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JUMO Wtrans B Programmable Head Transmitter with Radio Transmission

Brief description

The Wtrans B head transmitter with wireless data transmission is used in connection with a Wtrans receiver unit for stationary or mobile temperature measuring with RTD temperature probes or thermocouples. Alternatively, resistors with an ohmic-value of up to 10 kΩ, voltages up to 50 mV, and currents up to 20 mA that use an external shunt are measurable. Customer-specific linearizations are possible.

The measured values are transmitted wirelessly to the receiver of the Wtrans measuring system. These values are shown on the receiver's LCD display and are digitally available on the RS485-interface or as analog output(s). Optionally, different alarm types can be indicated with the two relay outputs.

This head transmitter is designed for industrial applications – it is made up of the transmitter with an integrated transmission unit and an antenna-battery case. The transmitter is designed to be installed into type B terminal heads and works in an ambient temperature range from -30 to 85 °C. It is possible to install the transmitter into customer-specific terminal heads. The antenna-battery case is connected to the terminal head through a screw connection (M20 × 1.5).

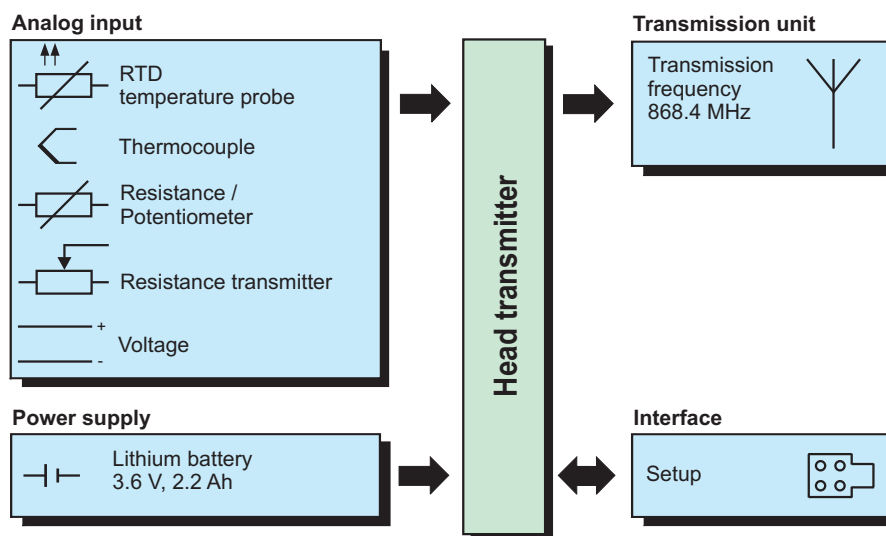
The transmission frequency of the Wtrans measuring system is 868.4 MHz. This frequency is unaffected for the most part by external interferences and it allows for transmissions even in a rough industrial environment. When using the antenna wall-holder with the 3 m antenna line for the receiver then the maximum open-air range is 300 m.

A 3.6 V, 2.2 Ah (size AA) lithium battery is used as a power supply for the transmitter. For the easy configuration and parameterization of the head transmitter and the Wtrans receiver on a PC an optional setup program is available. Additionally, measured values can be recorded on the PC with the online-chart function.



Type 707060/...

Block diagram



Special features

- Transmission frequency: 868.4 MHz
- Measuring input for RTD temperature probe, thermocouple, potentiometer and voltage
- Configurable probe ID
- Battery status monitoring
- Easy battery change
- Configurable via setup program
- Customer-specific linearization (value pairs in tables or fourth order number), can be configured on the receiver
- Online chart of the measured values via set-up program and receiver

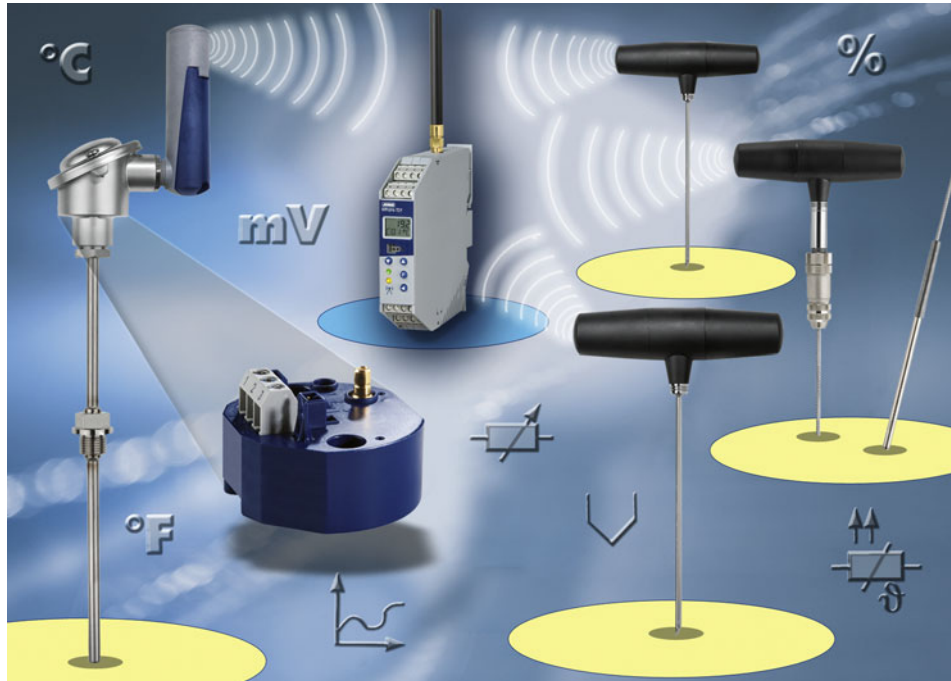
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JUMO Wtrans



The JUMO Wtrans device series also includes the receivers 902931/... and the probes 902930/... in addition to the head transmitter 707060/...

JUMO Wtrans - receiver/probe

		Data sheet
JUMO Wtrans receiver Type T01.EC1 Type T01.EC3	Receiver (voltage supply AC 110 to 240 V or AC/DC 20 to 30 V) 4x analog outputs 2x analog outputs and 2x relay outputs	902931
JUMO Wtrans probe Type T01.G1 Type T02.G1	Insertion RTD temperature probe Ambient temperature, handle: -30 to +85 °C Ambient temperature, handle: -25 to +125 °C	902930
JUMO Wtrans probe Type T01.G1 Type T02.G1	Mineral insulated RTD temperature probe with flexible sheath Ambient temperature, handle: -30 to +85 °C Ambient temperature, handle: -25 to +125 °C	902930
JUMO Wtrans probe Type T01.G2 Type T02.G2	With M12 connector for RTD temperature probe Ambient temperature, handle: -30 to +85 °C Ambient temperature, handle: -25 to +125 °C	902930
JUMO Wtrans B	Programmable head transmitter with radio transmission	707060

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Technical data

Analog input

RTD temperature probe

Designation	Standard	Measuring range	Measuring accuracy
Pt100 (TK value = 3.85×10^{-3} 1/K)	DIN EN 60751	-100 to +200 °C -200 to +600 °C	± 0.1 K ± 0.2 K
Pt500 (TK value = 3.85×10^{-3} 1/K)	DIN EN 60751	-100 to +200 °C -200 to +600 °C	± 0.1 K ± 0.2 K
Pt1000 (TK value = 3.85×10^{-3} 1/K)	DIN EN 60751	-100 to +200 °C -200 to +600 °C	± 0.1 K ± 0.2 K
Ni 100 (TK value = 6.18×10^{-3} 1/K)	DIN 43760	-60 to +250 °C	± 0.2 K
Ni 500 (TK value = 6.18×10^{-3} 1/K)	DIN 43760	-60 to +150 °C	± 0.2 K
Ni 1000 (TK value = 6.18×10^{-3} 1/K)	DIN 43760	-60 to +150 °C	± 0.2 K
Pt100 (TK value = 3.917×10^{-3} 1/K)	JIS 1604	-100 to +200 °C -200 to +600 °C	± 0.1 K ± 0.2 K
Pt50 (TK value = 3.91×10^{-3} 1/K)	ST RGW 1057 1985	-200 to +600 °C	± 0.2 K
Pt100 (TK value = 3.91×10^{-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 = 4.26×10^{-3} 1/K)	GOST 6651-94 A.4	-50 to +200 °C	± 0.2 K
Cu100 (TK value = 4.26×10^{-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. configurable lead wire resistance for 2-wire circuit: 22 Ω.		

Thermocouples

Designation	Standard	Measuring range	Measuring accuracy ^a
Fe-CuNi „L“	DIN 43710	-200 to +900 °C	± 0.1 %
Fe-CuNi „J“	DIN EN 60584	-210 to +1200 °C	± 0.1 % as of -100 °C
Cu-CuNi „U“	DIN 43710	-200 to +600 °C	± 0.1 % as of -100 °C
Cu-CuNi T	DIN EN 60584	-270 to +400 °C	± 0.1 % as of -150 °C
NiCr-Ni K	DIN EN 60584	-270 to +1372 °C	± 0.1 % as of -80 °C
NiCr-CuNi „E“	DIN EN 60584	-270 to +1000 °C	± 0.1 % as of -80 °C
NiCrSi-NiSi „N“	DIN EN 60584	-270 to +1300 °C	± 0.1 % as of -80 °C
Pt10Rh-Pt „S“	DIN EN 60584	-50 to +1768 °C	± 0.15 % as of 20 °C
Pt13Rh-Pt „R“	DIN EN 60584	-50 to +1768 °C	± 0.15 % as of 50 °C
Pt30Rh-Pt6Rh „B“	DIN EN 60584	0 to 1820 °C	± 0.15 % as of 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 % as of -80 °C
Chromel-Alumel		-200 to +1372 °C	± 0.1 % as of -80 °C
PLII (Platinel II)		0 to 1395 °C	± 0.15 %

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Designation	Standard	Measuring range	Measuring accuracy ^a
MoRe5-MoRe41		0 to 2000 °C	± 0.2 %
Cold junction		Pt1000 internal	
Cold junction accuracy		± 1 K	

^a All accuracies given in % refer to the maximum measuring range

Resistance / potentiometer

Designation	Measuring range	Measuring accuracy ^a
Resistance / potentiometer Linearization: 0 to 100 %	> 50 Ω to ≤ 400 Ω > 400 Ω to ≤ 4000 Ω > 4000 Ω to ≤ 10000 Ω	± 400 mΩ ± 4 Ω ± 10 Ω
Resistance / potentiometer Linearization: Resistance in Ω	> 50 Ω 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. configurable lead wire resistance for 2-wire circuit: 22 Ω.	

^a All accuracies given in % refer to the maximum measuring range

Resistance transmitter

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

^a All accuracies given in % refer to the maximum measuring range

Voltage

Designation	Measuring range	Measuring accuracy ^a
Voltage	0 to 50 mV	± 0.1 %

^a All accuracies given in % refer to the maximum measuring range

Measuring circuit monitoring

Measuring probe	Detection of overrange / underrange	Detection of probe / cable short circuit	Detection of probe / cable break
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

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Output (radio transmission)

Probe ID	Max. 5-digit ID, factory-set, can be configured to customer-request
Transmission interval	Adjustable from 1 to 3600 s (factory setting: 15 s)
Transmission frequency	868.4 MHz (Europe)
Transmission power	+10 dBm
Open air range	Max. 300 m when using the antenna wall-holder of the receiver and the 3 m antenna line. When installing the antenna directly on the receiver, a reduced range of approx. 40 % must be taken into account.
Output signal	
Thermocouple	Voltage (mV)
RTD temperature probe	Resistance (Ω)
Resistance / potentiometer	Percent (%) or resistance (Ω)
Resistance transmitter	Percent (%)
Voltage	Voltage (mV)
Configuration	With setup program
Configurable parameters	Probe ID (max. 5-digit ID) and transmission interval

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 (brief transmission interval and high or low ambient temperature reduce the battery operating life)
Battery change	Only use the lithium battery available as an accessory

Environmental influences

Transmitter in the B head with antenna-battery case

Ambient temperature range	-30 to +85 °C
Storage temperature range / storage humidity	-40 to +85 °C / relative humidity \leq 95 %
Temperature influence ^a	
Thermocouple	$\leq \pm 0.005$ % / K deviation from 22 °C plus accuracy of the cold junction
RTD temperature probe	$\leq \pm 0.005$ % / K deviation from 22 °C
Resistance / potentiometer	$\leq \pm 0.01$ % / K deviation from 22 °C
Resistance transmitter	$\leq \pm 0.01$ % / K deviation from 22 °C
Voltage	$\leq \pm 0.005$ % / K deviation from 22 °C
Climate class	10 cycles at 10 °C / 80 °C, according to IEC 68-2-30, relative humidity 95 %, during operation
Vibration resistance	According to GL characteristic line 2
Admissible mechanical shock resistance	10 g / 6 ms, according to DIN IEC 68-2.29
Electromagnetic compatibility (EMC)	According to DIN EN 61326-1
Interference emission	Class B
Interference immunity	Industrial requirements
Radio frequency spectrum	ETSI EN 300 220-1 (V 2.3.1) and ETSI EN 300 220-2 (V 2.3.1)

^a All accuracy values in % refer to the maximum measuring range.

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Casing

Transmitter

Type	Plastic case to be installed in connection 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: For open installation IP65: When installed in a suitable head, form B
Connections	
Sensor	3-pole connection terminal RM 5 mm, conductor cross-section 1.5 mm ²
Antenna	SMB connector
Voltage supply	2-pin header RM 2.54 mm
Setup	4-pin connector
Weight	Approx. 35 g

Antenna-battery case

Type	Plastic case with M20x1.5 thread for connection 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 cable socket, 50 Ω
Battery connection	2-pole connector RM 2.54 mm
Mounting orientation	Preferably vertical (optimum alignment is to the receiver antenna)
Weight (including battery)	Approx. 80 g

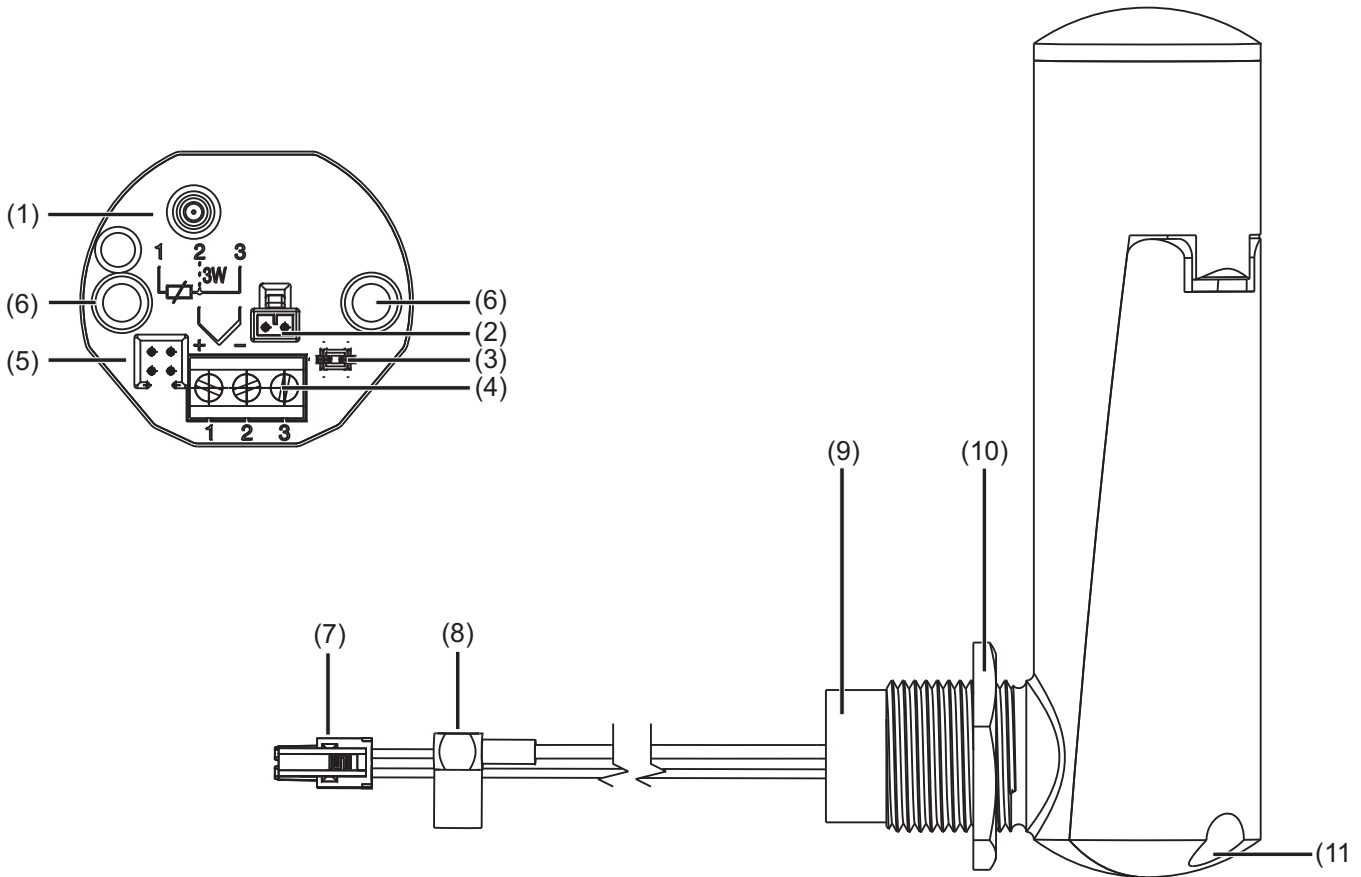
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Connection elements and connectors




- (1)SMB antenna connector (antenna connection)
- (2)Voltage supply connector (battery connection)
- (3)Cable guide for antenna cable and voltage supply
- (4)Probe connection
- (5)Setup connector
- (6)Mounting holes for installation in the terminal head, form B

- (7)Voltage supply socket (battery connection)
- (8)SMB antenna socket (antenna connection)
- (9)Seal
- (10)Lock nut
- (11)Battery lid screw

Connection diagram

The connection diagram included in the data sheet provides initial information about the connection options. Only use the installation instructions or the operating manual for the electrical connection. The know-how and the correct technical implementation of the safety warnings/instructions contained in these documents are the prerequisite for the installation, electrical connection, and initial start as well as for the safety during operation.

Voltage supply

Connection	Connector	Terminals	Symbol and terminal designation
Lithium battery, DC 3.6 V	2		

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Analog input

Connection	Connector	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	

Output

Connection	Connector	Terminals	Symbol and terminal designation
Antenna connector	1		

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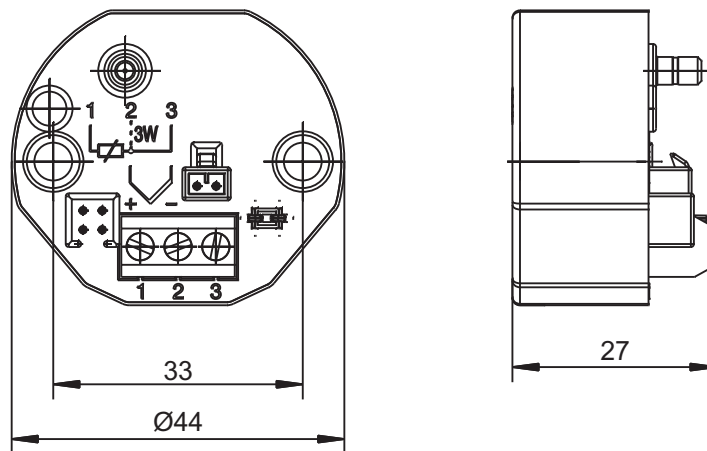


Interface

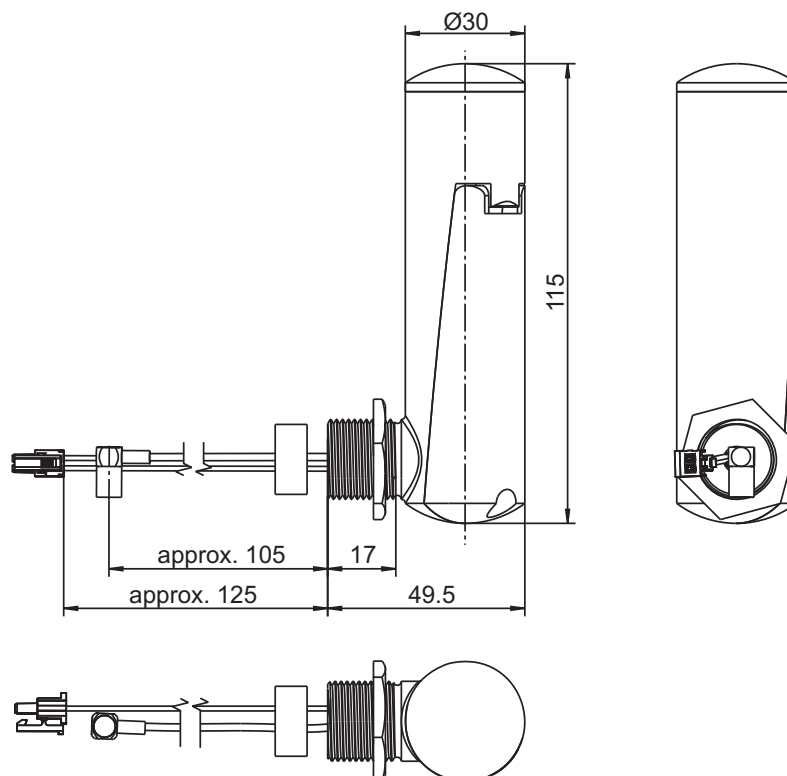
Connection	Connector	Terminals	Symbol and terminal designation
Setup	5		

Dimensions

Transmitter



Antenna-battery case



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Order details

(1) Basic type

707060 JUMO Wtrans B
 programmable head transmitter with radio transmission

(2) Input

- 8 Standard, with factory settings
- 9 Customized programming according to specification^a

(3) Output (probe)

- 10 Transmission frequency 868.4 MHz (Europe)

(4) Extra codes

000 None

^a Please specify the probe ID, transmission interval, measuring range, and, if required, the probe type in plain text.

Order code	(1)	(2)	(3)	(4)
	□	□	□	□
Order example	707060	/ 8	- 10	/ 000

Delivery package

1 transmitter in the ordered version (without terminal head form B) inc. mounting parts (2 screws and 2 compression springs)
1 antenna-battery case with reverse battery protection connection cables
1 lithium battery 3.6 V, 2.2 Ah (size AA) already inserted in the antenna-battery case ready for use
1 operating manual B707060.0

Accessories

Article	Part no.:
Lithium battery 3.6 V, 2.2 Ah (size AA)	70/00547559
PC interface with USB/TTL converter, adapter (socket connector), and adapter (pins)	70/00456352
PC interface with TTL/RS232 converter and adapter (socket connector)	70/00350260
Setup program on CD-ROM, multilingual	70/00488887
Setup program including OnlineChart on CD-ROM, multilingual	70/00549067
Activation for OnlineChart	70/00549188
Precision-resistor type 2.5 R / 0.1 % (shunt)	70/00555645