitter: adjust to 30 °C
after ~30 sec
the output switches on
- Transmitter: adjust 5 °C
after ~30 sec
the output switches off

5.2 Valve test

When the Δ button is pressed:

- The output is switched on (as long as the Δ button is pressed)
- The signal lamp lights up
- The signal tone sounds

After releasing the Δ button, the "Reset" button must be pressed within 10 seconds. As a result of this, the signal lamp extinguishes and the signal tone ceases to sound. After 10 seconds, the "Learning mode" starts; a link would be established to a transmitter which happens to be in the "Learning mode".

5.3 Quitting/Reset

To – quit the "Learning mode"

- acknowledge a failure or
- terminate the Radio link range test or
- terminate the valve test
- in the event of any other inexplicable phenomena

push the "Reset" button. This restores the output to its initial state (also reversed control action). When new actuating signals are received (possibly after 10-20 min.), the output will return to its previous state. Any existing radio link will be maintained.

5.4 Power failure

If there is a power failure in the transmitter or in the receiver, all data is saved. When power supply is restored, normal operation is resumed.

5.5 Faults

If faults occur, an alarm is triggered. In this case, the signal lamp flashes with varying duration, if necessary, a signal tone sounds.

5.5.1 Double addressing

In this case, the signal lamp shows continuous double flashing. It is cancelled by reprogramming one of the transmitters. The signal tone sounds.

5.5.2 Short time losses of the transmission signal

If the transmitter fails to receive an actuating signal within a period of 1 and up to approx. 10 hours, the signal lamp blinks permanently one time. No signal tone sounds.

When recurrence of the transmission signal, the alarm automatically ceases.

5.5.3 Long time losses of the transmission signal

If the receiver has not received an actuating signal for more than 10 hours, the signal lamp shows a permanent short flash. The signal tone sounds.

When the transmission signal recurs, the alarm automatically ceases to sound.

For all types of faults, the following applies:

- The output is switched with 30% (3 min. ON, 7 min. OFF), this means heating with 30% of capacity.

Note:

- Under unfavourable local conditions it is possible that the radio link between the transmitter and the receiver is insufficient, for instance, if the receiver is arranged in an interference-proof metal housing. Please check whether the situation improves when the transmitter is arranged in a different position. For checking the radio link, see section 3.1.3

5.6 Troubleshooting

1. Valve does not open:

- ⇒ Has it been properly wired up?
- ⇒ Has the radio link been established (see section 5.1)
- ⇒ See point 3 in the Table 1 as well as point 3 onwards
- ⇒ Press the Reset button (see 5.3)!

2. Signal lamp flashes and possibly a beeper is sounding

- ⇒ For basic fault procedures, see 5.5
- ⇒ "Learning mode", valve test, radio range test have not been interrupted! (see sections 5.1, 5.2, 3.1, 3.5.3)
- ⇒ Two transmitters are transmitting with the same address; reprogram one of the radio links! see 5.5.1.
- ⇒ No radio link, see point 7 in the Table 1.
- ⇒ In the case of inexplicable faults it is recommended to press the "Reset" button on the receiver and, if necessary, on the transmitter.

6. Common technical data

Model No.	INSTAT 868-a1A
EDP No.	0536 30...
Operating voltage	230 V AC (195...253 V) 50/60 Hz
Load circuit:	Relay, 1 NO contact, volt-free*
24 ... 250 V AC	16 A max. $\cos \varphi = 1$ 2 A max. $\cos \varphi = 0,6$
Number of actuators (3 W electrothermal)	230 V AC AC 24 V
	20 max. 8 max.
Power consumption	Approx. 12 VA
Operating temperature	0...+40 °C
Storage temperature	-20...60 °C
Antenna	Internal
Push-button for programming for reset	1 1
Signal lamp	1
Protection class of housing	IP 30 (Moisture condensation not permitted)
Class of protection	II** (see page 1)
Software Class	A
Rated impulse voltage	2.5 KV
Brinell test temperature	75 °C
Voltage and current for EMC emitted	230 V, 0,1 A
Weight	Approx. 100 g

Note:

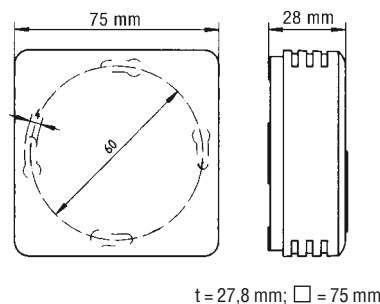
*) The volt-free contact of this mains-operated radio receiver do not ensure the requirement for the use of safety extra-low voltage (SELV).

***) Will be complied with, if the radio receiver is installed on a level, non-conducting surface.

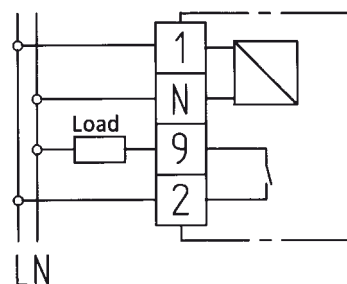
Note

Absolutely trouble-free operation of the radio link in accordance with the state-of-the-art technology is not always guaranteed. Therefore, we recommend checking its proper functioning at the respective place of installation.

7. Dimensions



8. Circuit diagram



This thermostat can be used in all EU and EFTA countries.

The manufacturer hereby declares that this device conforms with the basic and other relevant requirements laid down by directive R&TTE 1999/5/EC. The declaration of conformity can be downloaded from „www.funk868MHz.de“.



Table 1: If the radio link does not work, check the following:

Direction of action = normal = jumper J1 is plugged to two poles.

Check the following:	Yes	No
1. Receiver: Is power supply OK?	Continue with 2	Check fuse, if necessary
2. Receiver: Does the signal lamp flash? Can the warning tone be heard? (wait for an hour, if necessary)	Transmission signal is missing see 3., 5.6	Continue with 4
3. Transmitter: Is the battery OK?	Continue with 4	Insert new batteries
4. Transmitter: adjust to 30 °C. Is the output switched on after approx. 30 sec? (Lamp light up).	Continue with 5	The output was already switched on. Continue with 5 or the transmission signal is missing, continue with 6
5. Transmitter: adjust to 5 °C. Is the output switched off after approx. 30 s (Signal lamp does not light up)	Everything OK	The transmission signal is missing, continue with 6
6. Transmitter-actuator-receiver: Check wiring, if necessary, reprogram the connection to the Radio receiver. Has the remedial action taken under points 4 and 5 been successful?	Everything OK	Continue with 7, if necessary check the Radio link range, see section 3.1.3 "Testing the radio link range"
7. Reduce the distance between the receiver and the transmitter to approx. 2 m.	The thermostats are working properly	The transmitter or the Radio receiver are defective

Short form instructions for the radio receiver INSTAT 868-a

	See	
Test the radio range	3.1.3	<ul style="list-style-type: none"> • Adjust transmitter to "Learning mode" • Press Δ button + "Reset" button simultaneously • After that, release "Reset" button and then the Δ button • Signal lamp lights up - signal tone + output switches cont. • Press "Reset" button for termination
Function 1 "Switching mode" (Jumper BR1 has to be closed)	5.1	<ul style="list-style-type: none"> • Adjust transmitter to "Learning mode" • Briefly press Δ button • Signal tone sounds - signal lamp + output switch on briefly • Transmitter recognised - signal tone + signal lamp extinguish
Valve test	5.2	<ul style="list-style-type: none"> • Press the Δ button - output switches ON as long as Δ button is pressed • Release Δ button. And then press "Reset" button within 10 sec. for termination
Reversing control action	3.1.2	<ul style="list-style-type: none"> • Summer mode ((valves NO) J1 one-pole plugging • Winter mode ((valves NC) J1 double pole plugging

Signal lamp:

Blinking + no signal tone sounds 5.5
Blinking + signal tone
Double blinking

- Brief losses of control signal (from 1 hour up to 10 hours)
- Longer losses of control signal (more than 10 hours)
- Double addressing - reprogram the radio link

Additional functions for one-channel radio frequency receivers

IN STAT 868 -a1

These additional instructions supplement the basic "Installation and Operating Instructions Radio receiver INSTAT 868-a1..."
Nr. 468 931 002 933

They only need to be used when the following functions are used:

- Switching operation with time control (master/slave)
- Pump logic
- Timer

Contents

- Description of the functions**
 - 1.1 Function – switching operation
 - 1.2 Function – switching operation with master/slave
 - 1.3 Function – pump logic
 - 1.4 Function – timer output
 - 1.5 Learning Mode
 - 1.6 Determining active connections
- Function - switching operation**
 - 2.1 Without master
 - 2.2 With master/slave
- Function - Timer output**
- Function - Pump logic**
 - 4.1 Without master
 - 4.2 With master and slaves
- Function - Switching operation with pump logic and M/S**
- Brief instructions**

1. Description of the functions

All of the transmitters work with the same frequency of 868.95 MHz.

To ensure that the transmitters and the receivers understand each other (as though they were directly connected to each other by cables) and do not exchange commands with any other devices, the transmitters specify a connection number. This number is saved by all of the participants in the "Learning mode".

The receiver recognizes the function on the basis of the number of saved addresses.

Switching operation:

One address of a transmitter (room controller) will be saved

Switching operation with master/slave:

In addition to the address of the room controller, the address of the master is also saved

Timer output:

Two addresses (of the same transmitter) are saved.

Pump logic:

Three to six addresses are saved

Note:

The BR 1 jumper must be open in order to be able to use the functions described here

1.1 Function - switching mode "One transmitter controls one switching output"

One transmitter controls the output for heating or cooling ON/OFF, see Point 2.1, Figures 1, 2, 3.

Only one transmitter will be taught in the "Learning mode" (*INSTAT 868-r* or *INSTAT 868-r1*).

The BR 1 jumper can be either open or closed when using this function.

1.2 Function - switching operation with master/slave

(In combination with the *INSTAT 868-r1* simple transmitter and the *INSTAT 868-r* clock thermostat)

This corresponds to the switching operation function. However, the temperatures of the room are influenced by an *INSTAT 868-r* radio clock thermostat (master).

If the master switches to the set-back temperatures 2 ↓ or 3 ↓, the slave is also set back accordingly. See Point 2.2, Figures 4, 5.

Master = *INSTAT 868-r* clock thermostat

Slave = *INSTAT 868-r1* simple transmitter

The master/slave function also influences the pump logic. See Figures 7, 8, 9.

2 different transmitters are taught via the "Learning mode".

Note:

- In the event of a master malfunction, the receiver will control the comfort temperature and the lamp will flash.
- In the event of a slave malfunction, the receiver will go into a state of alarm (see the basic instructions, Point 5.5).
- Only slaves (transmitters) in automatic operating mode will follow the master.
- The M/S function is independent of the operating mode of the master.
If the master is set to party or manual mode, the switching times of the week program are used. In case of frost protection T3 is used.
If the day program is activated, its switching times are used.

1.3 Function - pump logic

Up to 6 transmitters can switch a pump ON/OFF.

The pump will be switched off if none of the related transmitters demands for heat (within 10 minutes). See Point 4.1, Figure 7.

3 or more transmitters will be taught in the "Learning mode" (in the case of only 2 transmitters, one transmitter has to be taught twice).

The pump logic can be expanded to more than 6 transmitters by switching the relay outputs in parallel.

Pump logic in the case of master / slave

The pump receiver requires both the signals of the room controller as well as those of the corresponding master (clock thermostat). See Point 4.2 Figure 8 and Point 5

A slave uses the next lower clock thermostat as its master.

For this reason the master has to be first taught via the "Learning mode" before the corresponding slaves are taught. Then the next master is taught, etc. See Figures 10c, 10d.

In the case of large zones, relay receivers can be switched in parallel, whereby the master on each receiver is taught via the "Learning mode". In the case of the second receiver, only 5 slaves can then be taught.

1.4 Function - timer output

"A transmitter controls as a timer output"

(Only possible with the *INSTAT 868-r* clock thermostat)

The output switches ON when the regulated temperature ↓ 3 (night) has been activated for the transmitter and the heating up period has not yet begun.

This output can e.g. be used to control the temperature set-back input (TA) of other controllers or to set back the boiler temperature, see Point 3, Figure 6.

The timer function is independent of the switching mode of the transmitter.

If the clock thermostat is set to party or manual mode, the switching times of the week program are used. In case of frost protection the output is always on

If the day program is activated, its switching times are used.

The one clock thermostat will be taught twice in the learning mode.

1.5 Teaching via the "Learning mode"

Teaching via the "Learning mode" is carried out in two steps.

"Teach/delete":

This step deletes all of the previous functions and teaches the first transmitter.

1. Simultaneously press the ▲ and the "Reset" pushbuttons.
2. Release the "Reset" pushbutton.
3. When the lamp lights up, release the ▲ pushbutton.
The signal tone will sound, the output will briefly switch on.
4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.

"Teaching":

All of the other transmitters are taught via the "Learning mode"

1. Briefly press the ▲ pushbutton
2. When the signal lamp lights up, release the pushbutton.
The signal tone will sound, the output will briefly switch on.
3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.

1.6 Determining active connections

After pressing the "Reset" pushbutton, the connections taught in the "learning mode" are signalled by the signal lamp by briefly flashing.

Several connections are signalled by series of flashes.

A master lights up longer than a slave.

Number of flashes	Function
1	Switching operation
2	Timer and master/slave
3 or more times	Pump logic

2 Function - switching operation

One transmitter controls the output for heating or cooling ON/OFF. Open the BR 1 jumper

2.1 "Switching operation" without master One transmitter controls one switching output

A connection is established between one transmitter and one or more receivers for transmitting the ON/OFF information (see Figures 1,2,3).

Procedure:

1. Switch the transmitter (*INSTAT 868-r* or *INSTAT 868-r1*) into the "Learning mode".
2. Execute "Teach/delete"
 - a. Simultaneously press the ▲ and "Reset" pushbuttons.
 - b. Release the "Reset" pushbutton.
 - c. When the lamp lights up, release the ▲ pushbutton.
The signal tone will sound, the output will briefly switch on.
 - d. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
3. Exit the "Learning mode" at the transmitter.

Figure 1

One transmitter (*INSTAT 868-r1*) controls a receiver

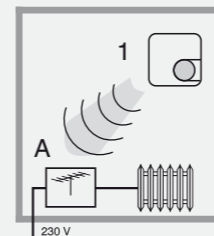


Figure 2

One transmitter (*INSTAT 6-r*) controls a receiver

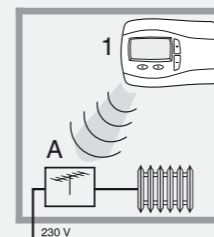
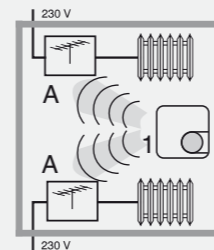


Figure 3

One transmitter controls several receivers. (also valid in the same manner for *INSTAT 868-r*)



Testing the switching operation function

without master: (direction of flow = normal)

- Receiver: • Press "Reset".
The lamp should only briefly light up once.
- Transmitter: • Set to 30 °C.
After approx. 30 s the output will switch on
- Transmitter: • Set to 5 °C.
After approx. 30 s the output will switch off

2.2 Switching operation with master /slave (time control) A transmitter functions as a switching output

A connection is established between one transmitter and one or more receivers for transmitting the ON/OFF information.

An additional connection is established between the one master and all of the slaves for transmitting the time information (see Figures 4, 5).

The slaves therefore follow the time profile of the master.

The time profile is independent of the operating mode of the master.

If the master is set to party or manual mode, the switching times of the week program are used. In case of frost protection T3 is used.

If the day program is activated, its switching times are used.

Principle procedure according to Figure 5:

First simultaneously teach the master (1) via the "Learning mode" at all of its receivers (A...E), then teach the corresponding slaves (2, 3, 4).

In detail:

1. Simultaneously teach the master (1) at all of the receivers (A...E) as follows:
 - a) Activate the "Learning mode" of the master (1) (see its operating instructions)
 - b) Activate the "Learning mode" for all of the receivers involved (A, B, C, D, E) as follows:
 1. Simultaneously press the ▲ and the "Reset" pushbuttons.
 2. Release the "Reset" pushbutton.
 3. When the lamp lights up, release the ▲ pushbutton.
The signal tone will sound, the output will briefly switch on.
 4. When the receiver has been recognized, the signal tone will cease and the lamp will turn off.
- c). Exit the "Learning mode" at the master
2. Teach the slave transmitter at its receivers as follows:
 - a) Activate the "Learning mode" at the slave, e.g. (2).
 - b) Activate the "Learning mode" at the receiver (B) as follows:
 - Execute "Teach"
 1. Briefly press the ▲ pushbutton
 2. When the signal lamp lights up, release the pushbutton.
The signal tone will sound, the output will briefly switch on.
 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
- c. Exit the "Learning mode" at the slave.

Testing the function switching operation with master/slave

with master: (direction of flow = normal)

Slave must be in the automatic operating mode

Receiver: • Press the "Reset" pushbutton.
The lamp must light up several times, first long for the master, then briefly for each slave

Master (transmitter): • Set to comfort temperature 1 (by changing the time),
wait approx. 30 sec.

Slave (transmitter) • Press "Reset"

Receiver: • will briefly switch on 3 times

Figure 4

Simple master/slave function

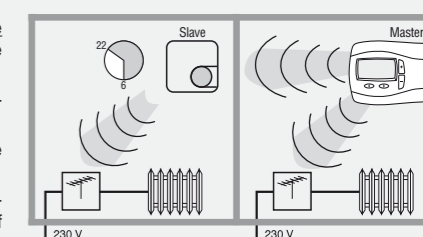
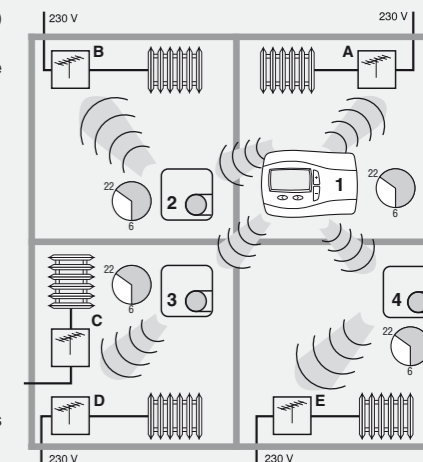


Figure 5

This figure shows an apartment with a master controller (1) (*INSTAT 868-r* clock thermostat), slave controllers (2, 3, 4) (*INSTAT 868-r1*) and receivers (A...E) (*INSTAT 868-a1*).

When the master e.g. switches to the set-back mode at night, the temperature is also reduced in the rooms controlled by the slaves.



3. Function - Timer output

Open the BR 1 jumper

"A transmitter functions as a timer output"

(only possible in the case of the *INSTAT 868-r* timer thermostat)

The *INSTAT 868-a1* receiver can also be used to control the the temperature set-back input (TA) of other controllers. The output is switched ON when the set-back temperature is activated (see Figure 6).

The output switches ON when the set-back temperature \downarrow_3 (night) has been activated on the transmitter and the heating up phase has not yet begun.

The timer function is independent of the operating mode of the transmitter.

If the clock thermostat is set to party or manual mode, the switching times of the week program are used. In case of frost protection the output is always on.

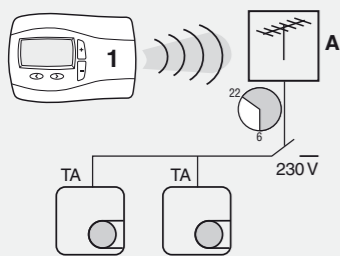
If the day program is activated, its switching times are used.

The one transmitter (*INSTAT 868-r* clock thermostat) must be taught via the "Learning mode" twice in order to activate the timer function (see Figure 6).

1. Activate the "Learning mode" at the transmitter (1).
 - a. Activate the "Learning mode" at the receiver (A) as follows:
 - Execute "Teach/delete"
 - 1. Simultaneously press the Δ and the "Reset" pushbuttons.
 - 2. Release the "Reset" pushbutton.
 - 3. When the lamp lights up, release the Δ pushbutton. The signal tone will sound, the output will briefly switch on.
 - 4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
2. Leave the same transmitter (1) in the "Learning mode"
 - a. Reteach the same receiver (A) as follows:
 - Execute "Teach"
 - 1. Briefly press the Δ pushbutton.
 - 2. When the signal lamp lights up, release the pushbutton. The signal tone will sound, the output will briefly switch on.
 - 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
3. Exit the "Learning mode" at the transmitter.

Figure 6

Timer function



TA = Temperature set-back input of the temperature-controller

Testing the "Timer output" function

- | | |
|--------------|---|
| Receiver: | <ul style="list-style-type: none"> • Press the "Reset" pushbutton. The lamp must light up twice. |
| Transmitter: | <ul style="list-style-type: none"> • Set the set-back temperature 3 (by changing the time) |
| Receiver: | <ul style="list-style-type: none"> • The lamp must turn off after approx. 30 s. |
| Transmitter: | <ul style="list-style-type: none"> • Set the comfort temperature 1 (by setting the time) |
| Receiver: | <ul style="list-style-type: none"> • The lamp must turn off after approx. 30 s. |

4 Function - pump logic

Up to 6 transmitters can switch a pump ON/OFF.

The pump will be switched off when none of the transmitters demands for heat (within a period of 10 minutes).

At least 3 transmitters must have been taught in the "Learning mode" in order to activate the pump logic. Open the BR 1 jumper.

4.1 Pump logic – without master:

Connections are established between several transmitters and one receiver for transmitting the pump information (see Figure 7).

Principle procedure:

Teach all of the transmitters in sequence.

If the *INSTAT 868-r* clock thermostat is also being used, teach it last (A different sequence or combination would cause a master/slave relationship. See Figure 10).

In detail (according to Figure 7):

1. Teach the first transmitter (not clock thermostat) as follows:
 - a) Activate the "Learning mode" at the transmitter (1).
 - b) Activate the "Learning mode" at the receiver (A) as follows:
 - Execute "Teach/delete"
 - 1. Simultaneously press the Δ and the "Reset" pushbuttons.
 - 2. Release the "Reset" pushbutton.
 - 3. When the lamp lights up, release the Δ pushbutton. The signal tone will sound, the output will briefly switch on.
 - 4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the "Learning mode" at the transmitter.
2. Teach all of the other transmitters as follows:
 - a) Activate the "Learning mode" at the transmitter (2).
 - b) Activate the "Learning mode" at the same receiver (A) as follows:
 - Execute "Teach"
 - 1. Briefly press the Δ pushbutton.
 - 2. When the signal lamp lights up, release the pushbutton. The signal tone will sound, the output will briefly switch on.
 - 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the "Learning mode" at the transmitter.
3. Execute Point 2 for all of the other transmitters.

Note:

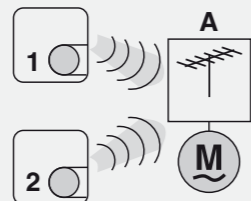
If only one transmitter is to be used, teach this one transmitter 3 times without exiting the "Learning mode" at the transmitter.

If only two transmitters are to be used, teach one of the two transmitters twice without exiting the "Learning mode" at the transmitter!

If more than 6 transmitters are required, use an additional *INSTAT 868-a1* receiver. Switch the relay outputs in parallel.

Figure 7

Pump logic with two transmitters



Testing the pump logic function

- | | |
|----------------------|--|
| without master: | (direction of flow = normal) |
| Receiver: | <ul style="list-style-type: none"> • Press "Reset". The lamp must light up the same number of times as transmitters are taught via the "Learning mode". |
| At one transmitter | <ul style="list-style-type: none"> • Set to 30 °C. Then the lamp must turn on after approx. 30 s. |
| At all transmitters: | <ul style="list-style-type: none"> • Set to 5 °C. The lamp switches off This could last up to 20 min. |

4.2 Pump logic – with master and slaves:

Connections are established between several transmitters and one receiver for transmitting the pump information.

The master must always be taught before the slaves are taught.

Principle procedure (according to Figure 8):

The master (1) of the respective zone is first taught before its slaves (2, 3) are taught. Further master/slaves are taught according to the same principle.

In detail:

1. Teach the master (*INSTAT 868-r* clock thermostat) as follows:
 - a) Activate the "Learning mode" at the master (1).
 - b) Activate the "Learning mode" at the receiver (A) as follows:
 - Execute "Teach/delete"
 - 1. Simultaneously press the Δ and the "Reset" pushbuttons.
 - 2. Release the "Reset" pushbutton.
 - 3. When the lamp turns on, release the Δ pushbutton. The signal tone will sound, the output will briefly switch on.
 - 4. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the "Learning mode" at the transmitter.
2. Teach all of the other transmitters as follows:
 - a) Activate the "Learning mode" at the transmitter (2).
 - b) Activate the "Learning mode" at the same receiver (A) as follows:
 - Execute "Teach"
 - 1. Briefly press the Δ pushbutton.
 - 2. When the signal lamp turns off, release the pushbutton. The signal tone will sound, the output will briefly switch on.
 - 3. When the transmitter has been recognized, the signal tone will cease and the lamp will turn off.
 - c) Exit the "Learning mode" at the transmitter.
3. Execute Point 2 for all of the other transmitters.

Note:

If only one master and one slave are being used, teach the one slave twice without exiting the "Learning mode" at the slave.

If more than 5 slaves are required, use an additional *INSTAT 868-a1* receiver. Simultaneously teach the master at all of the receivers.

Switch the relay outputs in parallel.

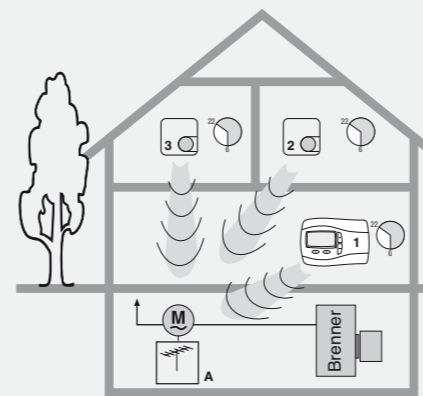
Testing the function - pump logic with master

- | | |
|---|---|
| with master: | (direction of flow = normal) |
| Slave must be in automatic operating mode | |
| Receiver: | <ul style="list-style-type: none"> • Press "Reset". The lamp must light up the same number of times as the number of transmitters taught. The lamp must first light up longer for the master, then shorter for the slaves. |
| At one transmitter | <ul style="list-style-type: none"> • Set to 30 °C. then the lamp must turn on after approx. 30 s. |
| At all transmitters | <ul style="list-style-type: none"> • Set to 5 °C. The lamp switches off This could last up to 20 min. |

Figure 8

Pump logic with master and slaves
Each transmitter affects the pump (pump logic)

If the room controllers are no longer demanding for heat, the pump will also switch off. The time profile of the master also affects the slaves.



5 Switching operation with pump logic and master/slave

This is a combination of "Switching operation with master/slave" and "Pump logic". Each controller (transmitter) controls one room. The master controls its room and also affects the time control in all of the other rooms. The pump will also switch off when none of the rooms require any more warmth.

Principle procedure (according to Figure 9):

Figure 10

The receiver of the pump (F) is handled in the same manner as a receiver in one of the rooms. However, each time it must also be taught via the "Learning mode".

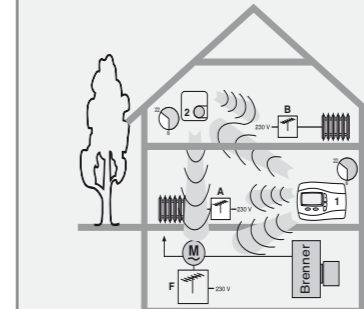
In detail (see Figure 9):

- Simultaneously teach the master (1) at all of its receivers (A...E + F [pump receiver]) (according to Point 2.2.1). Remain in the "Learning mode" until all of the receivers have been taught.
- Teach the slave (2) at both its receiver (B) and at the pump receiver (F) (according to Point 2.2.2). Remain in the "Learning mode" until all of the receivers have been taught. In Figure 9, teach the slave (2) at the pump logic receiver (F) twice, also see the note in 4.2.

Figure 9

Regulation of a single room with master/slave and pump logic.

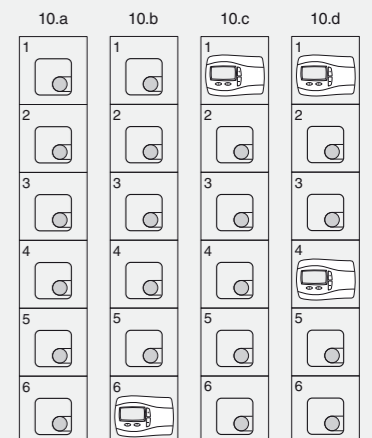
Each transmitter controls its own room. Each transmitter also affects the pump (pump logic). The *INSTAT 868-r* master affects time control at the slave.



Testing the function

Test separately according to the instructions in "Testing the function switching operations with master", see 2.2. and "Testing the function pump logic with master", see 4.2

Different combinations of transmitters at the pump logic (max. 6 transmitters respectively have been taught in each receiver).



- 10.a: 6 simple transmitters function as pump logic.
- 10.b: 5 simple transmitters and one clock thermostat function as pump logic (the clock thermostat must be taught last).
- 10.c: One master with 5 slaves function as pump logic.
- 10.d: Zone regulation with 2 zones (1-3, 4-6). Each zone with one master and 2 slaves

Note:

It is also possible to teach less than 6 transmitters.

6 Brief instructions

"Teach/ delete"

- | | | |
|--------------------|------------------------|---|
| At the transmitter | | |
| At the receiver | 1.5 | <ul style="list-style-type: none"> • Bring into "Learning mode" • Simultaneously press the Δ and "Reset" pushbuttons. • Release the "Reset" pushbutton. • When the lamp turns on, release the Δ pushbutton – Signal tone will sound • The output will briefly switch on • When the transmitter has been recognized – signal tone will sound and the signal lamp will turn off |
| "Teach" | At the transmitter 1.5 | <ul style="list-style-type: none"> • Bring into "Learning mode" • Briefly press the Δ pushbutton • When the lamp lights up, release the Δ pushbutton • Signal tone will sound, output will (briefly) switch on • When the transmitter has been recognized - signal tone will cease + signal lamp will turn off |

Switching operation function

- | | | |
|--|------|--|
| without master | 2.1. | • "Teach/delete" |
| Switching operation function with master | 2.2. | <ul style="list-style-type: none"> • First simultaneously "teach/delete" the master (clock thermostat) at all of the receivers, then • "teach" each slave (simple transmitter) at its receiver |
| Timer function | • | <ul style="list-style-type: none"> • "Teach/delete" the clock thermostat, then leave the transmitter in "Learning mode" and • "teach" only the receiver a second time |

Pump logic function

- | | | |
|--|-----|---|
| without master | 4.1 | <ul style="list-style-type: none"> • "Teach/delete" the first transmitter • Subsequently "teach" all of the other transmitters ("teach" the clock thermostat last) (At least 3 transmitters must be taught) |
| with master | 4.2 | <ul style="list-style-type: none"> • First "teach/delete" the master (clock thermostat) at the pump logic receiver and then • "teach" the slaves (simple transmitter) at the pump logic receiver • If necessary, "teach" an additional master (at least 3 transmitters must be taught) |
| Switching operation with pump logic and master/slave | 5 | <ul style="list-style-type: none"> • First simultaneously "teach/delete" the master at all of the receivers (including the pump logic receiver), then • "teach" the slave at its receiver and at the pump logic receiver |



Fig. 1

I. User Guide

Operation (Overview)

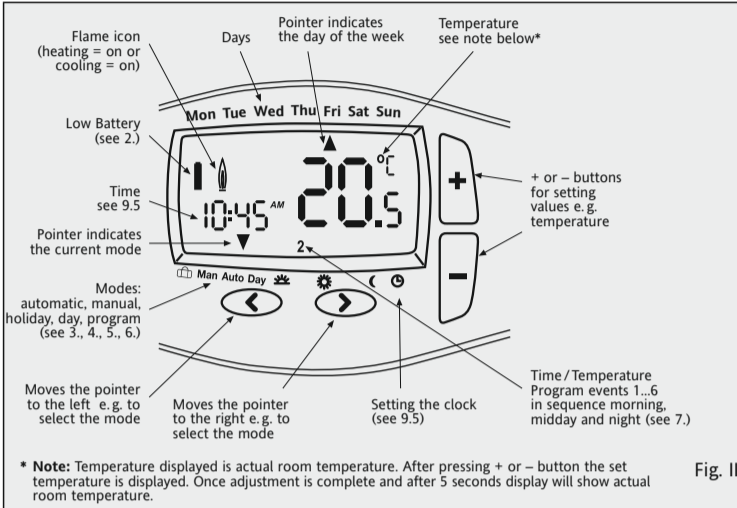


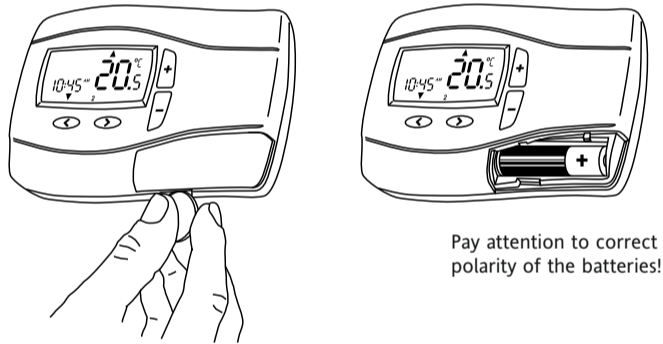
Fig. II

1. Principle of function

The INSTAT+ 868-r is a programmable room thermostat that allows you to set time periods (up to 6 per day) and temperatures to suit your own lifestyle. Once fully installed and powered the device will automatically show the correct time and in auto mode will control your heating system according to pre-set program 1 (see 7.). The temperature is controlled by sensing air temperature, switching on the heating when the air temperature falls below the thermostat setting and switching it off once this set temperature has been reached. No wiring is necessary, the information will be transmitted via RF to a receiver. An INSTAT 868-a.... radio receiver is required for operation.

NOTE:
 The adjusted values (while programming) will be accepted automatically after ~5 sec.

2. How to Insert/change batteries (2 AA 1.5V Alkaline)



When the batteries start to run low, the battery icon (see I) starts to blink. The thermostat continues to function normally. After ~6 months, the device will cease to function and will permanently display the battery icon. Dispose of batteries according to legislation.

3. Automatic mode (AUTO)

In this mode, the room temperature is automatically controlled according to the pre-set program. The pointer indicating the mode is set to AUTO. The number at the bottom right indicates the program event during the day. (Fig. 1)

4. How to change the temperature for a short period of time (override)

When in AUTO mode, you can override the existing temperature setting for a short period of time. Press the + or - buttons to change the temperature setting.

While in temperature override the pointer indicates both AUTO and MAN (Fig. 2). When the next programmed time/temperature event is reached, the device will revert to the AUTO mode.

5. How to set a constant room temperature (manual operation)

In this mode, a constant temperature can be set and the pre-set program is ignored. The last temperature selected here is chosen as the initial temperature

How to activate this mode

Press the < button until the pointer indicates MAN (Fig. 3). Set the temperature by pressing the +/- buttons

Exit the mode

by pressing the > button

6. How to set the room temperature for a set time (holiday/party mode)

In this mode, the temperature can be set for periods of time ranging from a few hours up to 199 days, e.g. when you are away from home for longer periods of time (holidays).

The remaining hours/days are shown. Time periods between 1 hour and 23 hours and 1 day and 199 days can be set.

How to activate this mode

Press the < button until the pointer indicates the suitcase icon (Fig. 4)

- Set the time by pressing the +/- button
- Select the temperature by pressing the > button
- Set the temperature by pressing the +/- button

Once you have set the temperature, it will flash for 10 seconds and then start the holiday/party period.

To exit this mode, press < or >.

When hours have been set, the thermostat will return to AUTO mode once the set hours have passed.

When days have been set, the thermostat will return to AUTO mode at midnight of the last day.

Note: the current day (today) must be included in the setting. e.g. 1 day is set; the thermostat returns to AUTO today at midnight.

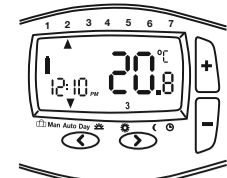


Fig. 1

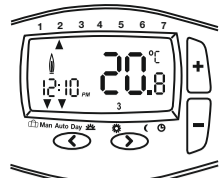


Fig. 2

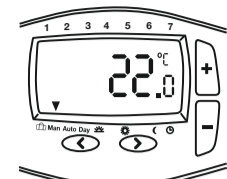


Fig. 3

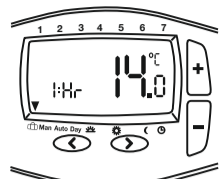


Fig. 4

7. Pre-set programs

There are 3 pre-set time/temperature programs which are already available in the thermostat. Pre-set program 1 (as shown below) is the default. Therefore, if pre-set program 1 is the best program to suit your lifestyle, you do not need to change the time/temperature settings on the device.

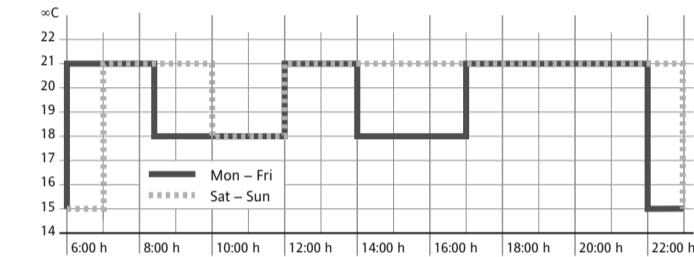
To select an other program see 9.2

The following diagrams are related to "Product programme type" = 7 days see table 2 option 1

Program 1 (home during the day)

Monday to Friday						
Events	1	2	3	4	5	6
Time	6:00	8:30	12:00	14:00	17:00	22:00
Temperature °C	21,0	18,0	21,0	18,0	21,0	15,0

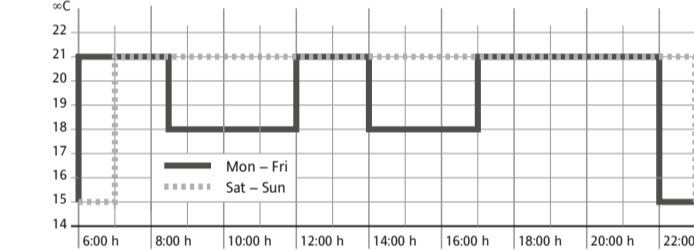
Saturday and Sunday						
Events	1	2	3	4	5	6
Time	7:00	10:00	12:00	14:00	17:00	23:00
Temperature °C	21,0	18,0	21,0	21,0	21,0	15,0



Program 2 (home for lunch and on weekends)

Monday to Friday						
Events	1	2	3	4	5	6
Time	6:00	8:30	12:00	14:00	17:00	22:00
Temperature °C	21,0	18,0	21,0	18,0	21,0	15,0

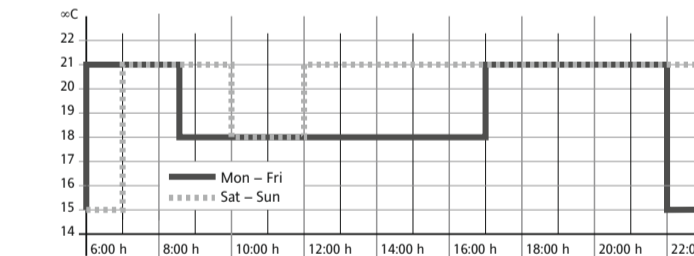
Saturday and Sunday						
Events	1	2	3	4	5	6
Time	7:00	10:00	12:00	14:00	17:00	23:00
Temperature °C	21,0	21,0	21,0	21,0	21,0	15,0



Program 3 (at work all day)

Monday to Friday						
Events	1	2	3	4	5	6
Time	6:00	8:30	12:00	14:00	17:00	22:00
Temperature °C	21,0	18,0	18,0	18,0	21,0	15,0

Saturday and Sunday						
Events	1	2	3	4	5	6
Time	7:00	10:00	12:00	14:00	17:00	23:00
Temperature °C	21,0	18,0	21,0	21,0	21,0	15,0



8. How to adjust the pre-set time/temperature program to suit personal needs

Select the day function by pressing the > button up to position "Day"
 Select the day by pressing the +/- button

Set the times for this day

Select the event (1...6) by pressing the > button
 Set the time by pressing the +/- button
 Select the temperature by pressing the > button
 Set the temperature by pressing the +/- button

The > button must be pressed to accept a setting.

If you wish to change other events or days, repeat the actions described above. To return to the auto mode, press the < button several times.

If operating mode "7 days" is chosen (see installer options, option 1), the days can be selected as blocks or individual days (Fig. 5 to 8).

The blocks are selected by repeatedly pressing the > button.

Table 1 User options (In AUTO Mode press the < and > buttons simultaneously for 3 seconds, USEr00 will be displayed)

User Option	Title	Min.	Max.	Factory setting
1	Clock Option	12	24	24
2	Pre-set programme selected	1	3	1
3	Number of events per day	2	6	6
4	Automatic Summer/Winter-Time change over	On	Off	On
5	Set clock/date			
6	Temperature offset	-5.0°C	+5.0°C	0
7	Restore pre-set programme	On	Off	Off
8	Access protection lock	Off	On	Off
9	Create Radio Link automatically	Off	On	Off
10	Create Radio Link manually	0	4094	actual
11	Relay ON/OFF (in the receiver)	Off	On	Off
12	Transmission test	Off	On	Off
13	Slave Eco limit	5.0 °C	< Comfort	16°C for heating / 24°C for cooling
14	Slave Comfort limit	> Set-back	32.0	20°C for heating / 20°C for cooling

Note: To facilitate programming, blocks of days with the same times/temperatures can be formed before starting.

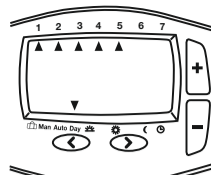


Fig. 5: Monday to Friday as one block (working days)

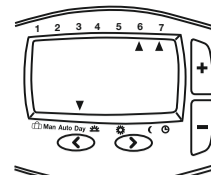


Fig. 6: Saturday and Sunday as one block (days off)

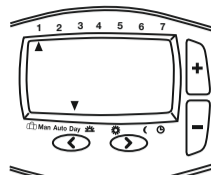


Fig. 7: Each day is individual day

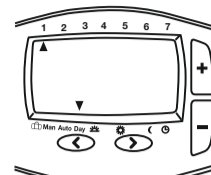


Fig. 8: Monday to Sunday as one block (all days)

9. How to change user options

The thermostat offers a number of options that can be changed by the user (see Table 1). To activate the menu, in AUTO Mode press the < and > buttons simultaneously for 3 seconds, USEr00 will be displayed.

Select an option by pressing the < or > button
 Change an option by pressing the +/- button

Press > to accept each change.
 Press < to cancel a setting without saving
 To exit the menu, press the < and > buttons simultaneously for 3 seconds.
 If no button is pressed within 2 minutes, the device will return to the auto mode.

9.1 How to change from 24h to 12h clock (option 1, table 1)

Shows the time as 24 hours or 12 hours

9.2 How to change to another pre-set program (option 2, table 1)

Selection of a pre-set program to be used for programming events (see 7.).

9.3 How to change the number of events per day (option 3, table 1)

2, 4 or 6 time/temperature events can be selected for all days according to individual need (unused events will be skipped). If there is no need for 6 events, choosing 4 makes programming easier.

9.4 How to switch on/off the automatic daylight savings time/standard time change (option 4, table 1)

You can select whether or not you want the time change to be carried out automatically. If it is not carried out automatically, the time has to be adjusted manually (see 9.5).

9.5 How to change the time, day, month and year (option 5 table 1)

The thermostat comes with a pre-set clock, that also automatically switches from daylight savings time to standard time.

There should be no need to change these settings. However, should the need arise, the settings can be changed in the following way.

Press button > until 5 will be displayed, dRRE can be read.
 Press button + Year is blinking, +/- button to change
 Press button > Month is blinking, +/- button to change
 Press button > Day is blinking, +/- button to change
 Press button > Time is blinking, +/- button to change

During setting date and time, a pointer to the ☉ Symbol will be visible

9.6 How to change the temperature display (option 6, table 1)

The temperature display can be adjusted to individual needs, e.g. 0:3 = +0,3°; -1:5 = -1,5°.

9.7 How to restore the built in time temperature programs (option 7, table 1)

Restores the active program to its original factory settings.

9.8 Access protection lock/child lock (option 8, table 1)

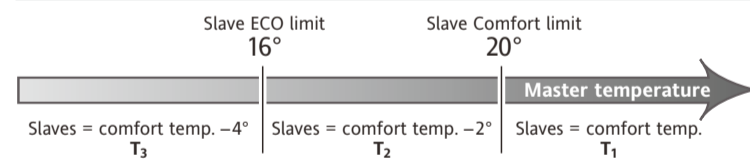
When this function is set to ON, all buttons will be locked. To switch off the protection lock, set this option to OFF.

9.9 Master/Slave (option 13, 14, table 1)

The INSTAT+ 868-r can be used as Master-thermostat; it is a time master. With the time Master, rooms controlled from simple transmitters INSTAT 868-r1 (slaves) will set back or set up its temperature according to the time info from the Master. The temperature limits can be set with option 13 and 14.

Note: If option 13 and 14 are set to the same value, then the slave rooms will only be controlled to its comfort temp. and comfort temp. -4°. The area comfort temp. -2° is not available.

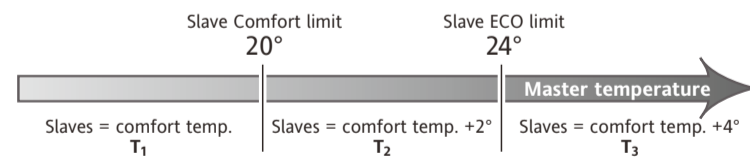
For Heating



As compare values, the lower temperature from the active program and (Auto, temporary override, Man and Holiday) will be used

E.g. Active program = 21°, Man = 12°
 12° will be used, the slave's rooms will set back the temp by 4°

For Cooling



As compare values, the higher temperature from the active program and (Auto, temporary override, Man and Holiday) will be used

E.g. Active program = 21°, Man = 25°
 25° will be used, the slave's rooms will set up the temp by 4° (the slaves need to be set to cooling mode)

Setting Slave ECO limit

press button > until option 13 is displayed
xx:x °C will be displayed; xx:x = actual value
press button +/- to change

Setting Slave low limit

press button > until option 14 is displayed
xx:x °C will be displayed; xx:x = actual value
press button +/- to change

10. How to switch off the thermostat

When switched off, the programmable thermostat no longer controls the room temperature and the room is not heated. The display will show OFF, and the buttons will not function.

In the installer options (see Installation Guide 3.2) you can select whether or not frost protection will be activated when the thermostat is in OFF state (heating if temperature falls below 5°C).

Switching OFF

Press button + and – simultaneously for 5 sec. -> OFF will be displayed

Switching ON

Press button + and – simultaneously for 5 sec. -> OFF disappears

II. Installation Guide

This thermostat can be used in all EU and EFTA countries.

The manufacturer herewith declares that the thermostat complies with the essential requirements of the R&TTE Directive 1999/5/EC and all other relevant regulations. The declaration of conformity can be downloaded from „www.funk868MHz.de“.



Note: The transmission frequency used in this control is used extensively in Europe, for similar applications. The transmitting power is very low. It is far below the power of a mobile telephone. Moreover, the transmitter is activated only every 10 minutes. The transmission quality is enhanced by employing special test procedures and repeating transmissions. Transmitter and receiver are tuned to each other by making use of the "learning mode".

1. Applications:

The electronic room thermostat *INSTAT+ 868-r* can be used for temperature control together with:

- Actuators of floor heating systems or radiators
- Oil and gas warm water heating
- Circulating pumps
- Heat pumps
- Electric radiators

An INSTAT 868-a.... radio receiver is required for operation.

2. Installation:

Installation location:

The device should be installed in a location in the room which:

- is easily accessible for operation
- is free from curtains, cupboards, shelves etc.
- enables free air circulation
- is free from direct sun light influence
- is free from draughts (e.g. opening of windows and doors)
- is not affected directly by heat sources
- is not located on an external wall
- is located approx. 1,5 m above floor level
- allows safe radio transmission
- is not in the vicinity of eg. a radio receiver, a television set or a radio transmitter
- is not in the vicinity of metal parts eg. metal doors, metal cupboards, mirrors or steel reinforced concrete
- if unsure, check radio transmission before installation (see receiver instructions, section "Radio range test"), look for suitable position if necessary.

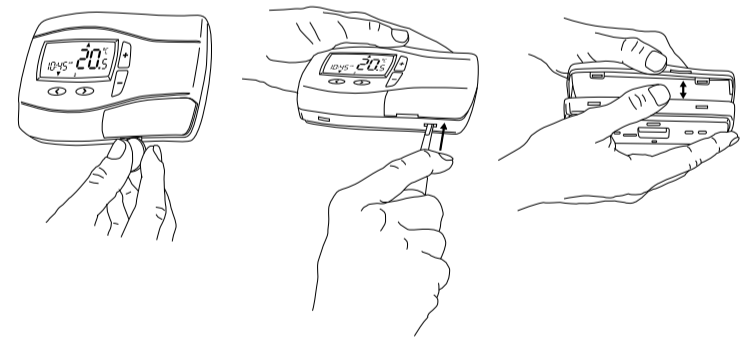
Note:

In some rare cases it may not be possible to establish a permanent radio link between the radio transmitter and the radio receiver. We therefore recommend to check the reliability of operation at the specific location.

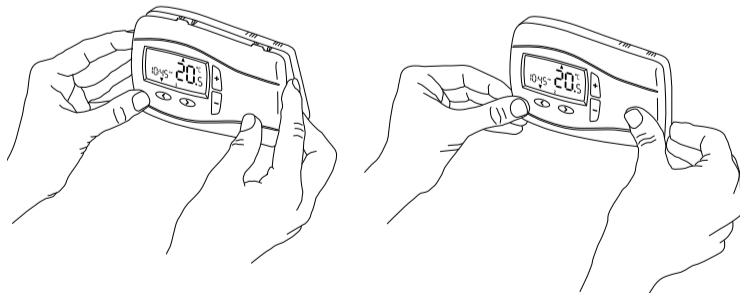
In order to establish longer transmission distances (up to 90 m) or in case of critical locations, the RF repeater INSTAT 868-rep can be used.

Installation of the thermostat directly onto the wall.

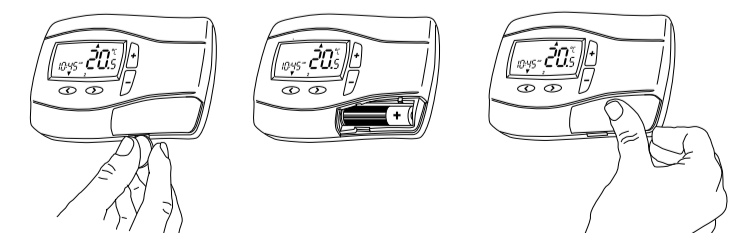
1. Remove battery cover using a coin, then remove batteries.
2. Remove the front cover using a flat screwdriver and separate from back plate.



3. Mount the back plate to a suitable location using suitable wall plugs and screws.
4. Replace the front cover by pushing it fully onto the back plate.



5. Install the 2 AA batteries provided.
6. Reattach the battery cover.



Once mounting has been carried out, the radio links must be established. see 2.1 oe 2.2

Then the thermostat is ready to work and will automatically start to control the room temperature according to the pre-set program 1 (refer to User Guide).

All important functions were pre-set in the factory. If you wish to change any of the settings, please refer to the options in the User Guide section 9.

2.1 Establish radio link address automatically (option 9, table 1)

With this option, a radio link between transmitter and receiver can be created

1. Activate "learning mode" on the receiver (see receiver instructions).
2. Activate "learning mode" on this transmitter as follows:
Activate USER-SETTINGS, see 9. on page before, and then:
 - a) press button > until option 9 is displayed.
 - b) press button + LErn will be displayed
press button > LErn is blinking, ON is visible; Learn-Mode is now active
When the connection has been created successfully, the indicator lamp on the receiver extinguishes (after ~1 minutes)
 - c) press button > on the transmitter to terminate Learn Mode
press buttons < and > simultaneously for 3 seconds in order to activate AUTO

Note: Activating learning mode will create a new address, all receivers linked to this transmitter need to be re-learned. The transmitter exits the learning mode after 10 minutes

2.2 Establish radio link, address manually (option 10, table 1)

Choose a unique number as address (room number) that is

not repeated throughout the whole building. Make a note of this number

1. Activate "learning mode" on the receiver (see receiver instructions).
2. Activate "learning mode" on this transmitter as follows:
Activate USER-SETTINGS, see 9. on page before, and then:
 - a) press button > until option 10 is displayed.
 - b) press button + xxxx = actual address will be displayed
press button +/- to change digit of address (max address = 4094)
press button > for the next digits; on last digit
press button > the address is blinking, ON is visible; Learn-Mode is now active
When the connection has been created successfully, the indicator lamp on the receiver extinguishes (after ~1 minutes)
 - c) press button > on the transmitter to terminate Learn Mode
press buttons < and > simultaneously in order to activate AUTO

When the connection has been created successfully, the indicator lamp on the receiver extinguishes (after ~1 minutes)

- c) press button > on the transmitter to terminate Learn Mode
press buttons < and > simultaneously in order to activate AUTO

See note at 2.1 c

2.3 Test the radio transmission See 2.4

Alternative 1: Adjust Temperature to 32°, the receiver channel will switch on
Adjust Temperature to 5°, the receiver channel will switch off

Alternative 2: Remove batteries for a few seconds after inserting, the output of the receiver's channel will flash twice.

2.4 Manually switching ON/OFF the receiver (option 11, table 1)

This function can be used to make some voltage measuring on receiver. The output remains active for 10 minutes.

To access this function, the USER-SETTINGS need to be activated, see 9. on page before, then:

- Press button > until option 11 is displayed
Press button + Receiver channel will switch ON
Press button – Receiver channel will switch OFF

This function will be terminated after 10 minutes after last key press.

2.5 Test the radio distance (option 12, table 1)

To access this function, the USER-SETTINGS need to be activated, see 9. on page before, then:

- press button > until option 12 is displayed
press button + ON will be displayed, now radio telegrams will be transmitted
Now follow the instructions in the receiver.

Cancel the function by pressing <

This function terminates after 5 minutes

Note: In the receiver there is also a description for "test the radio link" we recommend to use the one described here (this one will not affect the radio link)

3. Installer options

Attention: The settings should only be carried out by the installer, as settings may affect the functions and security of the heating system. List of Installer options see Table 2.

To activate the menu, in AUTO mode, press the < and + buttons simultaneously for 5 seconds
InSE00 will be displayed.

Select an option by pressing the < or > button
Change an option by pressing the +/- button

Press > to accept each change.
Press < to cancel a setting without saving

To exit the menu, press the < and + buttons simultaneously for 5 seconds.

If no button is pressed within 2 minutes, the thermostat will return to the auto mode.

3.1 Kind of program (option 1, table 2)

The operating mode of the thermostat is set via this function.

7 days (7d):
Different time/temperature settings can be chosen for each day individually.

5/2 days (5:2):
Different time/temperature settings can be chosen for the weekdays (Monday to Friday) and the weekend (Saturday and Sunday) in this mode.

24 hours (24h):
The same time/temperature settings are used for all days of the week in this mode.

3.2 Frost protection (option 2, table 2)

The frost protection of the thermostat can be activated via this option.

Frost protection will switch on the heating if the room temperature falls to 5°C and will then control the temperature at 7°C see 10.

Frost protection is active in OFF-mode only.

3.3 Control algorithm PWM or ON/OFF (option 3, table 2)

press button +/- to change
PI d = PWM
ON:OFF = ON/OFF

PWM for floor heating or radiator heating
ON/OFF for boiler control or special applications

3.4 Low and high limit set points (option 4, 5, table 2)

These limits can be used to prevent temperatures from being set too high or too low. The set point default values are 32°C (high limit) and 5°C (low limit).

3.5 Optimum start (option 6, table 2)

If this function is activated, the thermostat will automatically calculate the warm up time for the heating system in order to achieve the desired temperature for each event.

This function is a major energy saving factor.

Note: This function is only possible in the AUTO mode.

After commissioning, it takes a couple of days for the thermostat to gather enough information to correctly calculate this function.

3.6 Heating/cooling (option 7, table 2)

Use this function to select whether the thermostat is used exclusively for either heating or cooling applications.

HEATING: The receiver will switch on when the temperature falls below the set point.
COOLING: The receiver will switch on when the temperature rises above the set point.

Note: The same time/temperature events will be used as in heating

3.7 Valve protection (option 9, table 2)

If valve protection is selected, the receiver's relay will be switched on once a day at 10:00 h.

This function is designed to prevent the valves and pumps from seizing during the summer months.

For electric heating systems or in cases where seizing' is not expected, this feature should be switched off.

The valve protection time can be set here between OFF and 1...5 minutes

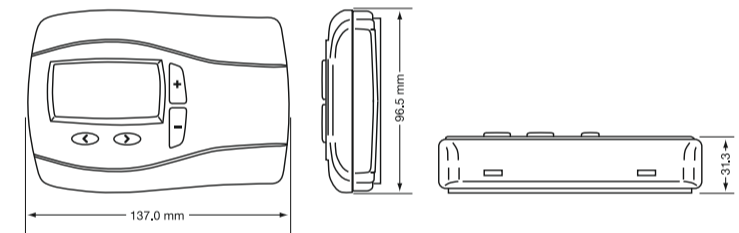
3.8 Master Reset (option 10, table 2)

Restores all settings to original factory settings, see table 2

4. Technical data

Order Type	INSTAT+ 868-r
Supply voltage	2 x AA 1,5V alkaline batteries
Battery life	2 years (typically)
Temperature setting range	5 °C to 32 °C
Temperature resolution	0.1 °C
Carrier frequency	868,95 MHz
Transmission interval	<10 minutes (radio data transmission 3 times)
Antenna	internal
Typical transmission range	100 m free air or 1 ceiling or 2 walls respectively
Output signal	Pulse Width Modulation (PWM) or ON/OFF adjustable
Timing resolution	1 Minute
Accuracy of clock	< 4 minutes / year
Ambient temperature	Operating 0 °C to 40 °C Storage -20 °C to 85 °C
Ambient humidity	Operating 45% to 93% (without condensation) Storage 45% to 93% (without condensation)
Degree of pollution	2
Degree of protection	IP 30 / insulated (moisture condensation not permitted)
Brinell test temperature	75 °C
Software class	A
Weight (with batteries)	~ 200 g

Dimensions



5. Troubleshooting

1. It is getting warm too late

- a. Are clock and program events set correctly?
- b. Is the Optimum Start switched on? (see 3.5)
- c. Did the thermostat have enough time (some days) to determine the room data?
- d. Was the radio link established properly and is it still active? see 2.1
If the receiver lamp is blinking, the transmission is interrupted. See receiver manual to correct

2. The thermostat does not accept any changes

Is the access protection lock switched on? (see 9.8)

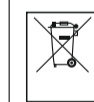
3. Setting temperature values is limited

Are set-points low limit or high limit activated? (option 4+5, Table 2)

4. E1 is displayed

This indicates a sensor fault

6. Battery handling



Batteries, rechargeable or not, should not be disposed of into ordinary household waste. Instead, they must be recycled properly to protect the environment and cut down the waste of precious resources. Your local waste management authority can supply details concerning the proper disposal of batteries.

In compliance with the EU Directive 2006/66/EC, the button cell battery located on the printed circuit board inside this product, can be removed at the end of the product life, by professional personnel only.

Table 2 Installer Options

Installer-Option	Title	Min.			Max.			Factory setting
		24hr	5/2days	7days	Off	On	7days	
1	Product programme type	24hr	5/2days	7days	Off	On	7 days	
2	Frost protection	Off	On		Off	On	On	
3	Temperature control algorithm	PWM (PI d)	ON/OFF		PWM (PI d)	ON/OFF	PWM	
4	Set point low limit	5 °C	High limit		5 °C	High limit	5 °C	
5	Set point high limit	Low limit	32 °C		Low limit	32 °C	32 °C	
6	Optimum start	Off	On		Off	On	On	
7	Heating/Cooling	Heat	Cool		Heat	Cool	Heat	
8	not used							
9	Valve protection	Off	1...5 minutes		Off	1...5 minutes	3 minutes	
10	Restore all Factory settings	On	Off		On	Off	Off	