



More than **sensors + automation**



# JUMO Wtrans Series

Wireless measurement of temperature, pressure, humidity, and CO<sub>2</sub>



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## Dear Reader,

The future is wireless!

"Wireless" has become a topic of our time, both in business life and in the private sector. In connection with "Industry 4.0" – the intelligent networking of the industrial value-added chain – wireless measurement technology also takes on an important role.

JUMO has been an established name in the field sensor technology for a number of decades. Throughout this time the company has continuously adapted its product portfolio in line with the latest customer requirements. In doing so, JUMO has often redefined the current technological level with its products. In the area of wireless measurement technology we offer extensive solutions for the measurands temperature, pressure, humidity, and CO<sub>2</sub>.

The majority of all sensors, actuators, and the associated electronic are connected through cables. However, a wide variety of applications cannot operate with a cable-based solution. The laying of cables often proves to be too elaborate, too cost-intensive, or simply as not technologically feasible. Especially for moving parts, wireless measurement technology is often the only practical solution. Even at locations already fitted with complex and wear-susceptible

solutions – such as signal transmission via slip rings – conversion to fail-safe wireless transmission can be beneficial. Perhaps you would prefer to remain flexible and use mobile equipment to perform spontaneous measurements quickly at various locations whenever they are needed. Then this is another reason that speaks for wireless data transmission.

The devices of the JUMO Wtrans series are products of the internal development department at our headquarters in Fulda, Germany. The expertise of our engineers has accumulated over decades. It guarantees continuously high quality and therefore the satisfaction of our customers all over the world. The individual application is the focus of each solution approach. Here, diverse requirements for several industrial sectors as well as specific customer requirements are always taken into account.

We would be happy to assist you in finding solutions for your individual measurement tasks and thereby contribute to your success.

Further information about our products can be found at [www.jumo.net](http://www.jumo.net).



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# Wireless measured value transmission

The JUMO Wtrans series is a system for wireless transmission of measured values using state-of-the-art wireless technology. The universally applicable sensors open up entirely new possibilities for measured value recording at moving and fixed locations. The measured value is initially transmitted to the JUMO Wtrans receiver. From there, the signal can be forwarded in either digital or analog form for further processing to various measurement and control technology devices such as controllers, automation systems, indicators, or recorders.

Two different radio frequencies are available depending on the operating location. For Europe the radio frequency is 868.4 MHz. The frequency for USA, Canada, Australia, New Zealand, and some other countries is 915 MHz.



## The JUMO Wtrans wireless transmission system as a multifunctional application

### Your benefits in a nutshell

- Wireless recording of measured values in moveable parts or areas which are hard to reach
- Enables measurements particularly at those locations where cable routing is not possible or where it would be technically problematic
- Suitable for permanent installation or temporary spontaneous measurements
- Complete spatial mobility (open air range up to 300 m)
- Unlimited flexibility, such as for temporary measurements, as no time-intensive mounting or installation is required
- Fail-safe, industry-standard data transmission for high process reliability
- Up to 16 transmitters per receiver
- Reduced installation work
- Reduced costs for plant reinstallation, maintenance, and repair
- Durable high-performance battery
- Intuitive setup program for use on PC
- Optional online chart function enables recording of measured values directly on the PC
- Special applications can be implemented with the help of customer-specific linearization
- Easy connection of additional devices for evaluation of data

### Application areas

- Mechanical and plant engineering
- Pharmaceutical industry
- Food and beverages industry
- Chemical industry
- Oil and gas industry
- Plastics industry
- Power stations
- Building automation
- Air-conditioning technology

### Application examples

- Monitoring of refrigeration plants, heating systems, sanitary engineering, and heating oil / sprinkler-water tanks in building management
- Temperature measurement in rotary furnaces
- Clamping pressure monitoring in mobile tool holders
- Temperature monitoring in warehouses
- Monitoring of the air quality in public rooms or warehouses (humidity and CO<sub>2</sub>)
- Level measurement in containers
- Temperature and pressure measurement in conveyor and transportation systems
- Elimination of slip ring transmission systems that are susceptible to wear and failure
- Temporary measurements for plant and process optimization or on startup and maintenance



# JUMO Wtrans receiver

The Wtrans receiver is compatible with all devices in the JUMO Wtrans series. Measurands temperature, pressure, humidity, and CO<sub>2</sub> can be received by a receiver and transmitted to peripheral devices for further processing. The  $\lambda/4$  antenna that is included in the delivery has an impedance of 50  $\Omega$  and can be screwed on directly or mounted externally. The antenna wall holder with a 3 m antenna cable enables an open air range of 300 m.



## Receiver – JUMO Wtrans universal receiver for JUMO wireless measuring probes

The JUMO Wtrans receiver can control a maximum of 16 channels. As a result, one receiver can have up to 16 JUMO Wtrans transmitters assigned to it. Offset, alarms, limit values, and other parameters can be configured individually for each separate transmission channel. The receiver can be operated and configured via the keypad mounted to the front in combination with a two-row LCD display or with the easy-to-use and intuitive setup program on a PC. Output for further processing of the measured values is optionally possible via a maximum of four configurable analog outputs or in digital form over an RS-485 interface. Additionally, with two relays limit value monitoring can be set up or alarm messages can be produced. Special applications can

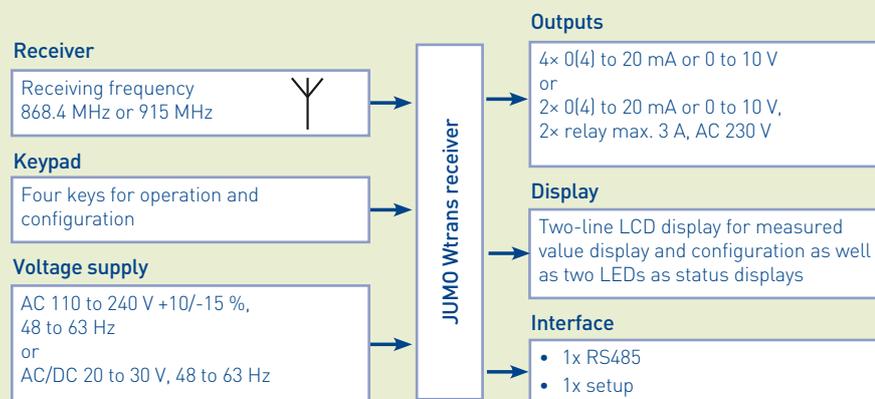
be implemented with a customer-specific linearization. Out of 40 entered value pairs a linear approximation can be performed. Alternatively, a polynomial function of the fourth order can be determined as the specific characteristic line. Additionally, a polynomial function – in as far as it is known – can be implemented through direct input. Last but not least, the online chart function that can be unlocked in the setup program allows measured values to be recorded on a PC/laptop without additional external devices. The online chart function allows the graphical display of up to eight analog and up to four binary channels. This feature is especially helpful during the startup phase.

### Features

#### Receiver – JUMO Wtrans in mounting rail case, type 902931

- Compatible with all JUMO Wtrans series devices
- Up to 16 transmitters per receiver (can be freely combined)
- Up to four analog outputs / up to two switching outputs (relay)
- Interface RS485 with Modbus protocol
- Operation directly on device or by using setup program on PC
- Ambient temperature: -20 to +50 °C
- Protection type IP20

### Block diagram



### Approvals / approval marks

- IC (Industry Canada) for 915 MHz, 902931/10, 230 V
- FCC (Federal Communications Commission) for 915 MHz, 902931/10, 230 V
- cULus (Underwriters Laboratories) 902931/10, 230 V

# Transmitter – JUMO Wtrans T

JUMO Wtrans T transmitters are used in conjunction with the Wtrans receiver for mobile or stationary temperature measurement. The measured value is transmitted wirelessly to the receiver of the Wtrans system and displayed on the LCD display. For use in potentially explosive areas, Wtrans T devices with ATEX approval up to zone 0 are available. Only the receiver must be placed outside of the Ex-area. Wireless data transmission makes elaborate and cost-intensive solutions with supply isolators and protective barriers unnecessary.

The Wtrans T transmitters can be equipped with different process connections so that the user can remain flexible as much as possible. Along with the JUMO PEKA adapter system an EHEDG-certified version for use in such hygienic processes is also available. The used seals meet FDA requirements.



## Transmitter – JUMO Wtrans T RTD temperature probe with wireless data transmission



General information	Description	JUMO Wtrans T01 RTD temperature probe with electronic modules up to 85 °C	JUMO Wtrans T02 RTD temperature probe with electronic modules up to 125 °C	JUMO Wtrans T03 Ex RTD temperature probe with ATEX approval and electronic modules up to 85 °C
	Type / data sheet	902930/10 902930/12 902930/50	902930/20 902930/22 902930/60	902930/15 902930/17 902930/55
	Features	<ul style="list-style-type: none"> <li>• Measuring ranges: -30 to +260 °C and -200 to +600 °C*</li> <li>• For mobile and stationary temperature measurement</li> <li>• No wiring work thanks to modern wireless technology</li> <li>• Fail-safe transmission with telegram coding</li> </ul>		
Technical data	Radio frequency	868.4 MHz (Europe); 915 MHz (USA, Australia, Canada, New Zealand, and other countries); 10 frequencies can be configured in the 915 MHz frequency band		
	Transmission interval	Adjustable from 1 to 3600 s (using setup program)	Adjustable from 5 to 600 s (using setup program)	Adjustable: 5 s, 10 s, 20 s, 45 s (using DIP switch)
	Open air range	Up to 300 m when using the antenna wall mounting holder for the receiver and 3 m antenna cable		
	Transmitter detection (transmitter ID)	Five-digit ID, factory set, can be configured according to customer specifications		
	Measuring input	Pt1000 according to DIN EN 60751, in three-wire circuit		
	Process connection	Various pipe connections, threads, and flanges acc. to DIN EN, JUMO PEKA, (VARIVENT®, aseptic, clamp), individual versions acc. to customer requirement		
	Protection type	IP67 according to DIN EN 60529; for basic type 902930/10, 902930/12, 902930/15, 902930/17, 902930/20, and 902930/22; for basic type 902930/50, 902930/55, and 902930/60**		
	Ambient temperature	-30 to +85 °C	-25 to +125 °C	-30 to +85 °C***
	Voltage supply	Lithium battery: 3.6 V (rated capacity 2.2 Ah / 1.7 Ah for JUMO Wtrans T02)		
Available approvals / approval marks	IC (Industry Canada) for 915 MHz, FCC (Federal Communications Commission) for 915 MHz, cULus (Underwriters Laboratories), ATEX approval for 868.4 MHz****			

\* Not for JUMO Wtrans T03 Ex.

\*\* Only with screwed-on machine connector M12x1

\*\*\* May be limited further by Ex-area.

\*\*\*\* Not for JUMO Wtrans T03 Ex.

# Transmitter – JUMO Wtrans p

The JUMO Wtrans p pressure transmitter with wireless data transmission is used on mobile or stationary systems in conjunction with the JUMO Wtrans receiver. This device reduces mounting and installation work to a minimum whether used at hard-to-access locations or on rotating components. The transmitters are available with different measuring ranges and different process connections. Along with the JUMO PEKA adapter system an EHEDG-certified version for use in such hygienic processes is also available. The used seals meet FDA requirements. The measured value is transmitted wirelessly to the receiver of the Wtrans system and displayed on the LCD display. From there, the signal can be forwarded in either digital or analog form for further processing to various measurement control technology devices.



## Transmitter – JUMO Wtrans p pressure transmitter with wireless data transmission



General information	Description	JUMO Wtrans p
	Data sheet	402060
	Features	<ul style="list-style-type: none"> <li>Measuring ranges: 0 to 250 mbar and 0 to 600 bar (relative pressure) 0 to 600 mbar and 0 to 25 bar (absolute pressure)</li> <li>For mobile and stationary pressure measurement</li> <li>No wiring work thanks to modern wireless technology</li> <li>Fail-safe transmission with telegram coding</li> </ul>
Technical data	Measuring principle	DMS
	Radio frequency	868.4 MHz
	Transmission interval	Adjustable from 0.5 to 3600 s (using setup program)
	Open air range	Up to 300 m when using the antenna wall mounting holder for the receiver and 3 m antenna cable
	Transmitter detection (transmitter ID)	Five-digit ID, factory set, can be configured according to customer specifications
	Accuracy	Max. 0.2 % of measuring span
	Process connection	Various threads acc. to DIN EN (internal, front-flush), NPT, UNF, JUMO PEKA (VARIVENT®, aseptic, clamp), and others upon request
	Case	UV-resistant
	Protection type	IP67
	Ambient temperature	-30 to +85 °C
	Medium temperature	-30 to +85 °C
	Voltage supply	Lithium battery 3.6 V (rated capacity 2.2 Ah)
	Approvals	EHEDG with the JUMO PEKA adapter system

# Transmitter – JUMO Wtrans B

The JUMO Wtrans B head transmitter with wireless data transmission is used in conjunction with the Wtrans receiver for stationary or mobile capture of temperatures with RTD temperature probes or thermocouples. Alternatively, resistances of up to 10 k $\Omega$  or voltages of up to 50 mV can be measured. A current normal-signal input (0 to 20 mA) can also be achieved with an external shunt.

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



## Transmitter – JUMO Wtrans B programmable head transmitter with wireless data transmission



Type 707060

JUMO Wtrans B has been designed for industrial use. It consists of the transmitter with integrated transmission unit and an antenna-battery case. The transmitter is suitable for mounting in form B connection heads (such as JUMO type 902020) and has an operating range of -30 to 85 °C. Installation in customer-specific terminal heads / cases is also possible. The antenna-battery case is connected to the terminal head / case with a M20 ×1.5 screw connection.

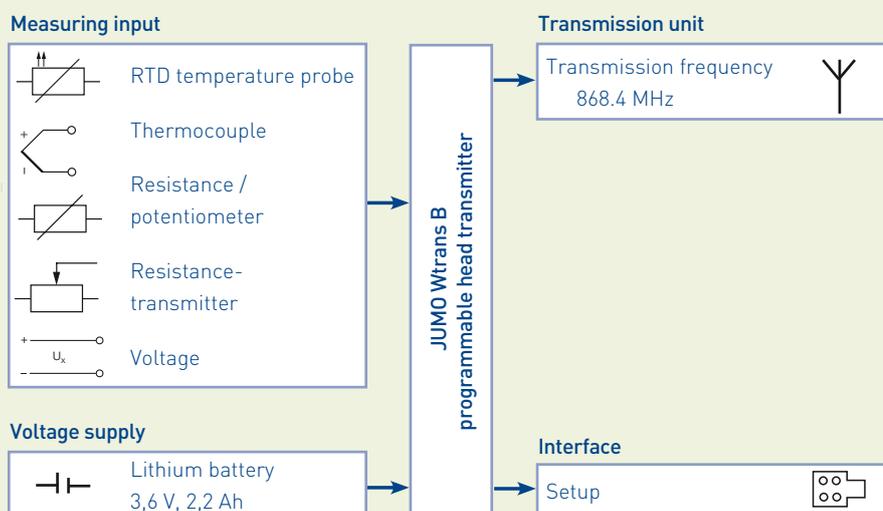
### Features

#### JUMO Wtrans B (transmitter)

- Radio frequency 868.4 MHz
- Open air range up to 300 m
- Universal measuring input
- Customer-specific linearization (40 pairs of value or 4th order polynomial)
- Lithium battery 3.6 V (rated capacity 2.2 Ah)
- Easy-to-use setup program



### Block diagram



# Transmitter – JUMO Wtrans E01

The measuring probe JUMO Wtrans E01 is used in connection with the JUMO Wtrans receiver to capture the measured values humidity, temperature, and CO<sub>2</sub>. The device has two M12 x 1 plug connectors with a practical Plug and Play function. Just a few seconds after the sensors have been connected, the measured values appear in an alternating sequence on the LCD display. Configuration and parameterization can be conveniently carried out with the JUMO setup program via the integrated USB interface. Depending on the use, the voltage can be supplied either by customary AA batteries or by a 24 V power supply unit.



## Transmitter – JUMO Wtrans E01 measuring probe for humidity, temperature, and CO<sub>2</sub> with wireless data transmission

The CO<sub>2</sub>s sensor of the JUMO Wtrans E01 works according to the infrared principle (NDIR). The autocalibration process compensates the aging effects of the sensor and an excellent long-term stability is ensured.

The combined humidity/temperature sensor is protected against dust and contamination through coating. At the same time the sensor is also particularly stable in the long term.

The integrated micro controller enables the display of the measurands absolute humidity (g/m<sup>3</sup>), dew point temperature (°C, °F), mixing ratio (g/kg), steam pressure (mbar/hPa), wet-bulb temperature (°C, °F), and specific enthalpy (MJ/kg), which are calculated from the measured values.

Sensor for humidity and temperature (combined)	Measuring range	Measurement uncertainty
Humidity measurand	0 to 100 % RH (RH = relative humidity)	±2 % (0 to 90 % RH) ±3 % (90 to 100 % RH)
Temperature measurand	-40 to +80 °C	±0,2 K to 20 °C
Response times (in air 2 m/s) • Humidity • Temperature	t0.9: approx. 30 s t0.63: approx. 240 s	

Sensor for CO <sub>2</sub>	Measuring range	Measurement uncertainty
CO <sub>2</sub> measurand (available measuring ranges)	0 to 2000 ppm 0 to 5000 ppm 0 to 10000 ppm	±(50 ppm + 2 % of the measuring range) ±(50 ppm + 3 % of the measuring range) ±(100 ppm + 5 % of the measuring range)
Response time (in air 2 m/s)	t0.9: approx. 195 s	

Sensor for temperature	Measuring range	Measurement uncertainty
RTD temperature probe Pt1000, class A acc. to DIN EN 60751	-50 to +150 °C	±(0.15 K + 0.002 ×  t ) ( t  = measured temperature in °C without prefix sign)
Connection type	Four-wire electrical circuit	
Sensor current	≤ 500 µA	
Lead wire resistance	Maximum 11 ohm per wire	
Response times (with 4 mm protection tube)	In water (0.4 m/s): t0.5: approx. 3 s; t0.9: approx. 7 s In air (3 m/s): t0.5: approx. 25 s; t0.9: approx. 80 s	

Wireless measuring probe	Technical data
Voltage supply	Four AA batteries or 24 V power supply unit
Protection type	IP65
Radio frequency	868.4 MHz



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