

Pharmaceutical engineering

Measure • Control • Record



JUMO – your partner for Pharmaceutical Engineering



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JUMO, a leading manufacturer of measurement and control systems, has been a competent pharmaceutical engineering partner for more than sixty years.

Highly qualified staff and state-of-the-art technology have enabled JUMO to establish a reputation with its products in the global markets.

Maximum innovation is achieved by new developments and improvements to existing products, as well as more economical production methods.

JUMO provides a variety of solutions for the various applications of pharmaceutical engineering.

Whatever is demanded of the measurement technology, JUMO will always meet every requirement. Because the aim is to produce products of a consistently high quality, it is imperative to have reliable and accurate measurements which can be controlled and monitored from a central point.

Whether you want to use the measurement variables of pressure, temperature, conductivity or the pH value to monitor the quality of your product, control cleaning, reduce production costs or improve productivity, your partner JUMO will be at your side, helping with all your problems and providing individual solutions.

As a partner of this industry, JUMO provides the necessary know-how and experience for numerous procedures and diverse processes.

This brochure gives you an overview of our pharmaceutical engineering products. Precise, technical descriptions of our measuring instruments can be found on the Internet under the specified product number, at www.jumo.net.



Christina Hoffmann



Contents

Validation and qualification	4
Monitoring production of ultra-pure water	5
Monitoring sterilization processes	6
Biological Active Pharmaceutical Ingredients	7
Drying techniques	8
CIP/SIP cleaning	9
Your safety is important to us	10
Main areas of application	11



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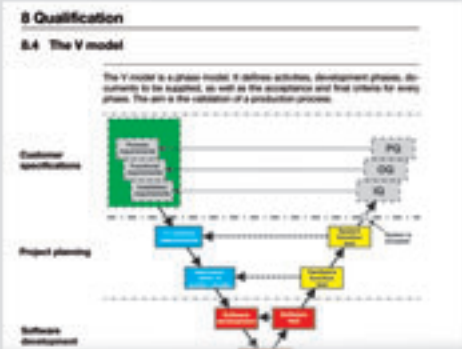
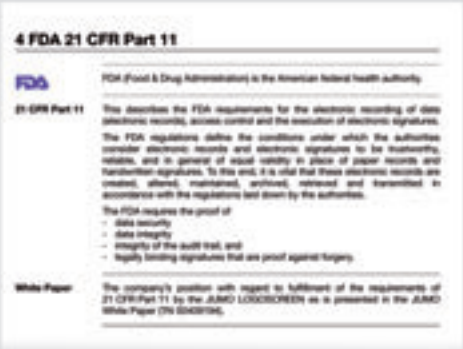
Christ Water Technology Swiss AG, Aesch/Suisse
JENAHEXAL Pharma GmbH, Jena
Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit, Erlangen
Harry Hautumm/pixelio (p.3 center)
Klaus-Uwe Gerhardt/pixelio (p.7 bottom)
pandi/pixelio (p.4 bottom)
knipseline/pixelio (p.2 top)



Validation and qualification

Improving productivity

Validation and qualification are crucially important here. Validation ensures that the end product is of a defined quality. This means an enormous amount of work for the manufacturer of pharmaceutical products and for the plant builder. As a pharmaceutical industry partner, JUMO wants to contribute and help you with documentation. What this means for you: If at all possible, we will document the tests performed by our products, the origin, etc., with this in mind. This will make it easier for you when you later come to qualify and validate the system. This will save you time and reduce cost accordingly.





Monitoring production of ultra-pure water



JUMO tecLine pH
pH combination electrodes with liquid KCl filling, refillable
Type 201020

USP<645>



JUMO ecoTRANS pH/Lf 03
Microprocessor transmitter/switching device for pH value/ORP, conductivity and temperature
Type 202723, Type 202732



JUMO AQUIS 500 pH/CR/Ci/AS
Transmitter/controller series for pH value, ORP, ammonia concentration, chlorine, chlorine dioxide, ozone, conductive and inductive conductivity, and temperature
Type 202560/202565/202566/202568

USP<645>

JUMO dTRANS Rw 01
Transmitter/controller for ultra pure water
Type 202545



JUMO tecLine Lf-VA
Stainless steel and titanium conductive conductivity cells
Type 202924

ASTM-Certificate

JUMO stainless steel process fittings and manual quick-change fittings
Type 202822/202825/202831



JUMO LOGOSCREEN nt
Paperless recorder with stainless steel front, operation with touch panel and Ethernet
Type 706581

Ultra pure water in pharmaceutical engineering

The production of ultra pure water is one of the most important processes in the pharmaceutical industry. Without it, it would not be possible to manufacture most active substances, because ultra pure water quality is a prerequisite for consistently high product quality. Monitoring the quality of ultra pure water by means of conductivity is the safest and most reliable method.

Measuring conductivity

A complete measurement chain for conductivity in ultra pure water comprises a JUMO AQUIS 500 CR, dTRANS Rw 01 or ecoTRANS Lf 03 ultra pure water transmitter/controller, a JUMO tecLine Lf-VA conductivity cell with integrated temperature probe and a connecting cable. JUMO ultra pure water transmitters provide you with exact cell constant entry, temperature compensation to ASTM D 1125-95 and limit monitoring to USP (water conductivity <645>).

pH measurement technology in ultra-pure water

pH measurement in ultra pure water is a stipulation in many areas. But because of the low conductivity and low ionic strength of ultra pure water, there are technical problems associated with measuring the pH value. JUMO's solution here is the refillable JUMO tecLine pH electrode with





Monitoring sterilization processes

Monitoring the sterilization process with JUMO LOGOSCREEN es

The sterilization process is one of the most important processes in the pharmaceutical industry.

With sterilization, regardless of whether it is steam, hot air or gas sterilization, the factors of temperature, pressure and time are enormously important.

When carrying out sterilization, it is essential for the measuring instruments to respond quickly and also to work accurately and reliably.

For measurement control, you can connect your measuring points to the JUMO LOGOSCREEN es recorder. The JUMO LOGOSCREEN es meets the requirements of FDA 21 CFR Part 11.

Reliable measurement of pressure and temperature

The basic idea of sterilization is to make the products you are sterilizing germ-free. The factors of temperature, pressure and time are enlisted to achieve this.

These factors are interdependent and mutually determinable.

JUMO provides you with fast-responding sensors and reliable measurement technology, so that you can rely on the outcome of sterilization.

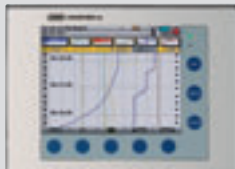
Reliable process control

With its diverse program functions, the JUMO IMAGO 500 can control each sterilization process and also ensure that the sterilizer switches off, if conditions are not observed.



JUMO LOGOSCREEN es

Paperless recorder for safe acquisition of FDA-compliant measurement data
Type 706560



JUMO LOGOSCREEN nt

Paperless recorder with stainless steel front, operation with touch panel and Ethernet
Type 706581



JUMO Screw in RTD temperature probes

Type 902020
and Type 902030



JUMO dTRANS p31

Pressure transmitter for elevated media temperatures
Type 402050



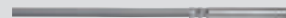
JUMO DELOS

Electronic pressure switch
Type 405052



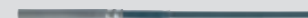
JUMO Push-in RTD temperature probes

with connecting cable
Type 902150



JUMO STEAMtemp

in steam-tight version
Type 902830



JUMO SVS3000

Process visualization software with batch-related data report and evaluation in a network
Type 700755



JUMO IMAGO 500

Program controller
Type 703590





Biological Active Pharmaceutical Ingredients

JUMO AQUIS 500

Transmitter/Controller
for conductivity, TDS,
resistivity and temperature
Type 202560



JUMO cTRON

Compact controller
Type 702070



JUMO PEKA

Process connection
adapter system
Type 409711



JUMO di 308

Digital indicator
Type 701550



JUMO dTRANS p31

Pressure transmitter
for elevated media
temperatures
Type 402050



JUMO dTRANS Rd 01

Transmitter/Controller
for redox potential (ORP)
Type 202535



JUMO tecLine pH/JUMO tecLine Rd

pH and redox combination electrodes
Type 201020



JUMO process and retractable assemblies

Type 202825 and Type 202831



JUMO SVS3000

Process visualization software
with batch-related data report
and evaluation in a network
Type 700755



JUMO LOGOSCREEN es

Paperless recorder for safe
acquisition of FDA-compliant
measurement data
Type 706560



21CFR Part 11

Fermentation

Fermentation is the key process of Bio APIs.

Bio APIs have high temperature and shear sensitivity, and they are also sensitive to the pH value, pressure and contamination. To selectively check all these conditions, the production process needs to specifically control and measure the components, to ensure that the additives can be reproduced.

Process visualization with the JUMO SVS3000 visualization software

When several fermenters are involved, it is worth using JUMO SVS3000 process visualization software for monitoring. This allows effective operator control, visualization and documentation. A feature here is batch documentation, which allows batch-oriented storing of the processes. A user-friendly operator interface with numerous functions is available for this: application explorer, alarm and event lists, recipe function, etc.





Drying techniques

Monitoring and control

Different forms of drying are used in the pharmaceutical industry.

Whichever drying method is adopted, there are JUMO humidity sensors, temperature sensors, pressure sensors and relevant control and regulation equipment to support the process and ensure that your end product is of a consistent quality.

The hygienic connections of the pressure and temperature sensors are geared to the requirements of the pharmaceutical industry.

Of course, you can take for granted that the materials used are FDA-listed and the process connections EHEDG-compliant.



JUMO Hygro and Hygrothermo Transducers
for relative humidity and temperature
DIN 43 710 and DIN EN 60 584
Type 907023



JUMO capacitive hygrothermal transducers
with intelligent interchangeable probes
Type 907027



JUMO Dtrans T100
Screw-in resistance probes with transmitter
Type 902815



JUMO dTRANS p31
Pressure transmitter for elevated media temperatures
Type 402050



JUMO dTRANS p02 DELTA
Pressure transmitter
Type 404382



JUMO IMAGO 500
Program controller
Type 703590



JUMO DELOS
Electronic pressure switch
Type 405052



JUMO resistance probe
with stainless steel protection tubes
Type 902810



JUMO LOGOSCREEN nt
Paperless recorder with stainless steel front, operation with touch panel and Ethernet
Type 706581

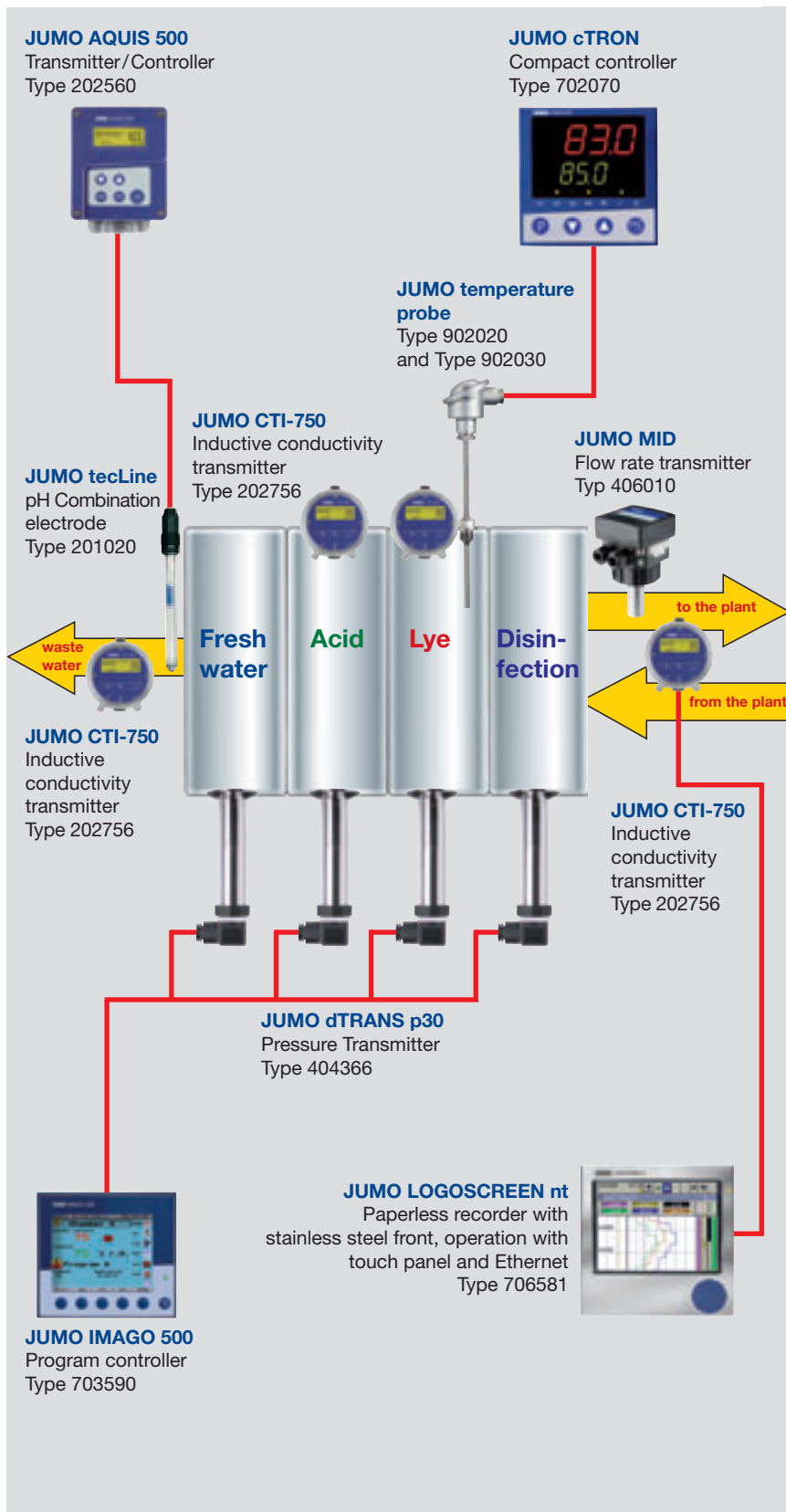


JUMO LOGOSCREEN nt
Paperless recorder with TFT display, CompactFlash® card and USB interfaces
Type 706581





CIP / SIP cleaning



Reliability and cleanliness for your plant with the JUMO CTI-750 conductivity transmitter

Cleaning in place (CIP) is used nowadays in all current plants. The JUMO CTI-750 inductive conductivity transmitter assists this process and with accurate measurement, ensures that cleaning proceeds quickly and reliably.

The JUMO CTI-750 monitors and controls the concentration of your cleaning agent by measuring conductivity with an inductive conductivity probe.

Precise, accurate dosing with JUMO MID

The JUMO MID flow rate transmitter measures and doses the flow of CIP media during cleaning.

Reliability and speed from monitoring CIP cleaning with the JUMO LOGOSCREEN nt

To document and monitor the CIP process with certainty, it is necessary to record all the important measurement variables on a recorder and evaluate them.

In this way you can accurately track and optimize the process, which will reduce the cost of cleaning agents, etc.





Your safety is important to us

Approvals and directives

So that you can rely on your process completely and utterly, we continually strive to adapt our products to the latest safety requirements and directives.

Communication

It is becoming more important nowadays to speak the right language, and the same applies to measurement technology. We provide you with the communication you need for your system concept.

Materials

In the pharmaceutical industry, the standard quality of stainless steel in use is 1.4404/1.4435 (316L).

All parts coming into contact with the product are made from this stainless steel and on request, are electropolished ($R_a \leq 0.8 \mu\text{m}$).

For critical processes and special applications, materials can be furnished with a 3.1 inspection certificate under traceability procedures.

Calibration

JUMO has its own DKD laboratory, which is directly subordinate to the PTB (German Federal Physical and Technical Institute). We will happily calibrate your temperature probes for you, even on site, to ensure that you maintain a consistently high standard of quality.



Approvals and directives



RoHS95



Communication



RS 485

Materials

Stainless Steel
1.4404/1.4435 (316L),
EPDM, VMQ, NBR, FPM
PEEK, PVDF

Calibration

DKD

PTB





Main areas of application

Biotechnology



- Fermentation
- Cultivation
- Harvesting



Additive production

- Mixing
- Separating
- Cleaning

Ultra-pure water



- Distillation
- Ultrafiltration
- Reverse osmosis



Drying technology

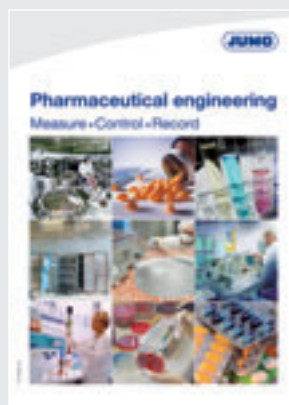
- Freeze drying
- Spray drying
- Roller drying

Further industry brochures



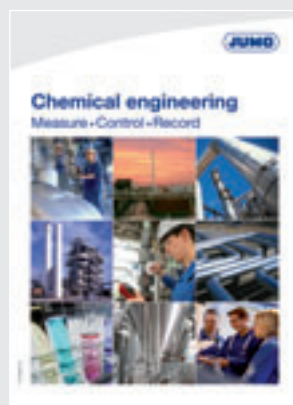
Food technology
Measure • Control • Record

PR 00038 EN



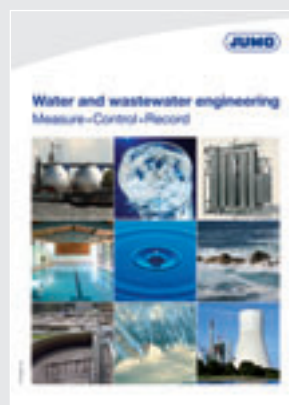
Pharmaceutical engineering
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PR 00058 EN



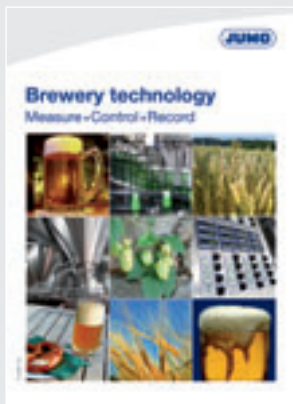
Chemical engineering
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PR 00056 EN



Water and wastewater engineering
Measure • Control • Record

PR 00059 EN



Brewery technology
Measure • Control • Record

PR 00057 EN



Dairy technology
Measure • Control • Record

PR 00061 EN



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