

# JUMO Wtrans B

Programmable head transmitter  
with wireless data transmission



Operating Manual



70706000T90Z001K000

V1.01/EN/00536757



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## 1.1 Safety information

### General

This manual contains information that must be observed in the interest of your own safety and to avoid material damage. This information is supported by symbols which are used in this manual as indicated.

Please read this manual before starting up the device. Store this manual in a place that is accessible to all users at all times.

If difficulties occur during startup, please do not intervene in any way that could jeopardize your warranty rights!

### Warning symbols



#### CAUTION!

This symbol in connection with the signal word indicates that **material damage or data loss** will occur if the respective precautionary measures are not taken.

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### Note symbols



#### NOTE!

This symbol refers to **important information** about the product, its handling, or additional benefits.

---



#### REFERENCE!

This symbol refers to **additional information** in other sections, chapters, or other manuals.

---

# 1 Introduction

## 1.2 Description

The Wtrans B head transmitter with wireless data transmission is used in conjunction with a Wtrans receiver for stationary or mobile acquisition of temperatures with RTD temperature probes or thermocouples. Alternatively, resistances of up to 10 kΩ or voltages of up to 50 mV and up to 20 mA using external shunt currents can be measured. Customer-specific linearization possible.

The measured values are transmitted wirelessly to the receiver of the Wtrans measuring system. The measured values are displayed on the receiver and are available in digital format on the RS485 interface and as analog outputs. Alternatively, different alarms can be signaled with two relay outputs.

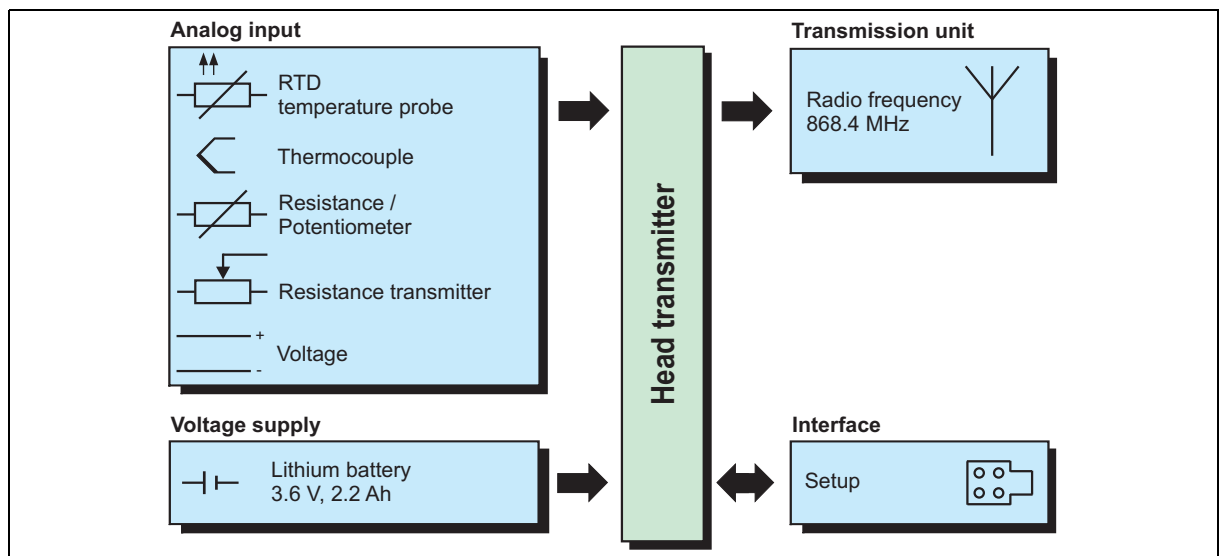
This head transmitter, designed for industrial applications, comprises a transmitter with integrated transmission unit and an antenna-battery housing. The transmitter is suitable for mounting in form B terminal heads and has an ambient temperature range of -30 to +85°C. Installation in customer-specific terminal heads is also possible. The antenna-battery housing is connected to the terminal head with a screw connection (M20 × 1.5).

The radio frequency of the Wtrans measuring system is 868.4 MHz. This frequency is largely impervious to external interference and allows data to be transmitted even in harsh industrial environments. When using the antenna holder for wall mounting with the 3 m antenna cable for the receiver, the open air range is 300 m.

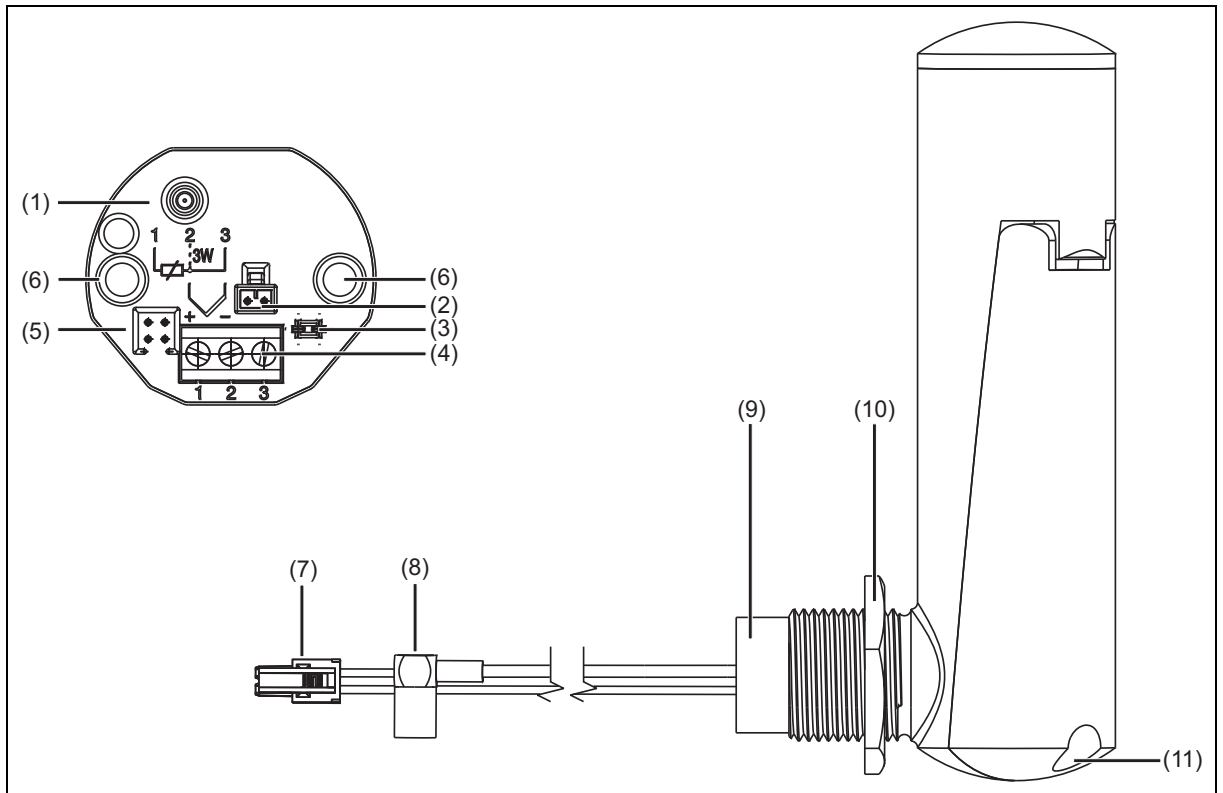
A 3.6 V, 2.2 Ah (size AA) lithium battery is used for the head transmitter voltage supply.

A setup program is available as an accessory for easy configuration and parameterization of the head transmitter and the Wtrans receiver on a laptop/PC. The OnlineChart function can be used optionally to record the measured values on a PC.

## 1.3 Block diagram



## 1.4 Connection elements and connectors

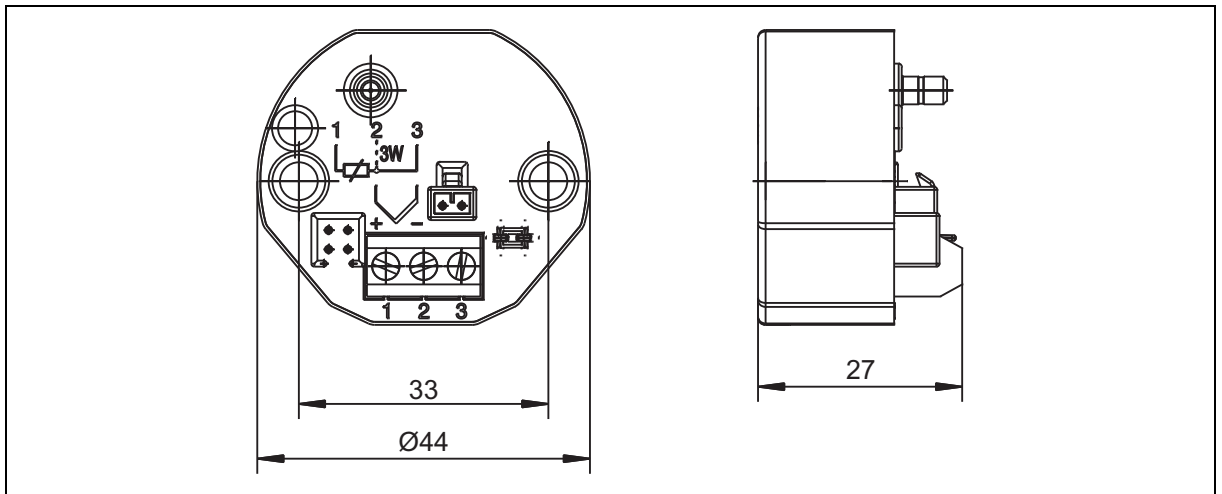


- (1) SMB antenna connector (antenna connection)
- (2) Voltage supply connector (battery connection)
- (3) Cable guide for antenna cable and voltage supply
- (4) Sensor connection
- (5) Setup connector
- (6) Fastening holes for installation in the terminal head, form B
- (7) Voltage supply socket (battery connection)
- (8) SMB antenna socket (antenna connection)
- (9) Seal
- (10) Locknut
- (11) Battery lid screw

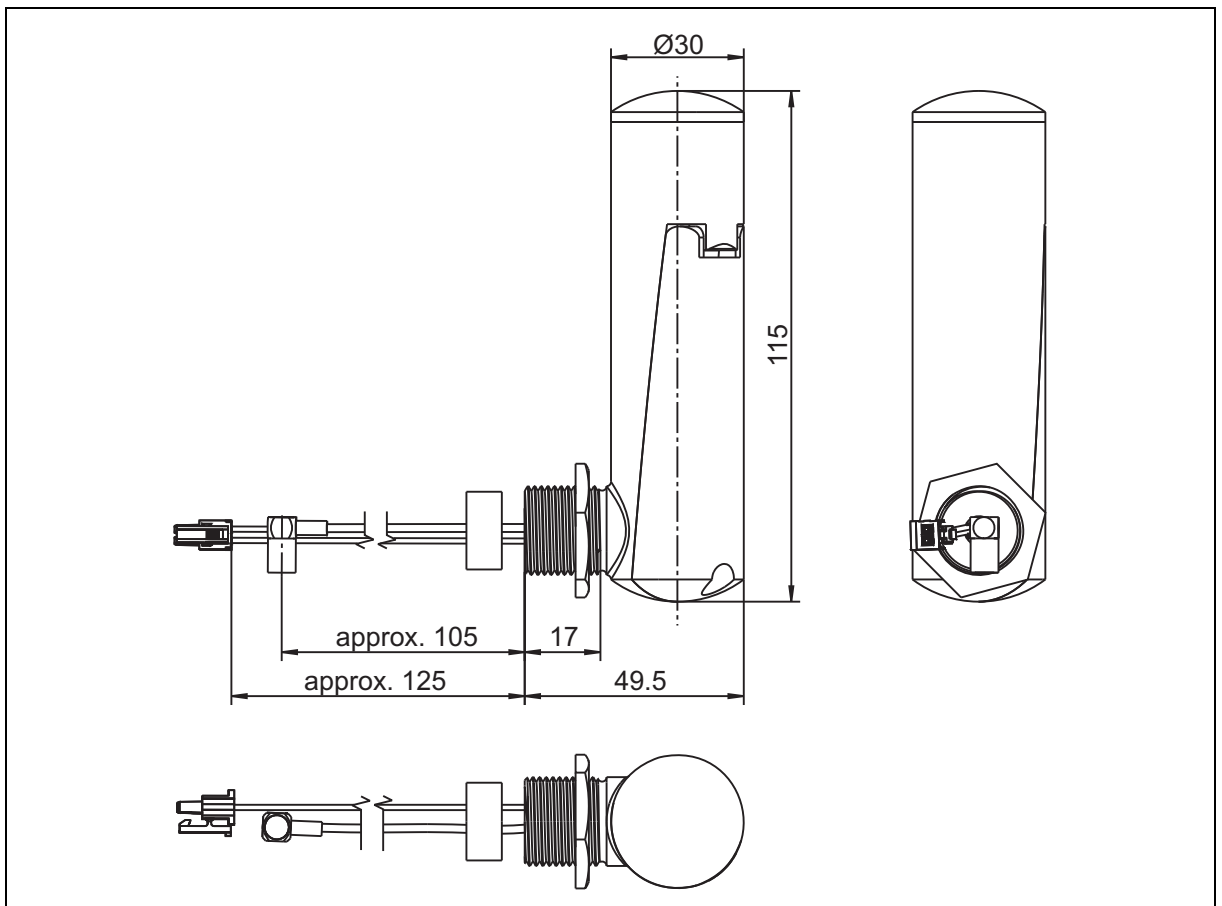
# 1 Introduction

## 1.5 Dimensions

### 1.5.1 Transmitter



### 1.5.2 Antenna-battery housing





## 1.6 Declaration of conformity



### **NOTE!**

Hereby JUMO GmbH & Co. KG declares that the radio equipment type Wtrans is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following Internet address: [www.jumo.net](http://www.jumo.net)

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# 1 Introduction

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## 2 Identifying the device version

### 2.1 Nameplate


#### Position

The rating plate is glued laterally to the transmitter.

The factory set transmitter ID is additionally stated on a sign fitted on top of the transmitter.

#### Contents

The nameplate contains important information. This includes:

Description	Designation on the nameplate	Example
Device type	Typ	707060/8-10/000
Part no.	TN	00XXXXXX
Fabrication number	F-Nr	0070033801216220006
Voltage supply		DC 3.6 V
Transmitter detection (transmitter ID)		123
Radio frequency		868.4 MHz

#### Device type (Typ)

Compare the specifications on the nameplate with your order documents. The supplied device version can be identified using the order code in chapter 2.2 "Order details", page 12.

#### Part no. (TN)

The part no. uniquely identifies an article in the catalog. It is important for communication between the customer and the sales department.

#### Fabrication number (F-Nr)

Among other things, the fabrication number indicates the date of manufacture (year/calendar week).

#### Date of manufacture

Example: F-Nr = 00700338012**1622**0006

The characters in question are digits 12, 13, 14, and 15 (from the left).

The device was produced in the 22nd calendar week of 2016.

#### Transmitter detection (transmitter ID)

The transmitter ID is factory set. It must be entered and activated on the receiver to establish communication between the transmitter and receiver. The transmitter ID can be changed to customer specific requirements using the setup program. The user must exclude that several transmitter with identical transmitter IDs are active.

#### Radio frequency

The radio frequency is the frequency at which the transmitter transmits data to the receiver. In the 868 MHz band (Europe), transmission is at 868.4 MHz.

## 2 Identifying the device version

### 2.2 Order details

<b>(1) Basic type</b>	
707060	JUMO Wtrans B Programmable head transmitter with wireless data transmission <sup>a</sup>
<b>(2) Input</b>	
8	Standard with default settings
9	Customer-specific programming according to specifications <sup>b</sup>
<b>(3) Output (transmitter)</b>	
10	Radio frequency 868.4 MHz (Europe)
<b>(4) Extra code</b>	
000	None

<sup>a</sup> The terminal head form B is not included in the scope of delivery.

<sup>b</sup> Please specify the transmitter ID, transmission interval, measuring range and the probe type in plain text.

	<b>(1)</b>		<b>(2)</b>		<b>(3)</b>		<b>(4)</b>
<b>Order code</b>		/		-		/	
<b>Order example</b>	707060	/	8	-	10	/	000

### 2.3 Scope of delivery

1 head transmitter in the version ordered, without terminal head, form B, including fastening material (2 screws and 2 pressure springs)
1 antenna-battery housing with plug connections protected against polarity reversal
1 lithium battery, 3.6 V, 2.2 Ah (size AA), inserted in the antenna-battery housing, ready for use
1 operating manual

### 2.4 Accessories

Description	Part no.
Lithium battery, 3.6 V, 2.2 Ah (size AA)	00547559
PC interface with USB/TTL converter, adapter (socket), and adapter (pins)	00456352
Setup program on CD-ROM, multilingual	00488887
Setup program including OnlineChart on CD-ROM, multilingual	00549067
OnlineChart activation	00549188
Precision resistor, 2.5 Ω / 0.1% (shunt)	00555645

### 3.1 Inserting/changing the battery

**CAUTION!**

**Make sure that pollutants, moisture, and steam cannot enter the device.**

The device could be destroyed.

- ▶ When inserting/changing the lithium battery, make sure that the device is not exposed to contaminants, moisture, or steam.
- 

**CAUTION!**

**The transmitter will not function if the poles are incorrectly connected.**

The transmitter's battery and electronics could be damaged.

- ▶ Make sure that the battery poles are correctly connected.
- 

**CAUTION!**

**Incorrect batteries put safety at risk.**

The device could be destroyed if incorrect batteries are used.

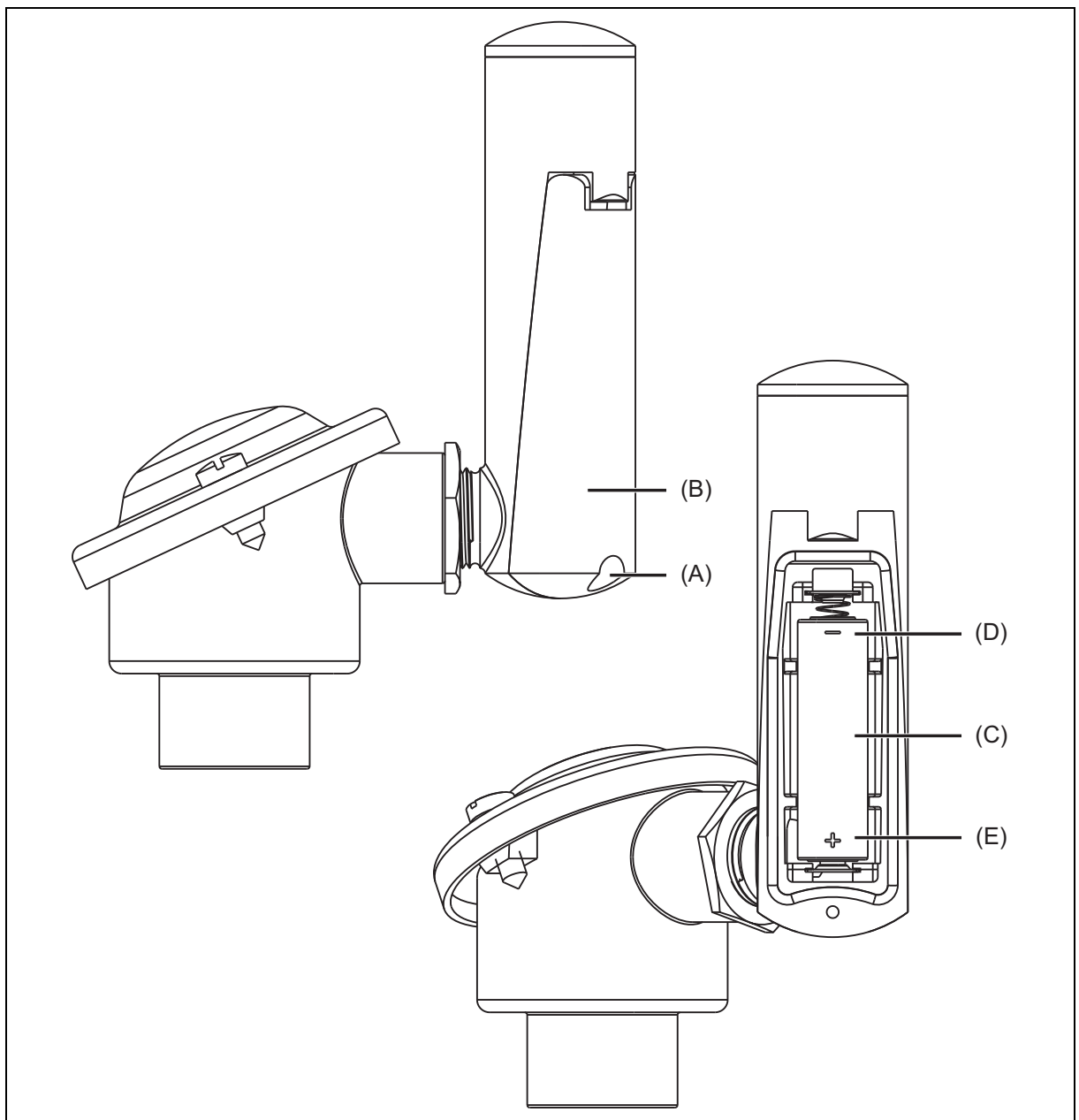
- ▶ Only use the lithium battery that is available as an accessory.
- 

The voltage supply to the transmitter is via the supplied 3.6 V, 2.2 Ah lithium battery inserted in the antenna-battery housing ready for use.

Battery service life depends on the set transmission interval and the ambient temperature: approx. 1 year with the factory-set values (transmission interval 15 s) and room temperature.

### 3 Preparing the transmitter

If the battery was removed or if it must be replaced, proceed as follows:



1. Undo the battery lid screw (A) on the antenna-battery housing and open the housing lid (B).
2. Press on the battery in the area of the minus pole (D) to remove the battery (C).
3. When inserting a battery, always insert the minus pole (D) side first followed by the plus pole (E).
4. Close the housing lid (B) again and ensure the correct seal position.
5. Retighten the battery lid screw (A).

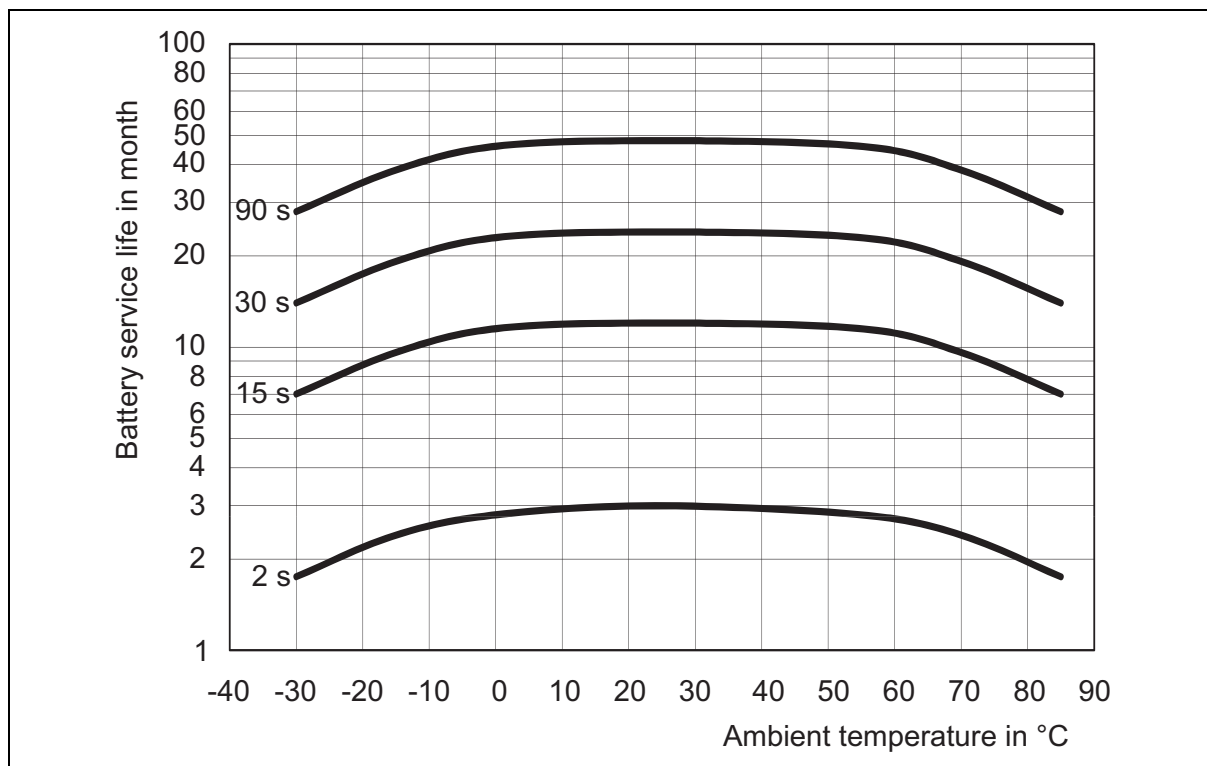
## 3 Preparing the transmitter

### 3.2 Safety information concerning lithium batteries

⇒ <http://battery.jumo.info>

### 3.3 Battery operating life

The battery service life, depending on the transmission interval (2 s, 15 s, 30 s, 90 s) and the ambient temperature, are shown in the following figure.



### 3.4 Disposal of lithium batteries

Please dispose of all batteries according to the Life-Cycle Resource Management and Waste Act and the national regulations.

Insulate the contacts of lithium batteries not completely discharged. Disposal of batteries together with domestic waste is expressly prohibited. Batteries can be deposited at communal waste collection points or the local retailers.

### 3 Preparing the transmitter

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## 4.1 General information about wireless transmission

Wireless signals are electromagnetic waves, the signal of which weakens during travel from the transmitter to the receiver (this is referred to as path attenuation). The field strength drops inversely proportionally to the square of the distance between the transmitter and receiver.

In addition to this natural range restriction, a reduced range may also be caused by the following:

- Reinforced concrete walls, metallic objects and surfaces, heat insulation, or thermal protection windows with a vapor-deposited metal layer reflect and absorb electromagnetic waves, meaning a dead spot is formed behind them.
- Metal tubes, chains, etc. on the transmitter housing; therefore, do not fasten any metallic objects to the transmitter housing.
- Insufficient spacing between several transmitters; therefore, ensure a minimum spacing of 20 cm.
- The antenna is installed at an insufficient height; therefore, install as high as possible above the ground and ensure there is a line of sight between the transmitter and receiver.

The following values are reference values relating to permeability for radio signals:

Material	Permeability
Wood, plaster, glass (uncoated)	90 to 100 %
Brickwork, press boards	65 to 95 %
Reinforced concrete	10 to 90 %
Metal, aluminum lamination	0 to 10 %

When using the antenna holder for wall mounting for the receiver, the free-field range between the transmitter and the receiver is 300 m. Optimum reception is achieved when a line of sight can be established between the transmitter and the receiver.

If the receiver is mounted in a control cabinet, behind concrete walls, or in the immediate vicinity of concrete ceilings, the antenna (vertical) with antenna holder for wall mounting and the appropriate antenna cable must be used on the receiver as a mandatory requirement.

# 4 Transmission range

## 4.2 Possible impairment of radio transmission

### Collisions in case of too many transmitters

When using a large number of transmitters, do not select a transmission interval that is too low, otherwise the radio channel will be unnecessarily occupied. A transmission interval that is too low leads to a very high data volume on the selected frequency, which can lead to collisions with other transmitters. The collisions can cause datagrams to be destroyed during wireless transmission.

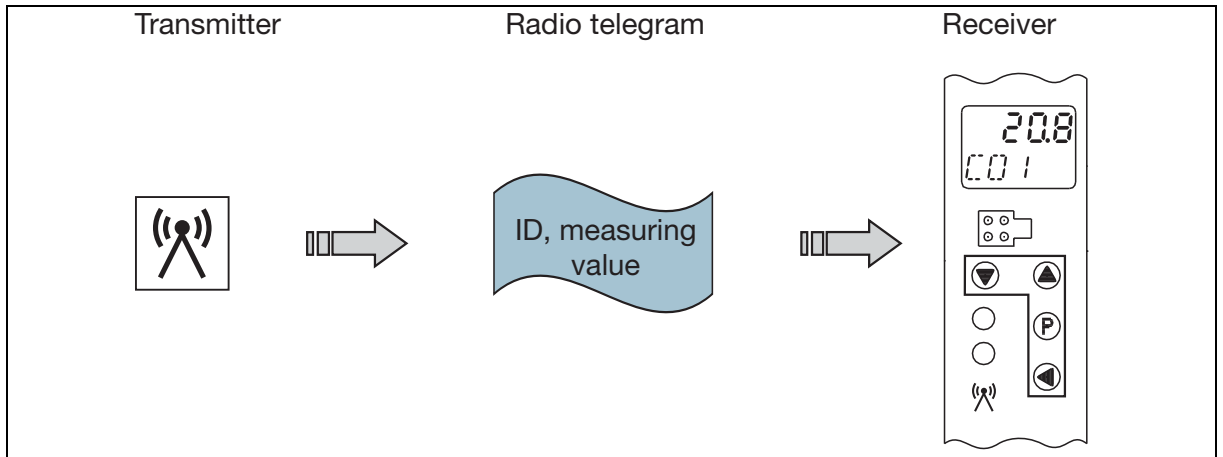


Fig. 4-1 The datagrams of a transmitter reach the receiver without collisions

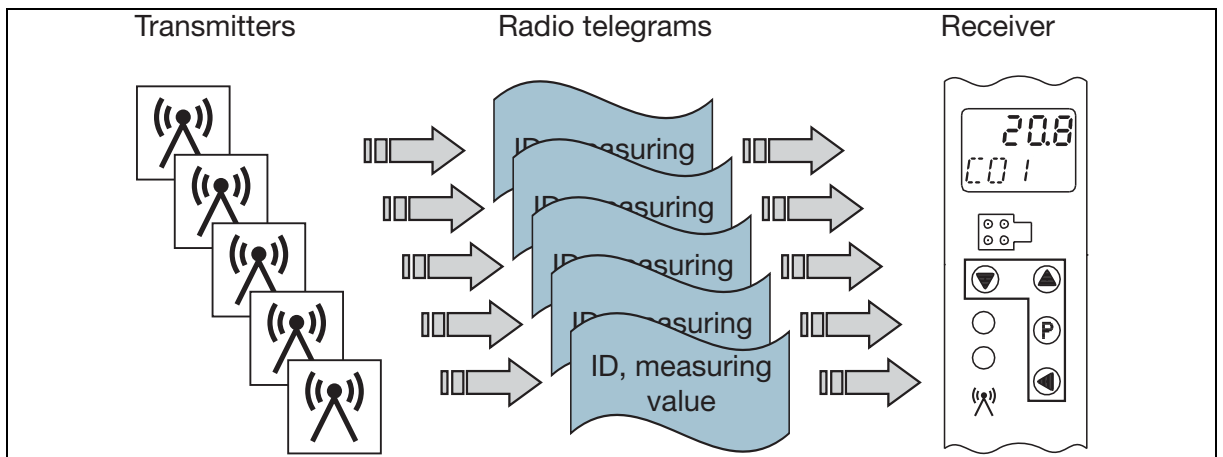


Fig. 4-2 The datagrams of several transmitters can collide

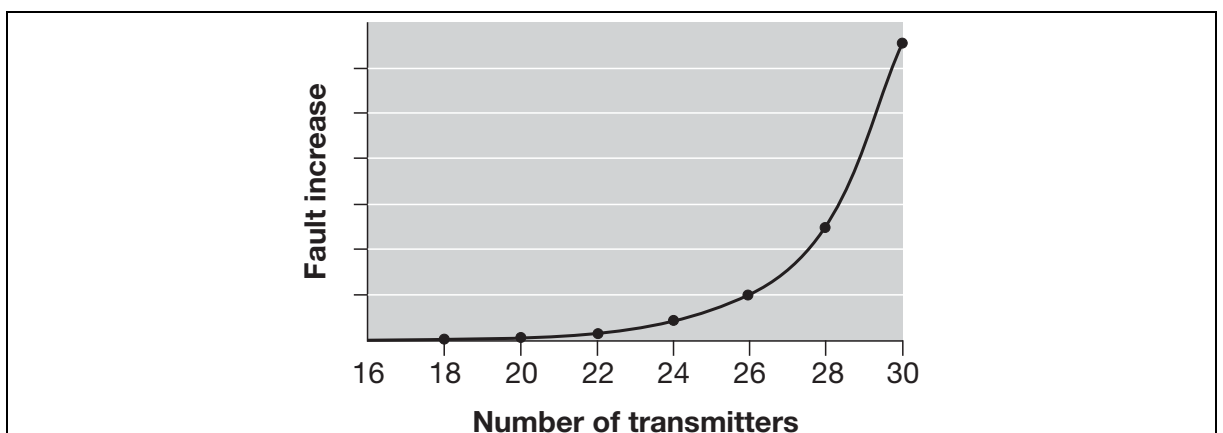


Fig. 4-3 Collisions depending on the number of transmitters with a transmission interval of 1 s

As you can see in Fig. 4-3 the error curve increases sharply once there are 24 transmitters.

## 4 Transmission range

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For this reason, we recommend using a maximum of 16 transmitters for the smallest transmission interval of 1 s. For the factory setting of 15 s, a considerably larger number of transmitters can be used.

### Estimating the maximum number of transmitters

If more than the recommended 16 transmitters are to be used with a transmission interval of 1 s, select a higher transmission interval to prevent an increased error quota.

Example:

16 transmitters with a transmission interval of 1 s = 32 transmitters with a transmission interval of 2 s

When the number of transmitters is to be increased additionally, the following calculation results in the next example:

Example:

16 transmitters with a transmission interval of 1 s = 48 transmitters with a transmission interval of 3 s (in theory)

However, from a transmission interval of  $\geq 3$  s, the datagram is transmitted twice. This means the number of transmitters that can be used is halved.

16 transmitters with a transmission interval of 1 s = 24 transmitters with a transmission interval of 3 s (effective)

The same behavior occurs with a transmission interval of  $\geq 60$  s. As of this transmission interval the datagram is transmitted three times.

### External transmitters

The 868-MHz band can also be used freely by other devices. External transmitters can transmit on the same frequency. If, for example, the transmitter and an external transmitter transmit their wireless datagrams at the same time, the datagram will be destroyed. No error is detected because the transmitters cannot check their own transmission while transmitting.

### Electrical devices

In a harsh industrial environment, wireless datagrams can be destroyed by such things as frequency converters, electrical welding equipment, poorly shielded PCs, audio/video devices, electronic transformers or electronic ballasts, etc.

### Error fade-out

Lost datagrams (caused either by external interference sources or by collisions when using a large number of transmitters) can be ignored on the receiving side by the wireless timeout parameter and do not cause error messages. As a result, the last received value is retained for 2 to 10 transmission intervals; the wireless timeout alarm is only activated then (indicated by "----") and the failure information is signaled to the receiver's analog outputs.

#### NOTE!



In the event of collisions caused by an excessive number of transmitters, observe and, if necessary, correct the factors "number of transmitters", "transmission intervals" and, on the receiver, "radio transmission timeout".

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## 4 Transmission range

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### 5.1 Information about fastening, mounting, and arrangement



**NOTE!**

Install the antenna-battery housing vertically to the top and, if possible, with free view to the receiver antenna.

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**NOTE!**

Never cover or coat the antenna-battery housing with metallic objects. Otherwise, the transmitter range is impaired.

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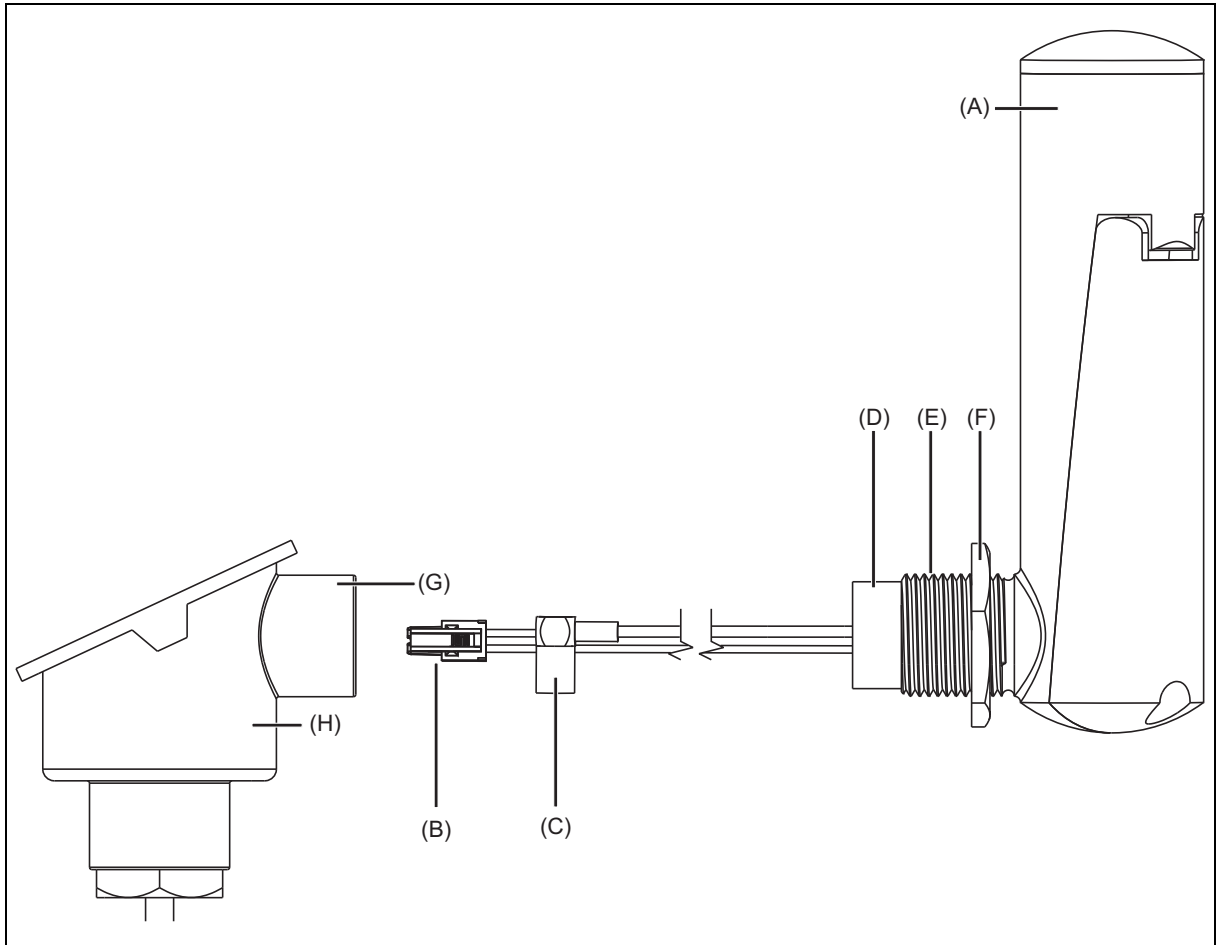
**NOTE!**

For optimum transmitter function ensure a minimum spacing of 200 mm between the transmitters.

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# 5 Mounting

## 5.2 Installing the antenna-battery housing



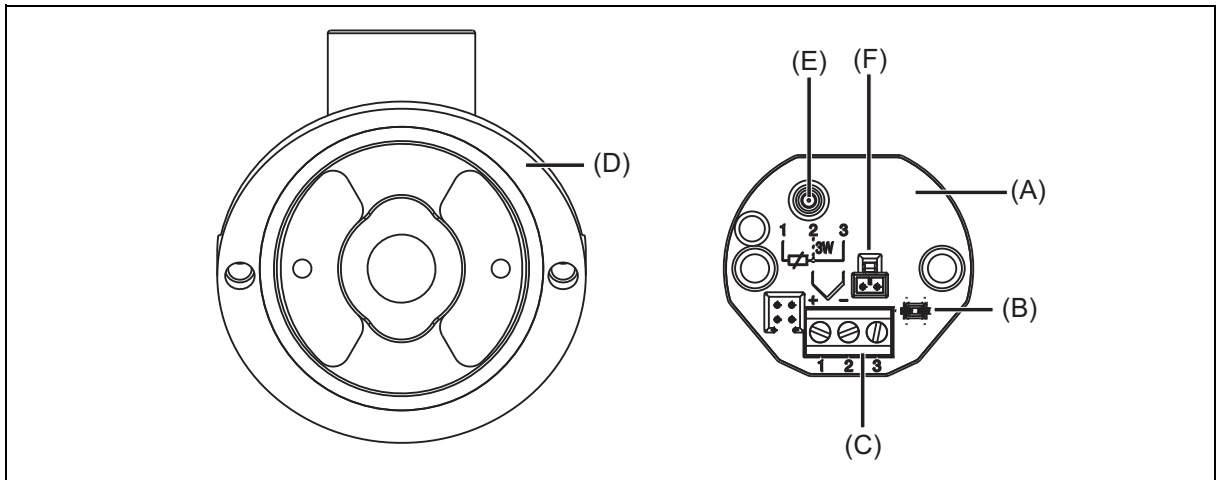
Proceed as follows to install the antenna-battery housing:

1. Route the voltage supply socket (B) and SMB antenna socket (C) of the antenna-battery housing (A) through the opening (G) of the connection head (H).
2. Push seal (D) into the opening (G).
3. Screw the thread (E) into the opening (G). Turn the antenna-battery housing until it makes contact with the seal (D). To ensure leak-tightness, continue turning for at least 1/2 to max. 1 1/2 revolutions.

For an optimum transmission performance, the antenna-battery housing should be positioned vertically (to the top) independent of the connection head position. Ensure that the cables also turn when the sockets (B) and (C) are turned while installing the antenna-battery housing. Avoid twisting the cables.

4. Tighten the locknut (F) and secure the antenna-battery housing against loosening.

### 5.3 Installing the transmitter



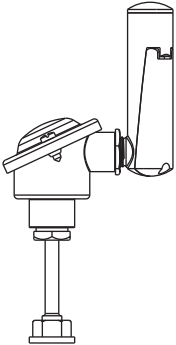
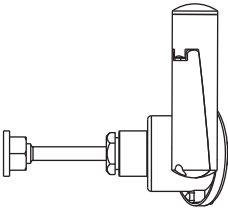
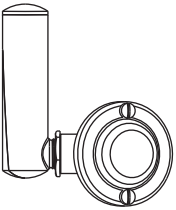
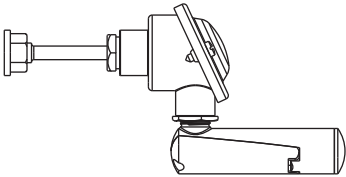
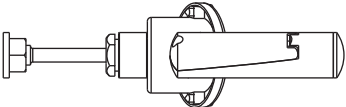
Proceed as follows to install the transmitter:

1. Let all connection cables hang out of the terminal head.
2. Insert the transmitter (A) into the terminal head (D).
3. Fit the transmitter (A) in the terminal head (D) using the screws and pressure springs (included in the delivery scope).
4. Connect the sensor lines to the connector (C) as per connection diagram.
5. Route the antenna and voltage supply connection clockwise with a large radius.
6. Connect the SMB antenna socket to the connector (E) without tensile stress.
7. Connect the voltage supply socket to the connector (F) without tensile stress.
8. Insert the antenna and voltage supply connection into the cable guide (B).
9. Fit the lid of the connection head.

# 5 Mounting

## 5.4 Aligning the antenna

The recommended and unfavorable antenna alignment possibilities are shown in the following figure. The best possible reception is ensured when the recommended alignment possibilities are used.

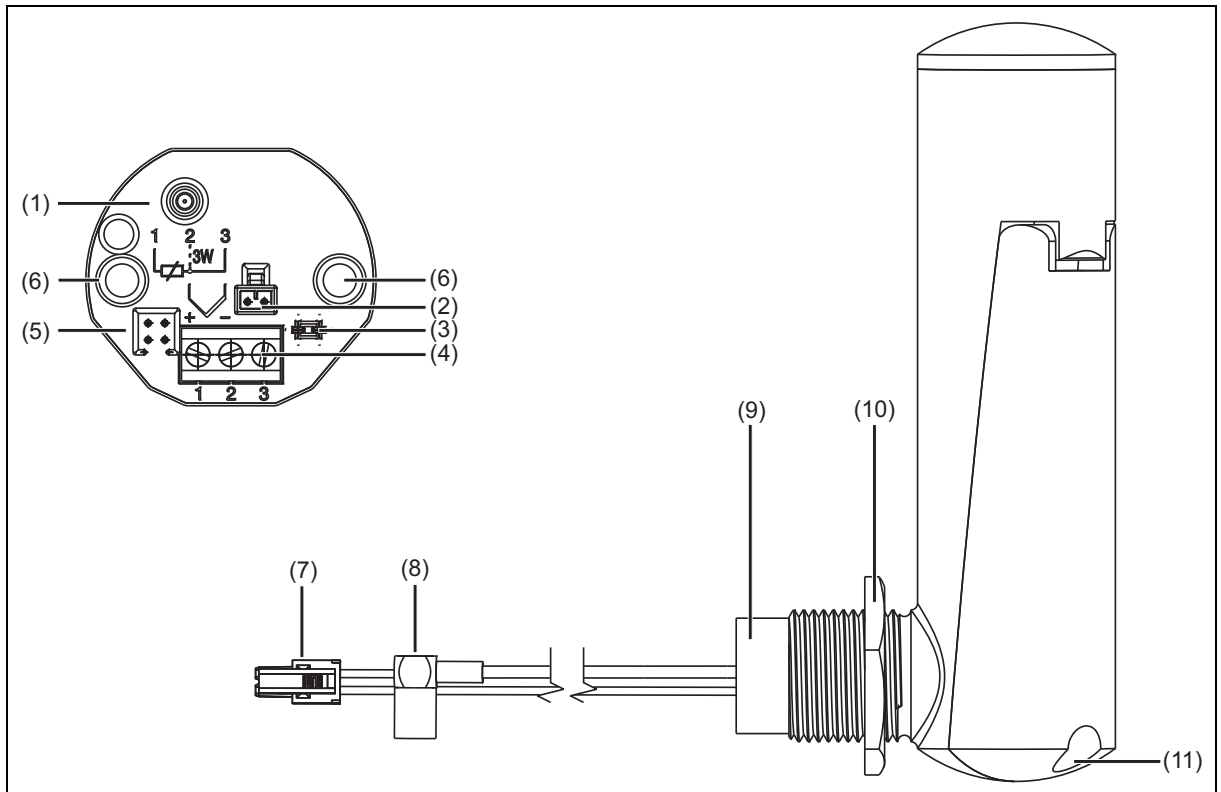
	<p>Recommended installation: Connection head vertical and antenna-battery housing vertical to the top</p>
	<p>Recommended installation: Connection head horizontal and antenna-battery housing vertical to the top</p>
	<p>Recommended installation: Connection head horizontal and antenna-battery housing vertical to the top</p>
	<p>Unfavorable installation: Never install the antenna-battery housing horizontally.</p>
	<p>Unfavorable installation: Never install the antenna-battery case horizontally.</p>



## 6.1 Safety information

- The electrical connection must only be carried out by qualified personnel.
- When installing and operating the transmitter ensure that no electro-static charging can take place.
- The transmitter is not suitable for installation and application areas with an explosion hazard.
- Never expose the transmitter to magnetic or electrical fields (e.g. caused by transformers, walkie-talkies, or electrostatic discharge).
- An electrical connection that deviates from the connection diagram can destroy the transmitter.

## 6.2 Connection elements and connectors




- (1) SMB antenna connector (antenna connection)
- (2) Voltage supply connector (battery connection)
- (3) Cable guide for antenna cable and voltage supply
- (4) Sensor connection
- (5) Setup connector
- (6) Fastening holes for installation in the terminal head, form B
- (7) Voltage supply socket (battery connection)
- (8) SMB antenna socket (antenna connection)
- (9) Seal
- (10) Locknut
- (11) Battery lid screw

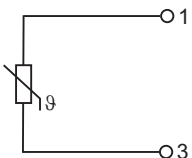
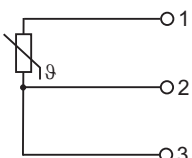
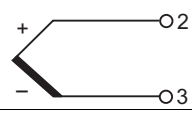
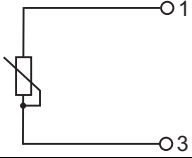
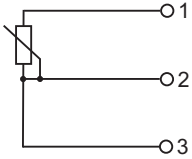
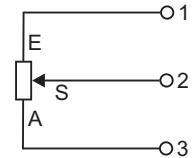
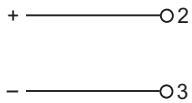
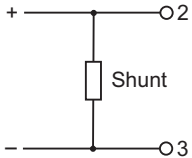
## 6 Electrical connection

### 6.3 Connection diagram

#### 6.3.1 Voltage supply

Connection	Con- nector	Terminals	Symbol and terminal designation
Lithium battery, DC 3.6 V	2		


#### 6.3.2 Analog input

Connection	Con- nector	Terminals	Symbol and terminal designation
RTD temperature probe 2-wire circuit	4	1 and 3	
RTD temperature probe 3-wire circuit	4	1 to 3	
Thermocouple	4	2 and 3	
Resistance/potentiometer 2-wire circuit	4	1 and 3	
Resistance/potentiometer 3-wire circuit	4	1 to 3	
Resistance transmitter A = Start S = Slider E = End	4	1 to 3	
Voltage (0 to 50 mV)	4	2 and 3	
Current (0 to 20 mA) Measuring range: Voltage (0 to 50 mV) with shunt 2.5 Ω (see accessories)	4	2 and 3	


## 6 Electrical connection

---

### 6.3.3 Output

Connection	Con- nector	Terminals	Symbol and terminal designation
Antenna connector	1		

### 6.3.4 Interface

Connection	Con- nector	Terminals	Symbol and terminal designation
Setup	5		

## 6 Electrical connection

---

## 7.1 General information about the setup program

The setup program serves to configure transmitters and receivers by means of a PC. The configuration data can be archived on data carriers and printed.

Configurable parameters include:

- Transmitter detection (transmitter ID)
- Transmission interval
- Configuration of the used sensor

The default settings are:

- Transmitter detection (transmitter ID), consecutive
- Transmission interval (15 s)
- Sensor setting depending on the order details  
(Example: Pt100 in 3-wire circuit, -200 to +600 °C)

The connection between transmitter and PC is established via a PC interface (USB/TTL or TTL/RS232 converter).

The screenshot shows the 'Setup1\_EN...' window. The left pane displays a tree view of configuration categories: Receiver EC, File info header, Hardware, Channels, Customized linearization, Analog outputs, Relay, &Device data, Interface, Undocumented parameters, File info text, and Probe. The 'Channels' category is expanded, showing 'Probe 1: 707060 transmitter' and 'Probe 2: No Probe' through 'Probe 5: No Probe'. The right pane shows the 'Channels:' configuration for Channel 1, including Probe ID (113), Limit 1 (0.000), Limit 2 (0.000), Hysteresis (0.000), Scaling start (0.000), Scaling end (100.0), Offset (0.000 °C), Filter time constant (0 s), Decimal place (xxx.x), RF timeout (3 Transmission intervals), Alarm type 1 (OFF), Alarm type 2 (OFF), Time delay (0 s), Linearization (Linear), and Unit (Percent).

Channel	Date	Time	Probe ID	Decimal place	Value	Min	Max	RF channel quality	operat
1	13.9.2010	08:35:17	113	Auto decimal place	22.691 °C	0.0020 °C	35.514 °C	100 %	3.2
2	13.9.2010	08:35:17	no link	Auto decimal place	---	---	---	---	---
3	13.9.2010	08:35:17	no link	Auto decimal place	---	---	---	---	---
4	13.9.2010	08:35:17	no link	Auto decimal place	---	---	---	---	---
5	13.9.2010	08:35:17	no link	Auto decimal place	---	---	---	---	---
6	13.9.2010	08:35:17	no link	Auto decimal place	---	---	---	---	---

At the bottom, it shows 'Connected with receiver EC - Addr.: 1 , USB <-> Serial (LID: 00000514)' and 'User: Specialist'.

## 7.2 Required hardware and software

The hardware and software requirements can be obtained from the manufacturer's website.

### NOTE!



If no communication with the transmitter (probe) or the receiver is possible through the setup program, update the setup program.

The latest setup program is available as download on the manufacturer's internet page.

# 7 Setup program

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## 7.3 Establishing the connection between PC and transmitter

The connection between transmitter and PC is established via a PC interface TTL/RS232 converter and adapter (socket) or USB/TTL converter and adapter (socket).



### CAUTION!

#### Permanent interface operation!

The PC interface TTL/RS232 converter or USB/TTL converter is only designed for a time-limited interface connection.

- ▶ Please ensure that the interface connection is disconnected and the transmitter correctly closed once the setup data transfer is completed.
- 



### CAUTION!

#### Disconnect and remove the voltage supply!

Malfunctions can occur, if the connection between battery and transmitter is disconnected while the setup connector is still connected.

- ▶ Do not disconnect the battery from the transmitter as long as the setup connector is still connected.
- 



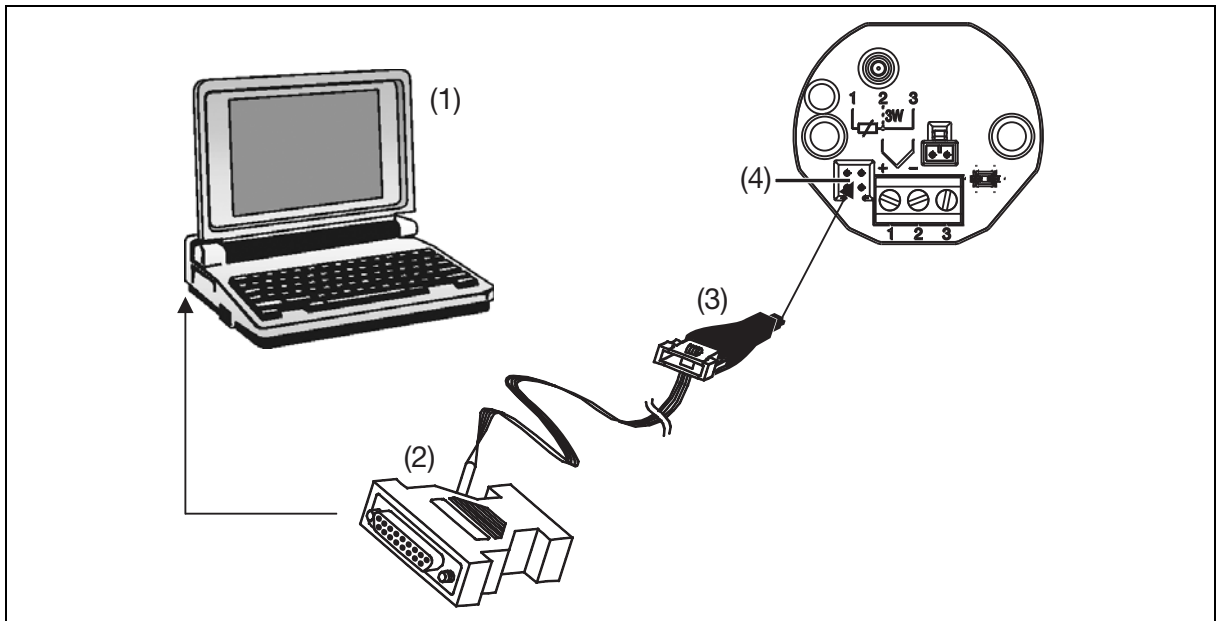
### CAUTION!

#### Low battery!

A low battery can lead to interface problems and result in an incorrect configuration or data loss.

- ▶ Please ensure that the battery used for the connection between PC and transmitter never reaches the "Low battery" status.
-

### TTL/RS232



- 1 Laptop/PC
- 3 Adapter socket, 4-pin
- 2 RS232 connector
- 4 Transmitter interface

For the setup via the TTL/RS232 converter, establish the following connections:

1. Insert the RS232 connector (2) into the laptop/PC (1).
2. Connect the adapter socket, 4-pin, (3) to the transmitter interface (4).

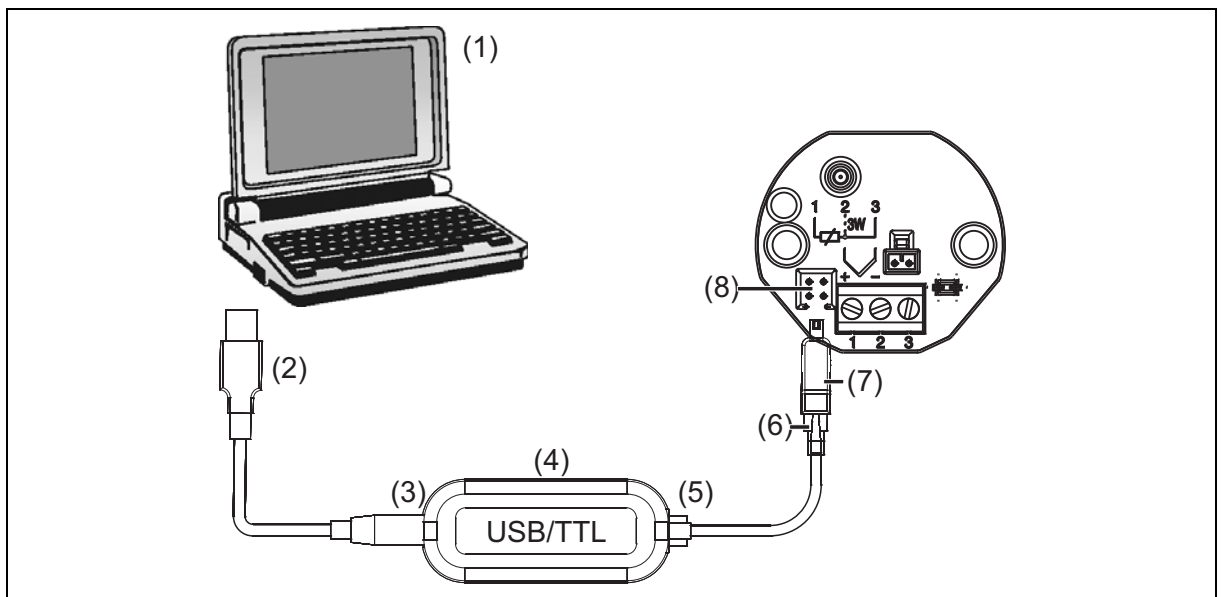


#### **NOTE!**

For the transmitter configuration, ensure that the transmitter is connected to the voltage supply of the antenna-battery housing.

# 7 Setup program

## USB/TTL



- (1) Laptop/PC
- (2) USB connector
- (3) USB socket
- (4) USB/TTL converter
- (5) Modular jack RJ-45
- (6) Modular line adapter
- (7) Adapter socket, 4-pin
- (8) Transmitter interface

For the setup via the USB/TTL converter, establish the following connections:

1. Insert the USB connector (2) of the USB cable into the laptop/PC (1).
2. Insert the USB bush (3) of the USB cable into the connector of the USB/TTL converter (4).
3. Connect the RJ-45 plug (5) of the modular line to the RJ-45 socket of the USB/TTL converter (4).
4. Connect the 4-pin adapter socket (7) to the adapter of modular line (6).
5. Connect the adapter socket, 4-pin, (7) to the transmitter interface (8).



### NOTE!

For the transmitter configuration, ensure that the transmitter is connected to the voltage supply of the antenna-battery housing.



## 7.4 Transmitter configuration

This chapter explains the configuration of a transmitter via the setup program. Prerequisite being that the transmitter and the PC are connected via an interface.

### 7.4.1 Establishing the communication

A differentiation is made between two different way of proceeding when establishing the communication between transmitter and setup program:

- Establish the communication with "Device settings assistant".  
This is the case when the setup program is used for the first time (list of devices empty).
- Establish the communication without "Device settings assistant".  
This is the case when the receiver/transmitter and setup program have already communicated (list of devices with entries).

#### Establishing the communication using the assistant

How to proceed:

1. Start the setup program.
2. Select the "Establish connection" function in the "Data transfer" menu.  
*The "Assistant for the device settings" appears.*
3. Select the transmitter under the "Device version" and confirm by pressing "Continue".
4. Confirm the PC communication interface "Serial interface" by pressing "Continue".
5. Select the serial interface (e.g. COM1) and confirm with "Continue".
6. Confirm the MU protocol (transmitter) by pressing "Continue".
7. Exit the assistant by pressing "Finish".  
*The device list with the selected transmitter appears.*
8. Click on the "Connect" button.  
*The device list is closed, the assistant terminated and the communication between transmitter and setup program established.*

#### Establishing the communication without using the assistant

How to proceed:

1. Start the setup program.
2. Select the "Establish connection" function in the "Data transfer" menu.  
*The device list containing all devices entered is mapped in.*
3. Select the desired transmitter by clicking with the left mouse key.
4. Click on the "Connect" button.  
*The device list is closed, the assistant terminated and the communication between transmitter and setup program established.*

# 7 Setup program

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## 7.4.2 Reading the current transmitter parameters

How to proceed:

1. In the "File" menu select the "New" function.  
*The "Device assistant" starts.*
2. Confirm the "User-defined setting" by pressing the "Continue" button.
3. Select the "Frequency band" and confirm with "Continue".
4. Select the receiver variant and confirm by pressing "Continue".
5. Exit the overview of the selected settings by pressing "Finish".  
*The current settings are displayed in the setup program.*
6. Select the desired transmitter from the navigation tree by clicking with the left mouse key.
7. In the "Data transfer" menu select the "Data transfer from device" function.
8. Exit the inquiry "Save file" by selecting "Skip".  
The current transmitter parameters are downloaded to the setup program.

## 7.4.3 Editing transmitter parameters

How to proceed:


1. Select the transmitter to be edited from the navigation tree by double clicking with the left mouse key.  
*The "Transmitter configuration" is opened.*
2. Edit the desired parameters.
3. Confirm editing with "OK".
4. Save the parameters in the "File" menu with the "Save" function.

## 7.4.4 Transmitting new parameters to the transmitter

How to proceed:

1. In the "Data transfer" menu select the "Data transfer to device" function.  
*The current parameters are transmitted to the transmitter.*
2. Finish the communication between setup program and transmitter in the "Data transfer" menu using the "Disconnect connection" function.

## 7.5 Parameter overview

Parameter	Factory setting	Value range/selection	
<b>Transmitter ID (Transmitter ID)</b>	Deactivated	1 to 99999	
<b>Transmission interval</b>	15 s	1 to 3600 s	
<b>Radio frequency</b>	868.4 MHz	Display only, cannot be edited	
<b>Sensor type</b>	RTD temperature probes	RTD temperature probes, Thermocouple, Resistance/potentiometer, Resistance transmitter Voltage	
<b>Sensor</b>	Pt100 DIN EN 60751 -200 to +600 °C	Depending on the sensor type	
<b>Connection type</b>	3-wire circuit	3-wire circuit, 2-wire circuit	
<b>Line resistance <math>R_l</math></b>	0 ohm	0 to 22 ohm Only with 2-wire circuit!	
<b>Resistance <math>R_x</math></b>	0 ohm	5 to 10000 ohm Only with resistance/potentiometer sensor type!	
<b>Resistance <math>R_0</math></b>	0 ohm	0 to 4000 ohm Only with resistance/potentiometer sensor type! Only with linearization of 0 to 100%!	
<b>Resistance <math>R_A</math></b>	0 ohm	0 to 10000 ohm Only with resistance transmitter sensor type!	
<b>Resistance <math>R_S</math></b>	0 ohm	5 to 10000 ohm Only with resistance transmitter sensor type!	
<b>Resistance <math>R_E</math></b>	0 ohm	0 to 10000 ohm Only with resistance transmitter sensor type!	
<b>TAG number</b>		10-digit number, freely selectable	
<b>Information text</b>		10-digit number, freely selectable	
<b>Installation date</b>	Current date	Any date	

### NOTE!



At a transmission interval of > 15 s, the transmitter transmits a link datagram (after a setup transmission), i. e. the datagrams are transmitted at the factory-set interval of 15 s for a period of 30 minutes, and only then at the set transmission interval.

### NOTE!



If the setup plug is connected, the transmitter automatically transmits datagrams with a transmission interval of 1 s to enable the receiver to detect changes. After the setup connector is removed, the datagrams are transmitted again at the set transmission interval.

# 7 Setup program

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## Term definition

### Transmitter ID

The transmitter ID is an unmistakable ID with max. 5 characters which is recognized by the receiver. The ID can be individually changed, for example, to achieve a better overview of a system. Ensure that an ID is not used simultaneously by two transmitters within the reception range to avoid malfunctions.

### Transmission interval

This parameter is used to define the time intervals used to transmit data to a receiver. The setting of the "Transmission interval" parameter affects the battery service life. For this reason, act with caution and do not only consider the transmission quality when selecting the interval.

### Radio frequency

The radio frequency is the frequency at which the transmitter transmits data to the receiver. In the 868 MHz band (Europe), transmission is at 868.4 MHz.

## 8.1 Analog input

### RTD temperature probe

Designation	Standard	Measuring range	Measuring accuracy
Pt100 (TK value = $3.85 \times 10^{-3}$ 1/K)	DIN EN 60751	-100 to +200 °C -200 to +600 °C	±0.1 K ±0.2 K
Pt500 (TK value = $3.85 \times 10^{-3}$ 1/K)	DIN EN 60751	-100 to +200 °C -200 to +600 °C	±0.1 K ±0.2 K
Pt1000 (TK value = $3.85 \times 10^{-3}$ 1/K)	DIN EN 60751	-100 to +200 °C -200 to +600 °C	±0.1 K ±0.2 K
Ni100 (TK value = $6.18 \times 10^{-3}$ 1/K)	DIN 43760	-60 to +250 °C	±0.2 K
Ni500 (TK value = $6.18 \times 10^{-3}$ 1/K)	DIN 43760	-60 to +150 °C	±0.2 K
Ni1000 (TK value = $6.18 \times 10^{-3}$ 1/K)	DIN 43760	-60 to +150 °C	±0.2 K
Pt100 (TK value = $3.917 \times 10^{-3}$ 1/K)	JIS 1604	-100 to +200 °C -200 to +600 °C	±0.1 K ±0.2 K
Pt50 (TK value = $3.91 \times 10^{-3}$ 1/K)	ST RGW 1057 1985	-200 to +600 °C	±0.2 K
Pt100 (TK value = $3.91 \times 10^{-3}$ 1/K)	GOST 6651-94 A.1	-100 to +200 °C -200 to +600 °C	±0.1 K ±0.2 K
Cu50 (TK value = $4.26 \times 10^{-3}$ 1/K)	GOST 6651-94 A.4	-50 to +200 °C	±0.2 K
Cu100 (TK value = $4.26 \times 10^{-3}$ 1/K)	GOST 6651-94 A.4	-50 to +200 °C	±0.2 K
Connection type	2-wire or 3-wire circuit		
Sensor current	< 0.5 mA		
Lead compensation	Not required for 3-wire circuit (max. admissible 11 Ω per line), max. adjustable line resistance for 2-wire circuit: 22 Ω		

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### Thermocouples

Designation	Standard	Measuring range	Measuring accuracy <sup>a</sup>
Fe-CuNi "L"	DIN 43710	-200 to +900 °C	±0.1 %
Fe-CuNi "J"	DIN EN 60584	-210 to +1200 °C	±0.1 % from -100 °C
Cu-CuNi "U"	DIN 43710	-200 to +600 °C	±0.1 % from -100 °C
Cu-CuNi "T"	DIN EN 60584	-270 to +400 °C	±0.1 % from -150 °C
NiCr-Ni "K"	DIN EN 60584	-270 to +1372 °C	±0.1 % from -80 °C
NiCr-CuNi "E"	DIN EN 60584	-270 to +1000 °C	±0.1 % from -80 °C
NiCrSi-NiSi "N"	DIN EN 60584	-270 to +1300 °C	±0.1 % from -80 °C
Pt10Rh-Pt "S"	DIN EN 60584	-50 to +1768 °C	±0.15 % from 20 °C
Pt13Rh-Pt "R"	DIN EN 60584	-50 to +1768 °C	±0.15 % from 50 °C
Pt30Rh-Pt6Rh "B"	DIN EN 60584	0 to 1820 °C	±0.15 % from 400 °C
W5Re-W26Re "C"		0 to 2320 °C	±0.15 %
W3Re-W25Re "D"		0 to 2495 °C	±0.25 %
W3Re-W26Re		0 to 2400 °C	±0.15 %
Chromel®-Copel®		-200 to +800 °C	±0.1 % from -80 °C
Chromel®-Alumel®		-200 to +1372 °C	±0.1 % from -80 °C
PLII (Platinel II)		0 to 1395 °C	±0.15 %
MoRe5-MoRe41		0 to 2000 °C	±0.2 %
Cold junction		Pt1000 internal	
Cold junction accuracy		±1 K	

<sup>a</sup> All accuracy values in % refer to the maximum measuring range.

### Resistance/potentiometer

Designation	Measuring range	Measuring accuracy <sup>a</sup>
Resistance/potentiometer Linearization: 0 to 100 %	> 50 to ≤ 400 Ω > 400 to ≤ 4000 Ω > 4000 to ≤ 10000 Ω	±400 mΩ ±4 Ω ±10 Ω
Resistance/potentiometer Linearization: resistance in Ω	> 50 to ≤ 10000 Ω	±0.1 %
Connection type	2-wire or 3-wire circuit	
Lead compensation	Not required for 3-wire circuit (max. admissible 11 Ω per line), max. adjustable line resistance for 2-wire circuit: 22 Ω	

<sup>a</sup> All accuracy values in % refer to the maximum measuring range.

### Resistance transmitter

Designation	Measuring range	Measuring accuracy
Resistance transmitter	> 50 to ≤ 400 Ω > 400 to ≤ 4000 Ω > 4000 to ≤ 10000 Ω	±400 mΩ ±4 Ω ±10 Ω
Connection type	3-wire connection	
Condition	$R_e + R_a + R_s \leq 10000 \Omega$ and $R_e + R_a \leq 1/3 R_s$	

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### Voltage

Designation	Measuring range	Measuring accuracy <sup>a</sup>
Voltage	0 to 50 mV	±0.1 %

<sup>a</sup> All accuracy values in % refer to the maximum measuring range.

### Measuring circuit monitoring

Measuring probe	Out of range detection	Probe/cable short circuit detection	Wire break detection
Thermocouple	Yes/Yes	No	Yes
RTD temperature probe	Yes/Yes	Yes	Yes
Resistance/potentiometer	Yes/Yes	Yes	Yes
Resistance transmitter	No/No	No	No
Voltage	Yes/Yes	No	Yes

## 8.2 Output (radio transmission)

Transmitter detection (transmitter ID)	Max. five-digit ID, default setting, customer-specific configuration possible
Transmission interval	Adjustable from 1 to 3600 s (default setting 15 s)
Radio frequency	868.4 MHz (Europe)
Transmission power	< +10 dBm
Open air range	Max. 300 m when using the receiver antenna holder for wall mounting, and 3 m antenna cable; when installing the antenna directly on the receiver, the user must take approx. 40 % less range into consideration
Output signal	
Thermocouple	Voltage (mV)
RTD temperature probe	Resistance ( $\Omega$ )
Resistance/potentiometer	Percent (%) or resistance ( $\Omega$ )
Resistance transmitter	Percent (%)
Voltage	Voltage (mV)
Configuration	With setup program
Configurable parameters	Transmitter ID (max. 5-digit ID) and transmission interval

## 8.3 Electrical data

Voltage supply	
Lithium battery	Rated voltage: 3.6 V, rated capacity: 2.2 Ah; size AA
Operating life	Approx. 1 year with the factory-set values (transmission interval = 15 s) and at room temperature; shorter transmission interval and high or low ambient temperature reduce the battery operating life.
Battery change	Only use the lithium battery that is available as an accessory

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### 8.4 Environmental influences

#### Transmitter in the terminal head, form B with antenna-battery housing

Ambient temperature range	-30 to +85 °C
Storage temperature range; storage humidity	-40 to +85 °C; rel. humidity ≤ 95 %
Temperature influence <sup>a</sup>	
Thermocouple	≤ ±0.005 %/K deviation 22 °C plus accuracy of the cold junction
RTD temperature probe	≤ ±0.005 %/K deviation from 22 °C
Resistance/potentiometer	≤ ±0.01 %/K deviation from 22 °C
Resistance transmitter	≤ ±0.01 %/K deviation from 22 °C
Voltage	≤ ±0.005 %/K deviation from 22 °C
Climate class	10 cycles at 10 °C / 80 °C, according to IEC 68-2-30, rel. humidity 95 %, during operation
Vibration resistance	According to GL characteristic line 2
Admissible mechanical shock resistance	10 g for 6 ms, DIN IEC 68-2.29
Electromagnetic compatibility (EMC)	DIN EN 61326-1
Interference emission	Class B - household and small businesses -
Interference immunity	Industrial requirements
Radio frequency spectrum	ETSI EN 300 220-1 and ETSI EN 300 220-2

<sup>a</sup> All accuracy values in % refer to the maximum measuring range.

### 8.5 Housing

#### Transmitters

Type	Plastic housing to be installed in terminal head, form B
Material	Polycarbonate
Flammability class	UL 94 V2
Dimensions	
Diameter	44 mm
Height with/without connectors	31 mm / 27 mm
Protection type	IP00: With open installation IP65: With installation in suitable terminal head, form B
Connections	
Sensor	3-pin connection terminal RM 5 mm, conductor cross-section 1.5 mm <sup>2</sup>
Antenna	SMB connector
Voltage supply	2-pin multi-pin connector RM 2.54 mm
Setup	4-pin connector
Weight	Approx. 35 g




### Antenna battery housing

Type	Plastic housing with M20 × 1.5 thread for terminal head, form B
Material	Polyetherimide
Flammability class	UL 94 HB or UL 94 V-0
Dimensions	
Diameter	30 mm
Height	115 mm
Protection type	IP65, according to DIN EN 60529
Connection	
Antenna	SMB inlet, 50 Ω
Battery connection	2-pin connector RM 2.54 mm
Installation position	Preferably vertical (optimum alignment to the receiver antenna)
Weight (including battery)	Approx. 80 g

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 有毒有害物质或元素 Hazardous substances		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
		部件名称 Product group: 707060 外壳 Housing (Gehäuse) 过程连接 Process connection (Prozessanschluss) -螺母 Nut (Mutter) 螺钉 Screw (Schraube)	○	○	○	○	○
本表格依据 SJ/T 11364-2014 的规定编制。 (This table is prepared in accordance with the provisions of SJ/T 11364-2014.) O : 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。 (O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.) X : 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。 (X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.)							

## 9 China RoHS

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