JUMO

More than sensors + automation

Applications

System Solutions

JUMO Engineering guides you on your way!

Dipl.-Ing. (FH) Harald Schöppner
Head of Engineering
Phone: +49 661 6003-2295
harald.schoeppner@jumo.net

Martin Müller
Product Manager Engineering
Phone: +49 661 6003-2390
martin.mueller@jumo.net

Further information
engineering@jumo.net
www.engineering.jumo.info

Dear Reader,

JUMO Engineering, the service area of JUMO GmbH & Co. KG, combines expertise and industry specific experience in one team.

Our engineers and technicians develop customized solutions that are consistently based on your specific requirements. The JUMO Engineering team strongly believes in the importance of personalized support and consulting from the initial stages of a project through to its successful completion.

When carrying out the many different industry applications we always strive for optimum results with maximum customer benefits. Our innovative engineering services allow us to achieve this goal.

We always draw on the feedback from our customers to improve our products. This is reflected in our new developments.

We view complex tasks as challenges that allow us to develop tailored solutions for you and at the same time improve our product portfolio. JUMO Engineering with its range of services completes this comprehensive approach.

Your contact persons,

Harald Schöppner *Martin Müller*

We look forward to your inquiries and to working with you as a partner to meet your individual needs and challenges.

Your JUMO Engineering Team

Contents

JUMO Engineering

Food and beverage

Renewable energy

Plastics and packaging

Pharmaceuticals and biotechnology

Industrial furnaces

- Project management
- Feasibility analysis
- Product requirement specifications
- Project planning
- Startup
- Training

Processes

sensors + automation

- Controlling
- Recording
- Monitoring
- Automation
- Pressure
- Humidity
- Flow
- Level
- Analytical measurement
- Temperature

Industries

- Renewable energy
- Mechanical engineering
- Pharmaceutical engineering
- Water and wastewater engineering
- Industrial furnace construction
- Food technology
- Railway technology
- Heating and airconditioning

Expertise

- Personalized consulting and support
- Individual and market-oriented solutions
- Wide range of technologies
- Decades of experience

Service

- Service and maintenance concepts
- Technical support
- Training courses and workshops
- Implementation concepts
- On-the-job training

System Solutions

JUMO Engineering guides you on your way!

What began with a customer application in climate control that covered sensor technology, control, recording, and automation has now become the basis for JUMO Engineering. As a system provider specialized in complete solutions, we take a holistic yet individual approach to meeting your needs in a customized manner.
In addition to the required devices that we provide we also take on project planning and project management of plants. You benefit from the expertise we have acquired over decades of working in a variety of industries.

Our engineers and technicians are always available to assist with clarification of technical details, workshops, subapplications, and the development of complete solutions.
The structured process covering the creation of system specifications, implementation, documentation, and startup through to final training delivers clear and effective solutions.
Our global sales organization is available to provide additional information. Of course, you can also contact us directly.

Our services

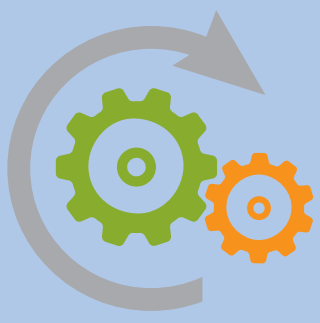
- Feasibility analysis
- Creating a technical concept including product requirements/system specifications
- Complete project planning and documentation
- Project planning incl. PLC programming, visualization, network technology, etc.
- Continuous project management
- On-site startup
- Training and support

Your advantages

- JUMO, as the central contact partner, develops a technical system solution specifically for you
- You benefit from our team's extensive expertise with all measurement and automation devices
- A global network of support from experienced specialists
- A flexible, tailored solution to suit your individual needs and application

In a nutshell

- Precise, prompt communication channels
  This saves you time and prevents mistakes!
- Highly developed expertise for maximum flexibility
  You benefit from fully reliable and secure project planning!
- Technology that has proven itself over decades reduces downtimes
  As a result you get optimal plant and process reliability!



Chamomile, peppermint, dandelion

Drying herbs with JUMO technology

Dried herbs have not only become an indispensable part of the kitchen. For millennia, they have also played an important role in the preparation of medications. One commonly encountered form is chamomile tea. The drying process is time-consuming. The herbs must be treated gently to guarantee optimal quality and the highest possible content of the active substance.

At Hofgutkräuter GmbH & Co. KG in Reinheim, Germany, various herbs are dried using a belt drying machine for further processing by tea producers or extractors. Among these are chamomile, peppermint, dandelion, arnica root, lemon balm, artichokes, and parsnips. Depending on the product, the temperature and belt speed of the drying process vary. The products to be dried are brought to the belt dryer with a conveyor belt. As the herbs pass through the system with a total of five turning points they are dried by a supply of warm air. The belt dryer used up to now in Reinheim has been retrofitted to improve the energy efficiency and increase the flexibility of the system.

At about 20 measuring points on and in the belt dryer, temperatures, pressures, fan, exhaust air speeds, and belt drives are measured and controlled for each drying process using the JUMO mTRON T automation system. The system is monitored for malfunctions and the measured values are saved to ensure traceability and documentation. The JUMO mTRON T system is modular in design and ideally suited to reliably control as well as monitor the numerous processes. 14 multichannel controller modules, 16 analog input modules, and 19 digital input/output modules are used in addition to two central processing units.

Numerous other JUMO products are used in the process in addition to the automation system. The intake air section has devices from the JUMO dTRON series that are used as

System Solutions

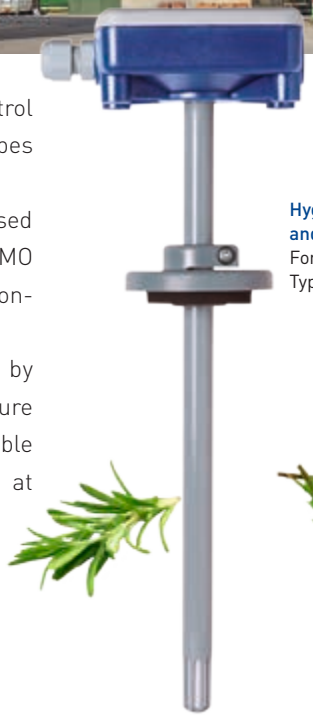
Chamomile, peppermint, dandelion

Hofgutkräuter GmbH & Co. KG in Reinheim, Germany

humidity and temperature controllers as well as to control the fans. Hygrothermal transducers and temperature probes are also used.

In the exhaust air section, JUMO dTRON controllers are used (among other devices) as speed sensors along with JUMO differential pressure transmitters. Also, the belt drive is controlled by JUMO dTRON controllers.

The entire plant was engineered and implemented by Hofgutkräuter GmbH & Co. KG with JUMO's help. To ensure trouble-free production startup, the employees responsible for operating the equipment were thoroughly trained at JUMO company headquarters in Fulda.



Hygro transducer/hygrothermal transducer and CO_2 measuring probe
For climate monitoring
Type 907021

JUMO dTRON 308Q
Compact controller with program function
Type 703043

Push-in RTD temperature probe
With connecting cable
Type 902150

Feeding the supply

Process screen

Overview screen

Inside view of the belt dryer

The finest wine thanks to automation

JUMO develops a complete solution for wine production

Germany is a country of wine – for 2,000 years the finest wine has been produced on the banks of the Moselle and Rhine. Today in Germany, around 80,000 wine growers produce more than nine million hectoliters of wine per year. During wine production, monitoring the temperature plays an increasingly important role. On behalf of Hüttenhein GmbH & Co. KG Anlagenbau, JUMO took on the role of service provider and developed an innovative automation solution for a wine grower in the Palatinate region, taking on planning and project management tasks.

The Welter winery in Engelstadt, Germany is a third-generation family-run business producing high-quality wine using organic methods. Furthermore, the Ortwin Welter Weinkellerei GmbH & Co. KG winery has gained an excellent reputation for the refinement of wines from contractual vintners. When the cooling system for various tank systems was recently modernized, the winery chose a solution developed by the company Hüttenhein GmbH & Co. KG Anlagenbau from Wittlich, Germany. Hüttenhein Anlagenbau has been a partner in the development of professional overall systems since 1978, particularly for the food and beverage industry. Since it was founded, the company has been developing and implementing tempering stations including the corresponding pipeline construction in stainless steel for wineries. For the project with the Welter winery, the plant engineering company chose to rely on the technology and expertise at JUMO.

Monitoring the fermentation of wine has become a highly relevant subject in the last few years. The better the temperature in the storage containers can be kept within the optimal temperature range, the higher the quality of the wine. This is particularly necessary immediately after filling the tanks with the grape must because so much heat is generated during the fermentation process that artificial cooling is required. In a special method known as cold fermentation, the temperature must constantly remain between 15 and 20 °C to allow particular yeast strains to work. The resulting wines are extremely fresh, pure, and uncomplicated with a relatively high alcohol content.

For the cooling solution which was implemented for the Welter winery by Hüttenhein Anlagenbau, the tanks are cooled in different zones using thermowells through which glycol flows. This way, almost any low temperature can be generated in the tank. The current project phase contains 70 tanks which are in different storage rooms, some of which are outside. Hüttenhein Anlagenbau used the modular measuring, control, and automation system JUMO mTRON T as a central control element. It analyzes the data from the JUMO probes, which are attached to each tank, and with the help of JUMO controllers controls the temperature. Furthermore, the pressure in the entire cooling system is monitored. With the help of the recording function of the JUMO mTRON T, important actual values are also recorded. The central processing unit sits in a control cabinet which is

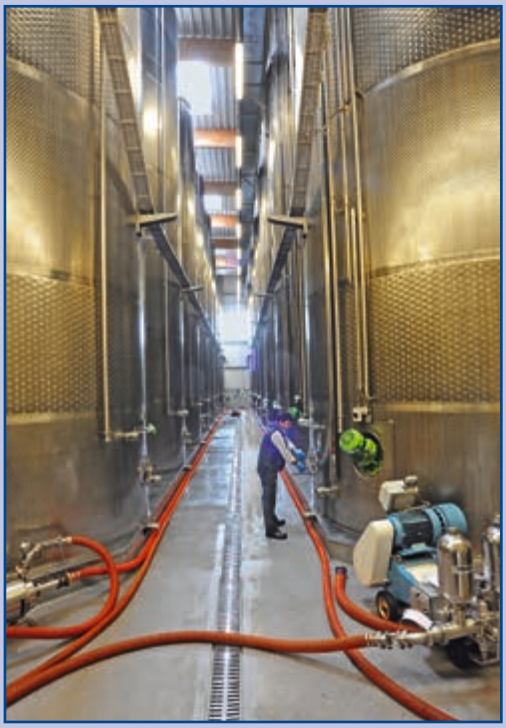
System Solutions

The finest wine thanks to automation

The Welter winery: a family-run business in Engelstadt, Germany

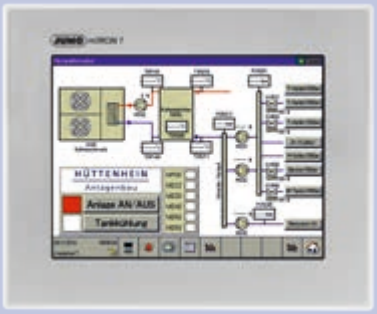
located in a container outside of the winery and which houses another tank for the coolant as well as several pumps for the 650 KW chilled water units. The main operating panel, which is used to control the temperature, is located in the office of the operations manager. Furthermore, a total of 29 JUMO mTRON T input/output modules are used. A special feature is the five subdistribution units which are dissipated around the company's premises and which are controlled by router modules. With the help of separate operating panels, individual process steps can be controlled directly on-site.

For all of this, JUMO not only delivered the different components but also supported the entire project with engineering services from the remit to startup on site. This meant that, among other things, individual process screens were programmed by the JUMO application team. Hüttenhein Anlagenbau and the Welter winery were, above all, impressed by the simple parameterization and configuration of the system on site, which are possible even without extensive PLC knowledge. The flexibility of the JUMO mTRON T system, which can be expanded modularly at any time, is also a clear plus. This is also the reason why Hüttenhein is now also using the system for other customers. Expansion of the plant at the Welter winery is also being planned.



One of the tank systems whose temperature is controlled through the JUMO mTRON T system

Process picture: hydraulic module



Process picture: fuel gauge

Installation situation of the JUMO mTRON T

Controlled cheese maturation –

with the aid of an automation system

Germany is a cheese country. Almost 25 kilograms of cheese are consumed annually per person and 1.1 million tonnes are exported. From the North Sea to Allgäu in the very south, large and small dairies offer around 150 regional and national cheese specialities. Cheese production is a traditional trade that has not changed for centuries. However, even though the principles have not changed, modern technology always finds its way into cheese production. One dairy in the Allgäu region is now using an automation system to ensure controlled cheese maturation.

The journey from milk to cheese is always the same. Fresh or pasteurized milk is skimmed and then adjusted to a defined fat content using cream. The milk mixture is pre-matured using lactic acid bacteria and then coagulated using rennet so that the curd is made. The remaining whey is separated from the curd by draining and pressing. The curd is then left to rest. It is during this phase, which can take weeks or months, that the cheese acquires its very special character.

Gebr. Baldauf GmbH & Co. KG has been producing cheese specialities from hay milk in the Allgäu region for over 150 years and runs several small alpine dairies. The task was to further optimize the cheese quality at two of these locations using heat treatment chambers. To do so, the company wanted to use thermophilic cheese cultures during the maturation process to provide a milder, less acidic flavor. While conventional, mesophilic cultures work optimally in temperatures as of 25 °C, their thermophilic counterparts require significantly higher temperatures. However, the process can be controlled very precisely based on the pH value, thereby ensuring a consistently high product quality.

The company relied on engineering solutions by JUMO GmbH & Co. KG to implement this project.

The JUMO Engineering team bundles decades of experience in industrial measurement, control, and automation technology. This team supports customers throughout the entire project handling and develops customized applications for a variety of industries. The extensive portfolio ranges from running basic feasibility analyses and workshops through to drawing up product requirements specifications and specification sheets as well as configuring, programming, and auditing automation solutions. In addition to startup and project documentation, tailor-made training courses are also offered.

The task in this case was to control two heat treatment chambers at each of the two locations using a temperature profile. In addition, the pH value of the products needed to be continuously measured as it is the termination criterion for the heat treatment process. The process data needs to be recorded and remote access must be possible via the Internet.

All these requirements could be implemented using the JUMO mTRON T automation system, the JUMO AQUIS touch multichannel measuring device, and JUMO temperature and pH sensors. The JUMO mTRON T system has a modular design. Different measurands such as temperature, pressure, or humidity can therefore be precisely recorded and digitalized using the same hardware. For individual control applications the system has a PLC (CODESYS V3), program generator and limit value monitoring functions, as well as math and logic modules. In addition to flexibility, future security and expansion options also played an important role in the deployment of the automation solution. For example, the JUMO mTRON T enables simultaneous operation of up to 120 control loops. Furthermore, the inputs and outputs of each controller module

System Solutions
Controlled cheese maturation

Baldauf alpine dairy in Gestratz, Germany

can be individually expanded and adjusted via expansion slots. The clear overview of all recorded values is another advantage. In addition to enabling visualization, the multifunction panel also enables easy to operate controllers and program generators. Moreover, user-dependent access to parameter and configuration data for the overall system is possible. The recording functions of a full-fledged paperless recorder, including a web server, are also implemented as a special feature in the JUMO system. Proven PC programs are available for extracting and evaluating recorded data. The solution for the dairy in the Allgäu region involved the HMI being operated entirely using custom process screens. The screens enable program selection, program start, and entries in a batch field.

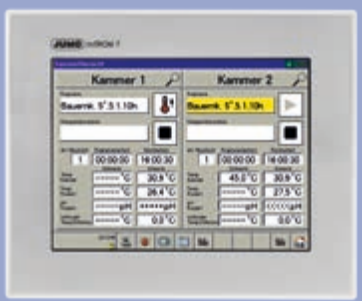
The pH value in the cheese is measured by a JUMO AQUIS touch using an insertion electrode while the temperature is measured using an insertion probe. The JUMO AQUIS touch is a modular multichannel measuring device for liquid analysis with an integrated controller and paperless recorder. Regardless of whether the measuring task involves the pH value, redox value, electrolytic conductivity, highly-purified water resistance, temperatures, or disinfection measurands (such as free chlorine, total chlorine, chlorine dioxide, ozone, hydrogen peroxide, or peracetic acid), the JUMO AQUIS touch P provides a central platform for displaying and processing the corresponding sensor signals.

The heating chambers in both alpine dairies are linked to the company's head office. The batch data from the plants are extracted on the server at the headquarters and relevant form printouts are stored on the server as PDF documents. Additionally, the form indicates which alpine dairy the batch comes from so that the form is also printed on the network printer of the respective dairy.

The quick and easy implementation of the required application was important to Gebr. Baldauf GmbH & Co. KG. A cost-effective package solution was possible thanks to JUMO Engineering's system concept.

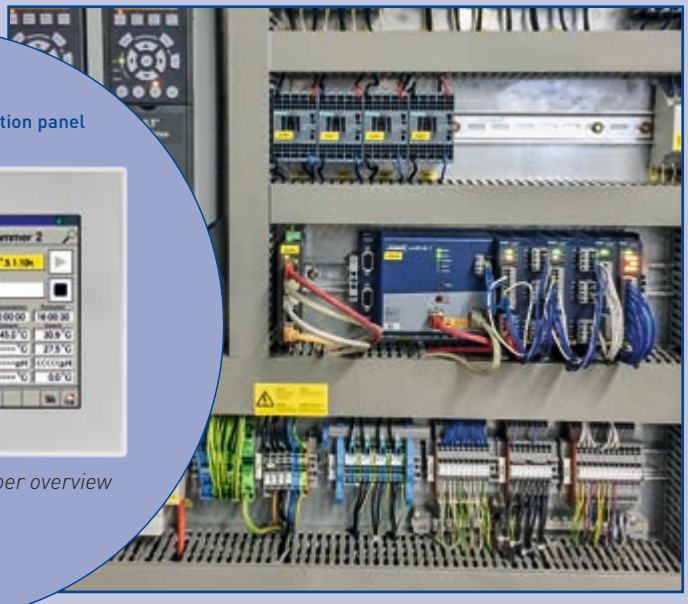
Ripening chamber

JUMO mTRON T multifunction panel
Type 705060



Process screen: chamber overview

JUMO AQUIS touch P
Modular multichannel measuring device for liquid analysis with integrated controller and paperless recorder
Type 202580



Installation situation of the JUMO mTRON T

On solid ground

Use of measurement and control technology in composting plants

Nowadays, composting is no longer something which only takes place in people's gardens, but is mainly carried out on a large scale by local authorities. In Germany, more than 1,000 composting plants exist for this purpose. According to data from the German Federal Statistics Office, in 2011 around 14 million tonnes of biogenic waste was composted or fermented in biogas plants and subsequently re-used on soil in Germany. Around two thirds of the biogenic waste is used in agriculture and a quarter in landscaping.

The correct handling of biodegradable waste destined for composting is stipulated in Germany by the German Biowaste Ordinance *(Bioabfallverordnung)*. This is important because dangerous pathogens can emerge during the process.

According to the German Biowaste Ordinance, the specified temperatures for all batches of a composting must be documented. Proof is necessary because dangerous microorganisms are reliably eliminated as a result of the temperature in the material. This data must always be available to the *Bundesgütegemeinschaft Kompost* (Federal Compost Association). During composting, a temperature of more than 55 °C must act upon the entire mixture for, if possible, a consecutive period of two weeks, or 65 °C over one week. The treatment temperature must be measured and documented in regular intervals – at least once per working day. Devices used for temperature measurement must be calibrated regularly – at least once a year – and the calibration must be documented. Only if documentation of the indirect process control is verifiable at any time can the manufactured composts be deemed hygienically harmless.

Often, this temperature check is carried out manually by the operators of composting plants. The costs for personnel are correspondingly high. Disposal provider "GfA Lüneburg - gkAöR" has chosen the JUMO mTRON T automation system and JUMO Wtrans B wireless temperature probes. As a result, the process is monitored completely automatically and documented in a tamper-proof way. Two JUMO mTRON T central processing units, two JUMO mTRON T multifunction panels, 48 Wtrans temperature probes, and four Wtrans receiver units are used for this purpose.

By building up the heap (pile for composting), the batch recording is started. In total four temperatures are recorded per batch. The temperature probes, which are 1,600 mm in length, are inserted directly into the heap for measurement. These are equipped with a JUMO Wtrans wireless temperature system in which the transmitter is located in the probe handle and is protected by watertight housing. The used radio frequencies are largely impervious to external interference and allow transmission even in harsh environments.

The probe contains a platinum chip resistor as its sensing

JUMO Wtrans B being used in a heap

System solutions
On solid ground

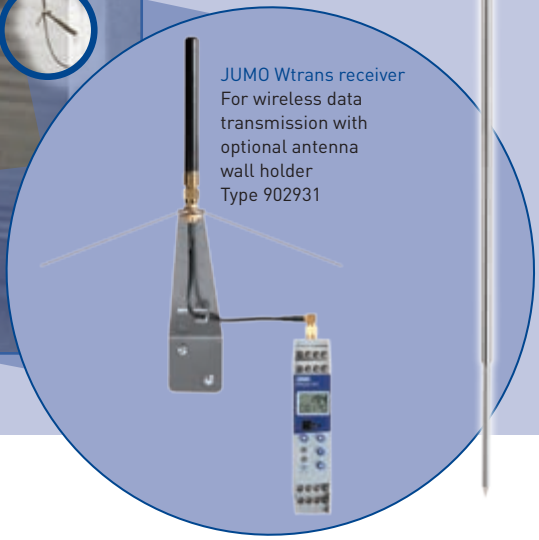
GfA Lüneburg, aerial view

element. On the transmitter side, a temperature measuring range of -30 to +85 °C is achieved. Up to 16 JUMO Wtrans transmitters can be managed per receiver via the RS485 interface. With the JUMO mTRON T system, the clear overview of all recorded values impressed the most. The multifunction panel enables not only visualization but also user-dependent access to parameter and configuration data of the overall system. In addition, a special feature of the JUMO mTRON T is the implemented data recording – fully-fledged and tamper-proof – and the implemented web server. Both functions are an ideal basis for the application at hand.

Proven PC programs are available for extracting and evaluating recorded data. Using standard predefined screen masks, startup times for the user are considerably reduced. The entire process of temperature monitoring and documentation is now much simpler for GfA Lüneburg thanks to the implemented solution. The data no longer has to be recorded manually with a lot of effort, but instead it is automatically documented and logged for the hygiene certification. In addition, the use of individual data loggers is no longer required. A particularly great advantage has proven to be the minimal effort required for programming and on-site installation.

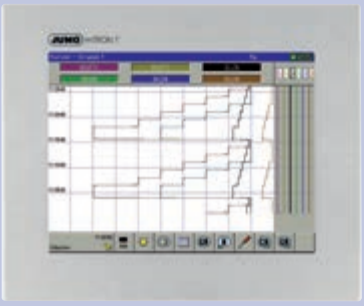
JUMO Wtrans B
Special version of the RTD temperature probe with wireless data transmission for temperature measurement in heaps

JUMO Wtrans T antenna in use



JUMO Wtrans receiver
For wireless data transmission with optional antenna wall holder
Type 902931

Additional operating panels
Type 705065



JUMO mTRON T multifunction panel
Type 705060

Automation makes it possible!

The controlled annealing of plastic parts

Modern plastics are truly high-tech products, replacing traditional materials in more and more areas. They have played a key role in the automobile sector for decades, where they are exposed to particularly extreme loads. Coburg ROS GmbH & Co. KG specializes in the manufacturing of thermoplast and duroplast parts for this industry.

In order to live up to customer demand, uniform quality in the production process must be guaranteed even for large quantities. In a new annealing furnace made by caldatrac® Industrieofenbau GmbH & Co. KG, a JUMO mTRON T automation system helps to ensure constant quality. The challenge for the new plant is to anneal the duroplastics using an even and precise heat treatment. The tolerance limits provided by the customer for these materials are extremely narrow. The raw parts are pushed into the furnace using a tempering trolley. Up to eight different batches on six tempering trolleys can be simultaneously put into the furnace and processed. Due to its construction, an even distribution of heat is achieved inside the furnace to produce a temperature distribution with a maximum deviation of +/– 3 K.

Due to the variety of products, it was particularly important for ROS GmbH & Co. KG to be able to save and edit different annealing programs directly in the system. The caldatrac plant engineering firm chose the JUMO mTRON T automation system as the ideal solution.

The advantages are clear: the modular design of the JUMO mTRON T offers maximum flexibility. Different input/output modules are available, including a multichannel controller module, an analog input module with four or eight channels, a relay module in a 4-channel version, and the freely configurable digital input/output module with 12 channels. The 4-channel analog input module is the special feature. It is equipped with universal and galvanically isolated analog inputs for thermocouples, RTD temperature probes, and standard signals. Different measurands, such as temperature, pressure, and humidity can therefore be precisely recorded and digitalized using the same hardware. For individual control applications, the system has a PLC (CODESYS V3), program generator and limit value monitoring functions, as well as math and logic modules.

At ROS GmbH & Co. KG, the different programs for the annealing process are conveniently launched by the user via the multifunction panel. The creation of programs, which comprise up to 100 segments, can also be performed directly on the device.

Each annealing process is not only controlled by the

A plastic part from ROS GmbH & Co. KG

System Solutions

Automation makes it possible!

ROS GmbH & Co. KG in Coburg, Germany

JUMO mTRON T system, but is also recorded. The batch reporting of the system enables continuous monitoring and evaluation of the individual furnace components. With a detailed evaluation of the temperatures and programs used, conclusions on quality can be drawn at any time under the influence of different factors.

The appearance of values in curve form is also carried out directly on the display. This recording function is integrated in the JUMO mTRON T and is available to the user for easy-to-use data recording.

The graphs plotted here can be evaluated, printed out, and exported using special software. Upon request, an automatic batch report can be made available as a PDF file, which is automatically produced by the system without user action. It also includes a detailed overview of all batches as well as the accurate representation of the recorded values.

The particular flexibility of the system also appears in the item management. Each item manufactured in the annealing furnace is created here and assigned to a program. A system plausibility test ensures that only items that were assigned to the previously chosen program can be annealed.

The batch data input is carried out directly on the multifunction panel. In this case, the operation masks were adjusted especially for ROS.

The annealing furnace

JUMO mTRON T multifunction panel
Type 705060

Input mask of the item management

JUMO safetyM TB/TW08
Temperature limiter, monitor according to DIN EN 14597
Type 701170

JUMO mTRON T
Measuring, control, and automation system
Type 705000

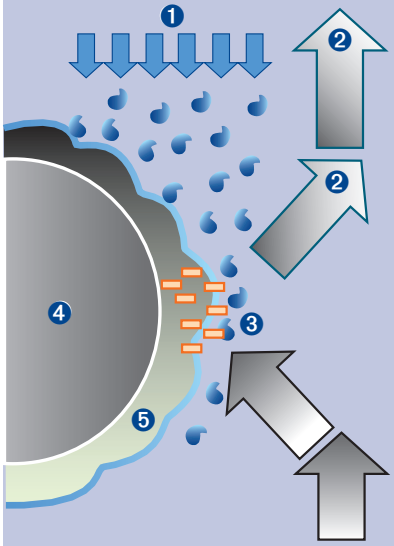
Systematic exhaust air decontamination

Automation, sensor technology, and engineering provide efficient solutions

Washing processes for treating exhaust air are used successfully in many sectors of industry. These processes can be used to decontaminate single-component and multiple-component exhaust gas compositions that are harmful to human health as well as exhaust gas flows that are both harmful to the environment and odorous. terra-care Umwelttechnik GmbH in Recklinghausen, Germany does not only use components from JUMO in the area of measurement and control technology, but also relies on the engineering services by JUMO.

terra-care Umwelttechnik GmbH prefers to use multistage systems with absorption agents and biological treatment stages to safely and effectively comply with the legally stipulated pollutant limits. The process relies on the mass transition of soluble raw gas components and the sorbent on the one hand, and the biodegradability of many exhaust air components on the other. The high deposition rate of the washing systems means the emission limit values stipulated in the German Federal Ministry's "TA Luft" (Technical Instructions on Air Quality Control) for the protection of the environment, nature, and reactor safety or BimSchV (Germany's Federal Emissions Protection Act) can be reliably reached and guaranteed. The raw gas is fed to the washer system and guided through the column. The aerosols that are carried along are removed from the treated exhaust gas stream before it is routed into the next cleaning stage. The solvent is recycled, continually checked

The function principle



The exhaust air decontamination system in use (from the left: stage 1, stage 2, stage 3)

with measurement technology and, if necessary, chemically balanced to minimize operating material costs. The process engineering in the biological cleaning stage can be viewed as an equivalent. However, the biodegradable materials are reduced using microbacterial implementation mechanisms here.

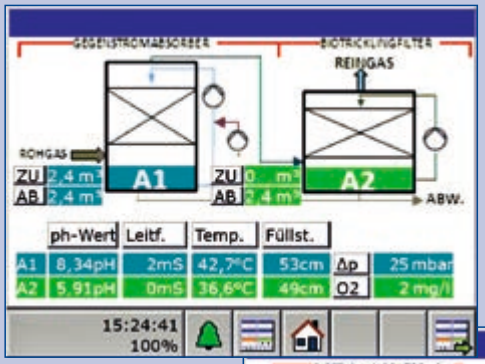
The safe functionality of the plant depends to a large extent on the controllable operating parameters of the installation parts and the water quality. For this reason, the entire system is exclusively monitored and controlled using JUMO's measurement and control technology components. The setup of the control system was developed in coordination between the engineers from terra-care Umwelttechnik GmbH and the JUMO Engineering department. In this process, the JUMO Engineering team collaborated with the customer to develop product requirements specifications and a specification sheet based on a feasibility analysis. This resulted in an individual system solution that allowed the use of the extensive JUMO product portfolio of measurement and control technology.

At the terra-care Umwelttechnik GmbH plants, the conductivity, water temperature, oxygen content, pH value, filling level, differential pressure, and supply air temperature are measured in the individual cleaning stages and evaluated by the JUMO AQUIS touch. The multichannel measuring device forms the central platform for displaying and processing the corresponding sensor signals. The JUMO AQUIS touch has a modular design and offers numerous interfaces. Measuring inputs, switching outputs, digital outputs, and analog outputs can be freely retrofitted and modified in a wide area. A process schematic and a tabular list of all the measurement parameters support the operator in the form of a chart on the JUMO AQUIS touch screen. Depending on the displayed measured values the water quality is ensured along with a response initiated by the control system in case of high load. Similarly, the circulation pump and fan outputs are controlled so that the whole system works independently and without any operator involvement. The important data is also evaluated through automated processes.

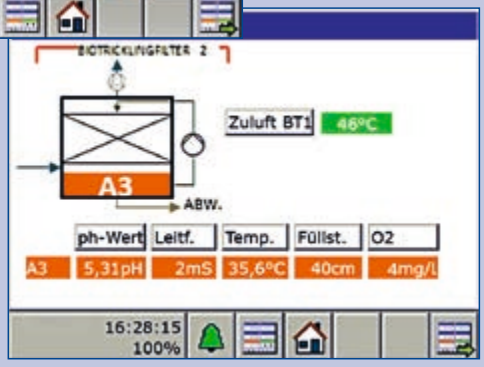
Multistage exhaust air decontamination systems

Furthermore, the innovative JUMO digiLine system is used to measure the oxygen content. JUMO digiLine is a bus-compatible connection system for digital sensors in liquid analysis that gives users the ability to build intelligent sensor networks. Only a single digital signal line is then routed to the evaluation unit or controller. This enables more efficient and faster cabling of plants in which several parameters need to be measured simultaneously at various locations.

Installation situation in the control cabinet



Process screen: overview of stage 1 and 2



Process screen: overview of stage 3

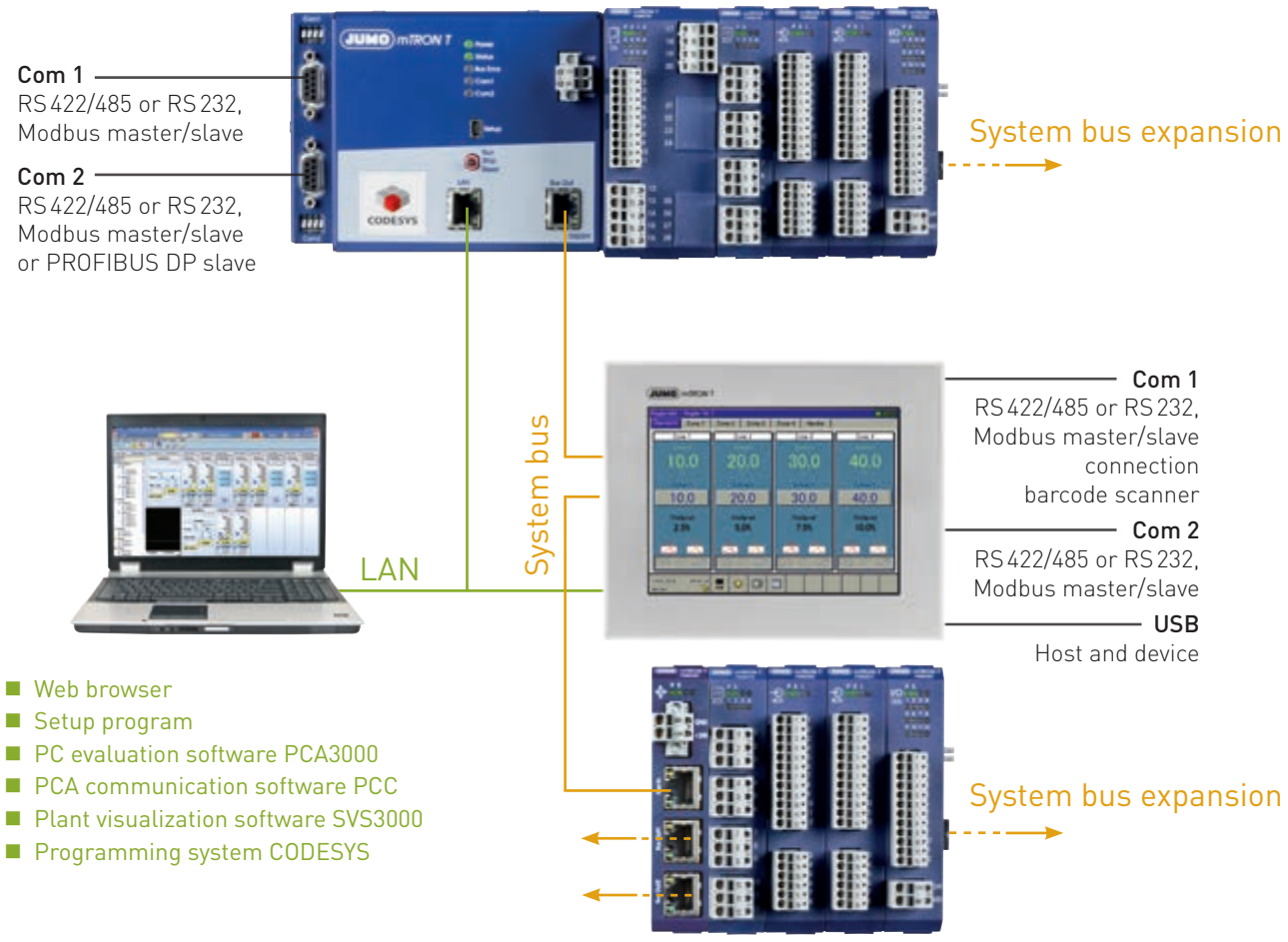
Furnace control and data archiving –

with the JUMO mTRON T automation system

Over the course of more than 90 years, Vacuumschmelze GmbH & Co. KG, with its headquarters in Hanau, has evolved into one of the world's leading companies for magnetic and metallic special materials and products refined from these materials. Today, the company employs over 4,000 employees and owns more than 800 patents. Excellent products for almost all industries and markets are produced every year in the business units semi-finished products, parts, cores, components, and permanent magnets.

Extremely precise, reliable, and reproducible temperature control is needed to manufacture and refine these materials. Temperatures above 1,000 °C are used in various furnaces. The scalable JUMO mTRON T measurement, control, and automation system is used at VAC in Hanau. The JUMO mTRON T with its modular design uses an Ethernet-based system bus and an integrated PLC – even for decentralized automation tasks. The universally deployable system stands out above all with its simple, application-oriented, and user-friendly configuration concept. At its heart is a central processing unit with a process map for up to 30 input/output modules. The CPU has superordinate communication interfaces including a web server. For individual control applications the system has a PLC (CODESYS V3), program generator and limit value monitoring functions, as well as math and logic modules.
In addition to enabling visualization of all processes, the convenient multifunction panel enables easy to operate controllers and program generators. User-dependent access to parameter and configuration data for the overall system is also supported. The recording functions of a full-fledged paperless recorder, including a web server, are implemented as a special feature. The use of predefined screen masks that come as a standard feature considerably reduces startup times. All recorded data is then analyzed and archived using the PCA3000 software.
Vacuumschmelze GmbH & Co. KG also used the Engineering services from JUMO to commission the JUMO mTRON T.

JUMO mTRON T – system structure



- Web browser
- Setup program
- PC evaluation software PCA3000
- PCA communication software PCC
- Plant visualization software SVS3000
- Programming system CODESYS

System Solutions

Furnace control and data archiving

JUMO's many years of experience with highly precise control technology was a particular benefit here. JUMO Engineering can implement even the most complex package solutions – from authoring the product requirements specifications through to startup and training. Vacuumschmelze GmbH & Co. KG particularly relied on JUMO Engineering to optimize the furnace systems, leading to noticeable improvements in the results and energy efficiency.

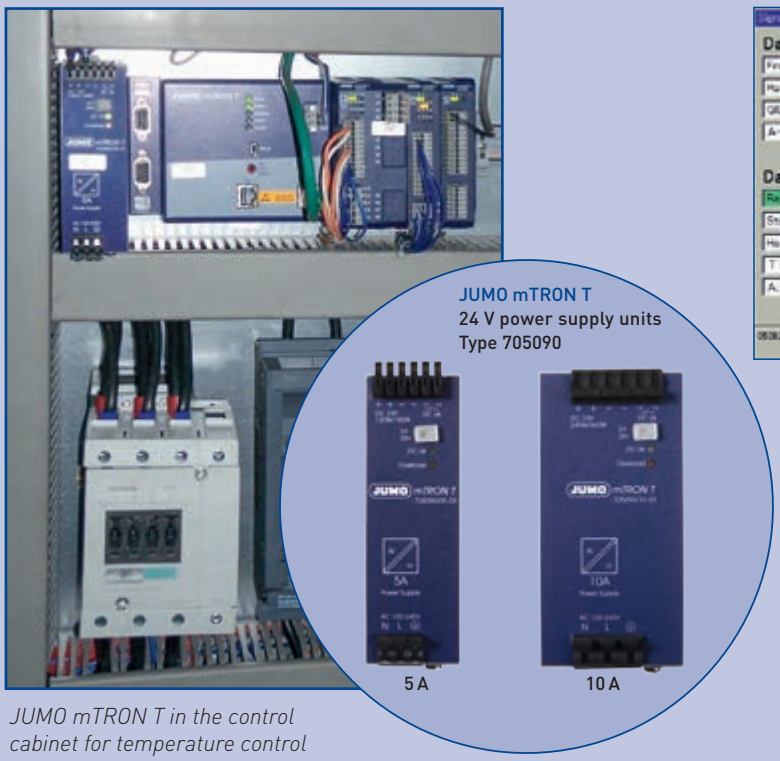
The extensive JUMO product portfolio which includes thermocouples, controllers, thyristor power controllers, recording devices, safety temperature limiters, and automation solutions was once again drawn upon to construct the furnaces.

JUMO PID control algorithms have an excellent track record in industrial furnaces, regardless of whether they are used in continuous-process or batch furnaces. The firing system type is not an important factor. Scheduling programs allow accurate mapping of the firing curves or process screen. Connections can be established with the JUMO SVS3000 visualization software via fieldbus interfaces, allowing the measurement data to be recorded and analyzed for each batch. Manufacturers who produce plants for the aerospace and automobile industry can also get JUMO devices with the required certificates according to AMS 2750E or CQI-9.

Bell furnace after removal of the heating mantle to start the cooling phase

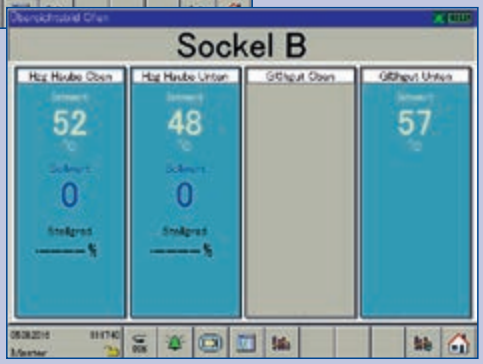
Bell furnace after removal of the heating mantle during the cooling phase

Bell furnace - without a heating mantle in the foreground, with a heating mantle installed in the background



JUMO mTRON T in the control cabinet for temperature control in the tower furnace

Process screen: control system signals



Process screen: configuration

www.jumo.net

PR 00100 EN/00677942/2018-04-25/V1