02/2017

sensors + automation

The Customer Magazine from JUMO

JUMO

Compact Controllers and Digital Indicators

JUMO diraTRON and JUMO diraVIEW series

| Page 4 |

Controller and Indicator Series

JUMO diraTRON and JUMO diraVIEW

The new controller and indicator series complements JUMO's product range by adding high-performance products in various DIN formats for controlling and displaying temperature, pressure, and other process variables.

- Fast and reliable startup
- Intuitive configuration and operation
- ST code (structured text) for individual application development
- Easy-to-use USB setup without auxiliary energy
- Compact design

Welcome to JUMO.

Dear Reader,

As the saying goes: "If you always do what you've always done, you'll always get what you've always got." In other words, companies constantly need to reinvent themselves and should not be afraid to look beyond their trusted, established ways of working and try something new.

JUMO has always set itself this challenge, and considers innovation to be a fundamental part of the company's development. As a result, in the space of almost 70 years our corporate group has grown from a mere producer of temperature measurement technology to a solution-focused system supplier serving a wide range of industries.

Once again, this issue includes numerous articles demonstrating that there is still plenty left to invent when it comes to measurement and control technology. For example, with the JUMO diraTRON and JUMO diraVIEW we are showcasing a new controller and indicator series which focuses on ensuring simple operation. JUMO Flip Chip is our patented, extremely compact platinum temperature sensor for mounting on circuit boards. JUMO thermoCOR is the result of combining our products and services and, as such, is a very special innovation. Not only do customers receive a premium all-in-one solution for calibrating industrial furnaces, they can also choose the ideal solution for the portable measuring system from a comprehensive service package.

In this issue of "sensors + automation" you will, of course, again find numerous application reports, news from the corporate group, as well as trade fair and seminar dates. We hope you enjoy reading this issue.

Your Managing Partners,

Bernhard Juchheim *Michael Juchheim*

| Page 6 |

| Page 10 |

| Page 17 |

Highlighted Topic

Compact controllers and digital indicators 4

Products and Services

Innovations and new products 6

Corporate Group

Two awards for JUMO 7

Applications

Small fish on long journeys 8

Ready for the energy transition 10

High level of control quality and simple use 12

A question of conductivity 14

Systematic learning 15

Worth Knowing

JUMO thermoCOR – the comprehensive carefree package 16

Temperature control for plastic window production 17

JUMO Campus 18

Upcoming Events

JUMO webinars in 2018 19

JUMO at trade fairs in 2018 20

LEGAL NOTICE

Publisher:

JUMO

JUMO GmbH & Co. KG

36035 Fulda, Germany

Phone: +49 661 6003-0

Fax: +49 661 6003-500

Email: mail@jumo.net

Internet: www.jumo.net

Project management (responsible for content): Michael Brosig

Layout: Manfred Seibert

Printing: Hoehl-Druck Medien + Service GmbH, Bad Hersfeld, Germany

Compact controllers and digital indicators

JUMO diraTRON and JUMO diraVIEW series

With JUMO diraTRON and JUMO diraVIEW, JUMO's range of controllers and indicators has been expanded to include two particularly powerful new products. The JUMO diraTRON controller series comprises five freely configurable, universally usable compact controllers in various DIN formats to control temperature, pressure, and other process variables. The new JUMO diraVIEW digital indicator series is used for displaying various values on-site.

JUMO diraTRON series

Simple

The JUMO diraTRON can be easily connected via spring-cage terminals using Push-In technology, which allows for fast wiring without tools. Parameterization and configuration are carried out using levels, which are supported by information provided in plain text. For this purpose, four device languages are already available per default.

Thanks to the JUMO autotuning function, the startup process for the controllers is incredibly simple. The devices can also be configured using a PC with the setup program. Furthermore, the setup program has a convenient software tool for the startup. This startup software allows for the visualization and storage of analog and binary signals, even while the plant is being optimized. The software is therefore an important tool for startup.

Intuitive

During development, heavy emphasis was placed on making the device intuitive to use. The device is configured, parameterized, and operated using the four keys on the front. Process values and parameters are shown by two 18-segment LCD displays. Individual device variants are additionally equipped with a pixel matrix LCD display for displaying text.

After selecting the device language, a clearly structured operating concept that is supported by texts guides the user through the various menus. In the interest of clarity, parameters and texts are shown as tickers.

Multifunctional

In this device class, the controller series is characterized in particular by its large functional range and diverse possibilities. The JUMO diraTRON can be used as a fixed-setpoint controller or a program controller.

The built-in timer can be used to implement various time-dependent functions like time-limited control, setpoint changeover, or time-delayed control. A service counter, operating hours counter, or service interval counter can be configured as standard. The result is that

servicing intervals can be determined so that servicing work and spare parts management are much easier to plan.
The controller is equipped with four limit value monitoring functions, each with eight configurable alarm functions. This allows for extensive alarm and limit value functions.
In addition to transferring the setup data, an RS485 interface enables communication with a Modbus master device. This can be used to additionally transfer up to two analog and two binary values to the controller.
Four digital control signals enhance the flexibility in the basic type. Furthermore, for more complex applications and for creating separate applications, users have available four freely configurable math and logic formulas as well as project planning via the programming language ST code (structured text).
A corresponding tool for editing and for selecting the variables, operators, function, function modules, and much more is integrated in the setup program.
Both functions – math and logic – as well as structured text, provide individual flexibility that stretches far beyond the standard configuration.

JUMO diraVIEW series

The intuitive operation and configuration in plain text format on the JUMO diraVIEW digital indicators shorten the startup times and allow adjustments to be made without referring to the operating instructions. The multifunction measurement input allows for the connection of thermocouples and RTD temperature probes, resistance transmitters, resistance potentiometers, and standard signals.

Versatile

The five different installation formats from the 48 × 32 mm compact format to the 96 × 96 mm large format as well as the high IP65 protection type on the front enable a versatile application in various industries.
Typical indicator functions are available such as min./max. value, measured value hold, as well as a tare function for weighing applications and delayed power-on. The indicator transmits the current measured value to higher-level systems via the RS485 interface or the analog output.

Adaptable

The customer-specific linearization with 40 value pairs or a mathematical 4th order polynomial as well as the math option enable the special sensors to be adjusted easily.
The "structured text" option can be used to program small applications in ST code. Examples include a rolling display of current, minimum, and maximum measured values shown as plain text and the option of manually switching using the up/down key. The ST code can be created using the easy-to-use setup program and the integrated editor. It can also be debugged online via a USB port.

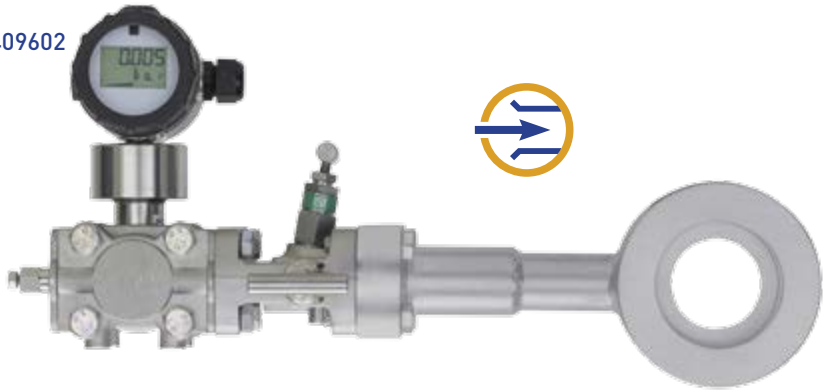
Further information
+49 661 6003-562
klaus.otto@jumo.net

JUMO diraVIEW indicator series

Innovations and new products

Flow measurement with primary elements

Type 409602



When measuring the flow on the basis of the differential pressure, both a pressure transmitter and a primary element are required for a complete measuring point. JUMO has two systems available in its product line. Numerous other variants are available upon customer request.
In both versions the core element is the JUMO flowTRANS DP R flowmeter, which can be used in liquids, gases, and steam. The meter run R01 with orifice plate is used for nominal widths up to DN 40. The one-piece orifice plate R02 is used for nominal widths between DN 50 and DN 1000.

Further information
+49 661 6003-2354
dirk.losert@jumo.net

Precise temperature measurement with the JUMO dTRANS T06

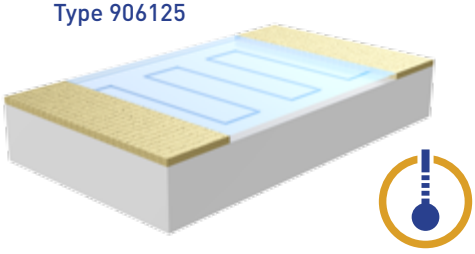
Type 707071

The new JUMO dTRANS T06 four-wire temperature transmitter is suitable for challenging applications in plant engineering. The universal measurement input with 22-bit resolution ensures high measuring precision. The reliable three-way isolation between input and output guarantees high signal stability even when measuring conditions are difficult. The SIL option is a special feature. It enables project planning for temperature measuring chains in safety relevant applications up to SIL 2/SIL 3. Options with a limit value relay output and an RS485 interface are available for reporting data to higher-level systems.

Further information
+49 661 6003-498
manfred.walter@jumo.net

New platinum temperature sensor in SMD design

Type 906125



The new JUMO Flip Chip temperature sensor was designed for automated placement on circuit boards. The chip sensor's contact is on one side and has an insulating surface on the back. Consequently, it can be placed against a housing wall and, in addition, takes up much less space on the circuit board than a standard sensor.
The sensor can be soldered with lead-free, leaded, or even high-temperature solder without restriction due to its gold-plated nickel contact.
It is available in the standard nominal values Pt100, Pt500, and Pt1000 as well as in the tolerance class F 0.3. Additional values are available upon request.

Further information
+49 661 6003-9194
kim.traxler@jumo.net

Two awards for JUMO

The "Große Preis des Mittelstandes" (Grand Prize for Medium-Sized Businesses)

JUMO won the "Große Preis des Mittelstandes" award at the end of September. For 21 years, the Oskar Patzelt Foundation in Leipzig, Germany has awarded this medium-sized business prize across Germany in 12 competition regions to acknowledge "outstanding performance of medium-sized businesses".

JUMO Managing Partners Michael (left) and Bernhard (right) Juchheim accepted the "Große Preis des Mittelstandes" award in Würzburg, Germany.

"This is a huge surprise and a great honor," says JUMO Managing Partner Bernhard Juchheim. This success is above all due to the 2,300 JUMO employees around the globe whose daily diligence ensures that the company continues to flourish.

Michael Juchheim, who manages the company as Managing Partner alongside his father, sees the honor as recognition of the company's business strategy: "As an owner-operated family company, we are developing high-tech products in Fulda that are successful around the world. This enables us to constantly tap into new growth markets with our work and successfully rise to the challenges posed by globalization."

In the competition region of Hessen, a total of 488 companies were nominated in 2017. Across Germany around 4,900 businesses were nominated for the prize this year.

In addition to the overall development of the company, other criteria for winning the "Große Preis des Mittelstandes" award include the creation and safeguarding of jobs and trainee positions as well as innovative strength. Regional involvement, service, and customer focus are also taken into consideration.

German Brand Award

In June, JUMO won a German Brand Award during an award ceremony held in the German Historical Museum in Berlin. This prize is awarded by the German Design Council and the German Brand Institute to successful brands in recognition of consistent branding and sustainable brand communication.

The German Brand Award was initiated by the German Design Council. This organization was created in 1953 by the German Bundestag (lower house of the German parliament) and established as a foundation by the Federation of German Industries. The aim of the German Brand Institute is to promote the importance of brands as a key success factor for companies on the national and international stage. The award recognizes brands which set their companies apart through the use of a clear concept.

The winners of the German Brand Award are decided by an independent panel made up of brand experts from different areas. The prize is awarded in three categories. In the "Industry Excellence in Branding" category (in which JUMO participates), the award recognizes the best product brands and company brands within a particular industry.

Small fish on long journeys

Digital sensors monitor water quality when transporting fry

Fish is one of the most popular foods in the world and demand has been increasing for years. Each German eats around 15 kg of fish every year, and this rises to as much as 90 kg for each Icelander. However, many areas of the world's oceans now suffer from overfishing so that rearing fish on an industrial scale is becoming more and more important. The world's largest producer of sea bream and sea bass is located in Turkey. It relies on JUMO technology to monitor the water quality when transporting fry.

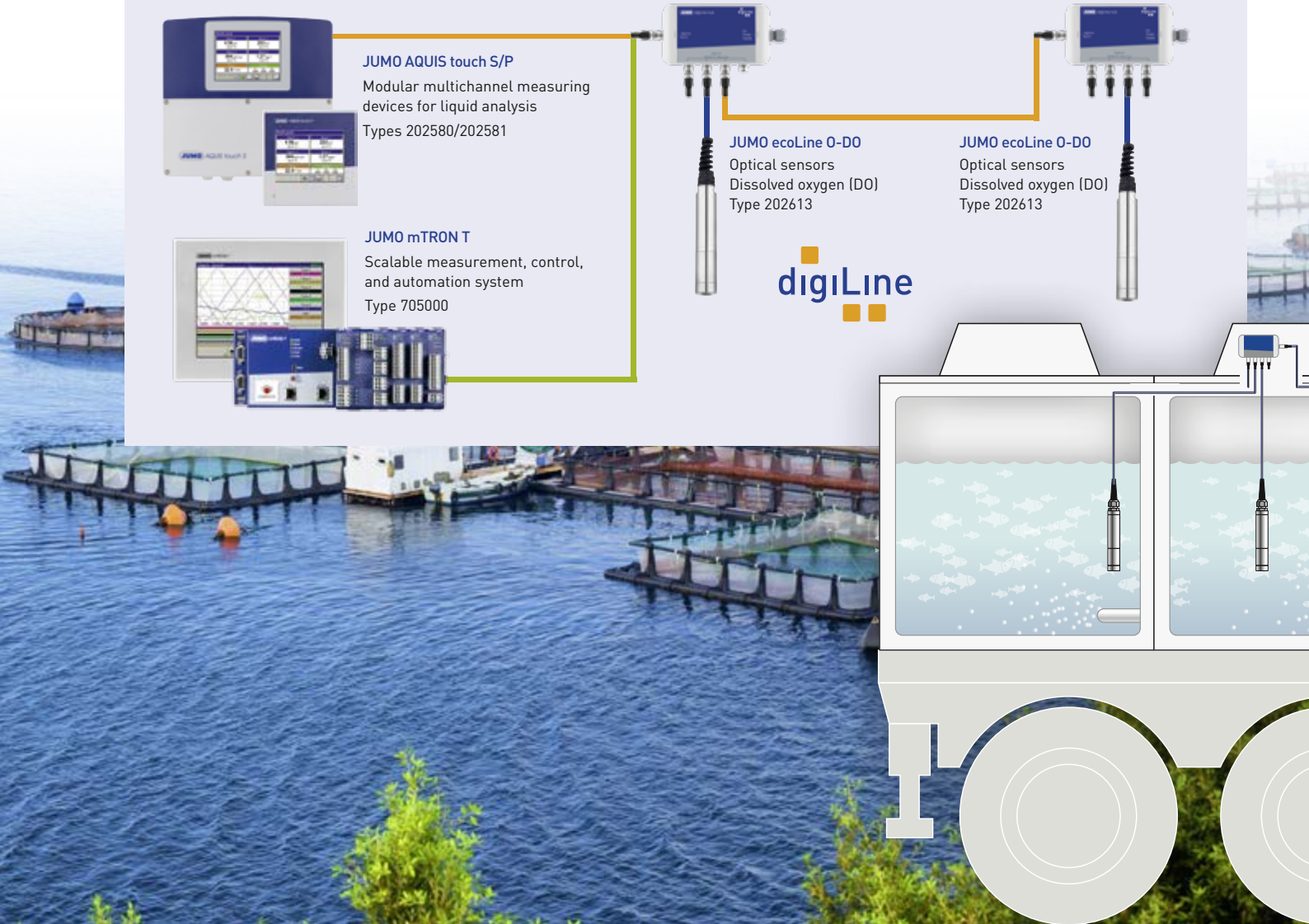
The Turkish company employs 2,500 people and produces more than 40,000 metric tons of fish each year, which is exported to more than 55 countries. In the process, the fry are moved in water tanks on trucks from the rearing area to the aquacultures. It's a journey of some 1,500 kilometers across Turkey, which means that the fry are on the road for two to three days. It goes without saying that the water quality and, in particular, the oxygen content need to be monitored constantly in such grueling conditions.

As part of the project, the JUMO team in Turkey faced a major challenge as the temperature and oxygen concentration had to be monitored simultaneously in eight tanks in each truck. In addition to providing the measured values, alarm messages also needed to be transferred to the cab to notify the driver if limit values were exceeded or undershot. Furthermore, all readings needed to be accessible on a smartphone at any time.

Simple "Plug and Play"

JUMO was able to win over the customer by providing an all-in-one solution. The oxygen concentration is acquired using JUMO ecoLine O-DO sensors, which also measure the temperature. This digital optical sensor distinguishes itself by providing measurements that are particularly low-drift, low-maintenance, and stable in the long term. The JUMO ecoLine O-DO saves the calibration data and calibration history straight to the head

JUMO digiLine system (network comprising digital sensors with evaluation and automation devices)



of the sensor. This enables simple on-site "Plug and Play". The robust sensor operates across a measuring range from 0 to 20 mg/l and can be used in a temperature range from 0 to 60 °C. It is resistant to corrosion from high salt concentrations and is therefore ideal for use in seawater.

The JUMO digiLine system was also used as an all-in-one solution. This is a bus-compatible connection system for digital sensors that gives users the ability to build intelligent sensor networks. With JUMO digiLine, a diverse range of sensors can be connected with one another for liquid analysis purposes. Merely a single digital signal line runs to an evaluation unit or controller such as to the JUMO AQUIS touch or the JUMO mTRON T automation system. This enables more efficient and faster cabling of plants in which several parameters need to be measured simultaneously at various locations, which in turn reduces the costs. The modular, compact JUMO AQUIS touch P multichannel measuring device for liquid analysis was used to evaluate the data. As such, the tasks of measuring, controlling, recording, and displaying can be performed by a single device. Two analysis parameters can be directly connected and an additional three can be connected as standard signals. It is even possible to connect six digital analysis parameters with the JUMO digiLine system. In this application, the JUMO AQUIS touch was used as a transmitter for the digital sensors.

Secure data recording

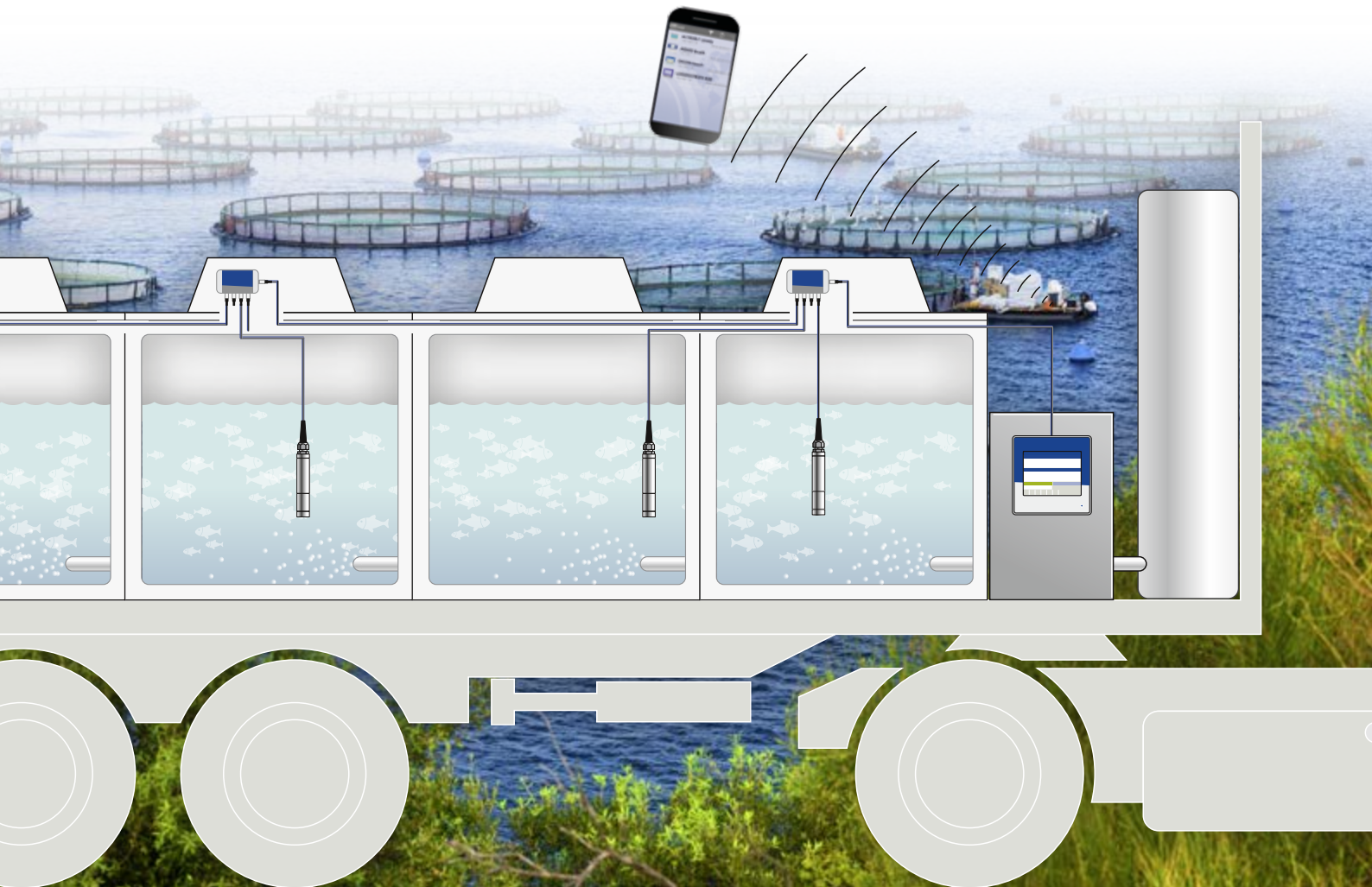
Tamper-proof data recording was ensured by the JUMO LOGOSCREEN 600. This paperless recorder combines JUMO's long-standing experience with a new control and visualization concept. The icon-based system in most cases only requires a maximum of three "touch movements" to display the requested process data.

Multiple versions of the JUMO LOGOSCREEN 600 are available for process data recording. The compact design with a mounting depth of 119 mm (including connecting plug) even enables the device to be installed in control cabinets of limited depth. Thanks to the secure data recording and manipulation detection, the JUMO LOGOSCREEN 600 is perfectly suited to this application. The challenge of ensuring data retrieval on a smartphone was mastered with the JUMO Device App. It ensures that the user always has mobile access to their process data. All current readings as well as alarm and event lists from selected JUMO devices can be viewed.

All the applied components were fitted and configured in control cabinets on-site by JUMO engineers. The JUMO Device App was also set up and parameterized. The whole system worked faultlessly from the very first trip, impressing the customer with its simple operation and excellent reliability.

Further information

+49 661 6003-9660
ulrike.storm@jumo.net



Ready for the energy transition

Power-to-Heat with JUMO technology

The energy transition is in full swing. By 2050, the aim is for Germany to obtain the energy it needs primarily from renewable energy sources such as wind, hydro power, solar power, geothermal energy, and sustainable raw materials. However, a major problem so far has been a lack of sufficient options to store the energy. That is why Power-to-Heat (P2H) – the process of converting excess power into thermal energy – is becoming increasingly important as a suitable technology. ELWA Elektro-Wärme GmbH & Co. KG, based in Maisach near Munich, Germany produces Power-to-Heat systems for power plants using measurement and control technology from JUMO.

Energy management is relatively straightforward for conventional power plants. If more power is needed in winter or at night then one simply has to increase the plant's output. However, it's a little trickier for renewable energy sources. What should be done on a sunny, windy summer's day, when thousands of photovoltaic systems are running at full capacity and the wind turbine installations in the North Sea and Baltic Sea are generating a huge amount of energy? What can be done with all this energy from Mother Nature? This exact scenario arose on Mother's Day in Germany in 2016. As a result, energy producers even had to pay money for the excess energy to be fed into other networks.

These so-called "negative energy prices" are, of course, not a sustainable solution, and alternatives need to be found. One highly promising solution is to convert power into thermal energy. Power-to-Heat plants can be used in power plants, biogas plants, or in conjunction with heat pumps. In the case of combined heat and power plants working together, P2H plants optimize efficiency and utilization.

Power-to-Heat

Heat from electricity

ELWA produces modular solutions which can be expanded at any time. Maximum operational safety, availability, and ease of servicing were top priorities in the development process. The system comprises at least one power station with an individual output from <100 kW to 1.68 MW. There is no upper limit on the number of power stations. A heat output drop in a particular subsystem is immediately compensated by the other systems. If enough power has been held in reserve, the electrics and hydraulics of the faulty system can be disconnected to carry out maintenance work. Additionally, all components can be replaced using standard tools. The system does not require more installation space than an individual system offering the total output. The stations are switched in parallel and are equipped with bypass pipes. The customer merely needs to connect the pipe connections and power cables. The ELWA P2H control system with its user-friendly 8.4 inch display is installed in a separate control cabinet from where it is able to control any number of P2H

The P2H plant and the JUMO products

P2H plant for network stability

JUMO mTRON T system in use

JUMO safetyM STB/STW
Safety temperature limiter, safety temperature monitor according to DIN EN 14597
Type 701150

JUMO TYA 202
Three-phase thyristor power controller in three-phase economy circuit
Type 709062

JUMO dTRANS p02 DELTA
Pressure transmitter with display
Type 404382

subsystems. Consequently, the system can be expanded at any time.

Safety is a particularly important aspect. P2H systems do not just require reliable power control, the measurands pressure and temperature must also be continually monitored and controlled. ELWA relies on JUMO products for these tasks. For example, the reliable JUMO TYA 202 three-phase thyristor power controller is installed in the plants.

The JUMO TYA 202 switches resistive inductive loads using a three-phase economy circuit in star-delta three-phase operation.

Energy management with power controllers

The standard dual energy management enables an equal distribution of energy in the network, thereby saving energy costs. All JUMO power controllers are equipped with an Ethernet-based communication protocol. This interface allows more data to be made available in a shorter time. As a consequence, the constant transfer of process data such as load current, load voltage, and impedance is possible. However, data concerning energy consumption and diagnosis functions such as mains voltage fluctuations, partial load failure, and excess temperature are also evaluated.

Another JUMO product that is used in Power-to-Heat plants is the JUMO dTRANS p02 DELTA pressure transmitter. It measures the differential pressure of non-aggressive and aggressive gases, vapors, and liquids (-40 to +85 °C). The pressure transmitter operates according to the piezoresistive measuring principle.

Reliable temperature monitoring

ELWA also uses JUMO technology to monitor the temperature. The JUMO safetyM STB/STW safety temperature limiter reliably monitors heat-related processes and, in the event of a malfunction, switches the plants into a safe operating status. A range of different RTD temperature probes, surface-mounted thermostats, microstats, and the JUMO DICON touch two-channel process and program controller are also installed. If special operating media is being used, the JUMO AQUIS S/P touch modular multichannel measuring device for liquid analysis is also offered for monitoring purposes.

The plant is controlled entirely using the JUMO mTRON T measurement, control, and automation system. JUMO mTRON T, with its modular design, uses an Ethernet-based system bus and an integrated PLC. The universally deployable system stands out mainly with its simple, application-oriented, and user-friendly configuration concept. At its heart is a central processing unit with a process screen for up to 30 input/output modules. The CPU has superordinate communication interfaces including a web server.

The recording functions of a full-fledged paperless recorder are implemented as a special feature. Predefined screen masks that come as a standard feature considerably reduces startup times. All acquired data is then analyzed and archived using the JUMO PCA3000 software.

Through the comprehensive portfolio for Power-to-Heat plants from ELWA, JUMO was able to offer an all-in-one solution from a single source, which won over the customer thanks to the wide variety of coordinated products.

Further information

+49 172 667 4852
martin.herold@jumo.net

High level of control quality and simple use

Automated ammonia dosing in power plants

MPT Meß- und Prozeßtechnik GmbH, headquartered in Rodgau near Frankfurt am Main, Germany specializes in plant engineering for dosing chemicals. Its portfolio includes planning, consulting, service, and implementation of components and systems for preparing and dosing chemicals in chemical processes and in water treatment. MPT worked together with the JUMO Engineering team to implement an ammonia dosing system.

The system is used for boiler water treatment in a power plant in Bolivia. Particularly stringent requirements are placed on the dosing pumps as well as on the safety and reliability of the entire dosing system here. This is because any deposits or even corrosion in the systems or on components of the water-steam circuit can jeopardize the correct operation of the power plant.

Different approaches are taken to prevent such contamination. In addition to feed water treatment (where the salt is removed from the water), alkalization of water and steam as well as condensate polishing are also required. Various chemicals such as carbohydrazide, ammonia water, trisodium phosphate, and – depending on the selected method – oxygen and caustic soda can be used for this purpose.

The ammonia solution is filled into a batching tank from an ammonia dosing station and is then diluted with water. The dosing station is often also provided in the form of a closing ISO container for outdoor use. The diluted solution is then fed into the process. The aim here is to control the conductance of the boiler water as accurately as possible. That is why the control quality plays a crucial role. MPT worked together with the JUMO Engineering department when developing this application. This team bundles the decades of company experience in industrial measurement/

Signaling of limit value violation on the overview screen

control/automation technology, supports customers throughout the entire project management, and develops customized applications.

The Engineering team has a large portfolio. It ranges from running basic feasibility analyses and workshops through to drawing up product requirements specifications/specification sheets and even end-to-end project management. The team has extensive experience in PLC programming, visualization, and network technology. Here, customer applications are developed and created based on JUMO products.

The JUMO mTRON T measurement, control, and automation system was used to implement the ammonia dosing system. With its universal I/O modules, flexible connection technology, and comprehensive communication/evaluation/automation software, the modular system can be used in a vast range of industries.

In this application, two control loops are used for the feed water and condensation water. The plant can be run in both manual and automatic mode. In automatic mode, the control system is active. In manual mode, the quantity of ammonia is specified according to a fixed formula depending on the flow. To control the process as accurately as possible, the flow at the present time is also acquired as an auxiliary variable. It determines the quantity of ammonia to be dosed. This requirement is met using disturbance feedforward control, which was implemented individually for the customer in the CODESYS environment of the automation system.

A process screen provides the user with a complete overview of the plant. Depending on the user's authorizations, further process screens may allow easy editing of process values and limit values.

Through the effective combination of services from JUMO Engineering and the flexible JUMO mTRON T system, MPT Meß- und Prozeßtechnik GmbH was able to provide a customized, easy-to-use solution.

Further information

+49 661 6003-2390
martin.mueller@jumo.net

Plant for boiler water treatment

JUMO mTRON T as a tailored solution:

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

A question of conductivity

Flow measurement in district heating plants

District heating is usually generated within the context of combined heat and power generation – in other words, the simultaneous production of power and heat. This solution offers great flexibility for generating heat for which any type of fuel can essentially be used. Flow measurement is a crucial aspect to consider in district heating plants. One power plant in Austria has opted for JUMO technology to achieve this.

The Austrian power plant is one of the cleanest and most state-of-the-art combined heat and power generation plants in Europe. A flue gas purification system filters out more than 90 % of nitrogen oxides as well as sulphur dioxides and almost 100 % of dust from the smoke.

The plant's high level of effectiveness can be traced back, among other factors, to the use of steam heat exchangers.

In the condensate pipelines in the power plant's steam heat exchangers, the flow and temperature need to be measured constantly as these two variables determine the output of the steam heat exchanger. To measure the flow, the plant operator recently started to use the JUMO flowTRANS MAG S01 electromagnetic flowmeter (MID).

An advantage of the MID is the short inlet and outlet sections. In some processes, a straight pipe with a length that is 50 times the DN pipe cross section may need to stabilize the flow after it has been swirled through bends, valves, or cross section changes or if the pipe has been subjected to turbulence. The JUMO flowTRANS MAG S01 merely needs an inlet of 3 x DN and an outlet of 2 x DN.

The JUMO flowTRANS MAG S01 is available for nominal widths ranging from DN 3 to DN 2000. The minimum conductivity of the measurement medium must be greater than 5 µS/cm (exception: water with 20 µS/cm); the maximum temperature lies at 180 °C. The flowmeter comes either as a compact device with protection type IP67 or with a separate transmitter (IP68). DIN versions or ASME versions are available as a flange.

In the application in Austria, the water has a conductivity of 6.4 µS/cm and the temperature is 65 °C. If the water conductivity is < 20 µS/cm, special MID devices are generally used which have a stronger magnetic field and a higher measurement frequency to ensure reliable measurements.

The JUMO flowTRANS MAG S01 is a standard MID, but comes with a stronger and very homogeneous magnetic field so that it conducts such measurement tasks to the customer's full satisfaction. Furthermore, an optional extra diagnostic function is available to detect undesirable deposits on the electrodes, which often occur with hot water. Flow measurements using ultrasound were previously used, but they did not always deliver the desired results. Ultimately, the plant operators were also won over by the simple configuration options for the devices as well as the excellent measurement results when dealing with low conductivity.

JUMO flowTRANS MAG S01
Flowmeter (MID)
Type 406012

Further information

+49 661 6003-2475
stefan.buechner@jumo.net

Systematic learning

JUMO technology for technical training

G.U.N.T. Gerätebau GmbH, headquartered in Hamburg, Germany, has been developing, producing, and selling training systems for technical training since 1979. The company's 130 employees develop and manufacture devices which are used across the globe in vocational schools, technical colleges/universities of applied sciences, and universities. JUMO supplies an extensive portfolio of measurement and control technology for these products.

The product range offered by G.U.N.T. Gerätebau GmbH includes more than 1,000 systems from more than 50 fields. It also offers training courses to teaching and university staff.

The company's portfolio includes devices for engineering mechanics and machine components. Examples include material properties, machine status monitoring, and the theory of design. There are also products for the fields of mechatronics and technical fluid mechanics.

The portfolio ranges from simple demonstration models right through to equipment for entire laboratories and technical classrooms. Examples include biogas plants, positive-displacement pumps, centrifugal pumps, ventilation systems and the related components, heat pumps, pipes, and primary/secondary controllers.

JUMO supplies high-quality components for a wide range of these devices. In terms of sensor technology, the company uses products such as push-in RTD temperature probes for temperatures from –50 to +400 °C and built-in temperature probes as well as JUMO pH electrodes from the JUMO ecoLine and JUMO tecLine series. Digital sensors such as the JUMO ecoLine O-DO to measure dissolved oxygen can also be found in G.U.N.T. devices. When it comes to liquid analysis, the JUMO AQUIS touch P, a modular multichannel measuring device with an integrated controller and paperless recorder, is also installed.

It goes without saying that the temperature values also need to be acquired and processed. Among other products, G.U.N.T. relies on the tried-and-tested JUMO dTRANS T05, a programmable transmitter with two-wire technology, for this purpose.

However, by far the largest proportion of JUMO devices is used in demonstration models and comes from the control technology field. Process technology and thermal energy technology are two key areas where G.U.N.T. calls on JUMO's longstanding "Made in Fulda" expertise. The portfolio in this respect ranges from compact controllers from the JUMO cTRON series to the JUMO dTRON controller with program function, right through to high-end devices such as the JUMO DICON touch – a two-channel process and program controller with paperless recorder and touchscreen.

JUMO, with its extensive product portfolio, makes an important contribution to the high quality and reliability of G.U.N.T. devices (see www.gunt.de for further details).

Further information

+49 160 9687 2326
michael.vesper@jumo.net

JUMO dTRON 304
Compact controller with program function
Type 703041

JUMO dTRANS T05
Programmable transmitter with two-wire technology
Type 707050

JUMO DICON touch
Two-channel process and program controller with paperless recorder and touchscreen
Type 703571

Demonstration model from G.U.N.T. Gerätebau GmbH

JUMO thermoCOR

The comprehensive carefree package

Compact system for calibrating industrial furnaces

Operators of industrial furnaces are sure to be familiar with the terms "AMS2750" and "CQI-9". The AMS2750 (Aerospace Material Specification) regulation describes the requirements of the aerospace industry regarding thermal process devices used in heat treatment. The "CQI-9 Heat Treat System Assessment" formulates the requirements from the automotive industry regarding industrial heat treatment and describes the procedure to follow when conducting process audits. For both standards, JUMO can now offer an easy-to-use compact solution for calibration in the form of the JUMO thermoCOR measuring system.

JUMO thermoCOR
Portables measuring system
Type 987050
(presentation model)

A fixed component of both the "AMS2750" and the "CQI-9" is the so-called TUS measurement. As part of this measurement, the uniformity of the temperature in the usable space of a heat treatment system needs to be checked at least once a year. Additionally, the system accuracy of the measuring chain needs to be checked every three months as part of a SAT test. All results must be carefully documented.

The JUMO thermoCOR is a portable measuring system with which plant operators can independently perform these SAT and TUS tests. The device is calibrated by JUMO in its own DAkkS laboratory and meets the tolerance limit requirements according to the AMS2750 and CQI-9 standards.

The key component of the system is a high-precision cold junction. The JUMO thermoCOR case has an overall capacity of up to 12 configurable thermocouple inputs and four freely configurable universal inputs to which such devices as RTD temperature probes or pressure transmitters can be connected.

A touchscreen offers easy handling of process screens. A master and user management system enables all activities to be easily understandable and all measured values to be acquired so that they are tamper-proof. The data is transmitted via LAN or USB interface through the JUMO PCC communication software to the JUMO PCA evaluation software. A test report can be prepared after testing.

Customers who are interested in this innovative testing system can choose from a range of different service offers. For example, the complete JUMO thermoCOR with DAkkS certificate can be purchased as part of the basic package. In this case, the customer performs all tests independently and creates the reports themselves.

The introduction package includes the JUMO thermoCOR rental fee for one month including one day of support from a JUMO employee for startup, tests, and training.

With a duration of 12 months, the maintenance package includes comprehensive services such as recalibration, a full functional check, firmware updates, and a loan device for the duration of the recalibration work.

Further information
+49 661 6003-2567
th.stumpf@jumo.net

Temperature control

for plastic window production

In Germany, the market for windows and doors has been growing rapidly for many years, which can be attributed to the construction boom in the public and private sector. Plastic windows now make up the largest share of the market. Precise temperature control is essential when these windows are manufactured.

The underlying design principle of plastic windows has barely changed since they were first invented back in 1954. The windows comprise a plastic profile into which a square steel tube, a steel U-profile, or an L-profile is almost always integrated for structural reasons. During the manufacturing process the PVC profile, which has already been adjusted to the correct length and miter, passes through different production steps.

The process begins with the welding of the profiles. Then the corner bearings are drilled, the weld seam is cleaned/removed, the sealing rubber and glass seals are positioned, and the fittings are inserted.

Extremely precise and reliable temperature control is crucial, particularly at the start of the production process when the profiles are welded. If the temperature is too high, the materials would be damaged. If the temperature is too low, the profiles would not bond to one another with sufficient strength. Once the PVC profiles have been aligned in a suitable holding device, the so-called "heating mirror" moves between the profile parts to be welded to heat them to a temperature of around 250 °C. The welding mirror then moves back and the PVC profiles are pressed together to weld them.

A renowned window manufacturer uses JUMO control technology to achieve the desired results when welding plastic components. During this process, the JUMO diraTRON compact controller takes care of temperature control for the welding mirror. For this purpose, the controller is equipped with control loop monitoring that checks whether the actual value obtained when the relay output is switched changes by a defined value over a defined period of time. Consequently, the functionality of the heating mirror can be monitored and an alarm can be signaled in case of a defect.

The new JUMO diraTRON controller series comprises freely configurable, universally usable compact controllers in various DIN formats to control temperature, pressure, and other process variables.

The devices are characterized by simple, clearly structured operation supported with texts. The basic type includes a ramp function, autotuning, limit value monitoring functions, binary functions, extensive timer functions, and a service counter. Furthermore, four freely configurable math and logic formulas as well as project planning via the programming language ST code (structured text) are available for more complex applications and for creating individual applications.

Thanks to their straightforward startup and high degree of reliability, JUMO diraTRON controllers are ideally suited to welding processes when manufacturing windows and doors.

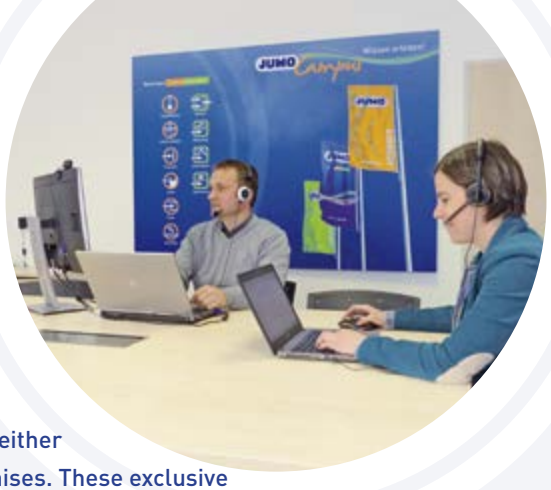
Further information

+49 661 6003-562
klaus.otto@jumo.net

JUMO diraTRON series
Compact controller
Types 702110/11/12/13/14

JUMO Campus

NEW: exclusive webinars for rapid, cost-effective startup work



For many decades JUMO has offered its customers exclusive seminars, which can either be held in the training center in Fulda, Germany, or on-site at the customer's premises. These exclusive seminars are tailored to each customer's requirements. They are a highly effective and efficient training method.

JUMO now also offers exclusive webinars. To participate, the attendee simply dials into the virtual training room from their computer. The trainer does likewise. The result is that no time and money needs to be spent traveling. The participants can see the trainer's screen (e.g. a presentation), can hear the trainer through the integrated conference call, and can see the trainer on the webcam. If so inclined, the participants can also share their own webcam so that the trainer can see them. The participants can choose to sit alone in front of their computers or they can gather with several colleagues in a meeting room. During the training session, communication goes both ways. This ensures that the participants and trainer can ask each other questions. It also means that topics can be amended during the webinar.

Application areas and topics

Exclusive webinars are recommended for compact training topics for which there is no need for active "hands-on work" on the device. Topics could include selected measurands or how to configure and use a JUMO component for a particular application.

As a result, a large part of the project planning work can be carried out during the session so that the participants can then carry out this work themselves in the future.

The duration of the webinars can vary, but we recommend that they last no more than two hours. If more extensive or longer topics need to be covered, on-site training is a better option as the participants' attention tends to drop faster with an online training session.

An exclusive seminar would also still be the best choice if fundamental topics need to be worked through completely or if it is particularly important to work with the device technology.

Advantages

Webinars are cost-effective and efficient as no travel expenses are incurred. This means a compact overview of a tailored topic or a particular issue can be provided at relatively little expense.

At the same time, an exclusive webinar is more time-effective compared with having participants familiarize themselves with the topic independently. The result is that mistakes during startup can be prevented.

Our complete range of training courses
http://campus.jumo-en.info

New JUMO technical literature: "Electronic pressure measurement technology"

The JUMO range of technical literature will soon be expanded to include another subject. JUMO has already been established in the field of pressure measurement technology for more than 30 years.

The new technical book entitled "Electronic Pressure Measurement Technology" provides information on the special features of the applied measurement principles. It is clearly structured and guides the reader through the various topics ranging from the basic principles to the sensor technology and accuracy values. Furthermore, it offers concrete guidance for performing practical work such as level measurements in pressurized containers.

This book uses more than 50 images to depict the various topics and application examples in a clear and understandable manner.

It will soon be available on the JUMO Campus website in PDF format. Customers who pre-order their copy will receive it in PDF format as soon as it is released.

Further information
http://literature.jumo-en.info

The book will be released soon

JUMO webinars in 2018

Keep your technical knowledge fresh

TEMPERATURE

Webinars:

Electrical temperature measurement
March 13 + September 05, 2018

Plastic sensor technology with JUMO plastoSENS T
February 21 + September 20, 2018

LIQUID ANALYSIS

Webinars:

pH measurement and use of measurement technology
January 16 + September 18, 2018

Redox potential measurement and use of measurement technology
January 17, 2018

Basic principles of chlorine measurement and use of measurement technology
January 18, 2018

Basic principles of measuring dissolved oxygen and use of measurement technology
January 23, 2018

Basic principles of turbidity measurement and use of measurement technology
January 25, 2018

Connection of JUMO digiLine sensor technology to a JUMO AQUIS touch S/P
January 30, 2018

PRESSURE AND LEVEL

Webinars:

Electronic pressure measurement technology – pressure types, sensor technology, and transmitters
February 06, 2018

Hydrostatic level measurement – basic principles and startup
February 07 + September 13, 2018

FLOW

Webinars:

Measurement according to the differential pressure method
April 12, 2018

Industrial flow measurement technology – basic principles and measurement methods
November 06, 2018

HUMIDITY

Webinar:

Introduction to humidity measurement – basic physical principles and overview of measurement methods
February 14 + September 12, 2018

CONTROL

Webinars:

Using cascade control
February 20 + November 13, 2018

Basic principles for using thermostats based on the example of the JUMO heatTHERM series
February 22, 2018

How to enhance efficiency by safely applying autotuning in JUMO controllers
April 26, 2018

RECORDING

Webinar:

JUMO PC Security Manager software
May 08, 2018

AUTOMATION

Webinars:

Transmitters: connection, configuration, handling
February 01, 2018

JUMO mTRON T – Process engineering application
February 27, 2018

JUMO functions in CODESYS – JUMO mTRON T applications
February 28, 2018

Modbus – basic principles and example configuration
May 02, 2018 (part 1)

Connection of Modbus slaves to the PLC from JUMO mTRON T
May 03, 2018 (part 2)

JUMO thyristor power controller of the TYA series – functions and controls for three-phase operation
June 19, 2018

MONITORING

Webinar:

Application of JUMO safetyM STB/STW – safety temperature limiter and safety temperature monitor
June 07, 2018

IO-Link GENERAL TOPICS

Webinars:

Basic principles of explosion protection (ATEX) and the use of JUMO equipment with the protection type intrinsically safe
February 15 + October 17, 2018

Connection of JUMO IO-Link sensors
March 01 + September 19, 2018

INDUSTRIES

Webinar:

Industrial heat treatment according to AMS2750E and CQI-9
June 05, 2018

Our complete range of training courses
http://campus.jumo-en.info

JUMO at trade fairs in 2018

Experience our new products and innovations live

Belarus
Automation. Electronics
February 28-March 1, 2018 *Minsk*

Belgium
Aquarama
October 25, 2018 *Brabanthal*

Canada
MEET Show
May 02-03, 2018 *Moncton, NB*

Czech Republic
AMPER
March 20-23, 2018 *Brno*

Denmark
Automatik
September 11-13, 2018 *Brøndby*

France
CFIA
March 13-15, 2018 *Rennes*

Germany
HANNOVER MESSE
April 23-27, 2018 *Hanover*
IFAT
May 14-18, 2018 *Munich*
ACHEMA
June 11-15, 2018 *Frankfurt am Main*
SENSOR + TEST
June 26-28, 2018 *Nuremberg*
SMM
September 04-07, 2018 *Hamburg*

Netherlands
Aqua Nederland Vakbeurs
March 13-15, 2018 *Gorinchem*
WoTS – World of Technology and Science
March 02-05, 2018 *Utrecht*

Poland
WOD-KAN
June 05-07, 2018 *Bydgoszcz*

Russia
Neftegaz
April 16-19, 2018 *Moscow*

Turkey
WIN EURASIA
March 15-18, 2018 *Istanbul*
Future Fish Eurasia
October 18-20, 2018 *Izmir*

United Kingdom
The HVAC & Refrigeration Show
January 23-25, 2018 *Exhibition Centre London (ExCeL)*

USA
AHR Expo
January 22-24, 2018 *Chicago, IL*
Sensors Expo
June 26-28, 2018 *San Jose, CA*

Uzbekistan
OGU Global Oil & Gas
May 16-18, 2018 *Tashkent*

Other scheduled trade fairs
http://fairs-international.jumo.info

JUMO. More than sensors + automation.