Brewery Technology

Innovative solutions for your success

Dear Reader,

Brewing beer – that is an art in itself. As a brewer, in addition to your expertise you depend on reliable and accurate measu-rements with centralized control and monitoring.

Here, JUMO is at your side as a reliable partner to help when you have questions and to provide you with quick solutions. We do so regardless of whether you monitor beer quality through pressure, temperature, conductivity, or pH value. We're also at your side for controlling the cleaning process or reducing production costs.

So how do we do it? Through long-standing experience and expertise: because for more than 70 years, JUMO has been one of the leading manufacturers in measurement and control technology. Consequently we are also an expert partner for the beverage industry.

We place particular importance on regular new developments, on continuous improvements in existing products, and on con-tinually making production methods more economical. These steps are the only way to achieve the highest level of innovation.

At JUMO we offer you only the best in the brewery industry as well. Specifically that means a large variety of solutions for the most varied applications.

Even though the brewing process has been subject to the German Purity Law since 1516 with regard to the raw materials used, today brewing is done with state-of-the-art instrumentation and control engineering technology.

This brochure provides an overview of JUMO products and systems for the brewery technology industry. Of course, we are also happy to work together with you to create customized solutions for individual requirements.

PS: Further information about our products can be found under the product group number at **http://www.industry.jumo.info**.

Table of contents

Malting process

As an experienced brewer, you know that beer quality depends on many factors. If you work with JUMO's reliable automation systems right from the early stages of manufacturing – the malting process – you are sure to have high-quality malt in your hands at the end of the process.

JUMO · CLOUD

JUMO smartWARE·SCADA

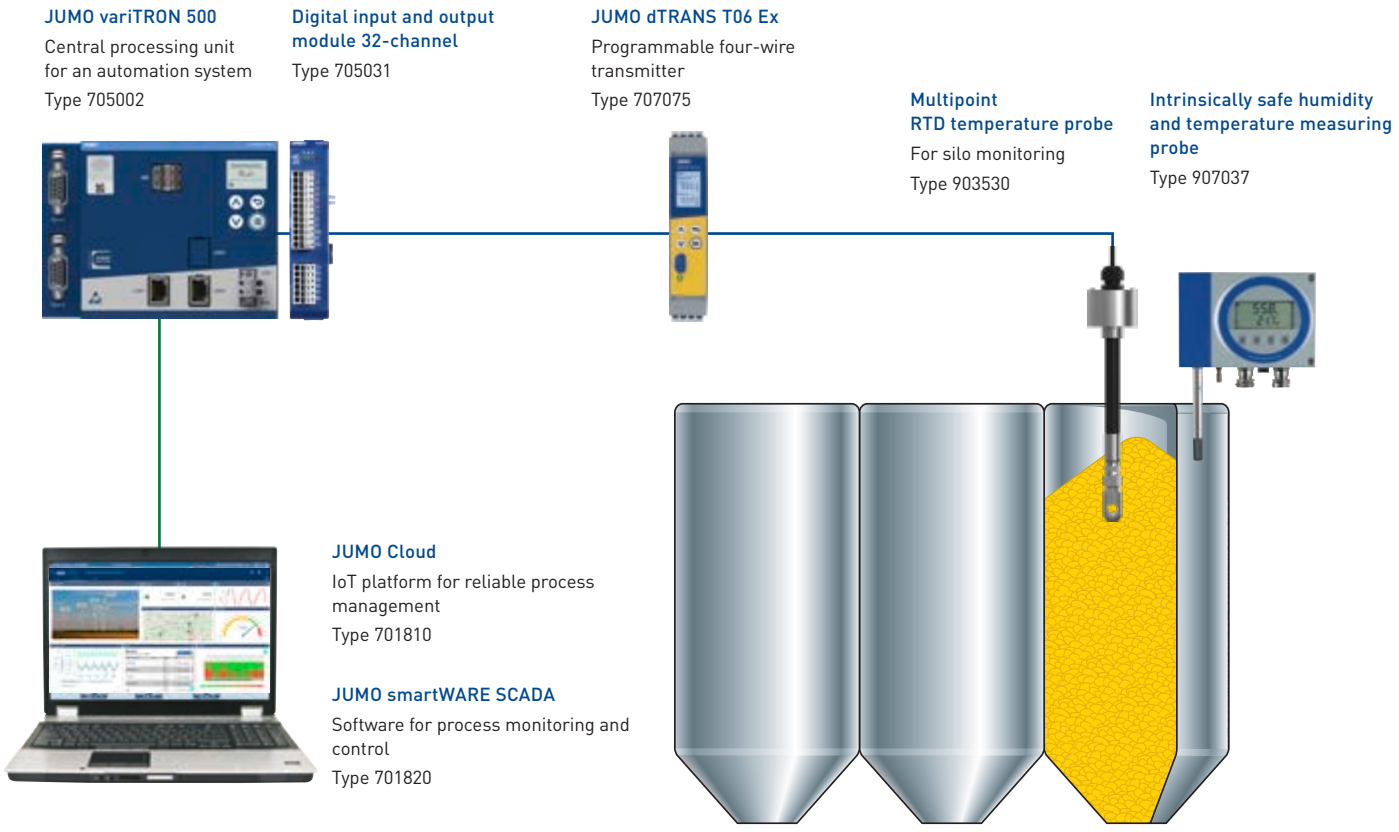
Storing

Precise temperature monitoring with silo probes from JUMO

JUMO silo probes have several Pt100 or Pt1000 units, which are installed at regular intervals. This way, you can easily measure the temperature in several places in the silo at the same time – using only one probe. The measured values can be transferred safely and reliably to the measured value acquisition system via an explosion-proof temperature transmitter.

Cover all measuring points with one system

JUMO variTRON, the automation system, offers you many advantages when storing barley or malt. For example, you can acquire all measured values through 4-channel or 8-channel analog input modules. In total, you can acquire up to 120 or 240 analog signals here and display them in your control room using JUMO smartWARE SCADA. This enables you to display all measured temperature values at a glance and, in the event of a malfunction, to see immediately which silo is experiencing problems.



Steeping

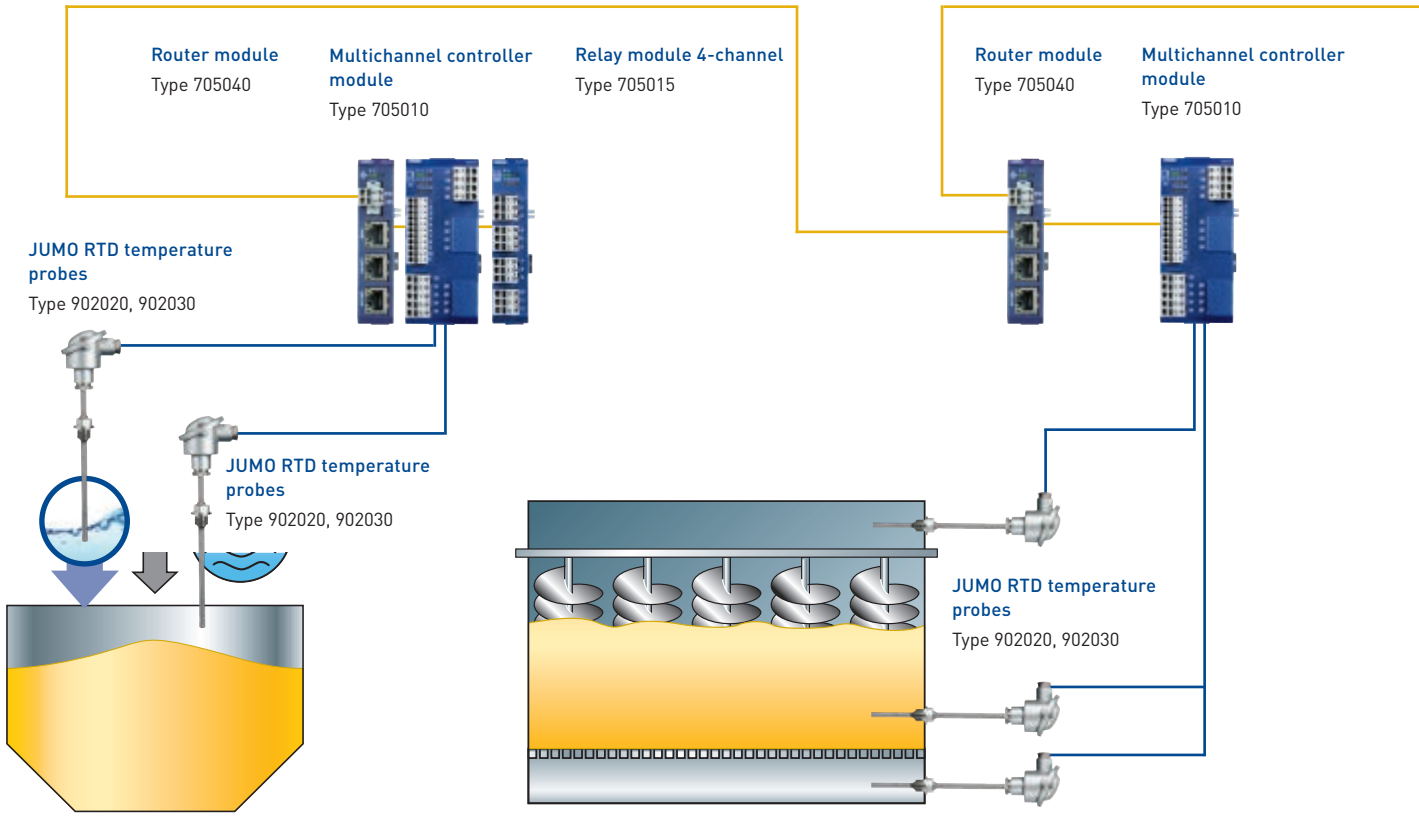
Precise control of the air and water supply in the steeping valve with JUMO variTRON 500

In the steeping, the barley is watered and aerated at regular intervals to initiate germination. The respiration, which increases due to the oxygen input, produces more CO_2 and heat, which must be constantly dissipated. For this purpose, the temperature in the steeping unit is recorded for control purposes and, if necessary, displayed directly on site. You can reliably control the air and water supply with the JUMO variTRON 500 automation system. And not only that: depending on the size and requirements, you can also record, control, and visualize the entire malting process.

Germination

Safe temperature monitoring during germination with the JUMO variTRON 500 automation system

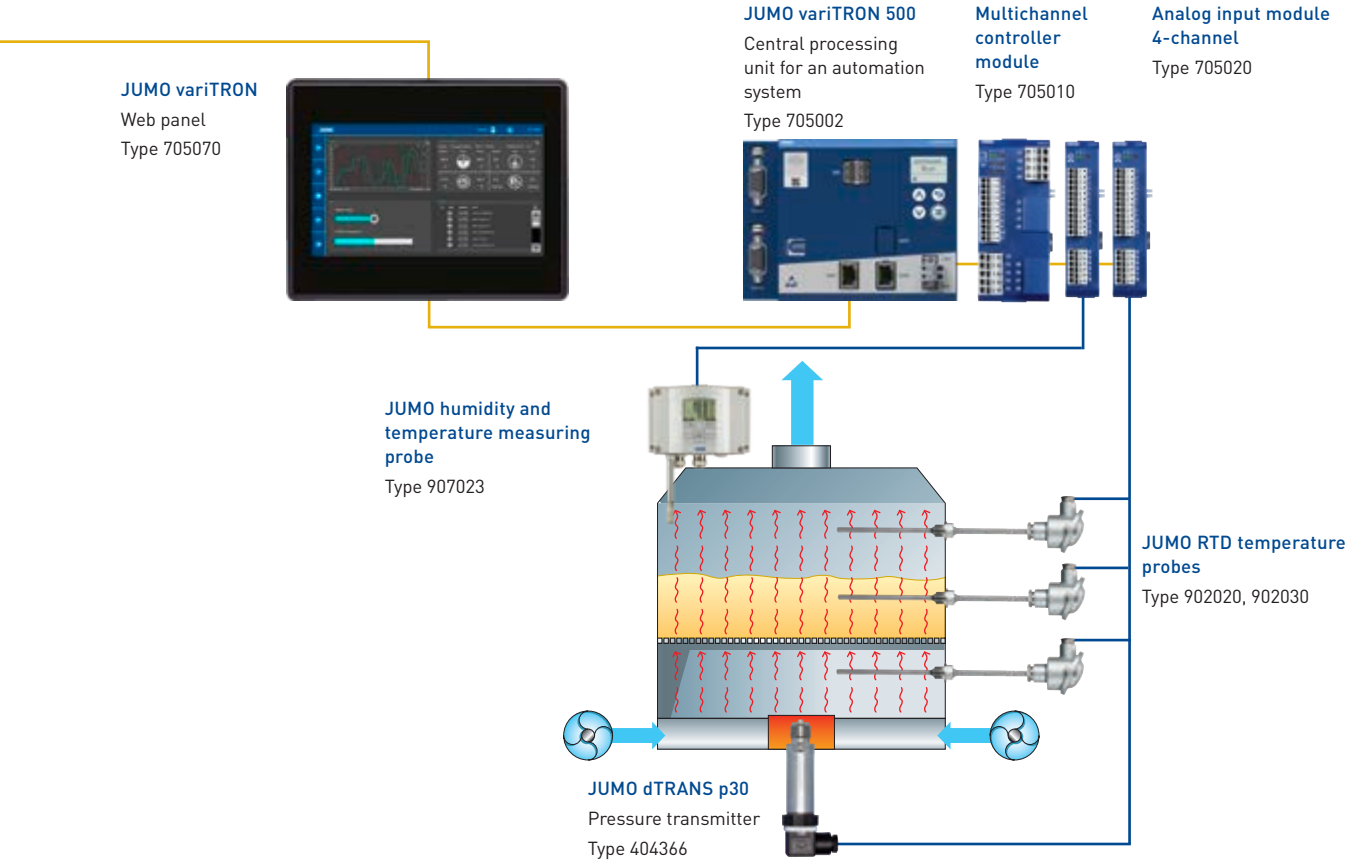
During germination, the necessary enzymes are formed, which are later needed for beer production. The critical factor here is that the introduced air is sufficiently moistened so that the barley maintains a constant moisture level and does not dry out. This is exactly what the JUMO variTRON 500 automation system provides – it allows you to easily control the temperature and humidity of the outside air as well as the exhaust air and then display them clearly using the multifunction panel or the visualization software.



Kilning

Optimum temperature control in the malt kiln

During kilning, the malt is dried until it is stable for storage. Here, constant temperature control is extremely important. This is the only way to ensure that the malt dries thoroughly but does not burn, which in turn would destroy the enzymes it contains. The sections are also controlled by the JUMO variTRON 500 automation system. It controls the heating coils in relation to the temperature above the rack. In addition, the ratio of fresh air to circulating air is adjusted to ensure optimum drying. As a further measured value, you can use the JUMO dTRANS p30 to acquire the negative pressure to check the leak-tightness of the heat exchanger and thereby prevent burner exhaust gases from entering the product.



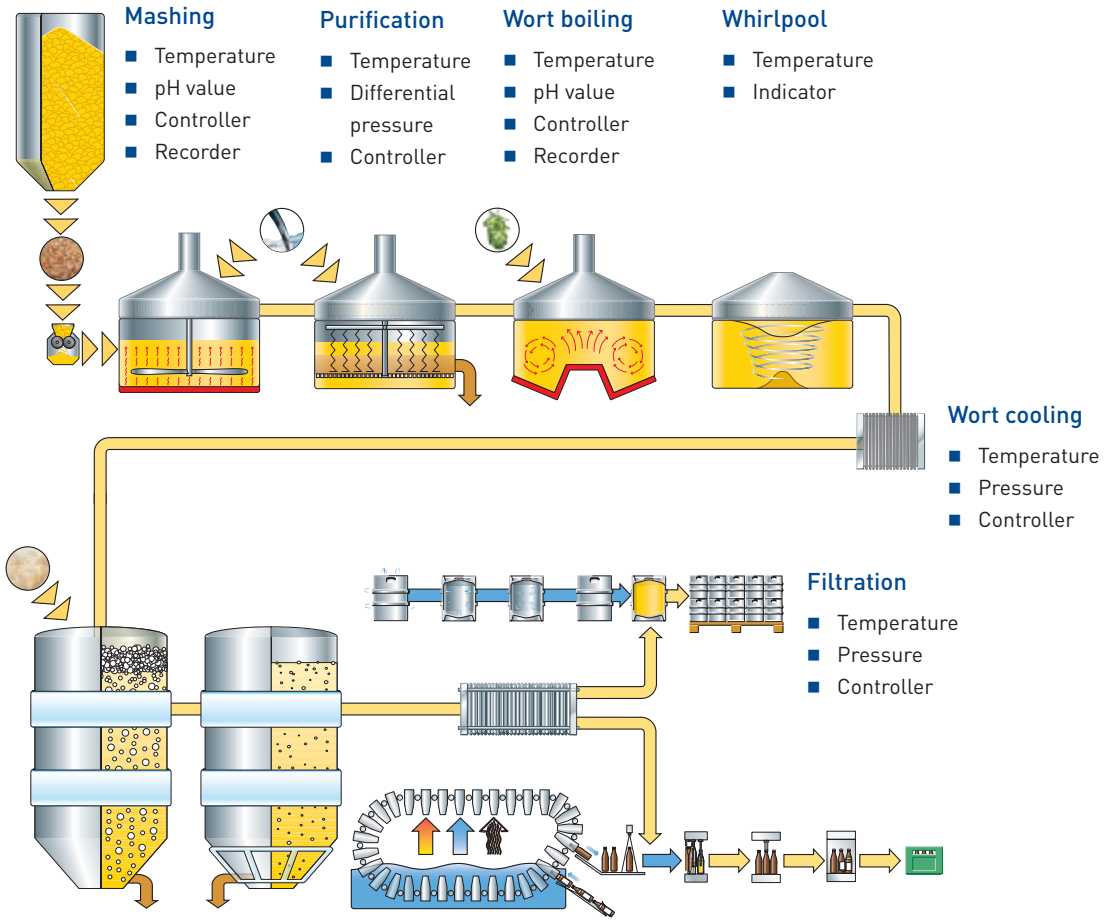
Brewing process

The brewing process takes time. It consists of a large number of separate details: mashing, purification, wort boiling, wort cooling, fermentation, and filtration. In all these individual processes, you depend on the precise monitoring of temperature, pressure, but also pH or conductivity. This is a task in which JUMO's first-class automation systems, which have been tried and tested over many years, provide you with perfect support throughout the entire process chain.

Overview of the brewing process

Control of temperature

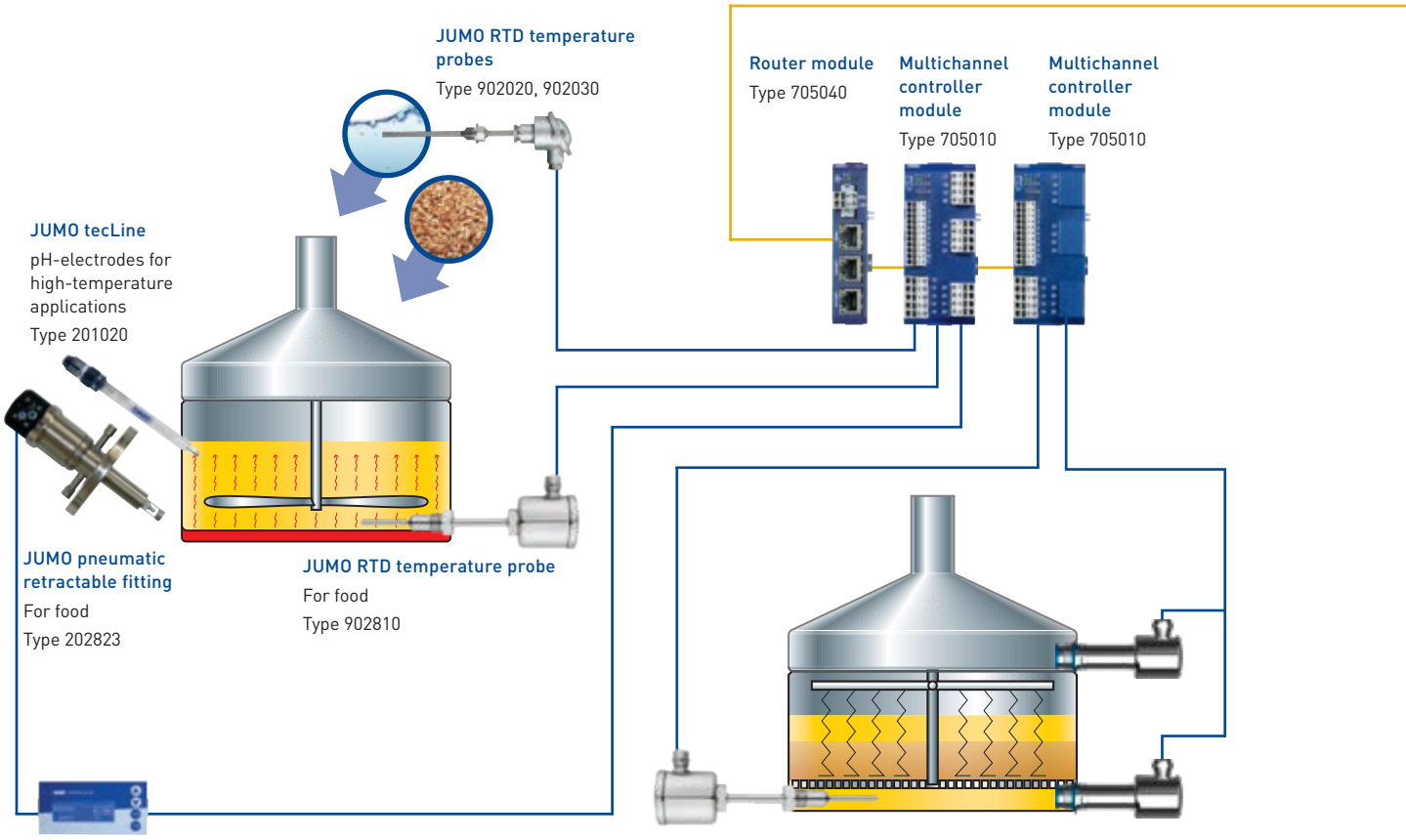
Temperature is one of the most important measured measurands in the brewing process. Only by precisely controlling the processes and regulating the temperature can the processes of mashing, wort boiling and cooling, fermentation, and storage be carried out reliably and reproducibly. In addition, by measuring the temperature accurately with regularly calibrated temperature probes you can optimize your costs and avoid excess heat output. A temperature difference of only 1 °C, for example, can reduce your energy costs by a significant amount. You can see the possible solutions for your process on the next pages. We will be happy to work out a complete solution with you that is precisely tailored to your process.



Brewhouse control system

JUMO variTRON 500 – the brewhouse control system

JUMO variTRON 500 is a system that can handle the majority of measurement and control tasks in the brewhouse. Up to 9 program generators enable the independent control of mashing, purification, and wort boiling. For example, you can already mash in the next batch during wort boiling. While the temperature-time programs of both processes are running, JUMO variTRON 500 registers all the data you require such as temperature, pressure, pH value, flow, steam temperature, or the stirring speed. The CODESYS PLC programming system gives you all the options you need to automate the process the way you want.



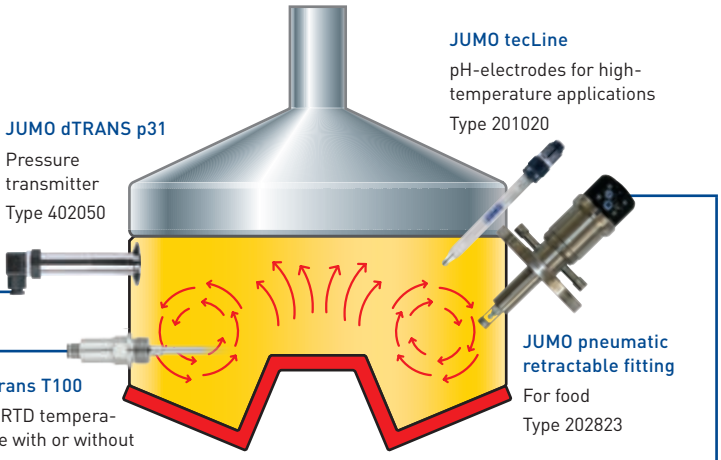
JUMO variTRON
Web panel
Type 705070

JUMO variTRON 500
Central processing unit for an automation system
Type 705002

Multichannel controller module
Type 705010

JUMO dTRANS p31
Pressure transmitter
Type 402050

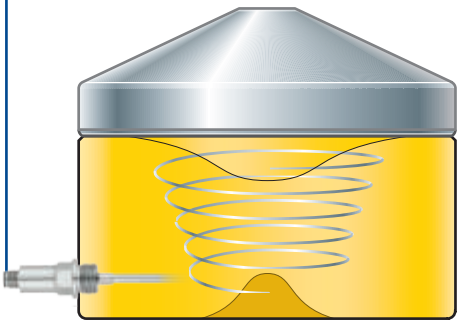
JUMO tecLine
pH-electrodes for high-temperature applications
Type 201020



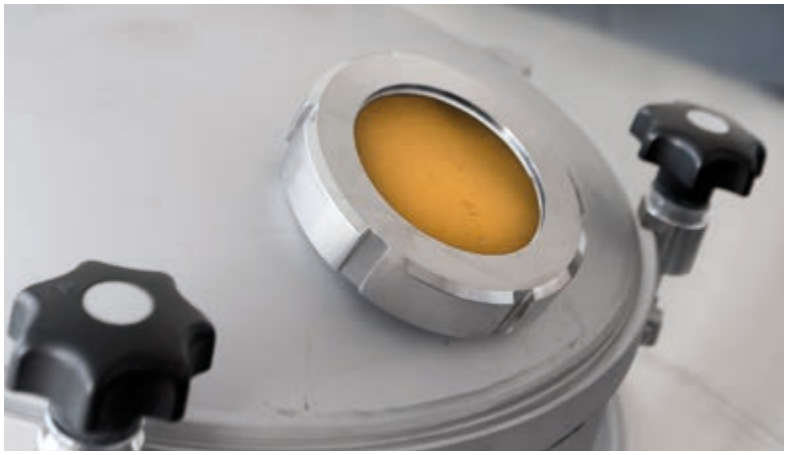
JUMO pneumatic retractable fitting
For food
Type 202823

JUMO Dtrans T100
Screw-in RTD temperature probe with or without transmitter
Type 902815

JUMO dTRANS pH 02
Compact multichannel transmitters and controllers for pH, redox, ammonia, standard signals, and temperature
Type 202551



JUMO Dtrans T100
Screw-in RTD temperature probe with or without transmitter
Type 902815

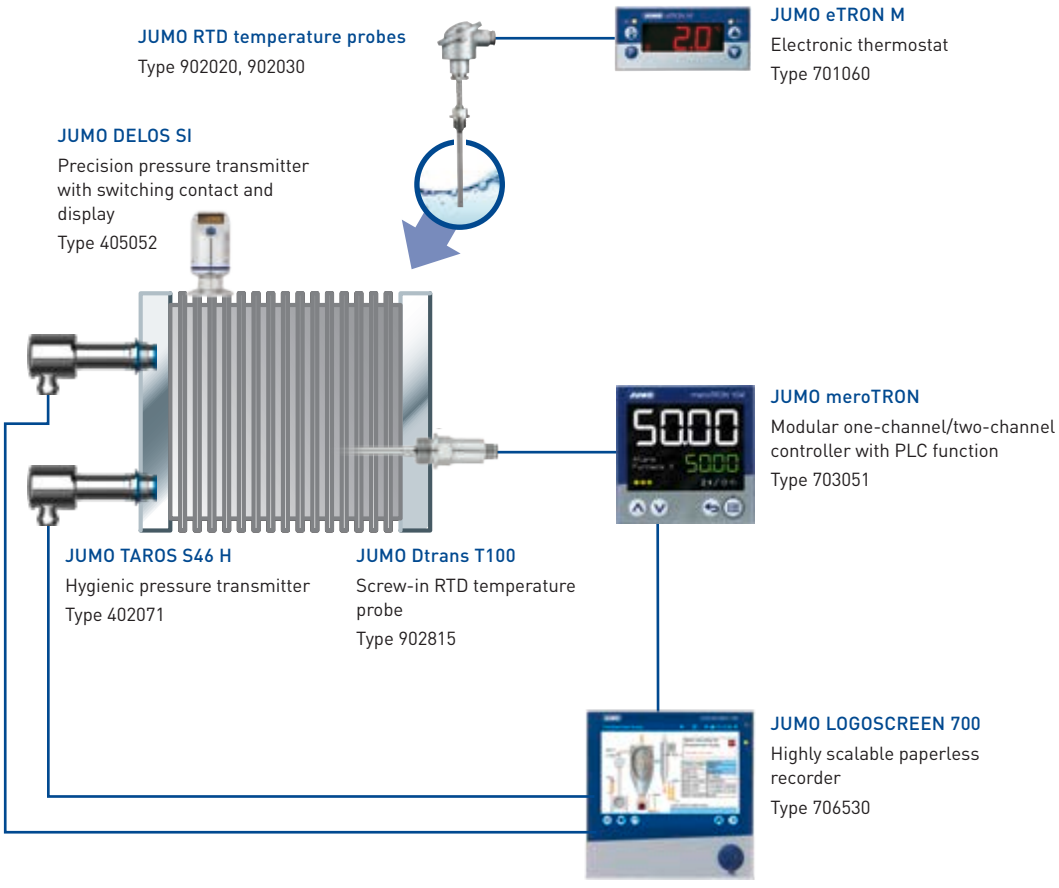


Wort cooling

Comprehensive control of wort cooling with JUMO meroTRON

The flow velocity of the beer is controlled by the beer temperature: the warmer the beer, the slower it flows through the cooler. For conscientious control, you should carefully monitor the beer temperature and differential pressure with a recording device.

This is the perfect task for JUMO LOGOSCREEN 700: thanks to its versatile functions, it is able to generate an alarm in the event of malfunctions or even a cooling failure, thereby ensuring high efficiency and availability of the plant.



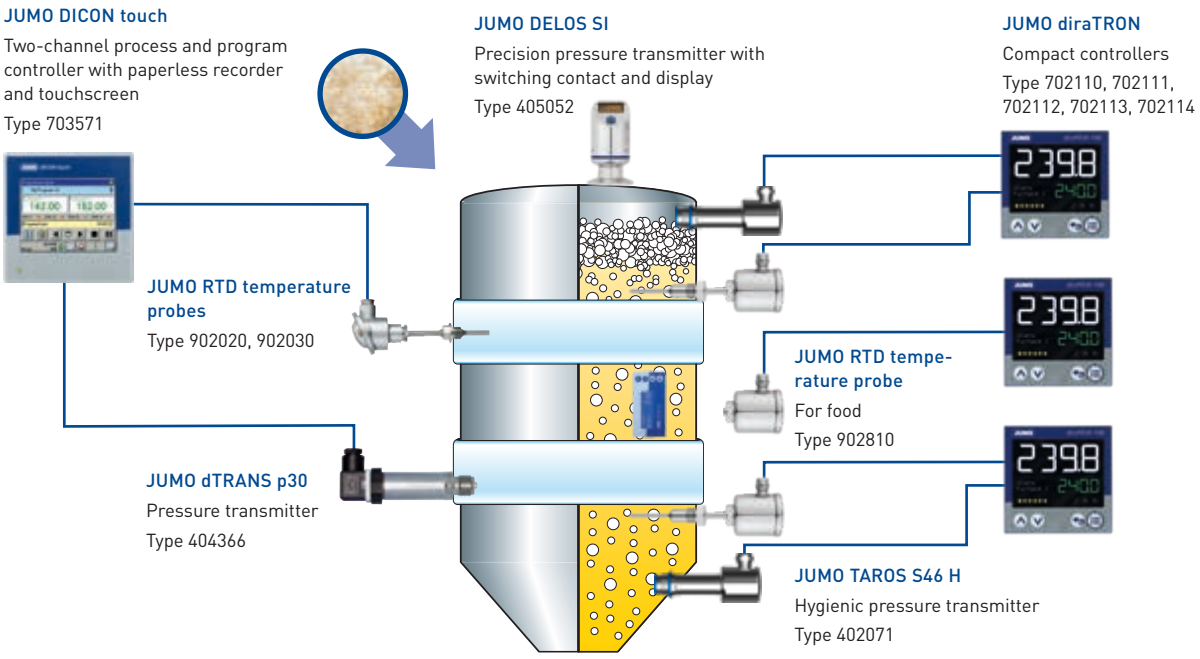
Fermentation and storage

Reliable determination of the CO_2 head pressure with the JUMO DELOS SI pressure transmitter

During fermentation, carbon dioxide is produced, which collects in the headspace of the tank and is discharged to the CO_2 recovery system at a certain pressure. This is a process in which our JUMO DELOS SI electronic pressure transmitter with display and a hygienic process connection provides you with the best possible support.

Precise control of the cooling zones with the JUMO diraTRON process controller

Several cooling zones exist in the cylindrical conical tanks which ensure that the green beer is circulated during storage by using different temperatures. JUMO diraTRON perfectly controls the exact temperature of the individual cooling zones, which ensures the quality of the beer.

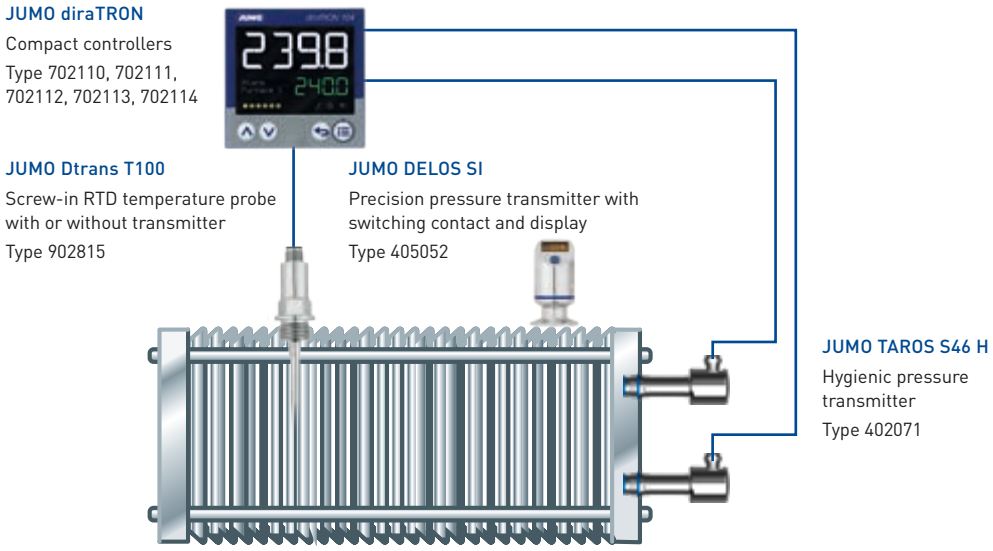


Filtration

Efficient filtration monitoring with the JUMO dTRANS p20 DELTA differential pressure transmitter

After the yeast has been extracted, the beer is sent to filtration, where it is preserved by removing any yeast cells and other turbidity particles that may remain. This filtration works via layer or cartridge filters. One of the filter materials used is diatomite, although this is now gradually being replaced by newer technologies such as crossflow filtration with membrane filters.

During filtration, the pressure on the filter gradually increases. This pressure is related to a certain degree to the purity of the beer. The JUMO dTRANS p20 DELTA differential pressure transmitter allows you to measure exactly how long the filter can still be used by determining the increase of differential pressure. This way you ensure the quality of your beer and the optimal use of your filters.



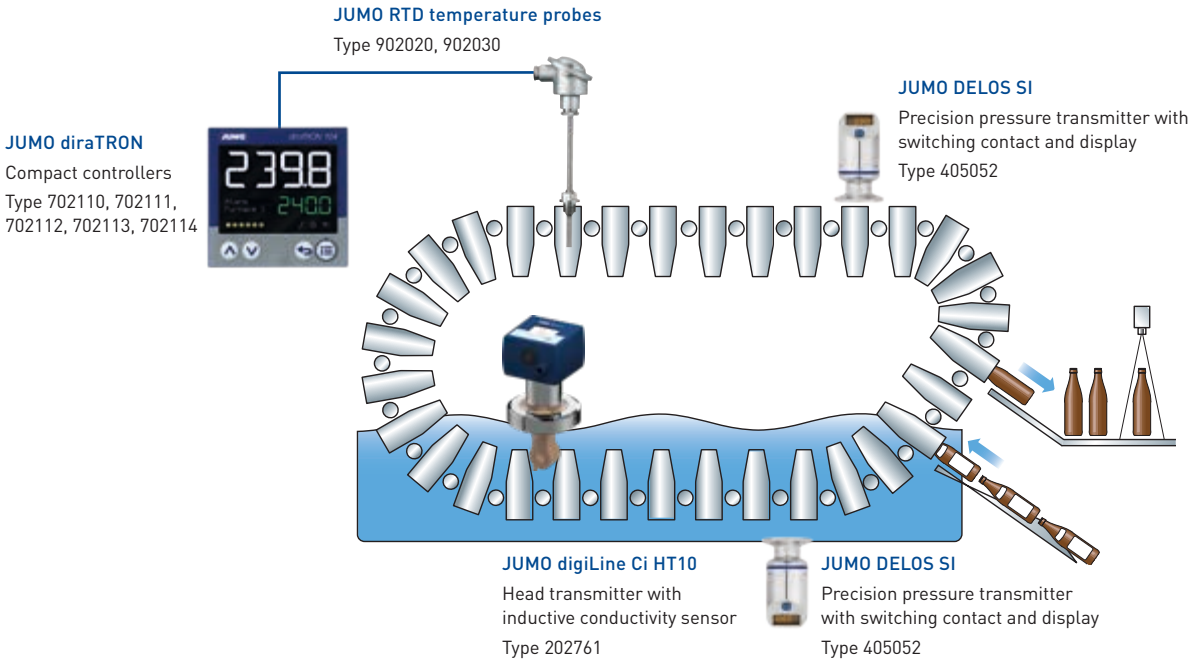
Bottle cleaning

Optimum setting and monitoring with the JUMO CTI-750 conductivity transmitter

In the bottle cleaning plant, the glass bottles are cleaned by warm lye baths and subsequent water rinsing at different temperatures. However, transport constantly carries away caustic soda, thereby changing the concentration of the lye. This is where the JUMO CTI-750 comes into play: it continuously adjusts the concentration of the caustic soda to optimum levels via conductivity and thereby ensures reliable cleaning of the glass bottles at a consistently high quality.

Temperature control in the bottle cleaning plant

Slow warming of the glass bottles is especially important in the winter. For this purpose, the cleaning plants have special prerinsing baths with water. In these baths, the temperature rises slowly, so that the risk of glass breakage on contact with the caustic soda at 80 °C is minimized. In turn, the JUMO diraTRON compact controller is perfect for controlling and regulating the temperatures in the cleaning plant.



CIP cleaning

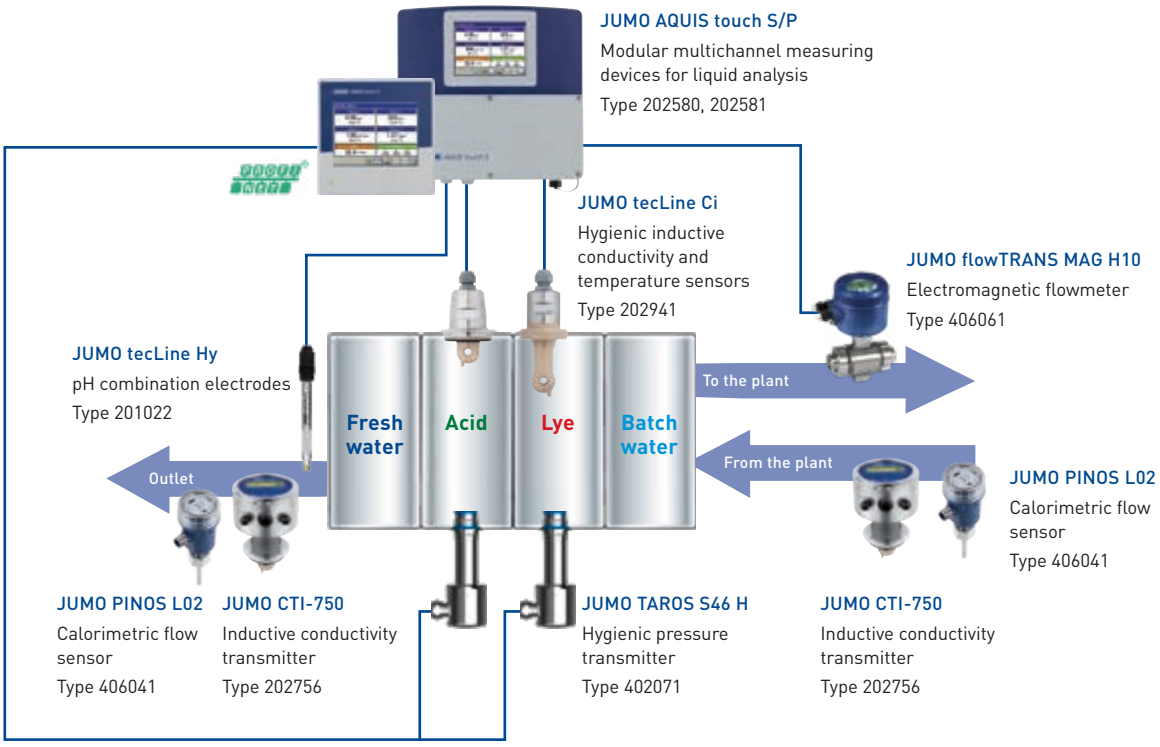
The basis of any good beer brewing process is hygienic and perfectly cleaned equipment. This is guaranteed by "CIP" – Cleaning in Place. In this field JUMO also offers first-class systems and solutions on which you can rely.

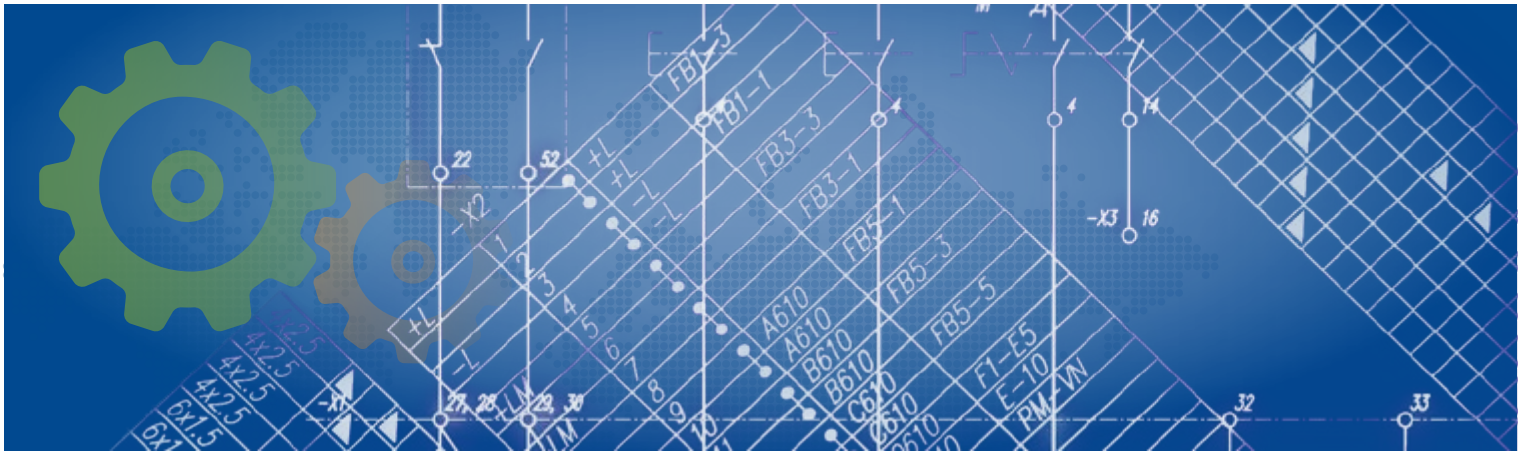
Measuring – Controlling – Displaying – Recording
New possibilities with the JUMO AQUIS touch S

The JUMO AQUIS touch S is a modular multichannel measuring device that provides new approaches in CIP cleaning. For example, the concentration setting of the acid and lye solutions, the level of both tanks, and the flow velocity can be measured, controlled, and displayed as well as registered on-site – all with one device. Essentially, a maximum of 4 analog analysis sensors can be used while a total of up to 10 parameters can be measured and managed simultaneously. In addition to numerous alarm, limit value, or time-controlled switching functions up to 4 higher-order control loops can be defined simultaneously in the JUMO AQUIS touch S.

Conserve resources – reduce maintenance costs

The function of the plant determines whether the application will be implemented with the modular multichannel measuring device JUMO AQUIS touch S or the tried-and-tested inductive conductivity transmitter JUMO CTI-750. Both systems have proven themselves through the benefits they provide. For example, the JUMO CTI-750 is the ideal solution when working with a PLC in the background. The JUMO AQUIS touch S on the other hand functions as a stand-alone solution. The low-maintenance sensor and highly accurate measurement of inductive conductivity help preserve resources and reduce the maintenance costs for your plant.





JUMO Engineering

JUMO Engineering, the service division from JUMO GmbH & Co. KG, combines expertise and industry-specific experience in one team. Our engineers and technicians develop customized solutions that are strictly based on your specific requirements. The JUMO Engineering team strongly believes in personalized support and consulting for its customers – from initial contact and the development of a customized solution to its series production. 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.

Innovative system solutions with expertise

We always draw on the feedback from our customers around the world to improve our products. This strategy 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.

Our services

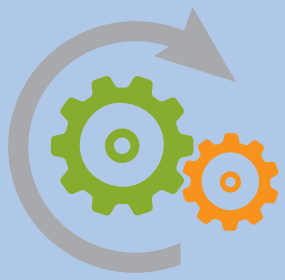
- Feasibility analysis
- Creating a technical concept including product requirements specifications and specification sheet
- Complete project planning and documentation
- Project planning including PLC programming, visualization, network technology, etc.
- Continuous project management
- On-site startup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

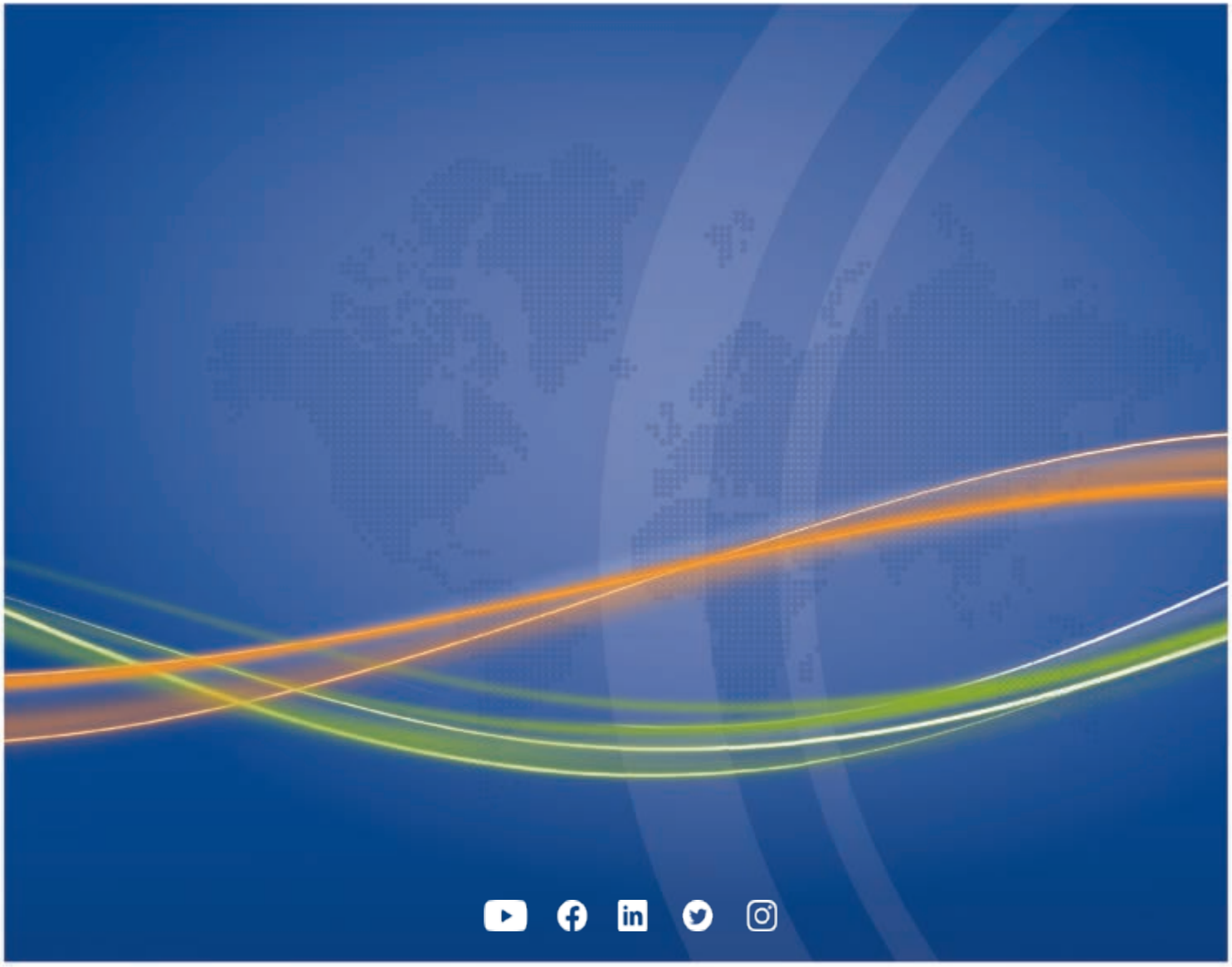
Your advantages

- As a central contact partner JUMO develops technical system solutions
- Extensive expertise with all measurement and automation devices
- Global support through experienced specialists
- Flexible, tailored solutions to suit your individual needs and applications

In a nutshell

- Precise and prompt communication channels:
  This saves you time and prevents mistakes!
- Fully developed expertise for maximum flexibility:
  For project planning that is fully reliable and safe
- Technology that has proven itself over decades reduces downtimes:
  For excellent plant availability and process reliability!





www.jumo.net

PR 00057 EN/00519743/V3