

Expertise in liquid analysis

From sensors to complete
turnkey solutions

Liquid analysis





Endress+Hauser - Your partner

For over 65 years, Endress+Hauser has been a reliable partner of the process industry. We help customers around the world to sustainably improve their processes, and thus their products. Process measurement technology forms the core of our competence. With excellent products, solutions and services, we support our customers in making their processes safe, reliable, efficient and environmentally friendly – throughout the entire life cycle of a plant.

We are close to our customers worldwide. With a tight network of own sales centers and selected representatives, we safeguard competent support around the globe. We know our customers' applications and the special requirements of their industries. That's how, over many years, we have become what we are today: the People for Process Automation.

Product centers on four continents ensure that we can supply our customers fast and flexibly, wherever they are. The use of innovative technologies has advanced the development of our company from the very beginning. Step by step, we have strengthened our process analytical business by additional acquisitions. Our offering today is unique in variety and depth.

Unique corporate culture As a family-owned company, we act responsibly. We deal with customers, employees and shareholders on a basis of partnership. Our unique corporate culture characterizes these relationships. For us, profit is not the ultimate aim, but the result of good management, for which the basis is our financial solidity. Profits predominantly flow back into the company – thus helping us to secure our success and our independence for the long term.

Expertise in liquid analysis

Within the globally active Endress+Hauser Group, Endress+Hauser Liquid Analysis counts among the leading international manufacturers of sensors, transmitters, assemblies, analyzers, samplers and complete solutions for liquid analysis. As a center of excellence, we have worked hard over the last 45 years to achieve a top-ranking position on the international market.

Endress+Hauser Liquid Analysis currently employs a workforce of more than 1000 people at five production plants: in Gerlingen (Germany), Waldheim (Germany), Groß-Umstadt (Germany), Anaheim (USA) and Suzhou (China).



Gerlingen, Germany



Waldheim, Germany



Groß-Umstadt, Germany



Anaheim, USA



Suzhou, China

Memosens 2.0 - For simple, safe and connected liquid analysis

The digital revolution in process analysis continues

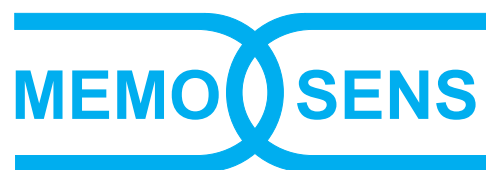
Memosens technology has revolutionized liquid analysis. It converts the measured value to a digital signal in the sensor and transfers it to the transmitter via a non-contact connection. This means that moisture and corrosion, which distort the measured value or cause the measuring point to fail, don't stand a chance. Memosens sensors store sensor, calibration and process data in the sensor head enabling real plug & play and pre-calibration of the sensors in the laboratory.



The result is a dramatic increase in the availability of your measuring point and a guarantee that your process will run safely.

Memosens 2.0 is leading Memosens technology into the future. The extended sensor electronics offer:

- Perfect basis for IIoT connectivity: You always have the relevant information on your measuring point close to hand using the right app.
- Predictive maintenance 2.0: The storage capacity for up to 8 times more relevant data is an excellent basis for predicting maintenance requirements and planning maintenance cycles. This ensures more accurate process management and enhanced plant management.
- Increased flexibility when configuring the measuring point even in hazardous areas: Any Ex-approved Memosens 2.0 sensor can be connected to any Ex-approved Liquiline transmitter.



With Memosens accessories, you can benefit from easy management of your measuring points and sensors

Validation, qualification and maintenance of Memosens measuring points using Memocheck

Memocheck tools simulate measured values and a measuring error for the qualification of digital data transmission. Memocheck establishes if deviant measured values are caused by factors other than the sensor e.g. the cable and coupling, the connection to the process control system or transmitter. You can rest assured that the measured values will always be transferred correctly, resulting in more process safety.

Using the Memobase software for measurement, calibration and documentation

The Memobase software supports your sensor and measuring point management. With this software, not only can you calibrate the sensor and read out sensor data, but you can also generate reports on the history and status of a sensor, with measuring data, calibration data and the sensor life cycle made visible at a glance. Your process becomes transparent and the traceability is taken to a whole new level. In addition, the Memobase software can be used in conjunction with a standard PC as a measuring station in a lab, thus improving the comparability of lab values and process values.

Calibration with quality buffers

Correct calibration is the be all and end all when it comes to the accuracy of a pH measuring point. Our permanent calibration laboratory for quality pH buffers has successfully completed the exacting accreditation procedure laid down by the German Accreditation body (DAKs) in accordance with DIN EN ISO/IEC 17025:2005. Our customers can rest assured that their pH measurements will always be accurate.



Memosens sensors and their assemblies

The Memosens sensor range covers all of the key parameters for liquid analysis, such as

- pH/ORP
- Conductivity
- Oxygen
- Disinfection such as chlorine, bromine, ozone
- Turbidity and sludge level
- Nutrients such as nitrate, ammonium
- SAC, COD, BOD, color



pH/ORP sensors

are available as glass electrodes or unbreakable ISFET and enamel sensors, with a ceramic, PTFE or open aperture junction and a reference system based on gel or liquid for the entire range of applications. The ORP-sensitive element is made of gold or platinum.



Disinfection sensors for chlorine, chlorine dioxide, total chlorine, bromine and ozone

The amperometric sensors provide reliable measurements and fast response times for safe processes and efficient process control. Their special membrane design ensures low maintenance.



Conductivity sensors

Contacting conductivity sensors offer a high degree of measuring sensitivity. Inductive sensors are not affected by dirt, high temperatures or corrosive media. 4-electrode conductivity sensors deliver reliable measured values over a wide measuring range.



Sludge level sensors

These ultrasonic sensors continuously monitor the separation and transition zones in clarification and sedimentation tanks and guarantee safe, economic and efficient sedimentation processes.



Installation assemblies

Fixed installations using installation assemblies are found particularly in batch processes, where the users have access to the sensor between two batches. These assemblies are often used in the production of pharmaceuticals and foodstuffs.



Retractable assemblies

With retractable assemblies, sensors can be replaced quickly and easily, and cleaning can be carried out without interrupting the current process. The sensor can be inserted in the process and removed from the process



either manually or automatically (pneumatic procedure). Pneumatically operated assemblies can be combined with automatic cleaning and calibration. Retractable assemblies are particularly suited to hygienic or heavy-



duty applications, wherever regular cleaning is required, or in cases where the sensor can come into contact with an aggressive medium for short-term measurements only.



The Memosens sensor family includes sensors with an inductive plug-in head or a fixed cable. The latter type does not require either regular recalibration or maintenance measures. All sensors use the standardized, digital Memosens protocol which allows for easy and fast operation. In addition, sensors with a plug-in head are fully resistant to corrosion and salt bridges, thanks to the non-contact, inductive transmission of data and energy.



Turbidity sensors

Optical turbidity sensors are used mainly in the treatment of water and wastewater. They offer maximum accuracy in drinking water in accordance with ISO 7027 and robust measurement in municipal and industrial wastewater due to compensation for soiling and aging.

Oxygen sensors

are available in amperometric or optical versions. The amperometric principle is characterized by stable measurement across a wide measuring range. The optical technology impresses with its high level of availability and low maintenance.

Sensors and spectrometers for nitrate, SAC, COD, BOD, turbidity

These optical sensors allow measurement directly in the medium, thereby enabling early detection of load peaks. Spectrometers allow the determination of all parameters mentioned with only one sensor. They are suitable for a wide range of process conditions in water and wastewater treatment and require very little maintenance thanks to an automatic compressed air cleaning system.

Nitrate and ammonium sensors

These ion-selective sensors offer prompt determination of concentrations thanks to online measurement directly in the basin. They therefore enable fast, load-dependent aeration control.



Modular immersion assemblies

These types of assemblies offer flexible installation in immersion applications such as those in the wastewater industry. They are suitable for sensors with different connection threads. This means that they are not only used for 12 mm sensors

for the measurement of pH or dissolved oxygen but are also used for turbidity or nitrate sensors. The system can be installed using different pipes, brackets etc. in almost any location (pipes, rails etc.).



Flow assemblies

Flow assemblies are used for installation in process pipes or bypasses. These configurations are often found in waterworks, in the beverage industry, the chemical industry or in analytical cabinets in power plants. Thanks to a range of process

connections, these assemblies ensure optimum adjustment to your pipe system. Different materials make them suitable for all types of applications ranging from hygienic to aggressive.

The Liquiline platform

Reduce storage costs, save on installation time and increase operational safety

Liquiline is the platform for all liquid analysis applications. It forms the basis of our ultra-modern transmitters, samplers and analyzers and has many benefits to offer.

- Uniform operation for greater comfort and safety during operation
- Fast commissioning and automatic sensor detection thanks to true plug & play functionality
- Standardized components for reduced storage costs and longterm availability of spare parts
- Based on Memosens digital sensor technology, for increased efficiency and quality in the field of liquid analysis
- Wide range of fieldbus protocols for seamless integration into your process control systems: 0/4 to 20 mA, HART, PROFIBUS DP, Modbus, EtherNet/IP
- Web server for easy remote access
- Complete flexibility from single-channel to 8-channel devices, and can be extended at any time
- Heartbeat Technology for easy and better control of measuring points: Extended proof test cycles and standardized diagnostic messages, verification of the measuring point without process interruption, monitoring data for trend recognition

Liquiline transmitters for wide-ranging customer requirements



Liquiline CM44 is the most flexible transmitter for all Memosens sensors. It measures twelve different parameters and allows up to eight sensors to be connected. Liquiline CM44 is available as a field device and also for mounting in control cabinets and on DIN rails.

Liquiline Compact CM72/CM82 the smallest transmitter for sensors with Memosens plug-in head offers easy operation by tablets or smartphones and the SmartBlue app via a secure bluetooth connection. The transmitter fits inside an assembly and does not require an external power supply.

Liquiline CM42 the two-wire transmitter for the parameters pH/ORP, conductivity and oxygen, impresses with reliable data transmission and easy operation. It can be used in all areas of process automation, including hazardous areas and hygienic applications.

Liquiline CM14 the four-wire transmitter for pH/ORP, conductivity and oxygen is an instrument used for straightforward measuring tasks. The compact design of Liquiline CM14 makes it suitable for use in panels or control cabinets, and it is an attractive solution for plant manufacturers.

Liquistation and Liquiport for safe sampling in all bodies of water



The stationary and portable samplers enable automatic extraction, distribution and preservation of liquid samples. Whether they are used in wastewater treatment, for the monitoring of water bodies or in drinking water, the sampling process complies with all international legislation. The failsafe, sustainable cooling system of the samplers prevents corruption of the samples.

The right sampler for any application:

- Liquistation CSF28 stationary sampler for basic wastewater monitoring: unique wizards for commissioning and programming; time-, volume- and flow-controlled sampling.
- Liquistation CSF48 stationary sampler for extremely variable applications in municipal and industrial water and wastewater: seamless integration in process control systems thanks to digital field busses; time-, volume-, flow- and event-controlled sampling; sampling and measurement of various parameters with one device; Heartbeat Technology for status-oriented maintenance
- Liquiport CSP44 portable sampler for flexible monitoring of municipal and industrial wastewater: time-, volume-, flow- and event-controlled sampling; sampling and measurement of various parameters with one device

Liquiline System guarantees high-precision measurement of nutrients, sum parameters and industrial parameters

Analyzers don't need to be complicated. Here again, the Memosens technology and the user-friendly Liquiline operating concept make for easier commissioning and operation. In addition, the analyzers offer advanced diagnostic options that can be availed of easily by remote access. Low reagent consumption and tool-free maintenance ensure that customers save money. Our analyzers guarantee reliable, legally compliant measurements in accordance with standard methods for:

■ Sum parameters

To assess the organic load in water and wastewater, the main parameters measured are TOC, SAC, COD.

■ Nutrients

Modern wastewater treatment plants remove not only carbon but also nitrogen and phosphate. Online measurement of nutrient parameters such as ammonium, nitrate, nitrite, orthophosphate or total phosphorus plays a key role here.

■ Metals, other water treatment parameters

The requirements vary between industrial sectors. However, most process water is softened, and almost all manufacturing processes require corrosion-free water that does not exhibit turbidity, has no color and does not contain iron.



Process photometers

Modern photometers enable accurate and reproducible concentration measurement by determining UV absorption, color, NIR absorption, turbidity and cell growth. Due to their simple measuring principle, fast response time, low maintenance requirements and low cross-sensitivity with other process parameters, they can be used in a huge variety of applications. Their hygienic design means that these process photometers are ideally suited for the food and life sciences industries. With an approval for use in hazardous areas, they can also be

applied in the chemical and oil & gas industries. Inline measurement replaces time- and labor-intensive sampling and measurement in a lab and also prevents product contamination. This saves the customers time and money. All process photometers are connected to the Liquiline CM44P transmitter. It offers multichannel and multiparameter functionality and gives our customers the opportunity to combine process photometers and Memosens sensors, facilitating the setup of complete measuring points for many industrial processes.



OUSAF44 UV sensor

Inline product quantification, consistent with lab results

OUSAF12/ OUSAF22 NIR/VIS sensors

Solids and phase detection, color monitoring

OUSBT66 NIR sensor

Cell growth, biomass processes, algae systems

OUSTF10 turbidity sensor

Undissolved solids, emulsions, immiscible media

OUSAF11 Glass-free Sensor

Detection of changing phases and solids



Analytical solutions

Complete turnkey solutions for your analytical measuring tasks

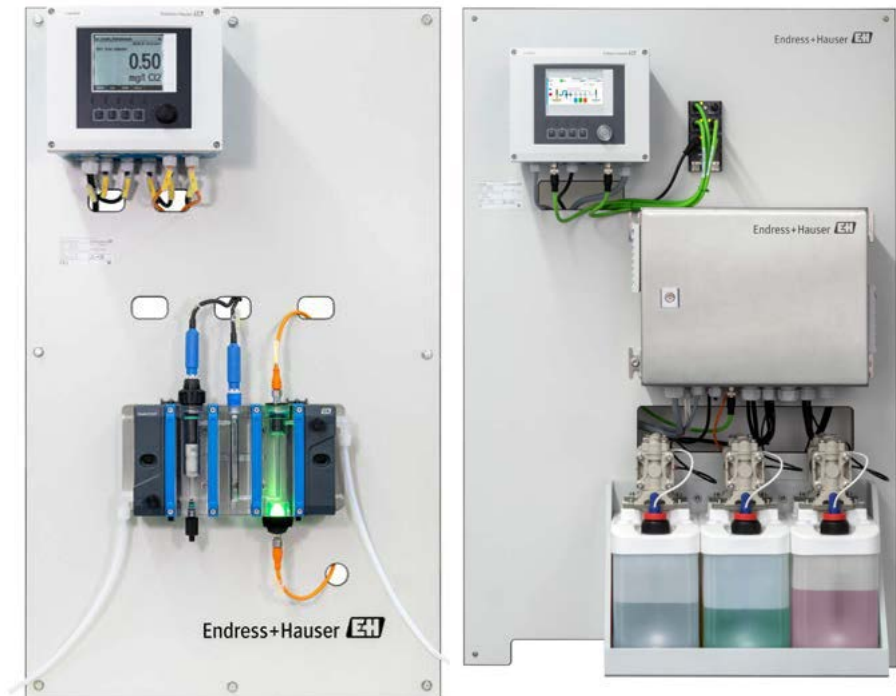
Depending on the measuring task in question, we develop customer-specific analytical solutions such as monitoring panels, cabinets or stations as well as automation systems. We will support you from the concept development stage to implementation and commissioning. What's more, with our global support network, you can rely on Endress+Hauser as your partner throughout the entire life cycle of your solution.

Monitoring

Our monitoring stations are supplied in turnkey condition and contain all of the components required from sample preparation right through to the transfer of data to higher-level systems. This guarantees easy installation, operation and calibration. These monitoring solutions are individually adapted to the customer's specific ambient conditions as well as communication and service requirements.

Automation

Our automation solutions support you in optimizing your processes, be this aeration control or phosphate dosing in a wastewater treatment plant or the automatic cleaning and calibration of pH measuring stations in the chemical, food or power & energy industries.



www.addresses.endress.com

FA01018C/07/en/04.22