Optimizing demanding applications

Precise and safe measurement of pH, ORP, conductivity or oxygen with Liquiline CM42B two-wire transmitter

Endress+Hauser

Liquiline CM42B two-wire transmitter

Many processes in the chemical, life sciences or food industries strongly depend on precise measurement of pH, conductivity or oxygen values to generate safe and high-quality products. These processes usually have high demands on either safety in hazardous areas or cleanability in hygienic environments. Liquiline CM42B offers all necessary approvals as well as a robust stainless steel version to meet all these demands.

Even wastewater management such as sludge treatment or tailings dams involve hazardous areas. In these applications pH measurement with Liquiline CM42B ensures stable conditions for bacteria and environmental safety.

Visit the product website

Two-wire transmitter
Liquiline CM42B

Benefits at a glance

The Liquiline CM42B transmitter features diverse benefits that ensure high product yield and process and environmental safety in various applications.

Comfortable operation and configuration
The intuitive operating concept makes commissioning and configuration on-site easy and fast.

Suitable for all process environments
The transmitter is available as stainless-steel, plastic or DIN-rail versions. Simply select the suitable version to integrate it into a skid, use it in hygienic environments or apply it in hazardous areas.

Increased process safety and uptime
Memosens technology ensures safe, digital data transmission and high availability of measured values. Plug & play of pre-calibrated sensors reduces process downtime for calibration.

Seamless system integration
HCF-certified HART communication makes integration into your process control system easy and secure.

Remote overview
Bluetooth connection and the SmartBlue app provide an overview of the measuring point on your smartphone or tablet, particularly when the transmitter is installed in barely accessible locations.

Unique security
The Bluetooth connection features a unique security concept that prevents intrusion and enables sophisticated role management of the operating staff. You profit from external and internal security.

Comfortable and safe operation

The intuitive operating concept makes commissioning and configuration on-site easy and fast. Bluetooth connection and the SmartBlue app provide an overview of the measuring point on your smartphone or tablet.

- **Simple operation and reduced training time**: All devices use a standardized user interface. As soon as you are familiar with one device, you will understand all devices quickly. This saves training time and thus operational expenses.
- **Quick commissioning:** Thanks to guided parameterization, devices can be commissioned quickly and safely, increasing the plant uptime.

- **Remote access**: Bluetooth technology and the SmartBlue app allow for a detailed overview on your measuring point using a smartphone or tablet.
- **Unique security:** Thanks to the unique security concept of the Bluetooth connection, unauthorized intrusion is prevented. The concept also enables you to implement a sophisticated role management of the operating staff. The result is highest security for your measurement.

Industry focus

Owing to its flexibility as well as the options and features already mentioned, Liquiline CM42B is designed for a wide variety of measuring points in many industries. It is especially useful in applications in hazardous areas which typically applies to the Chemical Industry and Power & Energy but plays also a role in wastewater management. The stainless steel version meets all requirements of hygienic industries such as Food & Beverage and Life Sciences while the DIN-rail version serves all applications where space is limited, e.g. skids or fermenters.

- Chemical
- Food & Beverage
- Life Sciences
- Water & Wastewater
- Power & Energy
- Mining, Minerals & Metals

Chemical applications

Process safety in chemical industry operations is vital, particularly when working with materials that are hazardous to people and the environment. The production of chemicals requires close monitoring of critical process parameters to ensure consistent product yield and quality. With Liquiline CM42B these measurements are connected to a real two-wire transmitter providing intrinsic safety and high accuracy and best reliability.

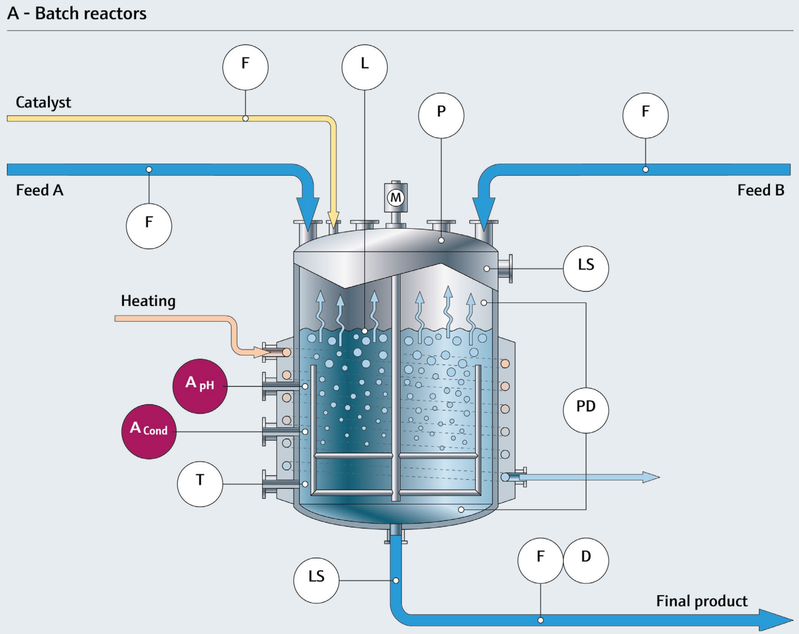
Batch reactor

Batch reactor

Batch reactors are often used for the production of specialty or fine chemicals. Keeping the pH value at optimum for synthesis steps such as polymerization or esterfication is vital to ensure consistent product yield and quality. Conductivity measurement helps maintain stable concentrations of solutions such as acids, bases or salts.

These measurements not only need highly accurate and robust sensors but also a transmitter that is approved for application in hazardous areas.

Batch reactor



Your challenge
Measuring task: pH, conductivity
Measuring point: Reactor
Measuring range:
pH 0 to 14, conductivity 2 µS/cm to 200 mS/cm
Medium: Specialty, fine chemicals
Ingress protection: IP66/67
Specific challenges: Safety and accuracy requirements

Our answer
Liquiline CM42B in combination with Memosens pH and conductivity sensors. It provides the required intrinsic safety and approvals for hazardous areas. Memosens 2.0 technology enables the storage of more process and sensor data which allows for even tighter process management and predictive maintenance. Thanks to Bluetooth connectivity and the SmartBlue app, a comfortable overview of the measuring point is available even if the actual transmitter is installed in barely accessible location.

Food & Beverage

Enhancing quality and adhering to food safety standards is essential in Food & Beverage. The robust stainless steel version of Liquiline CM42B provides perfectly cleanable, hygienic design preventing contamination and food-borne hazards.
The transmitter ensures reliable measurements to support consistent product quality and smooth preparation processes.

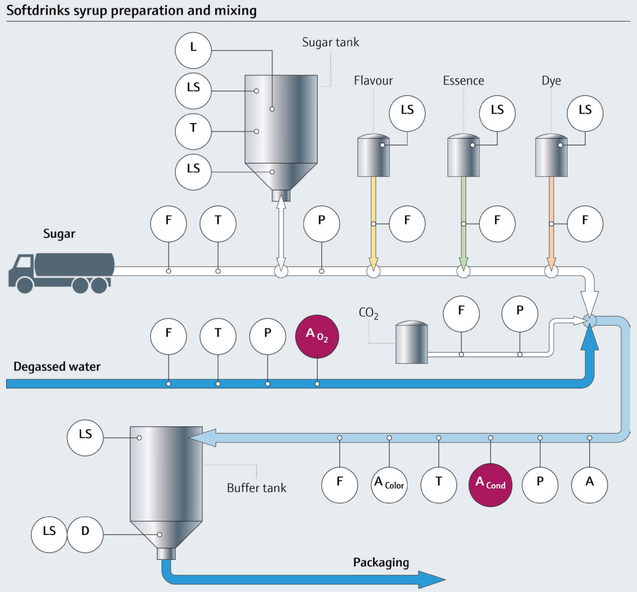
Food preparation

Food preparation

The major ingredient for soft drinks is water which needs to be free from oxygen to prevent oxidation of the drink to avoid quality impairment. In the dosing process, conductivity measurement is used to detect which medium is in the pipe and to ensure consistent quality of the drink.

These measurements require fast and accurate measurement and a transmitter that meets all hygienic and cleaning requirements. It must also be suitable for limited space which is often the case for skids in food preparation.

Preparation/mixing tank



Your challenge

Measuring task: Conductivity, dissolved oxygen
Measuring point: Dosing line, degassed water supply
Measuring range: O_2 0 to 10 mg/l, conductivity 100 µS/cm to 2000 mS/cm
Medium: Soft drinks, fruit juices
Ingress protection: IP66/IP67
Specific challenges: Outer cleaning, hygienic requirements, fast and accurate measurement

Our answer

Liquiline CM42B in combination with Memosens oxygen and conductivity sensors. It provides the required robustness for cleaning. Even the DIN-rail version is available with a stainless steel external display meeting all hygienic demands and offering space-saving integration in skids. Thanks to the two-wire technology, cabling the transmitter is low effort.
Memosens 2.0 technology ensures fast commissioning and enables safe determination of oxygen absence in degassed water and reliable conductivity measurement in phase separation.

Life Sciences

The Life Sciences industry demands high productivity and efficiency balanced with meticulous alignment to GMP standards. By using the Liquiline CM42B in combination with compliant pH, oxygen or conductivity Memosens sensors, you can optimize the growth in bioreactors and ensure optimum quality of water for injection.

- Bioreactor
- Water purification

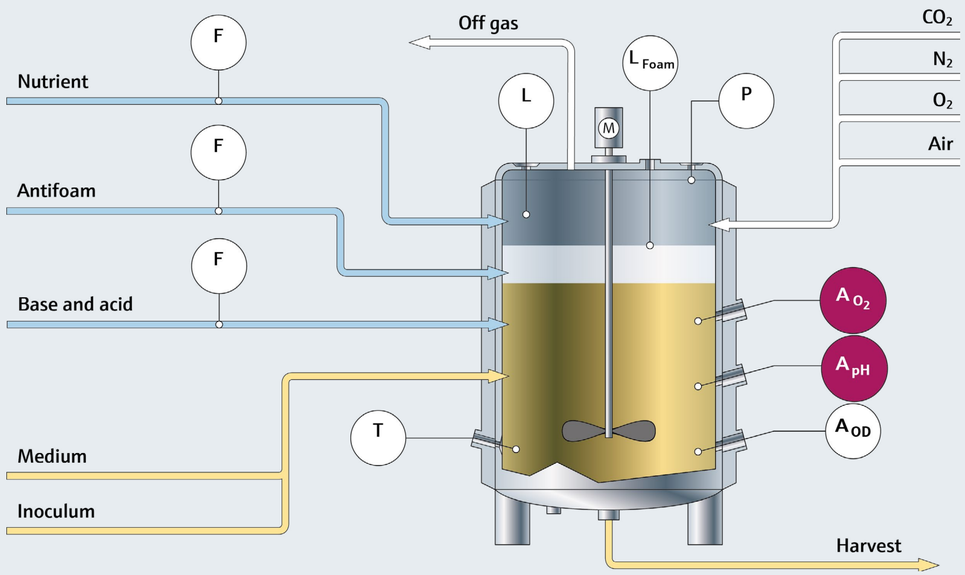
Fermentation / Bioreactor

In bioreactors, conditions are created for rapid growth of the biomass and maximized yield. The most important parameters are pH, dissolved oxygen, temperature and turbidity.
By using the Liquiline CM42B in combination with compliant pH and oxygen sensors, the growth can be regulated, monitored, recorded and documented, ensuring not only optimal yield, but also conformance to regulatory requirements.

Bioreactor

Water purification

A - Fermentation / bioreactor



Your challenge
Measuring task: pH and dissolved oxygen
Measuring point: Bioreactor
Measuring range: pH 0 to 14,
O_2 0.004 to 30 mg/l
Medium: Biomass
Ingress protection: IP66/IP67
Specific challenges: Hygienic requirements, Ex-approvals for purification steps, limited space in OEM installations

Our answer
Liquiline CM42B in combination with Memosens COS81E oxygen and Memosens CPS61E pH sensors. It is available as DIN-rail version with a stainless steel external display meeting all hygienic demands and offering space-saving integration for fermenter manufacturers (OEMs). The two-wire technology reduces cabling effort especially for redundant installation. The transmitter is also suitable if organic solvents are used in purification steps creating a hazardous atmosphere.
Memosens technology facilitates consistent scale up since the same sensors can be used in all process steps and scales.

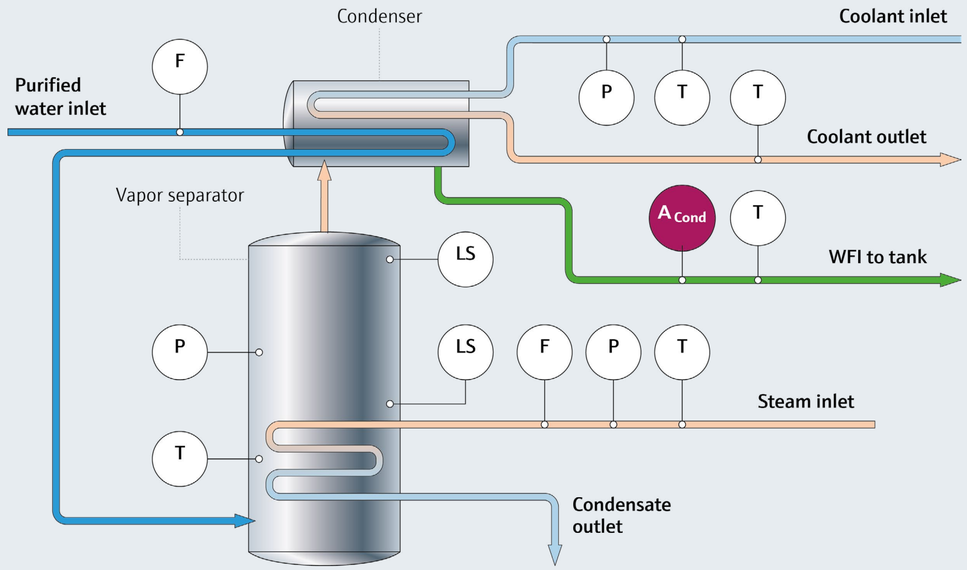
Water purification

Purified water is the pharmaceutical product with the biggest volume. Its production and distribution is regulated by pharmacopoeias. The major quality parameter for ultra-pure water or water for injection is conductivity. Liquiline CM42B in combination with the Memosens CLS16E conductivity sensor helps achieve optimum WFI quality for your pharmaceuticals.

Bioreactor

Water purification

B - Water purification, water for injection (WFI)



Your challenge

Measuring task: Conductivity
Measuring point: WFI line
Measuring range: 0.04 to 500 µS/cm
Medium: Water for injection
Ingress protection: IP66/67
Specific challenges: Hygienic requirements, potentially limited space

Our answer

Liquiline CM42B in combination with the Memosens CLS16E conductivity sensor. It is available as DIN-rail version with a stainless steel external display meeting all hygienic demands and offering perfect integration into water skids (OEMs). The measuring point provides highly precise, USP-compliant measurement of lowest conductivities and it allows for calibration according to USP <645> using the CLS16E calibration adapter.

Water & Wastewater

Wastewater has to be collected and purified before discharge into rivers or lakes. During the wastewater treatment, different sludges are produced that have to be handled carefully. The sludge is treated in digesters to stabilize it and reduce its quantity. Anaerobic bacteria metabolize approximately 50 % of the organic solids.

To provide optimum flourishing conditions for these bacteria, the pH value plays an important role. Liquiline CM42B provides intrinsic safety and high accuracy required for this measuring task.

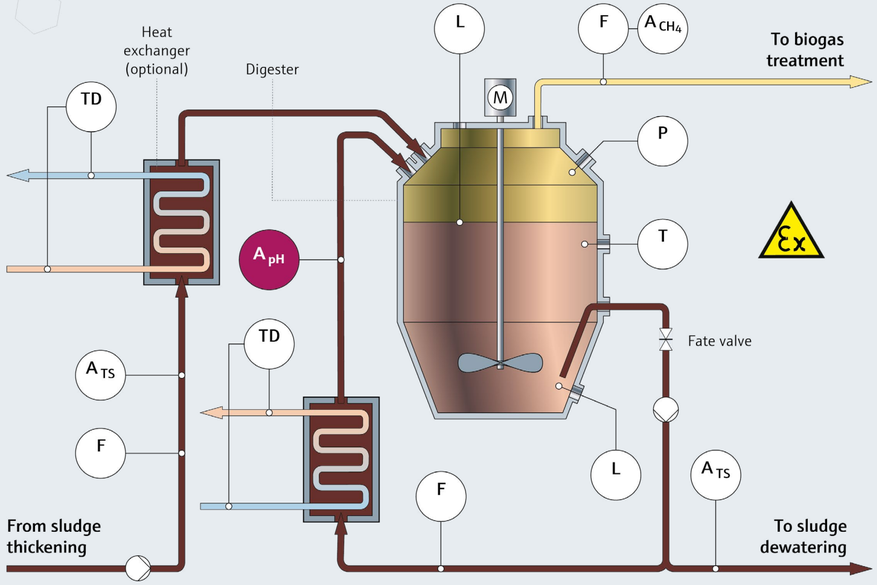
Digester

Digester

The digesting process reduces the sludge volume and stabilizes the sludge. Special bacteria digest organic substances producing biogas. These bacteria need an optimum pH range between 6.0 to 6.5 to be able to flourish. The atmosphere in digester areas is hazardous that is why the Liquiline CM42B with all relevant hazardous area approvals is the right choice. Memosens 2.0 technology and its Bluetooth connectivity ensure a tight process control.

Digester

G1 - Digester control



Your challenge
Measuring task: pH
Measuring point: Sludge circulation line for digester
Measuring range: pH 0 to 14
Medium: Sludge
Ingress protection: IP66/67
Specific challenges: Safety and accuracy requirements

Our answer
Liquiline CM42B together with the Memosens CPS16E combined pH and ORP sensor. It provides the required intrinsic safety and approvals for hazardous areas. Memosens 2.0 technology enables the storage of more process and sensor data which allows for tighter process management. It also enables pre-calibration of the sensor and avoids longer stays of personnel in the hazardous area.
Thanks to Bluetooth connectivity, measuring point data are easily accessible.

Power & Energy

Hydrogen is one the fuel sources with a great potential to reach carbonization goals in spite of growing energy demands. Hydrogen combustion releases intense heat with no CO_2 emissions and it can be used in fuel cells for electricity generation emitting only water vapor. Hydrogen produced with electricity from renewables is a game changer for sustainable energy. Green hydrogen can be produced by electrolysis processes where water and electrolyte quality is crucial.

Liquiline CM42B ensures safe operation in explosive environments and enables highly precise conductivity monitoring of feed water or electrolytes.

PEM electrolysis

Alkaline electrolysis

Feed water preparation

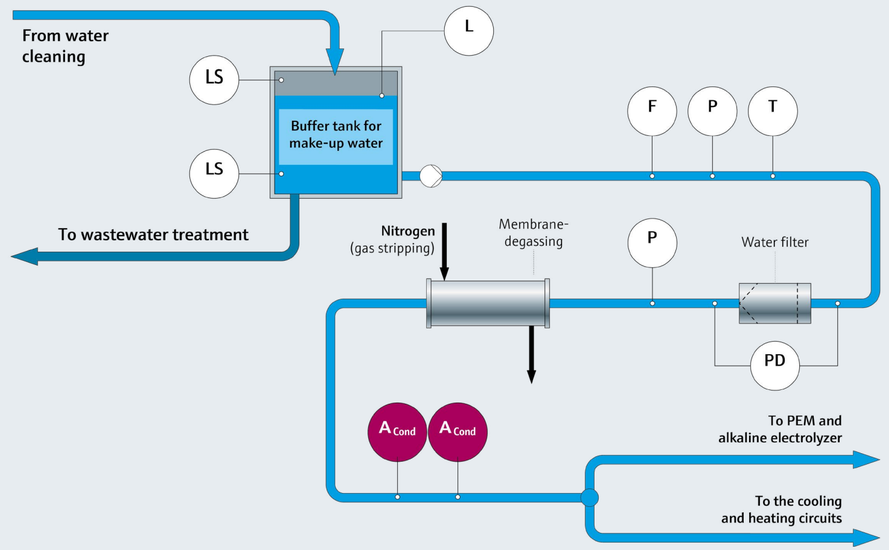
One of the most critical steps for electrolysis is the water preparation to a particular quality specification, which varies for different types of electrolyzer technology. For PEM electrolyzers the make-up water is treated via filters and degassing or gas stripping steps to reach a conductivity value < 0.1 µS/cm. To safely monitor this conductivity value, a redundant measurement is installed.

Liquiline CM42B in combination with the high-performance Memosens CLS16E conductivity sensor ensure optimum feed water quality.

PEM electrolysis

Alkaline electrolysis

A3 - Feed water preparation



Your challenge

Measuring task: Conductivity
Measuring point: Feeding line to electrolyzer
Measuring range: 0.04 to 500 µS/cm
Medium: Ultra-pure water
Ingress protection: IP66/67
Specific challenges: Accuracy of the measurement, hazardous areas, strict safety and industrial quality standards

Our answer

Liquiline CM42B in combination with the Memosens CLS16E conductivity sensor. It provides the required intrinsic safety and approvals for hazardous areas. Memosens 2.0 technology enables the storage of more process and sensor data and lab calibration which ensures accurate and reliable conductivity measurement of the ultra-pure water. Memosens CLS16E provides the sensitivity required in this process.
Bluetooth connectivity allows for easy accessibility of measuring point and measured values.

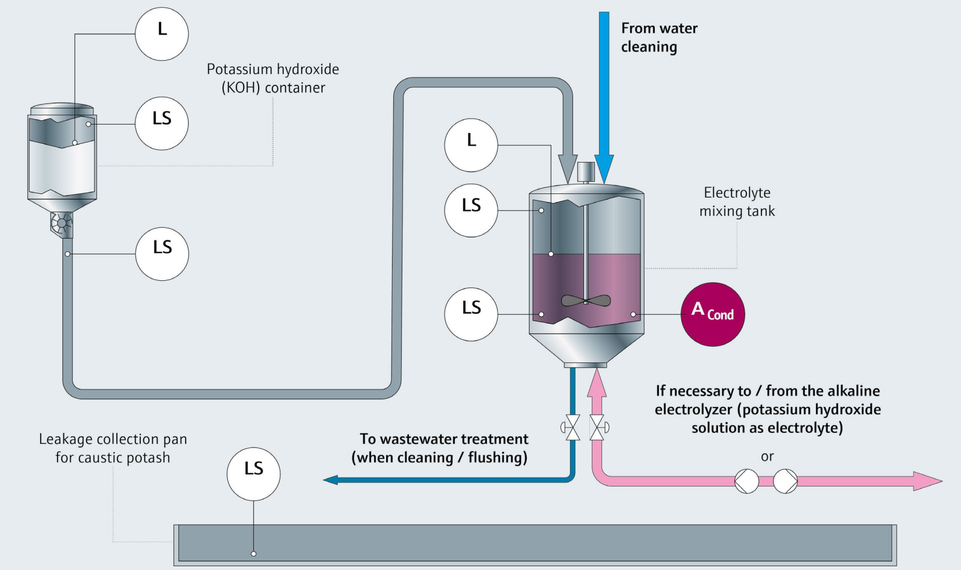
Electrolyte preparation

Alkaline electrolyzers use a solution of potassium hydroxide or sodium hydroxide as liquid electrolyte. Conductivity is a critical parameter to determine the optimum concentration of this electrolyte solution. Liquiline CM42B with a Memosens conductivity sensor help ensure optimal mixing of the electrolyte and thus optimize electrolyzer performance and longevity.

PEM electrolysis

Alkaline electrolysis

A4 - Electrolyte preparation



Your challenge

Measuring task: Conductivity
Measuring point: Mixing tank
Measuring range: 2 µS/cm to 2000 mS/cm
Medium: Potassium hydroxide solution
Ingress protection: IP66/67
Specific challenges: Accuracy of the measurement, hazardous areas, strict safety and industrial quality standards

Our answer

Liquiline CM42B in combination with the Indumax CLS50D conductivity sensor. It provides the required intrinsic safety and approvals for hazardous areas. Memosens technology enables the storage of process and sensor data which ensures accurate and reliable conductivity measurement of the electrolyte solutions. Bluetooth connectivity allows for easy accessibility of measuring point and measured values.

Mining, Minerals & Metals

A variety of mining processes are used to extract the required mineral from the ore. Most mining processes begin with crushing and grinding followed by other technologies such as froth flotation and leaching used to separate the ore. Gangue and other mining by-products end up in tailings dams. Their disposal does cause a significant environment hazard and must be treated accordingly.

Due to the complex and hazardous environment, Liquiline CM42B in combination with Memosens pH and conductivity sensors is perfectly suited for tailings management.

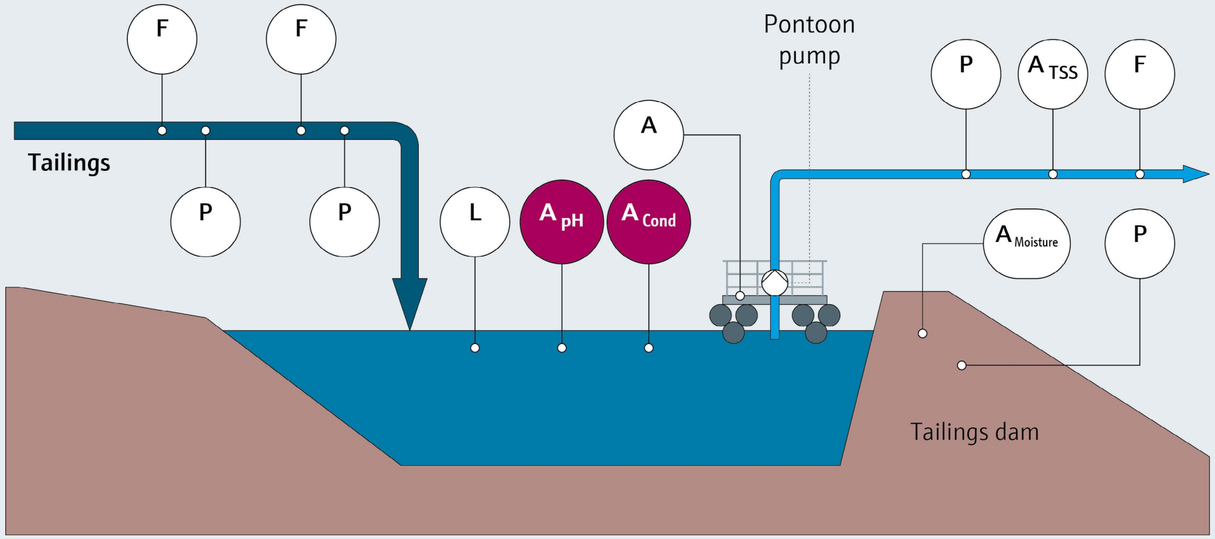
Tailings management

Tailings dam

By-products of mining processes that cannot be restored or recovered are considered waste. These tailings can be solid, slurry or liquid. They are pumped to a tailings dam where the solids settle and the water is recycled to be reused throughout the mining site. Accurate pH measurement ensures that the dam media is within design set points and is not an environmental hazard. While conductivity measurement is an indicator for poor performance in upstream processes. Liquiline CM42B in combination with Memosens pH and conductivity sensors support environmentally safe tailings management and help mining operators optimize the performance of their upstream processes.

Tailings management

H1 - Tailings dam



Your challenge
Measuring task: pH and conductivity
Measuring point: Tailings dam
Measuring range up to: pH 0 to 14, conductivity 2 µS/cm to 2000 mS/cm
Medium: Tailings slurry
Ingress protection: IP66/67
Specific challenges: Complex, hazardous environment

Our answer
Liquiline CM42B in combination with the Memosens CPS11E pH and Indumax CLS50D conductivity sensors. It provides the required intrinsic safety and approvals for hazardous areas. Memosens technology enables the storage of process and sensor data for safe tailings management. Bluetooth functionality allows for connectivity to the FieldEdge SGC200 edge device for cloud link up to provide required information to all involved stakeholders. The DIN-rail version saves installation space for cost-optimized wastewater treatment skids.

Overview

Versions

Liquiline CM42B is available as polycarbonate and stainless steel field device and DIN-rail version with optional external polycarbonate or stainless-steel display, offering high flexibility for different installation requirements.

Device versions

Technical data

Matching sensors

Polycarbonate field device

- High-quality polycarbonate plastic for challenging environments
- High resilience in acidic atmospheres
- Not affected by dust

Stainless steel field device

- Stainless steel 1.4408 (316) for hygienic applications
- Flat gasket
- Robust IP66/67 housing, easy cleanability

DIN-rail device

- Panel-mounted for skids or cabinets
- Space-saving
- Easy-to-mount external display, stainless steel or polycarbonate

Liquiline CM42B

Technical data

Display	▪ LCD display ▪ Size: 94 x 76 mm (3.7 x 3.0") ▪ Resolution 240 x 160 dots
Operation	▪ Via local display (operating elements) ▪ Via SmartBlue app (does not support full range of functions) ▪ Via process control system (HART)
Housing material	▪ Polycarbonate ▪ Stainless steel 1.4408 (316)
Design	Field device or DIN-rail device
Supply voltage	▪ Nom. 24 V DC ▪ Min. 17 V DC ▪ Max. 30 V DC
Ambient temperature	–30 to +70 °C (–20 to +160 °F), non-hazardous version
Degree of protection	IP66/67 (Type 4X enclosure)
Outputs/Inputs Communication	▪ 4 to 20 mA (1 or 2 outputs) ▪ HART (HCF-certified) ▪ Bluetooth
Approvals	Hazardous areas ▪ ATEX II 1G Ex ia IIC T6/T4 Ga ▪ C/US IS Cl. I Div. 1 Gr. A-D ▪ IECEx Ex ia IIC T6/T4 Ga ▪ CHN-Ex Ex ia IIC T6/T4 Ga

Device versions
Technical data
Matching sensors

Matching sensors

Liquiline CM42B is a two-wire transmitter for pH, ORP, conductivity or dissolved oxygen measurement. It can connect to all digital Memosens sensors for these parameters or to analog sensors for pH, ORP and conductivity.

Memosens technology provides safe, digital data transmission and high availability of measured values. Plug & play of pre-calibrated sensors reduces process downtime for calibration.

Device versions

Technical data

Matching sensors

pH and ORP sensors

Memosens

- pH glass and pH ISFET sensors
- Combined pH/ORP sensors
- ORP sensors

Analog

- pH glass sensors
- ORP sensors

Conductivity sensors

Memosens

- Contacting conductivity sensors
- 4-pole contacting conductivity senssors
- Inductive conductivity sensors

Analog

- Contacting conductivity sensors
- Inductive conductivity sensors

Dissolved oxygen sensors

Memosens

- Amperometric oxygen sensors
- Optical oxygen sensors

Optimizing demanding applications

Continuous inline measurement of pH, ORP, conductivity or oxygen with the Liquiline CM42B transmitter.

Achieve reliable and highly precise results in hazardous areas, hygienic environments or in skid where space matters. Monitor your processes closely and control them within even tighter limits.

Get further insights

Visit us on social media

Endress+Hauser