Lowest limit of detection
Highest resolution

Colorimetric system for online monitoring of water hardness with low limit of detection

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Endress+Hauser

Liquiline System CA82HA

Liquiline System CA82HA enables colorimetric online analysis of low range hardness concentration with a limit of detection (LOD) as low as 0.02 mg/l. It helps operators to increase efficiency, and to avoid damage on capital intensive equipment. The analyzer supports ensuring the quality of your product thanks to reliable pure and ultrapure water analysis.

- Lowest limit of detection (LOD) in the market
- Precise analysis with highest accuracy through colorimetric measuring principle
- Reliable pure and ultrapure online water analysis
- Helps to ensure product qualityand prolongs lifetime of critical components

Visit the product website

Liquiline System CA82HA analyzer for low range measurements

Benefits at a glance

Our low range water hardness analyzer supports your pure and ultra-pure water analysis and therefore ensures optimal product quality while protecting crucial assets in your process.

Up to 6 sample channels
Combine different measuring points with only one analyzer thanks to convenient process connection.

Supports existing infrastructure
Integrate your analyzer seamlessly into process control systems thanks to digital fieldbus systems (e.g., Modbus RS485, Ethernet) and web servers.

Reduced maintenance effort
Perform regular maintenance tasks easily and tool-free and advanced diagnostic functions support for predictive maintenance.

Easy and fast commissioning
Benefit from our proven Memosens technology and true plug-and-play while commissioning your hardness analyzer.

Complete your measuring point with up to 4 Memosens sensors
Reduce costs per measurement point with the possibility of connecting up to 4 Memosens sensors (e.g. pH, conductivity) to your analyzer.

Precise and reliable analysis
Achieve highest resolution and accuracy thanks to automatic colorimetric analysis, automatic calibration and automatic self-cleaning.

Flexible prioritization of sample channels
Individually program your measuring sequence of the channels regarding your needs; monitor crucial measuring points more closely.

Industry focus

Water hardness is crucial in a lot of different processes across all industries. Reliable monitoring supports smooth process operation, ideal product quality, and maximizes lifespan of cost-extensive components.

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

Power & Energy

In thermal power plants, it is crucial to monitor water hardness in the process steps of water preparation and condensate return.

Minimizing hardness in process water prevents build-ups in boilers and heat exchangers, enhancing operational efficiency. Furthermore, low water hardness reduces corrosion at critical components like heat exchangers. As a result, there are fewer abrasive particles circulating in the system wearing pipes and block safety valves.
Thus, replacement costs can be significantly reduced.

Online measurement, as opposed to grab sampling, ensures reliable measurements for high quality of the boiler feed water.

Even the smallest build-ups on heat exchanger and turbines cause tremendous reduction in efficiency. As result CO_2 emissions are increased due to loss of energy during the process. Therefore, the Liquiline System helps to reduce your energy and maintenance demand, increases process safety and supports the environment and sustainable energy production.

Food & Beverage

In applications such as beverage production, water quality is a parameter that is closely monitored.

The low-range water hardness analyzer helps to reduce the risk of non-compliance with water quality standards by providing precise measurements in the very low range between 0 mg/l and 2.5 mg/l $CaCO_3$.

The system also improves product quality consistency (e.g., taste) thanks to its reliable analysis with high accuracy. Low hardness is also crucial to increase the output at membrane based water purification processes for soft drinks.

Another important aspect supported by the analyzer is safety.
The Liquiline System CA82HA reduces risks compared to manual analysis through automatic sampling, calibration, and self-cleaning. Its advanced diagnostic functions enable remote access, allowing for 24/7 safety monitoring.

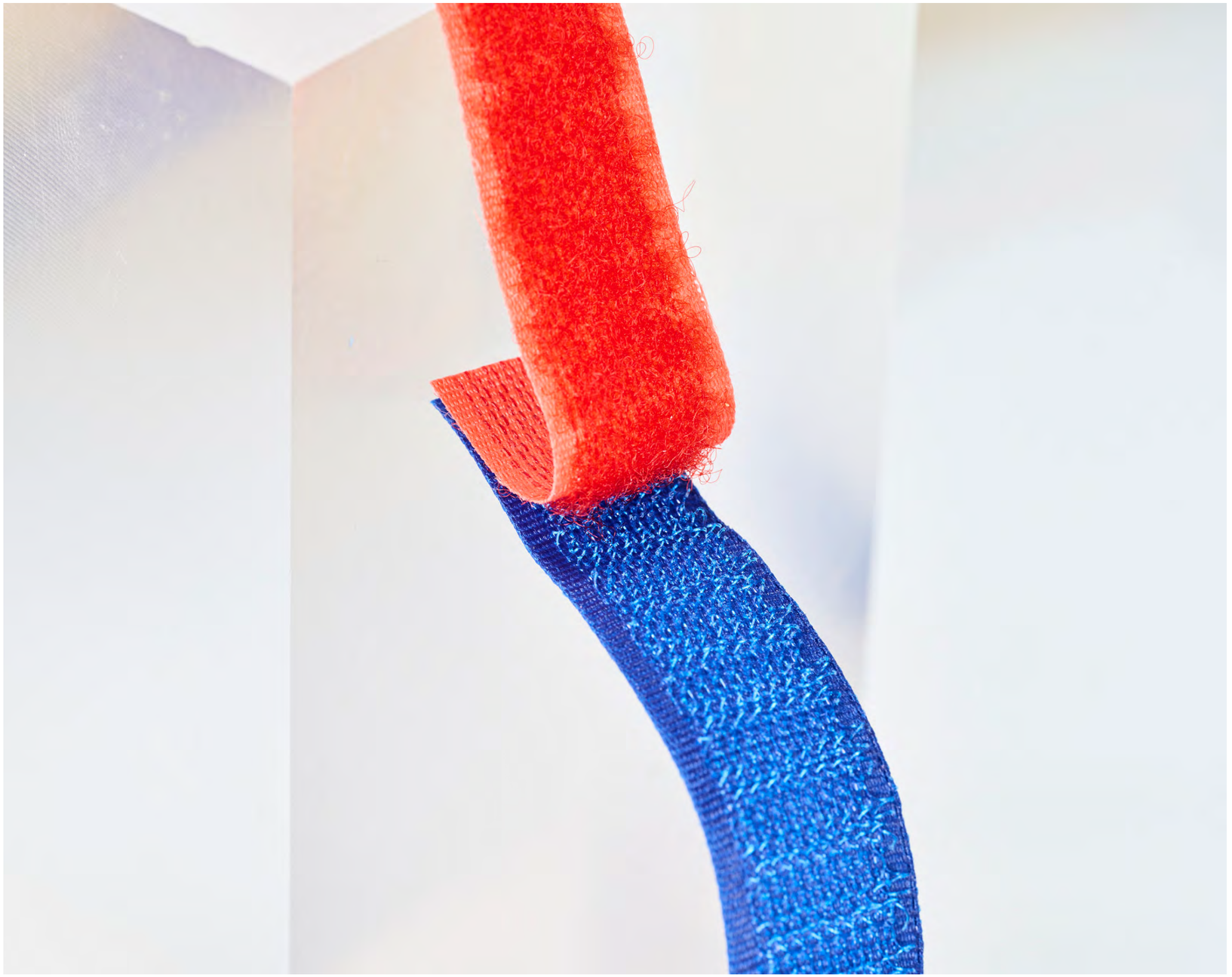
Chemical applications

In chemical processes, like colorization processes (e.g., of Velcro fasteners) ultrapure water quality is key for constant high quality of products and an efficient and reliable production.

The Liquiline System CA82HA also ensures constant monitoring of water hardness, boosting boiler efficiency, reducing downtime and preventing scale in steam circuits and heat exchangers.

By replacing manual grab sampling with online analysis, the system optimizes plant operation and supports compliance in distillation columns—helping to meet specifications and maintain warranties.

It also ensures ideal water quality for stripping processes, making it a versatile tool for efficient and reliable production.



Life Sciences

In the Life Science industry, reliable control of incoming water quality is essential to ensure stable and compliant production processes. Liquiline System CA82HA enables precise online analysis of low water hardness concentrations, with an impressive limit of detection of just 0.02 mg/l. This high sensitivity ensures that even minimal deviations in water quality are detected early, helping to maintain stringent purity standards.

By replacing manual sampling with real-time monitoring, the system significantly increases the reliability of water softening processes. Accurate control of ion exchangers minimizes downtime and enhances operational efficiency, which is particularly critical in environments where uninterrupted production is key.

Moreover, Memosens sensors can be attached to the Liquiline System CA82HA analyzer, combining e.g. conductivity and water hardness measurement in a single device. It allows for comprehensive monitoring of critical process parameters. This integration simplifies system architecture and supports proactive process control, contributing to both product quality and regulatory compliance.

Minerals, Metals & Mining

In the Minerals, Metals & Mining industry, water quality plays a crucial role in protecting equipment and ensuring product integrity. The Liquiline System CA82HA delivers precise water hardness measurements in cooling water circuits, helping to prevent scaling and deposits that can impair system performance.

In battery material production and recycling processes, the system supports optimal water preparation. Even minor impurities can reduce battery capacity and lifespan.

During quenching in hot rolling processes, the CA82HA helps avoid corrosion risks in steel products by ensuring consistent water quality. Its robust design and reliable online analysis make it a valuable tool for maintaining process efficiency and product quality across demanding industrial environments.

Colorimetric measuring principle

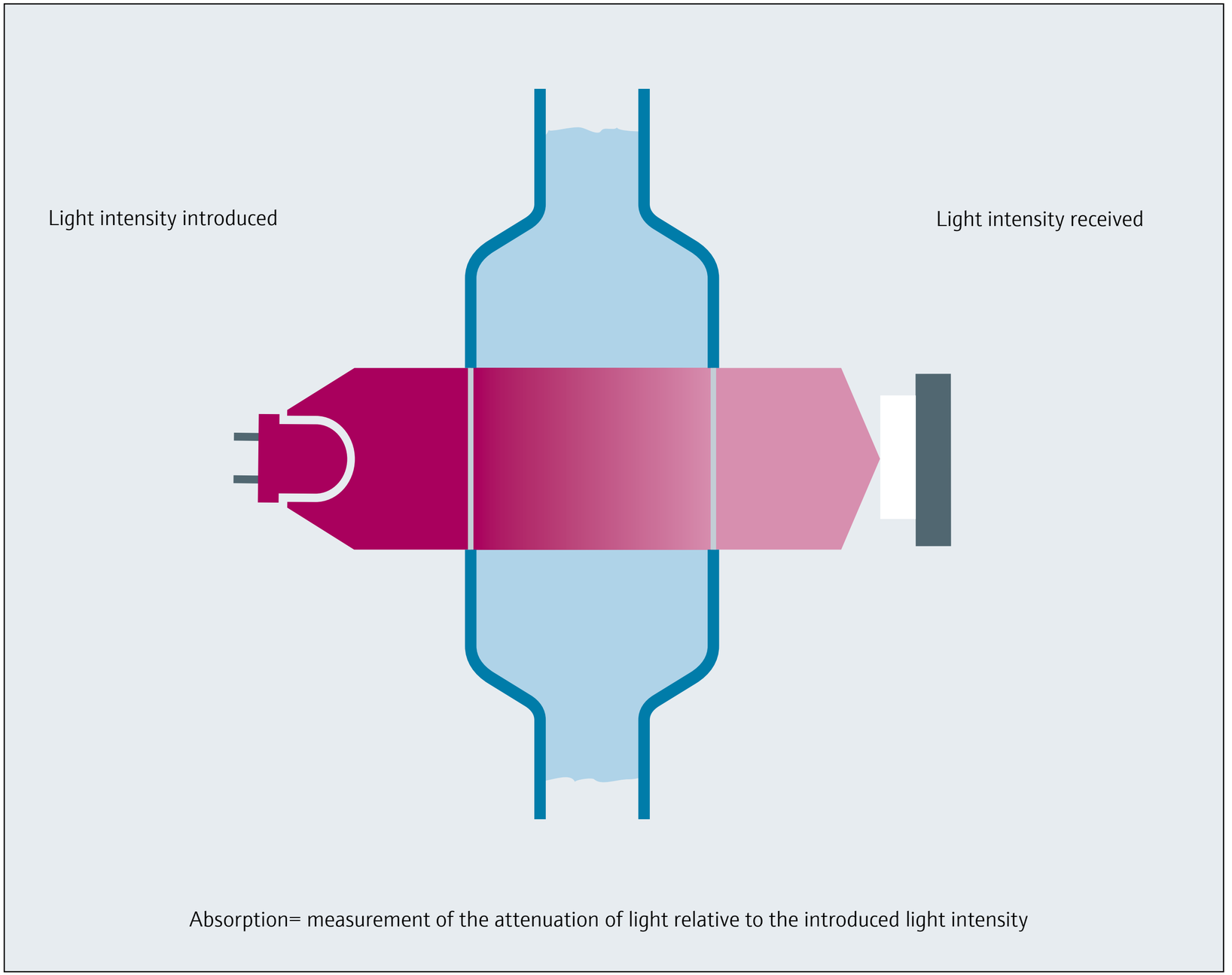
Precise analysis and highest resolution

One or more reagents are added to the water sample to "dye" the sample to be analyzed. Afterwards, the aqueous sample is measured by photometric means. The intensity of the specific absorption signal is proportional to the concentration of the dyed substance in the sample. A reference measurement (sample without chemicals) is taken before every measurement to be able to compensate for any interference caused by inherent color, turbidity or contamination.

The actual concentration of the substance is ascertained using this information.

By specifically selecting the dye reagents, many different parameters can be measured very accurately, ranging from water hardness and silicate to phosphate.
Most standardized procedures for water and wastewater inspection are based on photometry and colorimetry.
In contrast to titrimetry, a much higher resolution can be achieved by photometry.

▶ Take a look at the video on the measuring principle



Absorption= measurement of the attenuation of light relative to the introduced light intensity

Liquiline System CA82HA

Low range water hardness analyzer

Liquiline System CA82HA supports you in monitoring the total hardness of water with a low limit of detection according to your needs. Get to know the specifications and ideally equip your process.

For monitoring drinking water processes or if a wider measuring range is required, please refer to the water hardness analyzer Liquiline System CA80HA.

Design	Open design / cabinet (Plastic ASA-PC)
Process temperature	10 to 40°C (50 to 104 °F)
Ambient temperature	5 to 40°C (41 to 104 °F)
Process pressure	2 to 6 bar (29 to 87 psi)
Sample flow rate	60 to 250 ml/min (2.03 to 8.45 fl.oz/min)
Power supply	▪ 100 to 120 VAC / 200 to 240 VAC ▪ 50 or 60 Hz
Measuring range	▪ 0 to 2.5 mg/l (ppm) $CaCO_3$ ▪ LOD: 0.02 mg/l $CaCO_3$
Output / communication	▪ 2x 0/4 to 20 mA ▪ Optional: Webserver, Modbus, Ethernet/IP, Profibus DP
Input	▪ 1, 2, 4 or 6 measuring channels ▪ Optional with 1 to 4 digital inputs for sensors with Memosens protocol
Consumables	▪ Reagents and standard solutions CY82HA ▪ Maintenance kit CAV800

Comparison

Compare our Liquiline System analyzers for hardness measurement

Always make the right choice: make sure that your analyzer fits your needs. Depending on different variables choose between Liquiline System CA80HA and Liquiline System CA82HA.

Low range water hardness analyzer Liquiline System CA82HA

- Applications: Ultrapure water, boiler feedwater, steam and condensate, reverse osmosis, desalination systems, process water
- Measuring range: 0 ... 2.5 mg/l $CaCO_3$
- Limit of detection (LOD): 0.02 mg/l $CaCO_3$
- Process conditions:
  - Sample flow: 60 to 250 ml/min
  - Sample pressure: 2 to 6 bar
  - Consistency of sample: particle-free

Water hardness analyzer Liquiline System CA80HA

- Applications: Drinking water, Process water
- Measuring range: 0 ... 80 mg/l CaCO3;
  0...1600 mg/l CaCO3 (with dilution)
- Limit of detection (LOD): 0.8 mg/l
- Process conditions: Sample supply: unpressurized
  Consistency of sample: low solids content

Liquiline System CA82HA

Colorimetric system for online monitoring of process water with low limit of detection.

Liquiline System CA82HA enables colorimetric online analysis of low range hardness concentration with a limit of detection (LOD) as low as 0.02 mg/l. It helps operators to increase efficiency, e.g. by reducing deposits on heat exchangers. Moreover, Liquiline System CA82HA helps to avoid damage on capital intensive equipment like turbines. The analyzer supports ensuring the quality (e.g. steel, paper, tires) thanks to reliable pure and ultrapure water analysis.

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