





Innovative solutions to meet the most stringent standards





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#### Dear reader,

Perhaps you're wondering why JUMO has chosen to become a specialist in the area of analysis measurement technology in liquids. There's an easy answer. From the company's origin as a manufacturer of glass thermometers for technical processes, it moved through production of glass parts and glass sensors in the 1970s into the new area of electrochemical measurement variables, pH and ORP as well as electrolytic conductivity.

Overly reckless practices with water as a resource led to increasing pollution of natural water sources. The result was regulation enacted to prevent water pollution and requirements for cleaning and detoxifying production wastewater. During this time, industry and community operators were looking for suitable sturdy measuring and control systems to determine and regulate the main variables in water analysis. Previously this had been the domain of laboratory procedures. So JUMO began providing these products to well known suppliers and plant builders from the inception of this new sector in water treatment, dosing and sewage treatment technology.

Today the components produced in the "JUMO analysis measurement technology" product line are represented in almost all areas of water/wastewater technology. From high purity pharmaceutical water to measuring high concentrations of acids, bases and salts, from drinking, swimming pool and aquarium water to process water, JUMO covers almost all applications of our steadily growing com- munity of satisfied customers. Many of our products make their way into measurement applications throughout the world under our customers' brand names. JUMO is a reliable OEM supplier and partner with customers who rely on our technology.

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

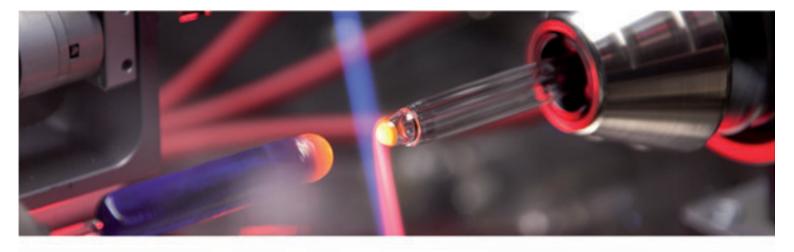
Detailed information about our products can be found under the specified type/product group number at www.jumo.de.

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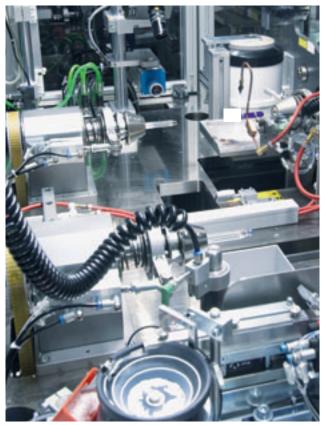
# JUMO electrode manufacturing

JUMO offers the highest quality with many years of experience, internally developed electrodes and measuring systems, and modern production lines to ensure flexibility. For both the glass and plastic versions, we can address your specific needs and customize the pH and ORP electrodes during production to optimize them for your application.

Electrode manufacturing pH and ORP measurement Conductivity measurement Membrane-covered sensors Accessories

### 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 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 such production of OEM versions and special designs.

#### Reliable and accurate: JUMO pH and ORP electrodes

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



# pH and ORP measurement

The pH value is the most commonly used measurement variable used in analyzing aqueous solutions. It is enormously important in nearly all sectors of industry. Product quality in the chemical and pharmaceutical industries depends significantly on maintaining a narrow pH-range. Accurate pH measurements help to improve yield and reduce the number of undesirable byproducts. The pH value determines whether or not the water in a drinking water supply system will cause corrosion damage or whether the precipitation reaction of heavy metal ions will work effectively in a treatment plant for wastewater from plating. As one of the leader manufacturers of electrochemical sensors in Europe and with an experience for more than 35 years in liquid analysis, JUMO is a competent partner offering tailor-made solutions for nearly all applications.



## pH and ORP Electrodes

	pH mV					
	Description	JUMO ecoLine, JUMO BlackLine	JUMO labLine	JUMO tecLine	JUMO tecLine PRO	JUMO ISFET*
	Data sheet	201005, 201010	201030, 201035	201020, 201025	201020, 201025	201050
	Features	<ul> <li>Favorable price/ performance ratio</li> <li>Version with a glass or plastic shaft</li> </ul>	<ul> <li>High quality</li> <li>Suitable for lab applications</li> </ul>	<ul> <li>High quality industrial and process electrodes</li> <li>Integrated temperature probe</li> </ul>	<ul> <li>Sturdy</li> <li>High mechanical and chemical resistance</li> </ul>	<ul> <li>Without glass</li> <li>For hygienic production processes</li> </ul>
General	Areas of application	<ul> <li>Drinking water</li> <li>Greenhouses</li> <li>Hand-held devices</li> <li>Swimming pools</li> <li>Aquariums</li> <li>Surface water</li> </ul>	<ul> <li>General lab applications</li> <li>Insertion measure- ments in food</li> </ul>	<ul> <li>Process measurement</li> <li>High temperature applications</li> <li>Suspensions</li> <li>Electroplating</li> <li>Varnishes</li> <li>Wastewater</li> <li>High purity water</li> <li>Water</li> <li>Highly polluted media</li> <li>Hygienic and sterile applications</li> <li>Boiler feed water</li> </ul>	<ul> <li>Wastewater treatment</li> <li>Sewage treatment works</li> <li>Paper industry</li> <li>Chemical industry</li> </ul>	<ul> <li>Food manufacturing</li> <li>Hygienic and sterile applications</li> </ul>
Data	Diaphragm	– Ceramic – Glass fiber	– Zirconium dioxide – PTFE – Glass fiber – Annular gap	– Zirconium dioxide – PTFE – Glass fiber – Annular gap – Perforated	Annular gap	Ceramic

 $^{\ast}$  can be connected to JUMO AQUIS 500 pH and JUMO dTRANS pH 02



# Transmitters/Controllers for pH, ORP and Temperature

Description	JUMO Handheld Meter	JUMO ecoTRANS pH03 Compact Transmitter	JUMO AQUIS 500 pH Transmitter/Controller with High Qualtity Controller Functions	JUMO dTRANS pH 02 Transmitter, Controller, Indicator and Data Logger, All in One
Data sheet	202710/20	202723	202560	202551
Features	<ul> <li>Compact design</li> <li>Min- and max- memory and hold functions are available</li> <li>Simple to operate by membrane keypad</li> <li>Easy-to-read LC display</li> </ul>	<ul> <li>Convenient device programming with PC setup program</li> <li>Changeover relay for alarm message or regulation</li> <li>Ideal partner for PLC</li> </ul>	<ul> <li>Multilingual cleartext operation</li> <li>Graphic display with background lighting</li> <li>P, PI, PD and PID control functions</li> </ul>	<ul> <li>Extremely compact design</li> <li>Simple operation in plain text, multiple languages available</li> <li>Modular structure</li> <li>Variable measure- ment display</li> <li>P, PI, PD and PID control functions</li> </ul>
Areas of application	General lab applications	Universally usable	Universally usable	Universally usable
Mounting	Handheld device	DIN rail mounting	Panel or surface mounting	Panel or surface mounting
Measurement parameter	– pH/ORP – Temperature	– pH/ORP – Temperature	– pH/ORP/NH <sub>3</sub> – Temperature	– pH/ORP/NH <sub>3</sub> – Temperature – Flow
Outputs	Indicator	<ul> <li>Up to 2 analog</li> <li>outputs</li> <li>1 relay</li> </ul>	<ul> <li>Up to 2 analog outputs</li> <li>Up to 2 relays</li> </ul>	<ul> <li>Up to 3 analog outputs</li> <li>Up to 8 relays</li> </ul>
Enclosure type	IP 65	IP 20	IP 67	IP 65

General

Data

Electrode manufacturing pH and ORP measurement Conductivity measurement Membrane-covered sensors Accessories

## Fittings

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	Description*	Immersion fittings for installing in open sluices, tanks and pools	Flow- through fittings for mounting in pipelines	Compact installation fittings for installation in pipeline or tank	Manual quick-change fittings for the in- stallation in liquid runs, pools and tanks	Pneumatic retracta- ble assembly with automatic sensor cleaning
	Data sheet	202820, 202821	202810	202825	202822	202823
General	Features	<ul> <li>Type 202820:</li> <li>For up to three sensors</li> <li>Enables measure ment in different immersion depths</li> <li>Type 202821:</li> <li>Sturdy design</li> <li>Integrated spray nozzles for the sensor rinsing</li> <li>Increases sensor service life</li> <li>Reduces main- tenance expenditur</li> </ul>	<ul> <li>Protects the sensors against breakage</li> <li>Enables for the correct flow oto avoid measurement errors</li> </ul>	<ul> <li>Used for holding and protecting of the electrode</li> <li>Suitable for media with increased hygienic requirements</li> </ul>	<ul> <li>Sensor replace ment without interrupting the process</li> <li>Installing one sensors with a mounting length of 120 mm or 225 mm</li> </ul>	<ul> <li>For one sensor [225mm]</li> <li>Cleaning of the sensors in integrated washing chamber without interrupting the process</li> <li>With pneumatic positional feedback</li> <li>Combined with cleaning machines</li> </ul>
	Material	Type 202820: PP Type 202821: Stainless steel (1.4404/316L)	– PC or PP – PVC	Stainless steel (1.4571)	Stainless steel (1.4571) and FPM or PP and FPM	Stainless steel (1.4404/316L) or PVDF
	Immersion length	Type 202820:           500 to 2000 mm           Type 202821:           500 to 2500 mm	-	5 to 90 mm	48 to 135 mm	71 mm
Data	Process connection	Type 202820: - Flange Type 202821: - Flange - Retainer	<ul> <li>G ½ A or solvent- weld sockets</li> <li>Inclined position DN 20/25</li> <li>T-piece DN 32/40/50</li> </ul>	<ul> <li>Weld seam</li> <li>Thread G ¾A</li> <li>Cone nipple DN 25/50</li> <li>Hygienic (Clamp DN 25/50, Varivent DN 40/50)</li> <li>Ingold-connection</li> </ul>	– Thread G ¾ A – Thread G 1A – Clamp DN 25	Flange DN 50
	Accessories	Type 202820: - Cleaning nozzle - Wetting cup Type 202821: - Integrated spray nozzle	-	-	-	<ul> <li>T-piece mounting</li> <li>Controller</li> <li>EXmatic 460</li> <li>Cleaning valve kit</li> </ul>

\* Fittings are not suitable for JUMO ISFET sensors and JUMO tecLine PRO electrodes.



# Conductive conductivity measurement

After the pH measurement, the electrolytic conductivity measurement is the most frequently measured parameter in liquid analysis.

In desalination of seawater as well as monitoring of high purity water or cooling water quality, conductivity measurements play an important role in many applications. For 2- or 4-electrode systems, with JUMO, you're ready for anything.



Conductivity measurement

Membrane-covered sensors Accessories

### Sample application



#### Conductivity measurement in high purity water

The production of high purity water is one of the most important processes in the pharmaceutical industry. Most additives could not be manufactured without it, because high product quality depends on consistent quality of high purity water.

A continuous conductivity measurement makes it possible to monitor the quality of high purity water quickly and reliably. The measurement is made with conductivity sensors that work according to the two-electrode method.

In keeping with 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 meeting these requirements for many years. Currently we are offering the conductive conductivity cell JUMO tecLine Lf-VA in a stainless steel or titanium version with the "ASTM test certificate". The certificate indicates the precisely measured cell constant, which can be entered directly in the transmitter. The measuring cell is then ready to use.

In addition to reliable conductivity sensors, high purity water applications also require measurement and control instruments 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), installation in a wall-mounted housing (JUMO AQUIS 500 CR) with a high protection rating (for example IP67), or a DIN rail mounting (JUMO ecoTRANS Lf 03).



# Conductive 2- and 4-Electrode Conductivity Cells

	Description	JUMO BlackLine Lf-GT/-EC/-GS	JUMO ecoLine Lf-PVC	JUMO tecLine Lf-VA	JUMO tecLine Lf-GT	JUMO tecLine Lf-4P with JUMO PEKA- Adapters
	Data sheet	202922	202923	202924	202925	202930
General	Features	– Compact design – Low cost version – Universally usable	<ul> <li>Well-proven versions for industrial use</li> <li>Insertion with tees</li> </ul>	<ul> <li>Wide variety of process connections</li> <li>Sturdy design</li> <li>Pharmaceutical version incl. ASTM- certificate</li> </ul>	<ul> <li>Industrial version</li> <li>Various process connections pro- vide optimum adaptation to pro- cess conditions</li> <li>With integrated temperature sensor</li> </ul>	<ul> <li>very wide measuring range</li> <li>CIP/SIP capability</li> <li>Hygienic design</li> <li>Certificate of quality included</li> </ul>
Gene	Areas of application	<ul> <li>Drinking water</li> <li>Ion exchangers and reverse osmosis plants</li> <li>Aquariums</li> </ul>	<ul> <li>Refrigeration and air conditioning systems</li> <li>Drinking and bathing water</li> <li>Industrial rinsing and process water</li> </ul>	<ul> <li>Pure and high purity water</li> <li>Boiler feed water</li> <li>Chip production</li> <li>Ion exchangers, Reverse osmosis plant</li> <li>High temperature applications</li> </ul>	– Drinking water – Wastewater – Process water	<ul> <li>Rinsing process in food and beverage industries, pharma- ceuticals and biotechnology</li> <li>CIP and SIP applications</li> </ul>
	Cell constant	K = 0.01; 0.1 and 1.0	K = 0.1 and 1.0	K = 0.01 and 0.1	K = 1.0; 3.0 and 10.0	K = 0.3 to 0.4
Data	Measuring range * from to	0.05µS/cm approx. 10mS/cm	0 15mS/cm	0.05µS/cm 1mS/cm	0.1mS/cm 200mS/cm	1µS/cm 600mS/cm
	Electrode material	JUMO BlackLine Lf-GT: Special graphite JUMO BlackLine Lf-EC: Stainless steel (1.4571) or titanium JUMO BlackLine Lf-GS: Platinum	Stainless steel (1.4571) or graphite	– Stainless steel (1.4571 bzw. 1.4435) – Titanium	Graphite	Stainless steel (1.4435)

 $\ensuremath{^*}$  Measuring ranges depend on type of measuring cells or the cell constant.



## Transmitters/Controllers for Conductivity, TDS, Resistivity and Temperature

	μS/cm mS/cm					Secret c A us
	Description	JUMO Handheld Meter	JUMO ecoTRANS Lf 01/02 Transmitter/ Switching Device	JUMO ecoTRANS Lf 03 Transmitter/ Switching Device	JUMO AQUIS 500 CR Transmitter/ Controller	JUMO dTRANS CR 02 Transmitter/ Controller
	Data sheet	202710/30	202731	202732	202566	202552
General	Features	<ul> <li>Compact design</li> <li>Min- and max- memory and hold functions are available</li> <li>Simple to operate by membrane keypad</li> <li>Easy-to-read LC display</li> </ul>	<ul> <li>Low cost</li> <li>Ideal partner for SPS</li> <li>User friendly setup software</li> </ul>	<ul> <li>Integrated LC display with varied display units (µS cm, mS/cm, kOhm x cm)</li> <li>USP switching function according to USP&lt;645&gt;</li> <li>Calibration certificate included</li> </ul>	<ul> <li>Multilingual clear- text operation</li> <li>Graphic display with background lighting</li> <li>P, PI, PD and PID control functions</li> </ul>	<ul> <li>Extremely compact design</li> <li>Transmitter, controller, indicator and data logger in one device</li> <li>Simple operation in plain text, multiple languages available</li> <li>Modular structure</li> <li>Variable measure- ment display</li> </ul>
	Areas of application	– General lab applications – Aquariums – Fish farms	General water engineering	Universally usable	Universally usable	Universally usable
	Mounting	Handheld device	DIN rail mounting	DIN rail mounting	Panel or surface mounting	Panel or surface mounting
Data	Measurement parameter	– Conductivity – Temperature	– Conductivity – Temperature	– Conductivity – Temperature – Resistivity	– Conductivity – Temperature – Resistivity – TDS	– Conductivity – Temperature – Resistivity – TDS
	Outputs	Indicator	– 1 analog output – 1 relay	<ul> <li>2 analog outputs</li> <li>1 relay or 2 open collector outputs</li> </ul>	<ul> <li>Up to 2 analog outputs</li> <li>Up to 2 relays</li> </ul>	<ul> <li>Up to 3 analog outputs</li> <li>Up to 8 relays</li> </ul>
	Enclosure type	IP 65	IP 20	IP 20	IP 67	IP 65



# Inductive conductivity measurement

The conductivity sensor in a CIP system 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 solution. JUMO offers a wide selection of inductive conductivity sensors: JUMO CTI-750 with stainless steel housing or JUMO tecLine Ci hygienic inductive conductivity sensor.



Conductivity measurement

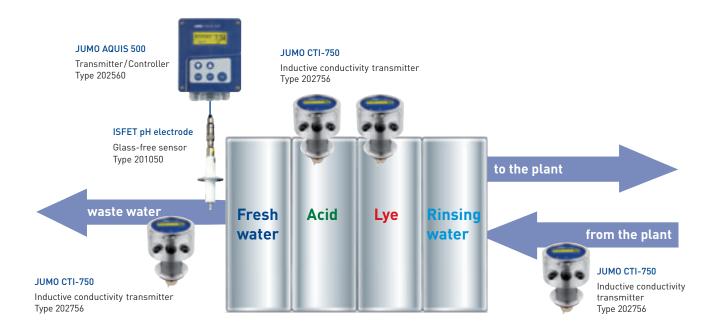
Membrane-covered sensors Accessories

### Sample application



#### Conductivity measurement in CIP cleaning

CIP cleaning is one of the standard cleaning methods for production systems 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 you 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 Cells

	μS/cm mS/cm			FDA
	Description*	JUMO tecLine Ci Hygienic Conductivity Sensor	JUMO tecLine Ci-S Conductivity Sensor for General Process Engineering	JUMO ecoLine Ci Inductive Sensor for General Water Engineering
	Data sheet	202941	202942	202943
	Features	<ul> <li>Hygienic sensor design</li> <li>A variety of process connection variants</li> <li>A fast-response, internal temperature sensor</li> </ul>	<ul> <li>Wide variety of mounting dimensions</li> <li>Different body materials</li> <li>An immersion variant is available</li> </ul>	<ul> <li>Maintenance-free conductivity measurement</li> <li>A compact, proven sensor</li> <li>Various process connections</li> </ul>
General	Areas of application	<ul> <li>Food industry (dairies, breweries, etc.)</li> <li>Soft drinks manufacturing/ bottling</li> <li>Mineral springs</li> <li>Drinking water</li> <li>CIP/SIP systems</li> <li>Concentration measurement of acids and lyes</li> </ul>	<ul> <li>Liquid foodstuffs</li> <li>CIP/SIP systems</li> <li>Rinsing and cleaning processes</li> </ul>	<ul> <li>Drinking water and wastewater</li> <li>Dilution monitoring in cooling towers</li> <li>Seawater desalination plants</li> <li>Electroplating</li> <li>Rinsing tanks</li> <li>Carwashes</li> </ul>
	Sensor material	PEEK	PVDF or PEEK	PP or PVDF
ta	Measuring range	0 to 2000 mS/cm	0 to 2000 mS/cm	0 to 2000 mS/cm
Data	Permissible medium temperature In operation: For short periods	-10to+125°C ≤150°C (≤60min, ≤5bar)	-10to+125°C ≤140°C	-10to+80°C (+100°C PVDF) ≤+100°C (+110°C PVDF)

 $\ast$  Inductive conductivity cells are designed for connection to the JUMO AQUIS 500 Ci 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 Switch Contacts	JUMO CTI-750 Inductive Conductivity/ Concentration and Temperature Transmitter in Plastic or Stainless Steel Housing
	Data sheet	202566	202755	202756
General	Features	<ul> <li>Multilingual cleartext operation</li> <li>Graphic display with background lighting</li> <li>P, PI, PD and PID control functions</li> </ul>	<ul> <li>Operation via keypad through setup program</li> <li>Activation of up to 4 ranges and temperature coefficients</li> <li>Fast-response temperature sensor</li> </ul>	<ul> <li>Freely definable concentration curve</li> <li>Easy-to-use programming option via setup program</li> <li>CIP and SIP capable</li> </ul>
	Areas of application	<ul> <li>Food and beverage industries</li> <li>CIP/SIP systems</li> <li>Concentration measurement of acids and lyes</li> </ul>	<ul> <li>Water and wastewater</li> <li>Cooling tower monitoring (dilution control)</li> <li>Electroplating</li> </ul>	<ul> <li>Food and beverage industries</li> <li>CIP/SIP systems</li> <li>Concentration measurement of acids and lyes</li> </ul>
	Measurement parameter	<ul> <li>Conductivity</li> <li>Concentration of NaOH, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HCl</li> <li>Temperature</li> </ul>	<ul> <li>Conductivity</li> <li>Concentration of NaOH, HNO<sub>3</sub></li> <li>Temperature</li> </ul>	<ul> <li>Conductivity</li> <li>Concentration of NaOH, HNO<sub>3</sub></li> <li>Temperature</li> </ul>
Data	Versions	Panel or surface mounting	<ul> <li>Combined unit (transmitter and measuring cell together in one unit)</li> <li>Split version (transmitter and cell connected by cable)</li> </ul>	<ul> <li>Combined unit (transmitter and measuring cell together in one unit)</li> <li>Split version (transmitter and cell connected by cable)</li> </ul>
	Montage	Panel or surface mounting	Pipe mounting, wall mounting	Pipe mounting, wall mounting
	Mounting	– Up to 2 analog outputs	– 2 analog outputs	- 2 analog outputs

- 2 switching outputs

IP 67

PP or PVDF

– Up to 2 relays

See sensors

IP 67

Enclosure type

Sensor material

-	Z	analog outputs	
_	2	switching outputs	

PEEK or PVDF

IP 67

16 17



# Membrane-covered sensors

Documentation of the disinfectant concentration of your system, monitoring for ammonia leakage in your refrigerating plant or controlling the oxygen content of your wastewater treatment plant – JUMO offers a wide range of solutions for many different applications, all from one source.



### Measurement of Free Chlorine, Chlorine Dioxide, Ozone, Peracetic Acid, Hydrogen Peroxide



### Dissolved Oxygen (DO) Measurement

Description	JUMO dTRANS 02 01– 2-wire Transmitter for Dissolved Oxygen with Operating Unit	Accessories for JUMO dTRANS 02 01 (Fittings, support columns, weather protection canopy, etc.)
Data sheet	202610	202610
Features	<ul> <li>Measuring range: 0to50mg/l</li> <li>Simpler, safer servicing by replacing modules</li> </ul>	<ul> <li>Enables measurement in different depths</li> <li>Protects operating unit</li> </ul>
Areas of application	Drinking water, wastewater, fish farming	Protects the plant

### Ammonia Measurement



Description	JUMO Ammonia-sensitive Sensor	JUMO AQUIS 500 pH Transmitter/Controller	JUMO Retractable Assembly for Ammonia-sensitive Sensor
Data sheet	201040	202560	201040
Features	<ul> <li>Measuring range:</li> <li>0.01 to 9,999 mg/l</li> <li>Simpler, safer servicing by replacing membrane cap</li> </ul>	<ul> <li>Multilingual cleartext operation</li> <li>Graphic display with background lighting</li> <li>P, PI, PD and PID control functions</li> </ul>	– G1/8A hose connection (POM)
Areas of application	Refrigerating plants*	Universally usable	Refrigerating plants*

\* Monitoring ammonia leakage (in indoor ice rinks or cold stores, for example).



# JUMO accessories for the liquid analysis

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





Electrode manufacturing pH and ORP measurement Conductivity measurement Membrane-covered sensors Accessories

## Accessories for Liquid Analysis

Description	Lines, Plugs and Sockets for pH, ORP, Conductivity and temperature sensors	Technical Buffer and Cleaning Solutions	Impedance Converter for Combination Electrodes	Simulators and Calibra- tion Adapters for pH, ORP and Conductivity Measurement
Data sheet	202990	202950	202995	202711
Features	<ul> <li>High-quality preassembled connection lines</li> <li>Highest possible protection type with factory assembly</li> <li>Wide range of connectors/sockets and special selection</li> <li>Customer-specific versions</li> </ul>	<ul> <li>pH buffer solutions as defined by DIN 19267</li> <li>ORP test solution as defined by ASTM D 1498</li> <li>Calibration solutions for conductivity can be retracted to PTN and NIST</li> <li>Diaphragm and electrode cleaners</li> </ul>	<ul> <li>Stabilizes the signal, independent of the electrical supply</li> <li>Can be retrofitted</li> <li>Enables the use of longer cables</li> <li>Can also be supplied for electrodes with SMEK connection</li> </ul>	<ul> <li>Simulates a pH/ORP or conductivity sensor in an application</li> <li>Facilitates the dry- run commissioning of installations</li> </ul>
Areas of application	For the use of electrochemical sensors	Calibration of pH/ORP and conductivity sensors	Converts the high- impedance signal of a pH electrode	<ul> <li>To start up, adjust, monitor and troubleshoot pH, ORP and conductivity measuring points</li> <li>For testing connect- ing cables and investigating faults</li> </ul>



# Services & Support

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

JUMO services & support – so that it all comes together!





Are you looking for a competitive and efficient system or component supplier? Whether you seek metal technology, electronic modules or perfectly fitting sensors, whether small batches or mass production, – we will willingly be your partner. From development to production, we can provide all the stages from a single source. Our experienced experts will work together in close collaboration with your company to find the optimum solution for your application, and will take on all the engineering. JUMO will then make the product for you. You will benefit from state-of-the-art production technologies, as well as our uncompromising guality assurance systems.

#### **Costumized Sensor Technology**

- Development of temperature probes, pressure transmitters, conductivity sensors or pH and ORP electrodes as per your requirements
- Numerous test and inspection systems
- Taking over qualification for the application
- Materials management
- Mechanical testing
- Thermal testing

#### **Electronic modules**

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

#### Metal production

- Tool manufacture
- Stamping and forming systems
- Flexible sheet metal working
- Float production
- Welding, jointing, and assembly systems
- Surface engineering
- Material testing service









#### **Information & Training**



Would you like to improve your process quality, or optimize one of your company plants? Then take us up on our offer on the JUMO homepage and participate in the know-how of a globally respected manufacturer. Under the "Services & Support" menu item, for example, you will find a highly diverse range of seminars. Available under the keyword "eLearning" are videos on specific measurement and control system topics, and under "Literature", you can find important information for beginners and practitioners. It goes without saying that you can also download the latest version of the JUMO software you require, as well as technical documentation for old and new products.

#### **Product Service**



For competent support right across our product portfolio, our customers have recourse at anytime to the efficient sales network we maintain on all five continents. Whether you seek advice, a selection of products, engineering or making optimum use of our products, there is always a team of competent JUMO-colleagues somewhere nearby, ready to answer your questions. You can count on us after commissioning, as well. You will get a fast response from our telephone support hotline. If an on-site fault has to be eliminated, our express repair service and our 24-hour spare part service are at your disposal. That is real security.

# Maintenance & Calibration



Our maintenance service helps you to maintain optimum system and equipment availability. In this way you prevent failure and downtime. We will work out a far-sighted maintenance concept together with your company officers, and will willingly prepare all the requisite reports, documentation and protocols. Because we know how important precise measurement and control results are for your processes, we naturally also undertake the professional calibration of your JUMO instruments on site, at your company premises. We then record the result in a calibration certificate, as defined by EN 10204.





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