



U 468 931 003 277-2

Installation and Operating Instructions Radio receiver

IN STAT 868-a1A



Caution!

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 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 3 min. 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

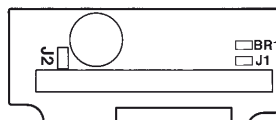
To demonstrate the radio range, see section 3.1.3 "Testing the radio link range". If necessary, a lamp can be connected to the output.

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
Blinking; Duration varies depending on type of fault
- Faults...
- 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 (Master/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 mounting 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.

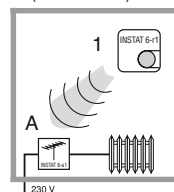


Fig. 2

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

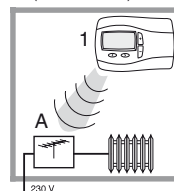
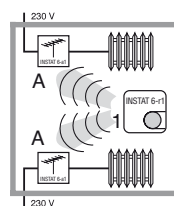


Fig. 3


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  button is pressed:

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

After releasing the  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

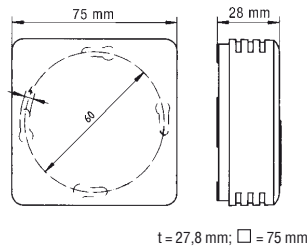
Model No.	INSTAT 868-a1A
EDP No.	0536 30...
Operating voltage	230 V AC (195...253 V) 50/60 Hz
Load circuit:	Relay, 1 NO contact, volt-free*
24 ... 250 V AC	16 A max. $\cos \varphi = 1$ 2 A max. $\cos \varphi = 0,6$
Number of actuators (3 W electrothermal)	
230 V AC	20 max.
AC 24 V	8 max.
Power consumption	Approx. 12 VA
Operating temperature	0...+40 °C
Storage temperature	-20...60 °C
Antenna	Internal
Push-button	
for programming	1
for reset	1
Signal lamp	1
Protection class of housing	IP 30 /insulated (Moisture condensation not permitted)
Class of protection	II** (see Caution page 1)
Degree of pollution	2
Software Class	A
Rated impulse voltage	4 kV
Brinell test temperature	75 °C
Voltage and current for EMC emitted interference testing	250 V, 0,1 A
Weight	Approx. 100 g

Note:

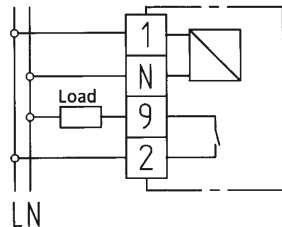
*) The volt-free contact of this mains-operated radio receiver do not ensure the requirement for the use of safety extra-low voltage (SELV).

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

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 off 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  button + "Reset" button simultaneously• After that, release "Reset" button and then the  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  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  button - output switches ON as long as  button is pressed• Release  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		<ul style="list-style-type: none">• 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