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sensors + automation

The Customer Magazine from JUMO

JUMO

A wireless future?

The significance of wireless measurement technology for the industry

| Page 4 |

JUMO mTRON T
New output module for automation system

| Page 6 |

Ship Ahoy! – great climate Sensor technology at sea

| Page 10 |

Wireless pressure and temperature measurement in the food and pharmaceutical industry

| Page 13 |

Traditionally innovative.

More than sensors + automation

Wireless measurement of temperature, pressure, CO_2, and humidity with the JUMO Wtrans series

JUMO wireless sensors enable measurements at locations where it would be too difficult or even impossible to install cables. They ensure failsafe, industrially suitable data transmission and are an ideal solution for permanent installations or flexible temporary measurements.

Welcome to JUMO.

www.en.wtrans.jumo.info

Dear Reader,

The words "wireless" and "Industry 4.0" are frequently used together. Wireless communication is a basic requirement for integrating different machines and plants into an efficient production network. Measurement and control technology play an important role here, since such complex systems must be carefully and precisely monitored.

With all the opportunities this technology has to offer the general risks may not be ignored. It makes a substantial difference, for example, whether a household refrigerator or a complete water treatment plant can be controlled remotely using a simple smartphone. Each day, Deutsche Telekom registers up to 800,000 attacks on honeypots that were installed to attract hackers. This figure, however, does not mean that wireless communication should be rejected across the board in the industry. In fact, it should raise awareness about being more responsible when dealing with "wireless" matters.
JUMO already presented its first wireless measuring probe back in 2007 and since then has continuously expanded its portfolio in this sector. Not only do we have the necessary expertise to offer high quality wireless measuring devices, we also provide customer service and technical consultation on the correct use and optimization. Therefore, this edition of our customer magazine is dedicated entirely to wireless measurement technology.

As always, we hope you enjoy reading the magazine.

Your Managing Partners,

Bernhard Juchheim *Michael Juchheim*

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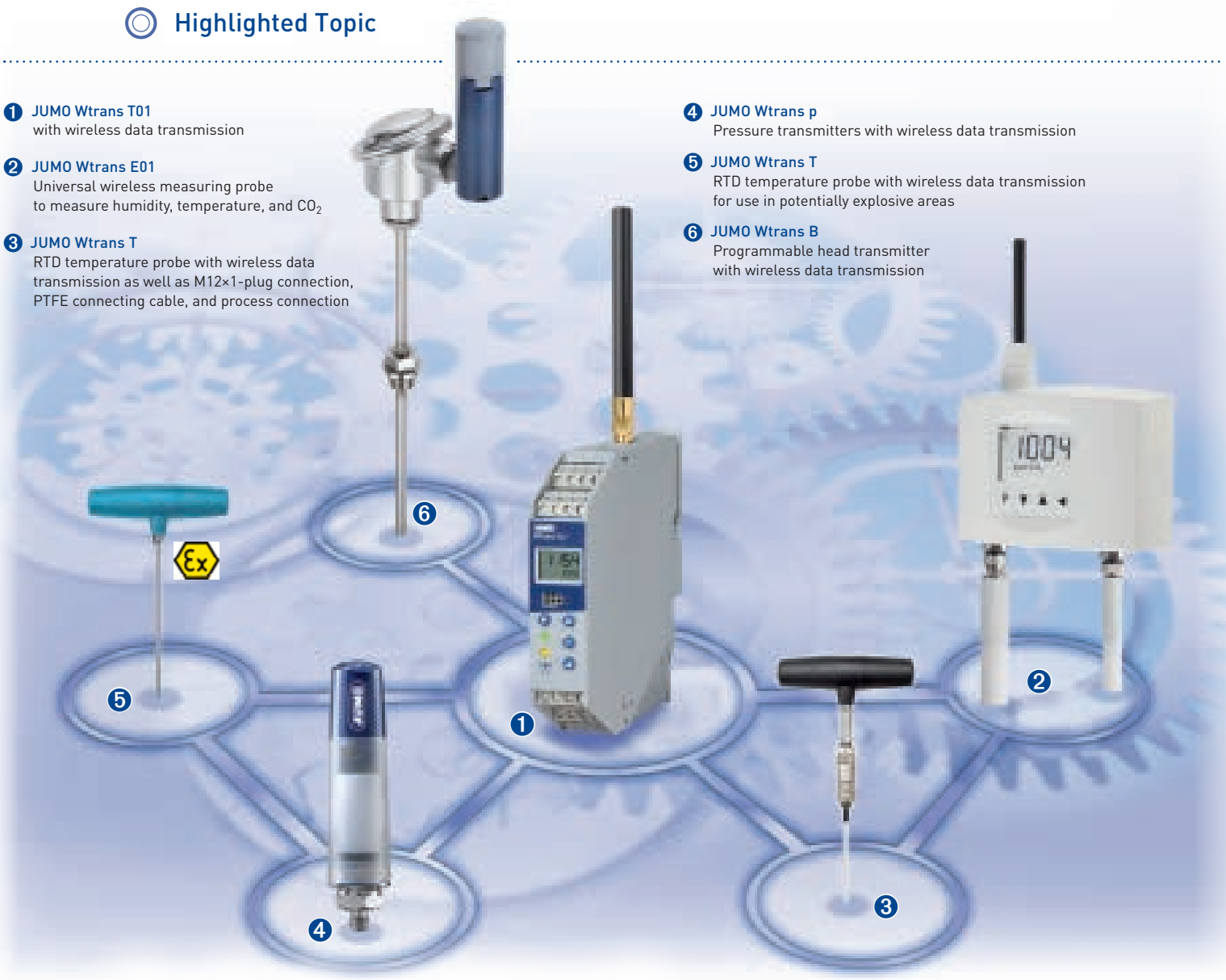

A wireless future?

The significance of wireless measurement technology for the industry

Even if the early beginnings of wireless data transmission can be traced back to the 40s of the previous century, the WLAN boom only really started around 15 years ago. The cause here lies mainly in the increasing popularity of the Internet. Around 70 percent of households were already connected wirelessly to the Internet in 2011. The technology gained additional traction through the increasingly widespread use of mobile devices. While 13 percent of all smartphone users connected to the Internet on their mobile devices in 2008, this figure climbed to 70 percent last year. The question whether the future of communication and information is wireless in the private sector can be answered with a clear "yes".

A different approach, however, is necessary for using this technology in the manufacturing industry. After all, while the failure of a household WLAN network might cause discontent over a short period of time, such a failure in an industrial plant could have expensive and possibly even dangerous consequences. However, wireless transmission technologies are used in more and more factories and companies. The reason for this is a development called "Industry 4.0", which is very much a current topic. The increasing interconnectivity of all departments within a company entails a growing need for control measures. An increasing number of areas must be measured, controlled, or automated to make the dream

of an intelligent, self-organizing factory come true. This development can be seen in JUMO products.

Wide portfolio of wireless measurement technology

The first JUMO probes for wireless temperature measurement were used predominantly in the meat-processing industry. Here, the raw products must run through a wide variety of process steps in which exact temperature measurement is essential. In head-to-head competition, hardwired solutions bow out, as the products must be run through various connected plant parts. As a result, JUMO acquired experience with wireless measurement technology early on and consistently applied it to additional measurands in the years to follow. The next product was a programmable head transmitter with wireless data transmission (JUMO Wtrans B). Furthermore, a device for wireless pressure measurement (JUMO Wtrans p) has been available since 2013. Earlier this year the JUMO Wtrans E01 was released. It can measure humidity, temperature, and CO_2. There are clear advantages. Using wireless transmission technology significantly reduces installation expenditure. Long connecting cables in hard-wired systems are usually cumbersome for users and present a potential source of errors in the measuring chain. In contrast to hard-wired solutions, wireless sensors offer effective and affordable alternatives here. In particular, the costs for installing hard-wired measuring systems are frequently exorbitant on extensive company premises, since the measuring points are sometimes widely dispersed and at high elevations. Even with subsequent plant automation and the associated recording of additional measuring points, users are frequently confronted with insurmountable obstacles in the truest sense of the word. Examples include streets, railways, or bodies of water. Expensive, fault-prone cable connections are not required; the radio-based sensor technology also functions in harsh industrial environments. Wireless technology can also exploit its strengths when it is used on moving, rotating, traveling, and non-fixed plant components. Even with temporary measurements that are required for such uses as process optimizations, pilot systems, or maintenance tasks, the user can save on time-intensive assembly and installation work.

Innovative wireless solutions for different measurands

Deployments must be planned precisely

In light of the seemingly endless options offered by wireless measurement technology, it would be wrong to become euphoric and establish an era of wireless factories. Wireless technology also has its limits, the first of which is its range. JUMO devices reliably transmit up to a range of 300 meters in an open field. This distance is generally not sufficient for most applications. A receiver that processes the data and forwards it via cables must be set up after 300 meters at the furthest. Here, JUMO offers a separate receiver that works perfectly with the Wtrans series devices and can process a maximum of 16 signals from different transmitters.

When planning the wireless measuring points, the environment must also be precisely taken into consideration. Are there any electronic sources of interference? Are there structural obstacles such as thick walls that must be overcome? Items such as these must be taken into account in advance to ensure constant, error-free data transmission.

Another topic that should not be underestimated includes the batteries used in the transmission units. The operating life of the power sources depends on many factors. The selected transmission interval, the ambient temperature, or the installation situation are the central factors here. We strongly suggest using lithium batteries. The advantages over conventional alkaline manganese batteries include a higher energy density and specific energy, high cell voltage, the very long shelf life due to the low self discharge characteristics, and the wide temperature range for storage and operation. In average general conditions, a lithium battery in JUMO devices for wireless measured value recording only has to be replaced after one year.

If you take all these points into consideration, hardly anything can compare with a production plant in which all components communicate with each other wirelessly.

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"The dream of wireless production is becoming reality thanks to wireless technologies."

Dipl.-Ing. Bernhard Juchheim
Managing Partner

JUMO mTRON T
Output module, 4-channel
Type 705025

JUMO mTRON T

New output module for automation system

The modular measuring, control, and automation system JUMO mTRON T is the result of over 60 years of experience in measurement and control technology. This experience and intensive customer contact enable us to continuously develop innovative and functional applications for a wide variety of challenges. As a result, the JUMO mTRON T is a variable system, which can always be expanded. Thanks to its universal input and output modules, flexible connection technology, and comprehensive communication, evaluation, and automation software, the device can be used in a vast range of sectors. These include the food industry, furnace construction, and mechanical engineering.

The new output module for the JUMO mTRON T system features four universal analog outputs for current or voltage, which can be freely configured. The current I/O assemblies are thus expanded again to ensure an even greater range of functions. The configurability and the flexible adjustment of the parameters are at the forefront with all modules. No programming experience is required for this, since these settings can be performed using a setup program with integrated hardware recognition.

In connection with the multifunctional panel JUMO mTRON T 840 (type 705060), a wide range of the parameters of the entire JUMO mTRON T system can also be selected and changed using preconfigured user screens. This allows for fast responses in case service and maintenance are required. This includes controller parameters and limit values as well as configuration parameters, such as the output signal of an analog output.

The new JUMO mTRON T analog four-channel output module (type 705025) can be flexibly configured on the signals 0-10 V/2-10 V/0-20 mA/4-20 mA. Special highlights include the galvanic isolation of the channels and the separate setting options for each output. As a result, an output with 0-10 V and three outputs with 4-20 mA can be configured. In case of an error, the output behavior can also be freely defined. The specifications, however, can be taken into consideration according to Namur NE 43 and set accordingly.

The easy-to-use software and the multifunctional panel can be used to set the system.

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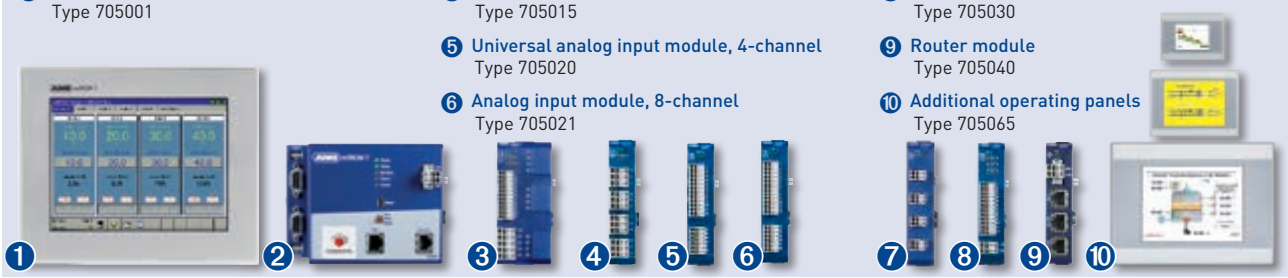
The new output module adds useful additional functions to the comprehensive range of JUMO mTRON T products. The following modules are now available:

1. Multifunctional panel
   Type 705060
2. Central processing unit
   Type 705001
3. Controller module
   Type 705010
4. Relay module
   Type 705015
5. Universal analog input module, 4-channel
   Type 705020
6. Analog input module, 8-channel
   Type 705021
7. Output module, 4-channel
   Type 705025
8. Digital input/output module, 12-channel
   Type 705030
9. Router module
   Type 705040
10. Additional operating panels
    Type 705065



INNOVATION

Type 706581 / 706585

New functions for JUMO LOGOSCREEN nt/fd paperless recorders

The JUMO LOGOSCREEN nt/fd paperless recorders with NEMA 4x approval stand out for their modular hardware concept for measurement data recording, intuitive operation, and their high security standard in terms of access controls and the security of the saved data. Additional useful functions have been implemented in the new device versions that are now available. As a result, numerous customer requests for the option of also displaying the recorder display horizontally were implemented. In addition, there are now 54 instead of 24 external inputs available. The time can now also be synchronized through SNTP (Simple Network Time Protocol). A new web server and a Modbus slave monitoring round off the functions.

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INNOVATION

Type 602021

5.3 million switching operations and no end in sight – record for JUMO panel-mounted thermostats

A test in the JUMO test laboratory has confirmed the operating life of JUMO products to be far above average. One mechanical switching operation with a switching capacity of 24 V/0.1 A was performed per minute with ten panel-mounted thermostats of the EM series. The surprising result: not a single thermostat failed after 5.3 million operation cycles. In continuous operation, this result yields an operating life of ten years. Due to the lack of time, the test series had to be stopped at this point. Panel-mounted thermostats of the EM series are used, among other fields, in railway technology for securing air curtain systems in trams or for anti-frost protection of fresh water and wastewater tanks in trains.

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INNOVATION

Type 902815 (special version)

JUMO railway sensor receives the "Environmental Testing" certificate according to EN 50 155

The JUMO screw-in RTD temperature probe with bayonet connection for railway technology fulfills even the most stringent requirements. A test performed by the Swiss institute QUINEL has now impressively confirmed that. The 902815 model was tested according to the EN 50 155 standard for the railway industry and easily met the requirements for the institute's Environmental Testing Certificate. To verify this, the JUMO screw-in RTD temperature probe was subjected to intense temperature tests as well as an extensive range of vibration and shock tests according to EN 61373. The integrated two-wire transmitter (Pt100 or Pt1000) converts the temperature value into a current signal of 4 to 20 mA.

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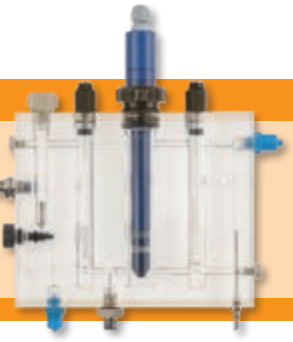
INNOVATION



Type 202811

New combination fitting for electrochemical sensors saves space and provides transparency

Thanks to its compact design, the combination fitting type 202811 from JUMO allows for the space-saving consolidation of several sensors. It is usually operated in a bypass or downstream of a tapping point of the main line. The sensors are easily visible through the fitting's crystal-clear design and can be visually inspected for pollutants. The typical full range of equipment for a drinking water or pool water measuring point consists of a pH and redox sensor, a disinfection sensor, a temperature sensor, a grounding rod, and a flow controller.

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Fig. 1: Control cabinet with the JUMO mTRON T automation system

Water well visualization at Förstina Sprudel

Förstina SPRUDEL
Der Schatz der Rhön.

Monitoring with JUMO automation system

During the modernization of the water well visualization of its now 14 wells, Förstina relied on the proven measurement technology from JUMO. By using the JUMO mTRON T automation system in combination with the visualization software JUMO SVS3000, level sensors, and conductivity sensors, all water wells can now be monitored and visualized.

Mineral water from Förstina is the treasure of the Rhön. The catchment area of the company's mineral water springs is located in the Hessian Rhön Nature Park and thus directly on the border to the biosphere reserve. The springs were first mentioned in the year 1200 and even the ecclesiastical rulers of Fulda appreciated the preciousness of drinking and bathing treatments.

The mineral water bottler Förstina Sprudel currently operates 14 water well installations in the district of Lütter and Rönshausen. The water is extracted from three different adjacent mineral water levels and directly bottled at the spring. The extraction of the mineral water is constantly monitored and its natural purity and quality is controlled. The reason behind the modernization was that the old plant had reached its capacity limits. The new plant will cover all 14 water wells and also offers the flexibility to subsequently add additional water wells. Another objective of the modernized water well visualization is securing an environmentally-friendly and sustainable production, which allows for the sustainable use of the spring source. To provide the legally stipulated proof for the responsible authorities, Förstina can very easily record and transmit all the necessary data with the new automation and visualization system. This includes, for example, the data for extraction quantities from the deep groundwater and flow rates with regard to the sinking of the water well.

The system

With JUMO mTRON T, the JUMO SVS3000, and the level and conductivity sensors, the following values are transmitted to the main server from the water well plants up to four kilometers away: the overall extraction in m^3, the extraction capacity in m^3/h, the water level in m, the conductivity in µS/cm, and the operating hours. Additional digital values, such as tank requirements, pump operation, and pump faults are also displayed.

The JUMO MAERA S28 level probe detects

JUMO MAERA S28
Level probe
Type 404392

Fig. 2: Overview of the wells (extract)

JUMO CTI-750
Inductive conductivity/concentration and temperature transmitter with switching contacts
Type 202756

the water level in the water well system through the hydrostatic pressure. Here, the level probe can detect filling heights of 0 to 2.5 m – 0 to 100 mWC (water column). Thanks to its sturdy structure and the materials used, the device can be mounted indoors and outdoors. When determining the filling height, it must be considered that every liquid has its own temperature-dependent density. Accordingly, the density value of a liquid with a temperature of +5 °C is different than that of a liquid with a temperature of +30 °C. This data is represented in tables. To simultaneously record the temperature changes of the measurement medium during measurement, an optional version with integrated Pt100 temperature probe is available.

The mineral water is extracted using pumps directly from the water wells into the Förstina bottling plant, where its conductivity is measured as the first step. The conductivity measurement at this point is the equivalent of an incoming goods inspection. The conductivity value depends on the mineralization. The more minerals released by the water during its formation/creation, the higher the conductivity value. The mineralization depends on the respective layers of rock that it runs through. The stainless steel JUMO CTI-750 version is used at Förstina to measure the conductivity. The integrated temperature measurement allows precise and quick temperature compensation, which is particularly important when measuring conductivity. Additional functions, such as the combined toggling of measuring range and temperature coefficient, allow for optimum use in CIP processes. Two integrated switching outputs can be freely programmed for monitoring the limit value of the conductivity/concentration and/or temperature. The operation is carried out via a membrane keyboard and plain-text graphic display or via an easy-to-use PC setup program. The display screen can be read when installed in either vertically or horizontally routed pipelines simply by rotating the case cover.

The heart of the new water well visualization is the JUMO mTRON T automation system *(fig. 1)*. The system here consists of the central processing unit, analog input modules, and digital input/output modules. All detected values are transferred to the JUMO SVS3000 visualization software for the visualization.

The advantages

The key advantages here are provided by the combination of the automation system with the visualization software. All detected measured values, such as the level of the wells and the conductivity values of the water as well as the flow, are detected by the automation system and forwarded via Ethernet to the visualization software. A personalized user interface can now be designed here. It is then tailored precisely to user needs *(fig. 2)*. In addition, another water well can be commissioned and integrated at any time. Ultimately, important values, such as the extraction quantity and rates, can be detected and documented for the responsible regulatory authorities.

If a fault occurs in the system (for example, on a pump), an alarm is generated, which can be sent by such methods as an email or an SMS text message via JUMO mTRON T and the Ethernet connection.

In short

Modernization efforts caused the production process at Förstina to be optimized. All necessary measured values are now detected and documented by an automation system. This ensures optimum water well capacity utilization, etc. The visualization software offers a screen display precisely tailored to the user which also shows the water well levels.

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Photo: Meyer Werft

Ship Ahoy! – great climate

Sensor technology at sea

Cruise ships are on trend: last year alone, around two million Germans took their vacation on the seas and spent more than 1.2 billion euro doing so. More than half of all the passengers are now well over 55.

A reason for the boom in all kinds of cruise ships is the ever-increasing comfort that the passengers find on luxury liners. This starts with the continuously growing pools and extends far beyond the cinemas, skating rinks, or climbing walls. Air-conditioned cabins are now standard. After all, passengers can no longer be reasonably expected to sleep in overheated cabins on voyages in southern climates.

JUMO on board

JUMO products have recently been deployed on the latest generation of Meyer Werft cruise ships to ensure a comfortable climate. To measure the temperature in cabins and ventilation ducts as well as CO_2 in individual rooms, the shipyard relies on JUMO technology.

CO_2 measuring probes from JUMO are used with a proven infrared technology. The NDIR procedure (non-dispersive infrared technology) utilizes a patented auto calibration function and eliminates all aging effects. The measuring probe in the indoor, wall-mounted, or rod version allows for a very broad field of application. For the respective process variables, standardized current and voltage outputs are available.

Air-conditioned cabins are essential on luxury ships

In addition, the use of hygrothermal transducers for measuring the relative air humidity and the temperature on the cruise ships is being tested. These measuring probes are designed for the most frequently used ventilation and air conditioning applications. They are characterized in particular by their easy installation, robust form, and reliable humidity measurement technology. The relative air humidity is recorded by a humidity-dependent capacitor. The capacitive sensor element consists of a carrier plate upon which electrodes are placed, with a hygroscopic polymer layer over the top. This polymer film absorbs or releases water molecules from the medium being measured (air), thereby changing the capacity of the capacitor. A downstream electronic circuit converts the capacity corresponding to air humidity and produces a standardized current or voltage signal. Other products from the JUMO portfolio include push-in RTD temperature probes and special temperature sensors for moisture prone environments, used to ensure the right temperature onboard.

If you find yourself enjoying a comfortable climate onboard your next trip on one of the world's seven seas, even with tropical outside temperatures JUMO is probably involved.

Selected JUMO products for climate monitoring:

1. **Hygro transducer, hygrothermal transducer, and CO_2 measuring probe**
   For climate monitoring
   Type 907021
2. **JUMO push-in RTD temperature probe**
   With terminal head form B
   Type 902120/10
3. **Indoor and outdoor RTD temperature probe**
   Type 902520/101
4. **Indoor and outdoor RTD temperature probe**
   Type 902520/13

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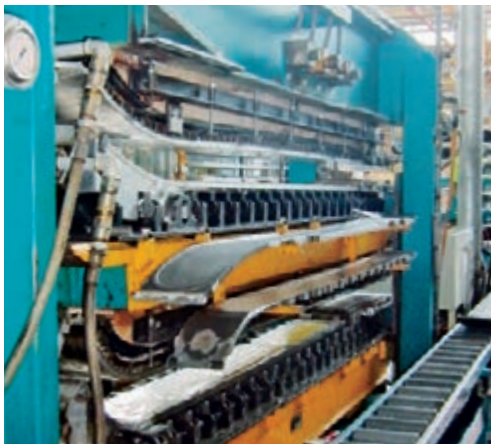
JUMO mTRON T – multifunction panel
Type 705060



JUMO ensures faster skis

Easy system operation makes an impression

Blizzard Sport GmbH is a company steeped in tradition and one of the best-known manufacturers of winter sports equipment. Famous world cup skiers and Olympic champions such as Mario Matt or Susanne Riesch race to success again and again on skis made in Mittersill, Austria. Blizzard relies on JUMO technology to manufacture its products. These products are are in demand across the globe.

Modern skis are high-tech products that no longer have anything in common with the straightforward "boards" from years past. True racing machines are made from materials such as wood, Titanal, and carbon in a sandwich procedure. These skis consist of several layers and the production process starts with a corresponding form of the ski geometry.

The design is carried out layer by layer with the coating, the edges, and a plating for the edges. A fiber layer of polyester, carbon, or other materials and, if necessary, an aluminum alloy is then frequently inserted. Afterwards comes a wood core, side panels, and above the wood core comes another fiber layer along with additional reinforcing materials if necessary.The ski surface forms the seal. The entire construction is fixed in the form and glued using epoxy resin under heat and pressure in a press. The materials used for construction must withstand extreme conditions. This is where innovative hotmelt adhesives and duroplastic adhesives made of polyurethane, for example, come into play, as they can withstand the icy cold, constant wetness, and extreme vibrations. A ski like this may well consist of more than 30 components.

Modern skis are baked

Gluing the skis, a process referred to as "baking", is of particular importance for the quality of the final product. This a very precisely coordinated process in which the measurands temperature and pressure must be continually monitored and controlled. Blizzard chose the JUMO mTRON T automation solution for this task. Thanks to its universal input and output modules, flexible connection technology, and the comprehensive communication, evaluation, and automation software, the modular system can be used in a vast range of sectors. The heart of JUMO mTRON T is the central processing unit with a process map for up to 30 input/output modules. The CPU contains superior communication interfaces, including a web server. For individual control applications, the system features a PLC (CODESYS V3), program generator, and limit value monitoring functions as well as math and logic modules. The available input/output modules include a multichannel controller module, analog input modules with four and eight channels, a 4-channel relay module, and the freely configurable digital input/output module with twelve channels. Above all, the executives at Blizzard were most impressed by how easy the system is to operate. After only completing a five-hour training program, an employee programmed and successfully implemented the entire project. In the future, additional ski presses will be equipped with the JUMO mTRON T system.

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Photo: Blizzard Sport GmbH

Tempering or cooling plant (excerpt)

High-precision tempering technology

with the JUMO DICON touch

The company "autotherm Nenninger" develops, manufactures, assembles, and services individual tempering and recooling systems for processes ranging from –50 to +350 °C. The products from Bad Königshofen, Germany are used in a wide range of industries worldwide. "autotherm Nenninger" uses the new JUMO DICON touch to control high-tech plants.

As part of a production plant, a tempering and cooling system tempers or cools a liquid medium for the production process. The plant's task is to keep the set target temperature precisely constant in a production process. Devices from autotherm use water or thermal oil as a medium for transporting energy. The liquid brought to its target temperature is routed via pipelines to the respective process. There it releases its heat or cold as energy and is returned to the plant in a closed circuit to raise or lower the thermal transfer fluid back to its specified target temperature.

To control the measurands temperature and flow, "autotherm Nenninger" relies on the new DICON touch from JUMO. The universal process and program controller with TFT touchscreen features two control channels with the tried-and-tested JUMO control algorithm with two possible optimization options. These enable precise and time-saving commissioning. As a result, even multizone, cascade controls, or other com-plex or concatenated control tasks pose no problem at all. All control processes can be visualized using a vibrant TFT color screen. The TFT-touchscreen also ensures user-friendly and intuitive operation. The modular hardware concept provides a high level of flexibility that allows it to be used in a wide range of applications. Four analog universal inputs for connecting to RTD temperature probes, thermocouples, standard signals, and up to eight external inputs are able to record a variety of physical measurands with high precision. The actuators can be controlled directly from the control device through different output variables in either analog or digital form. These digital outputs can be extended further via external modules. Various interfaces are available for communicating with higher-level systems. These systems include Modbus (master/slave), PROFIBUS-DP, and Ethernet with web server.

From the very beginning, "autotherm Nenninger" was impressed by the excellent control algorithm and the high flexibility of the JUMO DICON touch. It has already used the product in over 100 plants for a wide variety of tasks.

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Wireless pressure and temperature measurement

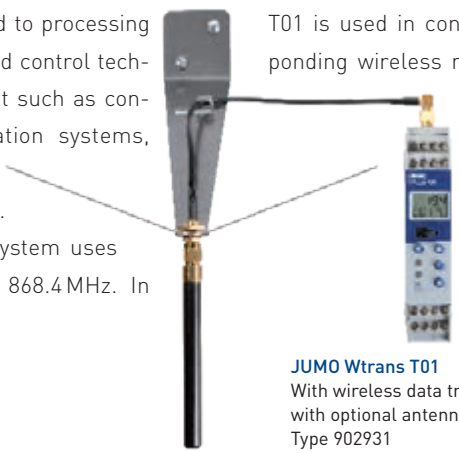
in the food and pharmaceutical industry

The range of applications for wireless pressure and temperature measurement in the food and pharmaceutical industry is vast and varied. The devices are used wherever traditional, hard-wired products are also used. This technology offers particular advantages, whether in difficult-to-access areas, mobile systems, or even on moving and rotating components. Wireless measurement technology reduces the effort required for mounting and installation during redesign or retrofitting and also saves materials in the process.

The JUMO Wtrans wireless system

The JUMO Wtrans series is a system for wireless capture of measured values using wireless technology. The recorded values are transmitted wirelessly to the receiver of the Wtrans system – from which it is then forwarded to processing measurement and control technology equipment such as controllers, automation systems, displays, or recording devices.

In Europe, the system uses radio frequency 868.4 MHz. In the USA, Canada, Australia, New Zealand, and elsewhere radio frequency 915 MHz is used. These frequencies are impervious to external interference and are especially suited for use in harsh industrial environments. The JUMO Wtrans receiver T01 is used in conjunction with corresponding wireless measuring probes for mobile or stationary temperature and pressure measurement. One receiver can process up to 16 radio signals.



JUMO Wtrans T01
With wireless data transmission
with optional antenna holder for wall mounting
Type 902931

The supplied lambda/4 antenna with an impedance of 50 Ω can be screwed on directly or fitted externally. If the antenna holder for wall mounting is used with an antenna cable, a maximum open air range of 300 m can be achieved.

Wireless temperature measurement from a smoking trolley through to spray drying

The JUMO Wtrans T transmitter, the insertion model of the Wtrans series, is particularly suited for determining the core temperature of food. In the meat-proces-

sing industry, for example, the temperatures of the cooking and smoking chamber as well as the core temperature of the product is continuously recorded. With these processes, the trolley with the product is automatically moved from the cooking chamber into the smoking chamber. When using temperature sensors with cables, faults and failures can frequently occur if the cable is bent somewhere or ever tears off. To guarantee a constantly high product quality and maximum process reliability, the JUMO Wtrans system offers new options.

The devices are also used in other areas of the food industry as well as the pharmaceutical industry. For example, when manufacturing baby food using spray drying, spray drying takes place in high spray towers. Installing temperature probes with cables in these towers requires considerable effort. JUMO Wtrans T Ex with ATEX approval is ideally suited for temperature measurement here. The device can be operated directly in a potentially explosive area. The corresponding receiver is installed outside the actual explosion zone without complex cable bushings.

Wirelessly detecting levels

A classic application example for wireless pressure measurement with the JUMO Wtrans is level measurement via hydrostatic pressure. The measurement can be implemented in ventilated tanks with a device as well as in closed tanks with two devices via differential pressure. Levels in the food and pharmaceutical industry are measured in very many applications. The JUMO Wtrans p provides advantages, particularly for performing level measurements in closed tanks. Since one device is installed on the floor and a second device in the top part of the tank (above the liquid level) for the differential pressure measurement, several meters of cable must be laid depending on the tank height. This process can be omitted by using the JUMO Wtrans p.

Requirements of the industry satisfied

The sensors used in the food and pharmaceutical industry with direct contact to the medium must meet specific hygienic requirements. This applies to the material, which is typically stainless steel 316L with a surface roughness ⩽ 0.8 µm. If seals are used, the standardized Food and Drug Administration-compliant (FDA) material is used. This also includes the resistance of the material to various cleaning agents, such as caustic soda and nitric acid. Specific requirements also apply for connecting the sensor to the production plants, the so-called process connection. There are also regulations and standards for this, which were created by such organizations as the European Hygienic Engineering & Design Group (EHEDG). The PEKA process connection adapter system from JUMO is particularly user-friendly here.

Reliable product quality through hygienic measurement technology

The JUMO Wtrans series can be used in a number of processes in the food and pharmaceutical industry. The plants can also be safely operated with wireless technology and using measurement technology featuring an ideal design, high accuracy, and hygienic process connections. The JUMO Wtrans series with the PEKA process connection adapter system is the ideal combination for many processes in the industry.

JUMO PEKA
PEKA process connection adapter with EHEDG
Type 409711

Further information

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The Wtrans transmitter for wireless pressure and temperature measurement for the food and pharmaceutical industry:

1. **JUMO Wtrans p**
   Pressure transmitter with wireless data transmission
   Type 402060
2. **JUMO Wtrans T01**
   RTD temperature probe up to 85 °C
   Type 902930/10
3. **JUMO Wtrans T02**
   RTD temperature probe up to 125 °C
   Type 902930/20
4. **JUMO Wtrans T03 Ex**
   RTD temperature probe with ATEX approval up to 85 °C
   Type 902930/15

JUMO at trade fairs during the first two quarters of 2015

We look forward to your visit!

Germany

ISH
World's leading trade fair for building, energy, air-conditioning technology, and renewable energies
March 10-14 *Frankfurt/Main*

Anuga FoodTec
Leading global trade fair of the international food and beverage industry
March 24-27 *Cologne*

HANNOVER MESSE
World's premiere industrial technology showcase
April 13-17 *Hanover*

SENSOR + TEST
The measurement fair
May 19-21 *Nuremberg*

VISION PHARMA
Modern processes, innovations, and solutions
May 19-21 *Stuttgart*

ACHEMA
World forum and leading trade fair for chemical engineering and the process industry
June 15-19 *Frankfurt/Main*

THERMPROCESS
International trade fair and symposium for thermo process technology
June 16-20 *Dusseldorf*

Further information
www.fairs-international.jumo.info

Austria

SMART Automation Austria
Trade fair for industrial automation
May 19-21 *Linz*

Azerbaijan

Caspian Oil & Gas
Caspian oil and gas exhibition and conference incorporating refining and petrochemicals
June 2-5 *Baku*

Belarus

Automation.Electronics
International fair for automation
February 3-6 *Minsk*

Belgium

M+R
Trade show for measurement and control instrumentation in the processing industry
March 11-12 *Antwerp*

INDUmation
Trade fair for industrial automation technologies and solutions
May 6-8 *Kortrijk Xpo*

Czech Republic

AMPER
International trade fair of electrotechnics, electronics, automation and communication technology
March 24-27 *Brno*

France

SEPEM
Trade fair for services, equipment for measurement, control, and regulation technology
January 27-29 *Douai*

CFIA
Exhibition for food processing and packaging machinery
March 10-12 *Rennes*

Netherlands

AQUA Nederland Vakbeurs
Exhibition for water treatment and water management
March 17–19 *Gorinchem*

Norway

NOR-SHIPPING
Exhibition of ship technology
June 2-5 *Oslo*

Poland

AUTOMATICON
International fair for industrial automation
March 17-20 *Warsaw*

Russia

MIOGE
Trade fair for energy oil and gas
June 23-26 *Moscow*

Sweden

ELFACK
Trade fair for the electronics and energy industries
May 5-8 *Gothenburg*

Serbia

SAJAM TEHNIKE
International technical fair
May 11-15 *Belgrade*

Slovenia

IFAM
International trade fair for automation, robotics, and mechatronics
January 30-February 1 *Celje*

Turkey

WIN World of Industry-WIN Automation
Leading trade fair for automation, electrotech, hydraulic and pneumatic, and materials handling
March 19-22 *Istanbul*

USA

AHR EXPO
Trade fair for the HVACR market
January 26-28 *Chicago*

Sensors Expo
Leading industry event focused on sensors and sensor-integrated systems
June 09-11 *Long Beach*

Uzbekistan

OGU
Trade fair for oil and gas
May 12-14 *Tashkent*

www.jumo.net

Our development experience is comprehensive ...
... our automation variety is as well.

Wherever the opportunity arises we use synergy effects as well as the specific experiences and knowledge of our global sites. This way we can offer our customers solutions that are perfectly in tune with one another.

Logical operating structures and easy handling ensure that the complexity of our products is reduced to a minimum.

Our customers all over the world know and appreciate that JUMO products simply have class.

JUMO. More than sensors + automation.