Brewery Technology

Innovative solutions for your success
Dear Reader,

Brewing beer is an art in itself. As a brewer, you depend on your technical knowledge as well as reliable and accurate measurements with monitoring and a central control unit.

JUMO, your reliable partner, is always at your side to help when you have questions and to provide quick solutions. Whether you want to monitor the quality of your beer by pressure, temperature, conductivity or the pH value, or whether you want to control cleaning or reduce production costs.

How can we accomplish that for you? So how do we do it? By applying years of experience and professional expertise. JUMO has been a leading manufacturer of measurement and control systems for more than 70 years. For all this time we have been an expert partner for the beverage industry.

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

JUMO also offers only the best for you in brewery technology: a wide range of solutions for the most diverse applications.

Brewing incorporates many time-honored elements, for example in Germany the Reinheitsgebot or “Purity Law”, which dates to 1516 and limits the ingredients of beer to water, barley and hops. Today quality is also achieved through instrumentation and controlling engineering at the latest state of the art.

This brochure provides an overview of JUMO’s products and systems for brewery technology. 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.branchen.jumo.info.
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Malting Process

As an experienced brewer you know that the quality of beer depends on many factors. If you work with reliable JUMO automation systems in the early phase of production, the malting process, you can rely on producing a high-quality malt at the end of the process.
Storing

Exact temperature monitoring with bin probes from JUMO
JUMO bin probes feature several Pt100 or Pt1000 sensors fitted at regular intervals. This makes it possible to measure the temperature at several places in the bin at the same time, using only one probe. Measured values are transferred safely and reliably to the detection system via an explosionproof temperature transmitter.

All measuring points are covered by one system
The JUMO mTRON T automation system offers several advantages for storing barley and malt. For example, all measured values can be recorded by four- or eight-channel analog input modules. Up to 120 or 240 analog signals respectively can be recorded and displayed in your control room using the SVS3000 plant visualization software. This allows you to display all temperature measured values at a glance. Furthermore, in case of an error you can immediately see in which silo problems occur.
Steeping

Precise control of air and water supply to the steep with JUMO mTRON T

In the steep, the barley is soaked and aerated at regular intervals to promote germination. The increasing respiration caused by the added oxygen produces more CO₂ and heat, which must be removed continuously. For this purpose the temperature in the steep is recorded for monitoring and displayed directly on site when required. With the JUMO mTRON T automation system you can control the air and water supply reliably. But there’s more: Depending on the size and requirement you can also record, control and display the entire malting process.

Germination

Reliable temperature monitoring during termination with the JUMO mTRON T automation system

During germination, the enzymes that will later be needed to make the beer are formed. It is crucial that the air being introduced has been sufficiently moistened to prevent the barley from drying out and instead to maintain a relatively constant moisture content. This is exactly what the JUMO mTRON T automation system does: You can use it to monitor the temperature and humidity of the outside air simply and easily and then show the results with the multifunction panel or the visualization program.
Kilning

Optimum temperature control in the malt kiln

During kilning, the malt is dried until it is stable for storing. Constant temperature control is extremely important as this is the only way to ensure that the malt is completely dried through but does not burn, which would destroy the enzymes in the malt. The sections are also controlled by the JUMO mTRON T automation system. It controls the heating registers in relation to the temperature above the rack.

The ratio of fresh air to ambient air is also adjusted to ensure optimum drying. You can record negative pressure as an additional measurement value with the JUMO dTRANS p30 to verify the seal of the heat exchanger. This will prevent burner exhaust gas from getting into the product.
Brewing Process

The brewing process requires time. It consists of a large number of individual details, starting with mashing and lautering, then boiling and cooling the wort and finally fermentation and filtration. In all of these individual processes you relay on precise monitoring of temperature, pressure, the pH value or conductivity, etc. Top-class JUMO automation systems have been proven over many years in this application. They provide perfect support in these monitoring tasks along the entire process chain.
Overview of the brewing process

Temperature control and regulation

Temperature is one of the most important process variables in brewing. Precise control of processes and regulation of temperature is the only way to ensure the important processes – mashing, boiling and cooling the wort, fermentation, and storing – run reliably and reproducibly. With exact temperature measurements and regularly calibrated temperature sensors you can also optimize your costs and avoid excess heat output. For example, with a difference in temperature of just 1°C you can cut your energy costs considerably. Look for some approaches to a solution for your processes on the following pages. We would be happy to work out a complete solution with you, fine-tuned precisely to your process.
Brewhouse control

**JUMO mTRON T – the brewhouse control system**

With JUMO mTRON T we offer you one system that is capable of mastering the majority of measurement and control tasks in a brewhouse. Up to 9 program generators ensure independent control of mashing, lautering and wort cooking. As a result, you can macerate the next ingredient while the wort is cooking. While the temperature/time programs of the two processes are running, JUMO mTRON T records all the data you specify, such as temperature, pressure, pH value, flow rate, steam temperature and stirring speed. The PLC programming system CODESYS gives you a full range of options for automating processes according to your criteria. The PLC programming system CODESYS gives you a full range of options for automating processes according to your criteria.

**JUMO tecLine**

pH and redox combination electrodes

Type 201020

**JUMO pneumatic retractable assembly**

for food industry

Type 202823

**JUMO RTD temperature probe**

for food industry

Type 902810

**JUMO dTRANS p20 DELTA**

Differential pressure transmitter

Type 403022

**JUMO pressure separator**

Type 409176

**JUMO mTRON T Router module**

Type 705040

**JUMO mTRON T Multichannel controller module**

Type 705010

**JUMO mTRON T Multichannel controller module**

Type 705010

**JUMO dTRANS pH 02**

Transmitter and controller for pH, redox, ammonia, standard signals and temperature

Type 202551
**Brewery technology**

- **JUMO mTRON T**
  - Multifunction panel B40
  - Type 705001

- **JUMO mTRON T**
  - Multichannel controller module
  - Type 705010

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

- **JUMO tecLine**
  - pH and redox combination electrodes
  - Type 201020

- **JUMO pneumatic retracted holders**
  - for food industry
  - Type 202823

- **JUMO dTRANS pH 02**
  - Transmitter and controller for pH, redox, ammonia, standard signals and temperature
  - Type 202351

- **JUMO dTRANS p31**
  - Pressure measurement
  - Type 402050
Comprehensive control of wort cooling with JUMO dTRON

The flow rate of beer is controlled by its temperature: The warmer the beer, the more slowly it flows through the cooler. To ensure meticulous control, you should carefully monitor the temperature of the beer and the differential pressure with a recording instrument. This is the perfect job for JUMO LOGOSCREEN 700: Because of its versatile functionality, it can generate an alarm in case of malfunction or even total failure of the cooling system, thus ensuring high efficiency and availability of the plant.

**JUMO dTRON 304**
Compact controller
Type 703044

**JUMO eTRON M**
Electronic microstat
Type 701060

**JUMO RTD temperature probe**
Type 902020, 902030

**JUMO DELOS SI**
Precision pressure transmitter with switching contacts and display
Type 405052

**JUMO pressure separator**
Type 409776

**JUMO dTRANS p20 DELTA**
Differential pressure transmitter
Type 403022

**JUMO Dtrans T100**
Screw-in RTD temperature probe
Type 902815

**JUMO LOGOSCREEN 700**
Highly-scalable paperless recorder
Type 706530
Fermenting and storing

Reliably determining CO₂-top pressure with the JUMO DELOS SI pressure transmitter

Fermentation produces carbon dioxide, which collects in the top of the tank and is removed to a CO₂ recovery plant above a certain pressure. Our JUMO DELOS SI electronic pressure transmitter with display and hygienic process connection provides ideal support for this process.

Precise monitoring of cooling zones with the process controller JUMO diraTRON

There are several cooling zones in the CCV (cylindro-conical vessel) with different temperatures to ensure that the “green” beer is agitated during the storing phase. JUMO diraTRON perfectly controls the exact temperature of individual cooling zones for this task, thereby ensuring the quality of the beer.
Filtration

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

After the yeast has been extracted, the beer is moved to filtration, where it is made durable by removing residual yeast cells and other particles that cause turbidity. The filtration may be based on layer or sieve filters. Filter materials include diatomaceous earth, although it is being gradually replaced by newer technologies such as crossflow filtration with membrane filters.

During filtration, the pressure increases gradually at the filter. To a certain extent, this pressure is related to the purity of the beer. You can use the JUMO dTRANS p20 DELTA differential pressure transmitter to measure precisely how long the filter can still be used by determining the increase in differential pressure. In this way you can ensure the quality of your beer and make optimum use of your filters.
Cleaning bottles

Optimum setting and monitoring with the conductivity transmitter JUMO CTI-750
In the bottle cleaning plant, glass bottles are cleaned by a warm lye solution and then rinsed with water at a different temperature. However, the caustic solution is continually diverted by this process, which changes the concentration of the lye. The JUMO CTI-750 is at home for this task: It continually adjusts the concentration of the caustic solution based on conductivity. This ensures reliable cleaning of glass bottles with consistently high quality.

Temperature control in the bottle cleaning plant
Slow warming of glass bottles is important especially in winter. Special pre-rinsing baths are available for this in cleaning plants. The temperature rises slowly in these baths to minimize the danger of the glass breaking on contact with the caustic solution, which is at 80 °C. The JUMO diraTRON compact controller is ideally suited for monitoring and controlling temperatures in the cleaning plant.
Cleaning in Place (CIP)

Hygienic and perfectly cleaned plants are the basis of any good beer brewing process. This is ensured by CIP or „Cleaning in Place“. JUMO also offers top-class systems and solutions you can rely on for this application.
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 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 standalone solution. The low-maintenance sensor and highly accurate measurement of inductive conductivity help preserve resources and reduce the maintenance costs for your plant.
Das skalierbare Mess-, Regel- und Automatisierungssystem

JUMO mTRON T – Your System


Systemaufbau

Com 1
RS 422/485 oder RS 232, Modbus (Master/Slave)

Com 2
RS 422/485 oder RS 232, Modbus (Master/Slave) oder PROFIBUS DP (Slave)

- Webbrowser
- Setup-Programm
- PC-Auswertesoftware PCA3000
- PCA-Kommunikationsssoftware PCC
- Anlagenvisualisierungssoftware SYS3000
- Programmiersystem CODESYS

Erweiterung Systembus

LAN

Systembus

USB

Host und Device

Erweiterung Systembus

Com 1
RS 422/485 oder RS 232, Modbus (Master/Slave), Anschluss Barcodescanner

Com 2
RS 422/485 oder RS 232, Modbus (Master/Slave)