JUMO

More than sensors + automation

Liquid Analysis

Innovative solutions for the toughest requirements

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Dear Reader,

Perhaps you're wondering why JUMO – as a specialist for temperature, pressure, and automation solutions – has chosen to focus on "analytical measurement in liquids." This question is simple to answer. JUMO began as a manufacturer of technical glass thermometers. In the 1970s the company moved on to produce glass parts and glass sensors for the new area of electrochemical pH-value and redox potential measurands as well as electrolytic conductivity.

Overly reckless practices with water as a resource led to increasing pollution of natural water resources. This resulted in regulations to prevent water pollution and requirements for cleaning and detoxifying industrial wastewater. During this time, industry and municipal operators were looking for suitable sturdy measurement and control technology to determine and regulate the main variables in water analysis. Previously this had been the domain of laboratory procedures. So from the beginning JUMO supplied these products to well-known suppliers and plant builders in the new industry dealing with water treatment, dispensing systems, and sewage treatment technology.

Today the components produced in the "JUMO analytical measurement" product line are represented in almost all areas of water/wastewater engineering. From highly-purified pharmaceutical water to measuring high concentrations of acids, lyes, and salts – and from drinking/swimming pool/aquarium water to process water – JUMO covers nearly all applications of our steadily growing community of satisfied customers. Many of our products make their way into measurement applications throughout the world under our customers' brand names. As a result, JUMO is a reliable OEM supplier and partner of specialized customers.

JUMO is continuously developing and improving its sensors and measuring devices. This ensures our analytical measurement technology remains at the cutting edge and that our customers as well as our users have a reliable market position and products. We place great emphasis on ensuring production quality for highly sensitive sensor systems such as this. Our motivation is satisfied customers whose plants and investments will protect water as a valuable resource to be used by us all.

Detailed information about our products can be found under the specified type/product group number at **www.jumo.net**.

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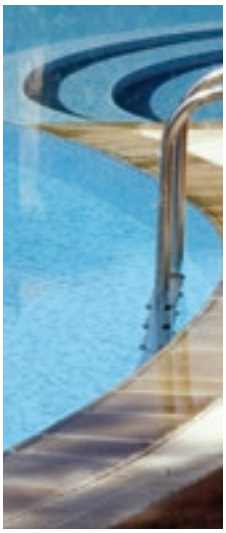

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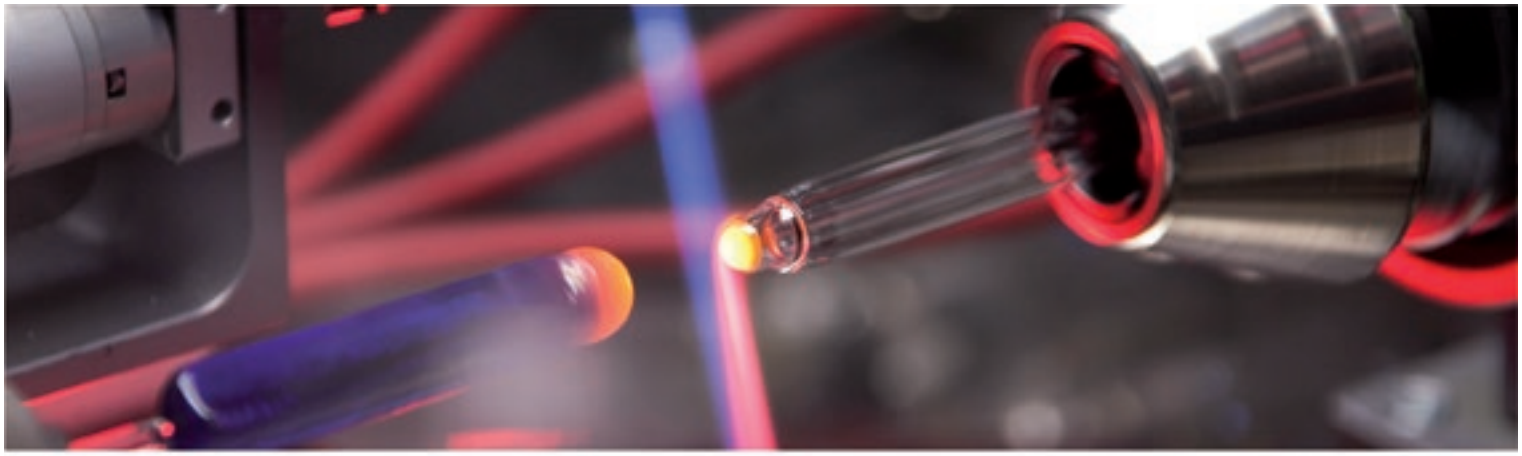


JUMO electrode manufacturing

JUMO offers the highest quality with internally developed electrodes and measuring systems. At the same time JUMO offers flexibility through modern production lines and many years of experience.
For both the glass and plastic tube versions we can address your specific requirements. That means we produce the pH and redox electrodes so that they are optimized for your application.

JUMO electrode manufacturing

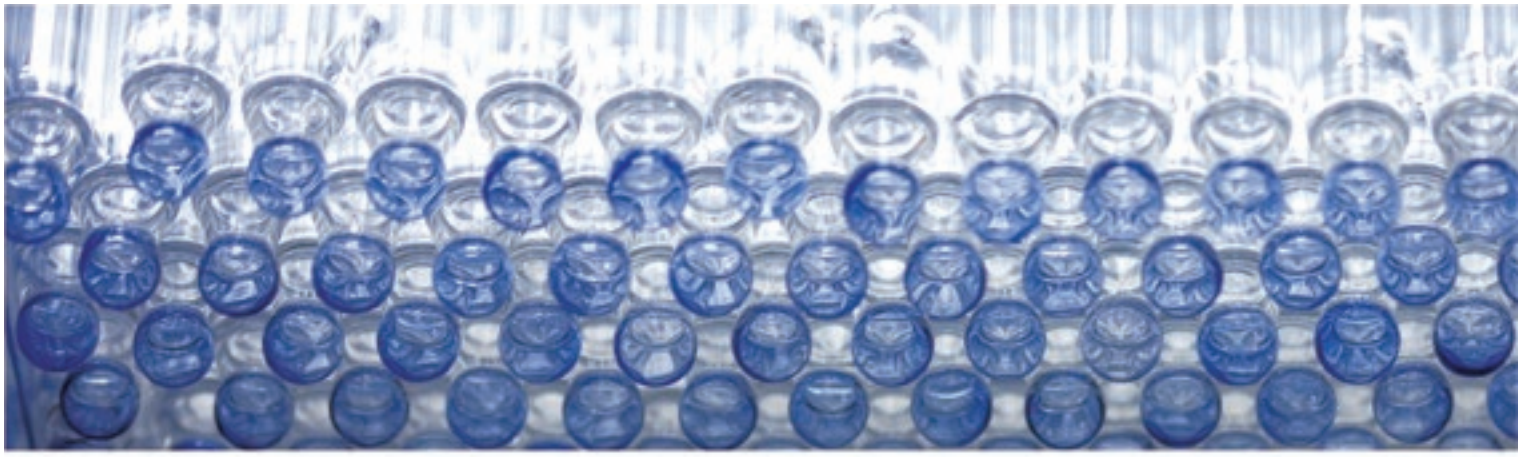
The success story of JUMO pH electrodes

The success story of JUMO pH electrodes is closely tied to glass technology. Glass thermometers have been produced in Fulda, Germany since 1947. On the basis of this experience in working with glass as a material, production of glass parts for pH electrodes began in the 1970s.

Today JUMO is one of the largest producers of electrochemical sensors in Europe. Many customers purchase their electrodes from JUMO with their own company logo on the electrodes. One of our strengths is the production of such OEM versions and special designs.

Reliable and accurate: JUMO pH and redox electrodes

Today pH electrodes are produced in semi and fully automated work processes. This ensures constant high quality. JUMO pH and redox electrodes are used in almost all areas of industry today: drinking and swimming pool water, domestic and industrial wastewater, neutralization plants, final inspections, the chemical industry, process and rinsing water, food technology, laboratory measurements, biotechnology, and aquariums.



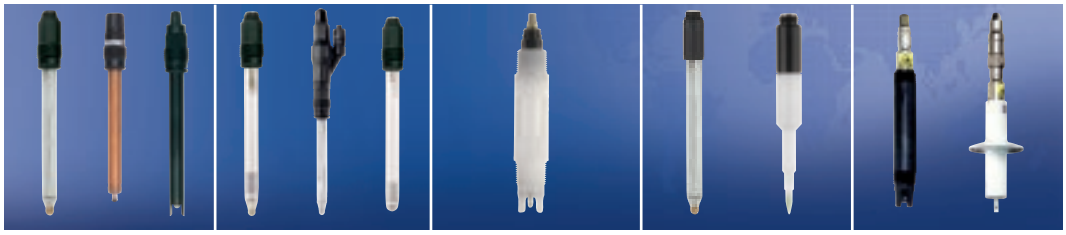
pH and redox measurement

The pH-value is the measurand most commonly used in analyzing aqueous solutions. Product quality in the chemical and pharmaceutical industries depends significantly on maintaining a narrow pH range. Accurate pH-measurements help to improve the yield of the finished product and to reduce the number of unwanted by-products.

As one of the largest manufacturers of electrodes in Europe and with more than 35 years of experience in analytical measurement, JUMO is a professional partner offering tailor-made solutions for nearly all applications.

pH and redox electrodes

pH
mV



	Description	JUMO ecoLine, JUMO BlackLine	JUMO tecLine	JUMO tecLine PRO	JUMO labLine	JUMO ISFET*
	Data sheet	201005, 201010	201020, 201025	201020, 201025	201030, 201035	201050
General information	Features	– Favorable price/ performance ratio – Glass or plastic version	– High quality – With integrated temperature probe	– Sturdy design – High mechanical and chemical resistance	– High quality – Suitable for lab applications	– Without any glass parts – For hygienic production processes
	Areas of application	– Drinking water – Greenhouse technology – Hand-held devices – Swimming pools – Aquariums – Surface water	– Process measurement – High temperature applications – Suspensions – Electroplating – Varnishes – Wastewater – Highly-purified water – Water – Highly-polluted media – Hygienic and sterile applications – Boiler feed water	– Wastewater treatment – Paper industry – Chemical industry	– General lab applications – Insertion measurements in food	– Food production – Hygienic and sterile applications
Data	Diaphragm	– Ceramic – Glass fiber	– Ceramic – Glass fiber – PTFE – Perforated – Annular gap	– Annular gap	– Ceramic – PTFE – Glass fiber – Perforated	– Ceramic

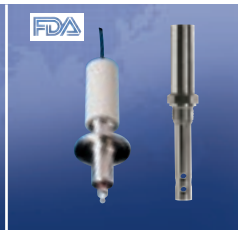
* Can be connected to JUMO AQUIS 500 pH and JUMO dTRANS pH 02.

Transmitters/controllers for pH-value, redox, and temperature

pH
mV

	Description	**JUMO handheld meter**	**JUMO ecoTRANS pH03 Compact DIN rail transmitter**	**JUMO dTRANS pH 02 Transmitter, controller, display unit, and data logger in one device**	**JUMO AQUIS 500 pH Transmitter/controller with high-quality controller functions**
	Data sheet	202710/20	202723	202551	202560
General information	**Features**	– Compact design – Min./max. value – Memory and hold function – Easy-to-operate membrane keypad – Easy-to-read LCD display	– Easy-to-use device programming with PC setup program – Changeover relay for alarm message or control – Ideal partner for PLC	– Extremely compact design – Multilingual plain text operation – Modular structure – Variable measured value display – P, PI, PD, and PID control functions	– Multilingual plain text operation – Graphic display with backlighting – P, PI, PD, and PID control functions
	Areas of application	– General water monitoring – Aquariums – Fish farming	Universally usable	Universally usable	Universally usable
Data	**Mounting**	Handheld device	DIN rail	Surface or control cabinet mounting	Surface or control cabinet mounting
	Measurands	– pH/redox – Temperature	– pH/redox – Temperature	– pH/redox/NH_3 – Temperature – Flow	– pH/redox/NH_3 – Temperature
	Outputs	Display unit	– Up to 2 analog outputs – 1 relay	– Up to 3 analog outputs – Up to 7 relays	– Up to 2 analog outputs – Up to 2 relays
	Protection type	IP65	IP20	IP65	IP67

Fittings

						
	pH mV					
	Description*	**Flow fittings for insertion in pipelines**	**Immersion fittings for insertion in open flumes, tanks, and pools**	**Quick-change fittings for insertion in closed liquid runs, pools, and tanks**	**Pneumatic quick-change fitting with automatic sensor cleaning**	**Permanent fittings for insertion in pipelines or tanks**
	Data sheet	202810	202820, 202821	202822	202823	202825
General information	**Features**	– Protects the electrodes against breakage – Ensures correct sensor flow to prevent measurement errors	**Type 202820:** – Up to 3 sensors – Enables measurement in different immersion depths **Type 202821:** – Sturdy design – Integrated spray nozzles for sensor rinsing – Increases sensor service life – Reduces maintenance costs	– Sensor replacement without interrupting the process – Installing sensors with an insertion length of 120 mm or 225 mm	– For one sensor (225 mm) – Cleaning of the sensor in the integrated washing chamber without interrupting the process – With pneumatic positional feedback – Can be combined with cleaning machine	– Used for protecting and mounting the electrode – Suitable for use in media with increased hygienic requirements
Data	**Material**	– PC or PP – PVC	**Type 202820:** PP **Type 202821:** stainless steel (1.4404/316L)	Stainless steel (1.4571) and FPM or PP and FPM	Stainless steel (1.4404/316L) or PVDF	Stainless steel (1.4571)
	Immersion length (as of process connection)	–	**Type 202820:** 500 to 2000 mm **Type 202821:** 500 to 2500 mm	48 to 135 mm	71 mm	5 to 90 mm
	Process connection	– G ½ A or bonded socket joints – Angled seat DN 20/25 – T-piece DN 32/40/50	**Type 202820:** – Flange **Type 202821:** – Flange – Retainer	– Screw-in thread G ¾ A – Screw-in thread G 1 A – Clamp DN 25	Flange DN 50	– Weld seam – Screw-in thread G ¾ A – Taper socket DN25/50 – Hygienic process connections: (clamp DN 25/50, VARIVENT® DN 40/50) – Ingold screw connection
	Accessories	–	**Type 202820:** – Cleaning nozzle – Wet bucket **Type 202821:** – Integrated flushing nozzle	–	– T-piece insertion – Controller EXmatic 460 – Cleaning valve kit	–

* The fittings are not suitable for JUMO ISFET sensors and JUMO tecLine PRO electrodes.

Conductive conductivity measurement

After pH-measurement, the electrolytic conductivity measurement is the most measured parameter in liquid analysis.
For desalination of seawater and for monitoring the quality of highly-purified water or cooling water, conductivity measurement plays an important role in many applications. Whether 2 or 4-electrode systems: with JUMO, you're ready for anything.

Application example

Measuring cells
with "ASTM test certificate"

Conductivity measurement in highly-purified water

The production of highly-purified water is one of the most important processes in the pharmaceutical industry. Most additives could not be manufactured without highly-purified water because consistent product quality depends on the quality of the highly-purified water.

A continuous conductivity measurement enables the quality of the highly-purified water to be monitored quickly and reliably. The measurement is made with conductivity sensors that work according to the two-electrode method.

According to the European Pharmacopoeia (EP), the cell constant of a measuring cell must be certified by its manufacturer. The JUMO product portfolio has featured measuring cells that meet these requirements for many years.

We currently offer the conductive conductivity measuring cell JUMO tecLine CR in a stainless steel or titanium version with the "ASTM test certificate." The certificate indicates the precisely measured cell constant that was measured in the factory. The cell constant can be entered directly in the transmitter. The measuring cell is then ready to use.

In addition to reliable conductivity sensors, highly-purified water applications also require measurement and control devices that can be mounted according to on-site requirements. JUMO offers a wide selection of models to meet this need. Customers typically choose panel mounting (JUMO dTRANS CR 02), mounting in a surface-mounted case (JUMO AQUIS 500 CR) with a high protection type (for example IP67), or DIN-rail mounting (JUMO ecoTRANS Lf 03).

Conductive 2 and 4-electrode conductivity measuring cells

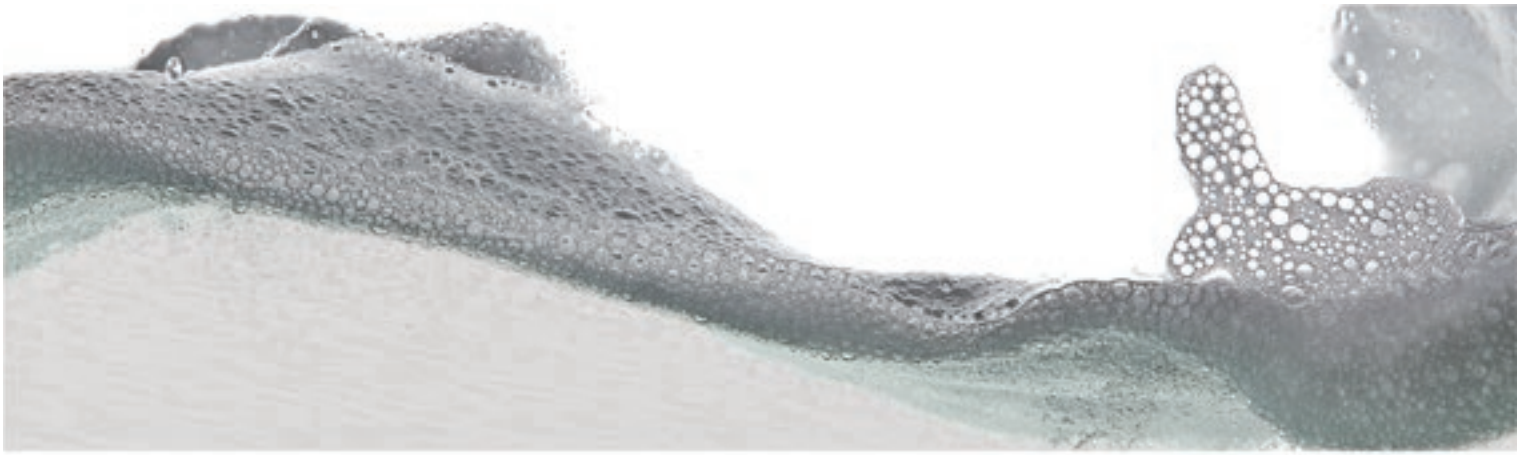
µS/cm
mS/cm

	Description	JUMO BlackLine CR-GT/-EC/-GS	JUMO ecoLine CR-PVC	JUMO tecLine CR	JUMO tecLine CR-GT	JUMO tecLine CR-4P with JUMO PEKA adapters
	Data sheet	202922	202923	202924	202925	202930
General information	Features	– Compact design – Low cost version – Universal	– Proven versions for industrial use – Can be inserted with T-piece	– Wide variety of process connections – Sturdy design – Pharmaceutical version incl. ASTM certificate	– Industrial version – Various process connections provide optimum adaptation to process conditions – With integrated temperature probe	– Very wide measuring range – CIP/SIP capability – Hygienic design – Certificate of quality included
General information	Areas of application	– Drinking water – Ion exchangers and reverse osmosis plants – Aquariums	– Cooling and air-conditioning system technology – Drinking and swimming pool water – Industrial rinsing and process water circuits	– Pure and highly-purified water – Boiler feed water – Chip production – Ion exchangers and reverse osmosis plants – High temperature applications	– Drinking and wastewater – Service water treatment	– Rinsing processes in the food and beverages industry, as well as the pharmaceuticals and biotechnology sector – CIP and SIP applications
Data	Cell constant	K = 0.01; 0.1 or 1.0	K = 0.1 or 1.0	K = 0.01 or 0.1	K = 1.0; 3.0, or 10.0	K = 0.3 to 0.4
Data	Measuring ranges* from to	0.05 µs/cm approx. 10 ms/cm	1 µs/cm 15 ms/cm	0.05 µs/cm 1 ms/cm	10 µs/cm 200 ms/cm	1 µs/cm 600 ms/cm
Data	Electrode material	**JUMO BlackLine CR-GT:** special graphite **JUMO BlackLine CR-EC:** stainless steel (1.4571) or titanium **JUMO BlackLine CR-GS:** platinum	Stainless steel (1.4571) or graphite	– Stainless steel (1.4571 or 1.4435) – Titanium	Graphite	Stainless steel (1.4435)

*The measuring ranges depend on the measuring cell types and/or the cell constant.

Transmitters/controllers for conductivity, TDS, resistance, and temperature

		µS/cm mS/cm				
	Description	**JUMO handheld meter**	**JUMO ecoTRANS Lf 01/02, Transmitter/switching device**	**JUMO ecoTRANS Lf 03, Transmitter/switching device**	**JUMO dTRANS CR 02, Transmitter/controller**	**JUMO AQUIS 500 CR Transmitter/controller**
	Data sheet	202710/30	202731	202732	202552	202566
General information	**Features**	– Compact design – Easy-to-operate membrane keypad – Easy-to-read LCD display – Includes adjusted measuring cell	– Low cost – Ideal partner for PLC – User-friendly setup program	– Integrated LCD display with varied display units (µs/cm, ms/cm, kohm x cm) – USP switching function according to USP<645> – Calibration certificate included	– Extremely compact design – Transmitter, controller, indicator, and data logger in one device – Simple operation in plain text, multiple languages available – Modular structure – Variable measured value display – USP switching function according to USP<645>	– Multilingual plain text operation – Graphic display with backlighting – P, PI, PD, and PID control functions – USP switching function according to USP<645>
	Areas of application	– General water monitoring – Aquariums – Fish farming	General water engineering	Universal	Universal	Universal
Data	**Mounting**	Handheld device	DIN rail	DIN rail	Surface or control cabinet mounting	Surface or control cabinet mounting
	Measurands	– Conductivity – Temperature	– Conductivity – Temperature	– Conductivity – Temperature – Resistance	– Conductivity – Temperature – Resistance – TDS value	– Conductivity – Temperature – Resistance – TDS value
	Outputs	Display unit	– 1 galvanically isolated analog output – 1 relay output	– 2 analog outputs – 1 relay output or 2 open collector outputs	– Up to 3 analog outputs – Up to 7 relays	– 2 analog outputs – 2 relays with changeover contact
	Protection type	IP65	IP20	IP20	IP65	IP67



Inductive conductivity measurement

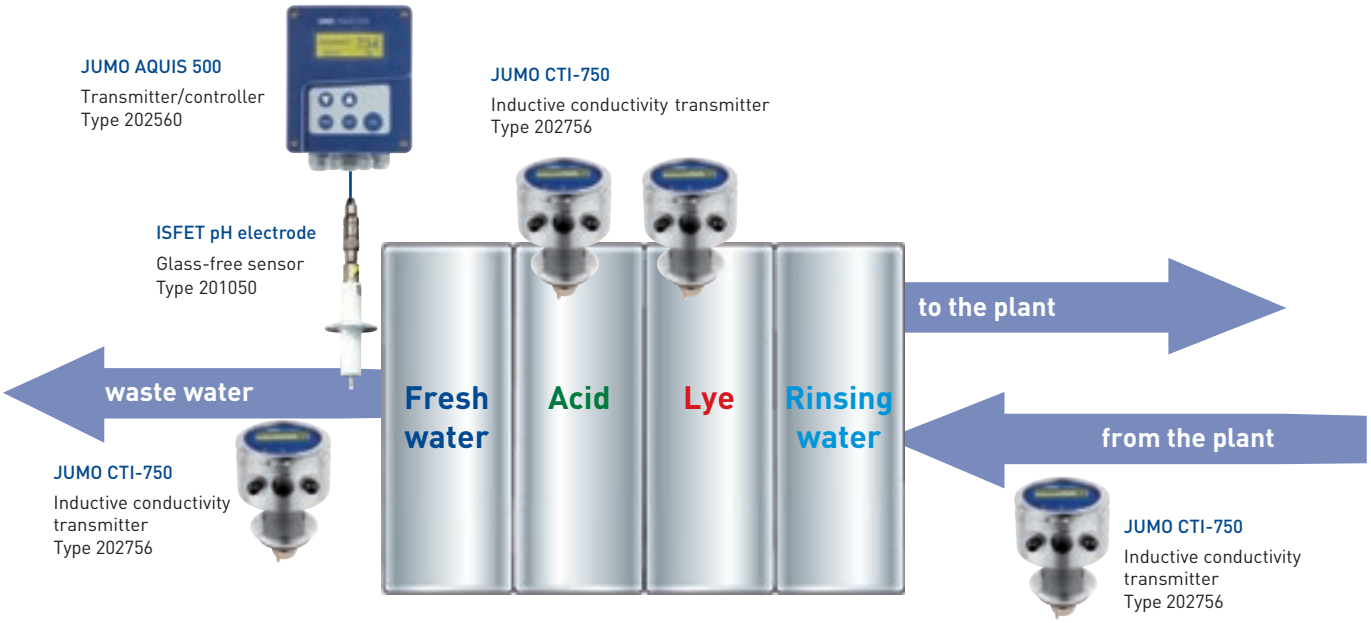
The conductivity sensor in a CIP plant must be resistant to highly aggressive and hot cleaning agents and must be suitable for occasionally very high conductivity values. Inductive measurement technology is ideal for this application, since the measuring instrument has no actual contact with the measurement solution. JUMO offers a wide selection of inductive conductivity sensors in this area. Examples are the JUMO CTI-750 with stainless steel case and the JUMO tecLine Ci hygienic inductive conductivity sensor.

Application example

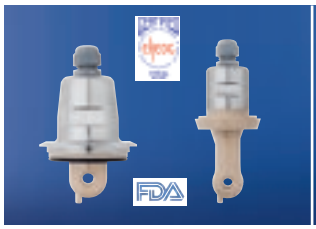
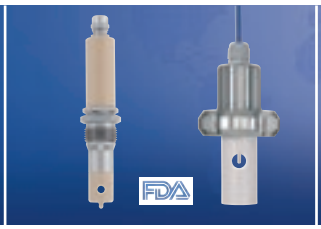
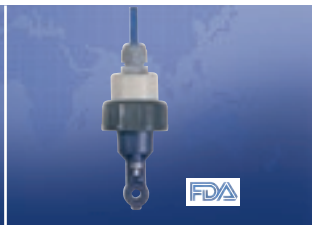
Conductivity measurement in CIP cleaning

CIP cleaning is one of the standard cleaning methods for production plants in both the food and pharmaceutical industries. Automating this cleaning process allows companies to reduce costs and produce more efficiently. Inductive conductivity sensors could offer significant advantages in this application.

The JUMO CTI-750 conductivity transmitter supports this process with accurate measurements to ensure that cleaning proceeds quickly and reliably. The JUMO CTI-750 also monitors and controls the concentration of your cleaning agent by measuring conductivity with an inductive conductivity sensor.

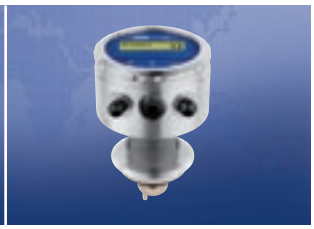


Inductive conductivity sensors

		µS/cm mS/cm		
				
	Description*	**JUMO tecLine Ci Hygienic conductivity sensor**	**JUMO tecLine Ci-S Conductivity sensor for process technology**	**JUMO ecoLine Ci Conductivity sensor for water engineering**
	Data sheet	202941	202942	202943
General information	**Features**	– Hygienic sensor design – Variety of process connections (milk cone, clamp, VARIVENT®) – Fast-response internal temperature sensor – Constructed without seals	– Wide variety of mounting dimensions – Different body materials – Immersion version also available	– Maintenance-free conductivity measurement – Compact, proven sensor – Various process connections available
General information	**Areas of application**	– Food industry (dairies, breweries, etc.) – Soft drinks production/ bottling – Mineral springs – Drinking water – CIP/SIP plants – Concentration measurements of acids, lyes, and cleaning chemicals	– Liquid foods – CIP/SIP plants – Rinsing and cleaning processes	– Drinking and wastewater – Dilution monitoring in cooling towers – Plants for desalination of seawater – Rinsing baths (electroplating plants) – Car washes – Wet scrubbers – Use in media with light chemical pollution
Data	**Sensor material**	PEEK	PVDF or PEEK	PP or PVDF
Data	**Measuring range**	0 to 2000 ms/cm	0 to 2000 ms/cm	0 to 2000 ms/cm
Data	**Admissible medium temperature In operation: For short periods**	–10 to +125 °C ≤+150 °C (≤60 min, ≤5 bar)	–10 to +125 °C ≤+140 °C	–10 to +80 °C PP (+100 °C PVDF) ≤+100 °C PP (+100 °C PVDF)

* The inductive conductivity sensors are designed for connection to the JUMO AQUIS 500 Ci inductive conductivity transmitter/ controller.

Transmitters/controllers for inductive conductivity, concentration, and temperature

		µs/cm ms/cm		
				
	Description	**JUMO AQUIS 500 Ci** **Transmitter/controller for inductive conductivity, concentration, and temperature**	**JUMO CTI-500** **Inductive conductivity/concentration and temperature transmitter with switching contacts**	**JUMO CTI-750** **Inductive conductivity/concentration and temperature transmitter in plastic or stainless steel case**
	Data sheet	202566	202755	202756
General information	**Features**	– Multilingual plain text operation – Graphic display with backlighting – P, PI, PD, and PID control functions	– Operation via keypad and via setup program – Activation of up to 4 measuring ranges and temperature coefficients – Fast-response temperature sensor	– Freely definable characteristic line for concentration display – Easy-to-use programming options with setup program – CIP and SIP capable
General information	**Areas of application**	– Food and beverages industry – CIP/SIP plants – Concentration measurement of acids and lyes	– Water and wastewater engineering – Cooling tower monitoring (dilution control) – Rinsing baths (electroplating plants) – Wet scrubbers	– Food and beverages industry – CIP/SIP plants – Concentration measurement of acids and lyes
Data	**Measurands**	– Conductivity – Concentration of NaOH, HNO_3, H_2SO_4, HCl – Temperature	– Conductivity – Concentration of NaOH, HNO_3 – Temperature	– Conductivity – Concentration of NaOH, HNO_3 – Temperature
Data	**Versions**	Surface or panel mounting	– Combined device (transmitter and measuring cell together in one device) – Split version (transmitter and measuring cell connected by cable)	– Combined device (transmitter and measuring cell together in one device) – Split version (transmitter and measuring cell connected by cable)
Data	**Mounting**	Surface or control cabinet mounting	Pipe mounting, wall mounting	Pipe mounting, wall mounting
Data	**Outputs**	– Up to 2 analog outputs – Up to 2 relays	– 2 outputs – 2 floating contacts	– 2 outputs – 2 floating contacts
Data	**Protection type**	IP67	IP67	IP67
Data	**Sensor material**	See sensors	PP or PVDF	PEEK or PVDF

Membrane-covered sensors

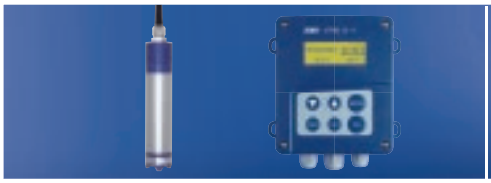
Documentation of the disinfectant concentration of your plant, monitoring for ammonia leakage in your cooling system, or controlling the oxygen content of your sewage treatment plant with an amperometric or a luminescence method – JUMO offers a wide range of solutions for many different applications, all from one source.

Sensors for total chlorine, free chlorine, chlorine dioxide, ozone, hydrogen peroxide, and peracetic acid

Description	**JUMO tecLine Cl2/TC/ClO2, O3/ H2O2, PAA Membrane-covered amperometric measuring cells**	**JUMO AQUIS 500 AS Display unit/controller**	**JUMO flow fitting for membrane-covered measuring cells**
Data sheet	202630/31/34/36	202568	202630/31/34/36
Features	– Measuring range: 0 to 50,000 mg/l* – Temperature-compensated current output (4 to 20 mA)	– Display: mg/l, ppm, pH, mV, µs/cm, etc. – Choice of display visualizations	– Ideal for bypass messages – Measuring vessel made from PC
Areas of application	Drinking water, swimming pool water, service water	Universal	Drinking water, swimming pool water, service water

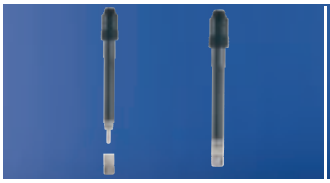
* Measuring range depends on the measurand.

Oxygen measurement (DO)



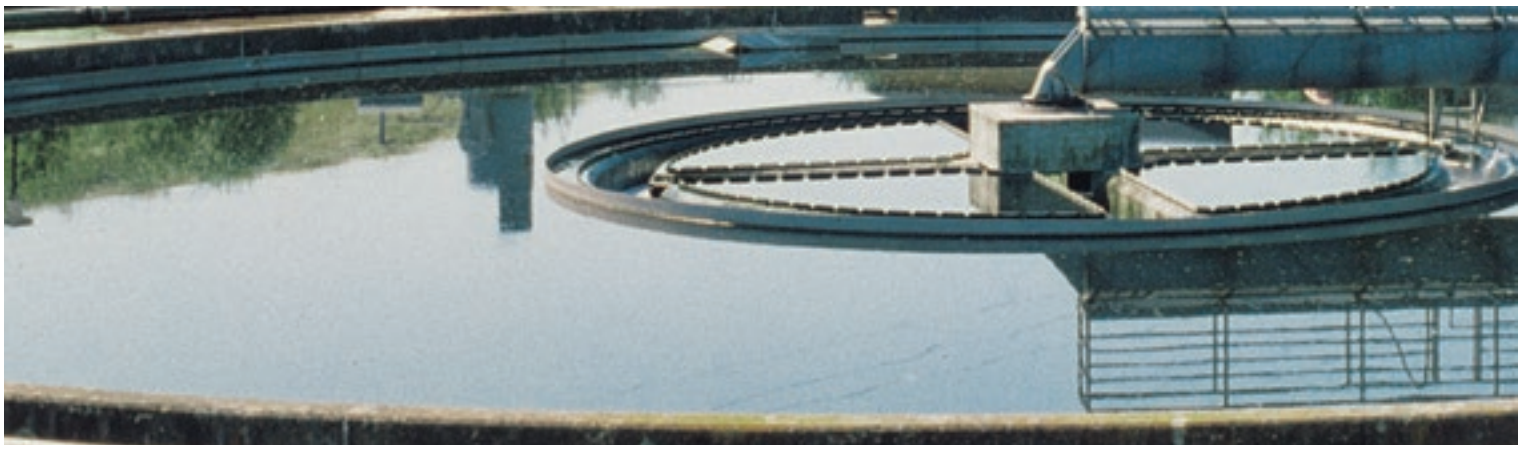
Description	**JUMO dTRANS O2 01 – 2-wire transmitter for dissolved oxygen with operating unit**	**JUMO ecoLine O-DO – optical sensor for dissolved oxygen with display unit/controller JUMO AQUIS 500 RS**
Data sheet	202610	202613, 202569
Measuring principle	Amperometric	Luminescence
Features	– Measuring range: 0 to 50 mg/l – Simple, safer servicing through exchange of modules	– Measuring range: 0 to 20 mg/l – Long-term stability and low maintenance
Areas of application	Drinking water, wastewater, fish farming	

Ammonia measurement



Description	**JUMO ammonia-sensitive sensor**	**JUMO AQUIS 500 pH Transmitter/controller**	**JUMO quick-change fitting for ammonia-sensitive sensor**
Data sheet	201040	202560	201040
Features	– Measuring range: 0.01 to 9,999 mg/l – Simple, safer servicing through exchange of modules	– Multilingual plain text operation – graphic display with back-lighting – P, PI, PD, and PID control functions	– Simplifies handling – Hose connection G 1/8 A (POM)
Areas of application	Cooling systems*	Universal	Cooling systems*

* Monitoring of ammonia leakage (such as in indoor ice rinks or cold stores).

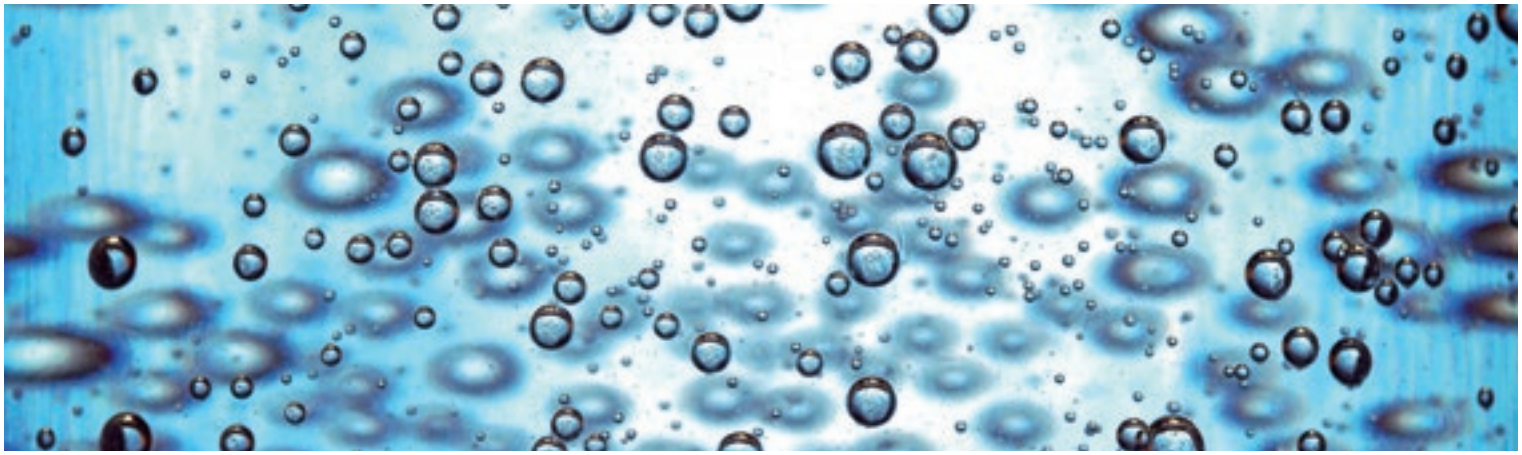


Turbidity measurement

The turbidity measurement according to DIN EN ISO 7027 is a tried-and-tested method for monitoring water with low to medium levels of turbidity. The measuring principle is based on the infrared measurement according to the 90° scattered light method. Due to the light measurement in the wavelength of 880 nm and the wide measuring range of 0 to 4000 NTU. Possible uses of the sensor are for quality control and assessment of drinking water as well as wastewater control.

Turbidity measurement (NTU)

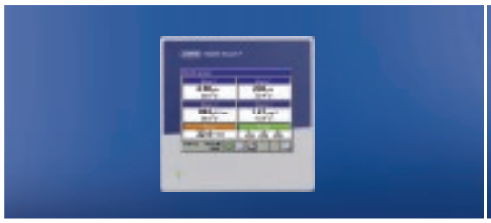
	Description	**JUMO ecoLine NTU – Optical sensor for measuring turbidity with display unit/controller JUMO AQUIS 500 RS**
	Data sheet	202670, 202569
Allgemeines	**Features**	Durable sensor, Low maintenance, Calibration data and history saved in the sensor electronics Complete unit with JUMO AQUIS 500 RS (a display unit with 2 integrated controller and 2 switching outputs)
Allgemeines	**Areas of application**	– Municipal and industrial sewage treatment plants, – Drinking water monitoring – Protection of water bodies – Fish farms – Technical processing plants
Daten	**Measuring principle**	Infrared measurement (880 nm) according to the 90° scattered light principle (according to DIN EN ISO 7027)
Daten	**Measuring ranges**	4 measuring ranges: – 0 to 50 NTU – 0 to 200 NTU – 0 to 1000 NTU – 0 to 4000 NTU
Daten	**Resolution**	0.01 to 1 NTU (depending on the set measuring range)
Daten	**Measuring error**	< 5 % of the displayed measured value
Daten	**Temperature sensor**	Integrated NTC (Negative Temperature Coefficient)
Daten	**Operating temperature**	0 to 50 °C
Daten	**Interface**	RS485
Daten	**Voltage supply**	DC 5 to 12 V
Daten	**Dimensions**	Diameter: 27 mm, length: 170 mm
Daten	**Material**	PVC
Daten	**Max. pressure**	5 bar
Daten	**Protection type**	IP68



Multichannel measuring devices

Measure – display – control – record. These are terms that have been closely associated with the JUMO brand for decades. The four tasks have been combined into a single innovative device series for liquid analysis, a field that promises to play a much greater role in the global future market. This device is the JUMO AQUIS touch.

Multichannel measuring devices



	Description	**JUMO AQUIS touch P**	**JUMO AQUIS touch S**
	Data sheet	202580	202581
General information	**Features**	– 3.5" touchscreen – Modular structure – 10 inputs and outputs as standard – 7 slots for input and output modules – Customized process screen – Data monitor, registration function – Web browser with online visualization – Timer functions – Math and logic functions – Setup program, PC evaluation software (PCA3000) PCA communication software (PCC) – Calibration routines, calibration log books, calibration timers	– 5.5" touchscreen – Modular structure – 14 inputs and outputs as standard – 13 slots for input and output modules – Customized process screen – Data monitor, registration function – Web browser with online visualization – Timer functions – Math and logic functions – Setup program, PC evaluation software (PCA3000) PCA communication software (PCC) – Calibration routines, calibration log books, calibration timers
	Areas of application	– Universal – Water and wastewater engineering – Food and beverages industry (CIP/SIP) – Pharmaceuticals and biotechnology (USP, ASTM) – Drinking water technology, desalination of seawater – Process technology (rinsing tanks, galvanic equipment, cooling tower control, gas scrubbers, air washers) – Swimming pool technology	
Data	**Mounting**	Control cabinet mounting (front dimensions 96 x 96 mm)	Surface-mounted case
	Measurands	– pH-value, redox voltage, NH_3 concentration – Electrolytic conductivity (conductive) – Electrolytic conductivity (inductive) – Acid and lye concentration – Resistance (MOhm x cm; kOhm x cm) – TDS value (ppm) – Temperature (Pt100/Pt1000/NTC/PTC) – Flow (pulse input) – Free chlorine, total chlorine, chlorine dioxide, ozone, hydrogen peroxide, peracetic acid – Universal inputs via standard signal (0 to 20 mA; 4 to 20 mA or 0 to 10 V) for various measurands	
	Protection type	IP66 (front side)	IP67
	Interfaces	Ethernet, USB host, USB device (setup), RS422/RS485 with Modbus protocol, PROFIBUS-DP	
	Approvals	cULus (at preparation stage)	

Accessories

Useful for maintenance, troubleshooting, and startup of pH/redox and conductivity measuring points, technical buffer solutions, or connecting cables – JUMO offers a large selection of proven designs.

Accessories for liquid analysis

Description	**Cables, connectors, and sockets for pH, redox, and conductivity measurement**	**Technical buffer and cleaning solutions**	**Impedance converters for pH and redox electrodes**	**Simulators and calibration adapters for pH, redox, and conductivity measurement**
Data sheet	202990	202950	202995	202711
Features	– High-quality preassembled connecting cables – Highest possible protection type with factory mounting – Wide selection of connectors/sockets in special range – Customer-specific versions	– pH buffer solutions according to DIN 19267 – Redox test solutions according to ASTM D 1498 – Reference solutions for conductivity can be traced back to PTB and NIST – Diaphragm and electrode cleaners	– Stabilizes the signal, independent of the electrical supply – Can be retrofitted – Enables the use of longer cables – Can also be supplied for electrodes with SMEK connection	– Simulates a pH/redox or conductivity sensor in an application – Facilitates dry-run startup of plants
Areas of application	– For use with electrochemical sensors	– Calibration of pH/redox electrodes and conductivity measuring cells	– Converts the high-impedance signal of the pH electrode	– For startup, calibration, and monitoring of pH, redox, and conductivity measuring points – For testing connecting cables and troubleshooting

Services & Support

It is the quality of our products that is responsible for such a high level of customer satisfaction. But our reliable after-sales service and comprehensive support are also valued. Let us introduce you to the key services we provide for our innovative JUMO products. You can count on them – anytime, anywhere.

JUMO Services & Support – so that it all comes together!

Manufacturing Service

Are you looking for a competitive and efficient system or component supplier? Regardless of whether you seek electronic modules or perfectly fitting sensors – either for small batches or mass production – we are happy to be your partner. From development to production we can provide all the stages from a single source. In close cooperation with your business our experienced experts search for the optimum solution for your application and incorporate all engineering tasks. Then JUMO manufactures the product for you.
As a result you profit from state-of-the-art manufacturing technologies and our uncompromising quality management systems.

Customer-specific sensor technology

- Development of temperature probes, pressure transmitters, conductivity sensors, or pH and redox electrodes according to your requirements
- A large number of testing facilities
- Incorporation of the qualifications into application
- Material management
- Mechanical testing
- Thermal test

Electronic modules

- Development
- Design
- Test concept
- Material management
- Production
- Logistics and distribution
- After-sales service

Metal technology

- Toolmaking
- Punching and forming technology
- Flexible sheet metal machining
- Production of floats
- Welding, jointing, and assembly technology
- Surface treatment technology
- Quality management for materials

Information & Training

Would you like to increase the process quality in your company or optimize a plant? Then use the offers available on the JUMO website and benefit from the know-how of a globally respected manufacturer. For example, under the menu item "Services and Support" you will find a broad range of seminars. Videos are available under the keyword "E-Learning" about topics specific to measurement and control technology. Under "Literature" you can learn valuable tips for beginners and professionals. And, of course, you can also download the current version of any JUMO software or technical documentation for both newer and older products.

Product Service

We have an efficient distribution network on all five continents available to all of our customers so that we can offer professional support for everything concerning our product portfolio. Our team of professional JUMO employees is near you ready to help with consultations, product selection, engineering, or optimum use of our products. Even after our devices are commissioned you can count on us. Our telephone support line is available to give you answers quickly. If a malfunction needs to be repaired on site our Express Repair Service and our 24-hour replacement part service are available to you. That provides peace of mind.

Maintenance & Calibration

Our maintenance service helps you to maintain optimum availability of your devices and plants. This prevents malfunctions and downtime. Together with the responsible parties at your company we develop a future-oriented maintenance concept and are happy to create all required reports, documentation, and protocols. Because we know how important precise measurement and control results are for your processes we naturally also professionally calibrate your JUMO devices – on site at your company or in our accredited DAkkS calibration laboratory for temperature. We record the results for you in a calibration certificate according to EN 10 204.

www.jumo.net

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Christ-Pharma & Life Science GmbH

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