

Density calculator QML51

For inline density measurement
with vibronic technology



At a glance: Density calculator QML51

Density calculator QML51 is designed for continuous inline measurement of density, reference density and concentration of liquids as well as media detection using proven vibronic technology. Installed in the control cabinet, it operates in conjunction with up to two Liquiphant point level switches equipped with integrated density electronics. To ensure high measurement accuracy, the system compensates for temperature and pressure influences by integrating dedicated sensors.

Thanks to its high modularity, density calculator QML51 is ideally suited for liquid applications in tanks and pipelines across a wide range of industries, including Chemical, Mining, Minerals & Metals, Food & Beverage and Life Sciences.



Added values

Density calculator QML51 combines efficient operation, intuitive use and full safety and compliance.



Reliable monitoring

Modular design for efficient processes.

Density calculator QML51 offers a modular design tailored to your specific process requirements. As the system continuously delivers real-time data, it replaces time-consuming manual sampling.

High modularity

Density calculator QML51 is designed to connect up to two Liquiphant point level switches with integrated density electronics. Additionally, up to two temperature or pressure sensors can be connected to automatically compensate for changes in temperature and pressure.

Reliable measurement results

Based on the proven Liquiphant vibronic technology, the calculator delivers highly repeatable measurement results, even under demanding conditions. Thanks to the low sensitivity of Liquiphant sensor to build-up, you benefit from long-term reliability.

Increased productivity

Replacing manual sampling and time-consuming laboratory analysis, density calculator QML51 provides real-time density data. Its high measurement accuracy enables early detection of deviations, helping you maintain consistent product quality.

Added values

Density calculator QML51 combines efficient operation, intuitive use and full safety and compliance.



Easy setup

Simplified configuration for process clarity.

Fast commissioning and intuitive operation simplify integration in your process. With predefined settings and remote access via Ethernet, configuration and monitoring are simple.

Fast commissioning

Guided setup sequences via web server enable fast and easy commissioning. Predefined concentration tables for alcohol, sugar and electrolytes concentration further simplify configuration for industry-standard applications.

Easy operation

Ethernet connectivity provides remote access via mobile devices or desktop computers, while clear visualization on the dashboard supports interpretation of measurement results.

Flexible configuration

The settings are customizable, allowing the software to adapt to your specific process requirements. For example, measured values can be displayed in freely selectable units of your choice such as °Brix, °Baumé and °API.

Added values

Density calculator QML51 combines efficient operation, intuitive use and full safety and compliance.



Secure Performance

Advanced protection for process safety.

The robust design of Liquiphant sensors ensures safe operation across industries. With industry approvals and integrated cybersecurity, density calculator QML51 supports critical process requirements.

Process safety

Liquiphant vibronic sensors are available in a wide range of materials and coatings, including specialized variants for hygienic and chemically aggressive environments. In addition, empty pipe detection further enhances process safety by preventing interruptions and protecting equipment.

Industry approvals

Density calculator QML51 and Liquiphant sensors are developed in compliance with necessary industry approvals. This includes explosion-proof certified sensors and barriers for operation in hazardous areas.

Proven security measures

High level of cybersecurity is ensured with software developed in accordance with IEC 62443-4-1, which defines secure development practices for industrial automation and control systems.

Benefits at a glance

Density calculator QML51 simplifies density measurement while meeting industry standards for safety and accuracy.



Modular connectivity with industry-specific Liquiphant vibronic sensors and two additional input channels optionally used for temperature and pressure sensors

Real-time inline density data replaces manual sampling and laboratory analysis

Fast and guided commissioning via integrated web server with selectable, predefined concentration tables

Proven vibronic technology ensures repeatable measurement results with minimal sensitivity to build-up

Verification of sensor accuracy provides precise and stable measurement results

Industry focus

Density calculator QML51 is the perfect fit for inline density measurement in liquid processes across various industries.

It enables precise measurement of density, reference density and liquid concentration as well as distinction between up to four media.



Chemical

Combined with a Liquiphant vibronic sensor and a temperature sensor, density calculator QML51 ensures precise inline density measurement, even in chemically aggressive environments.

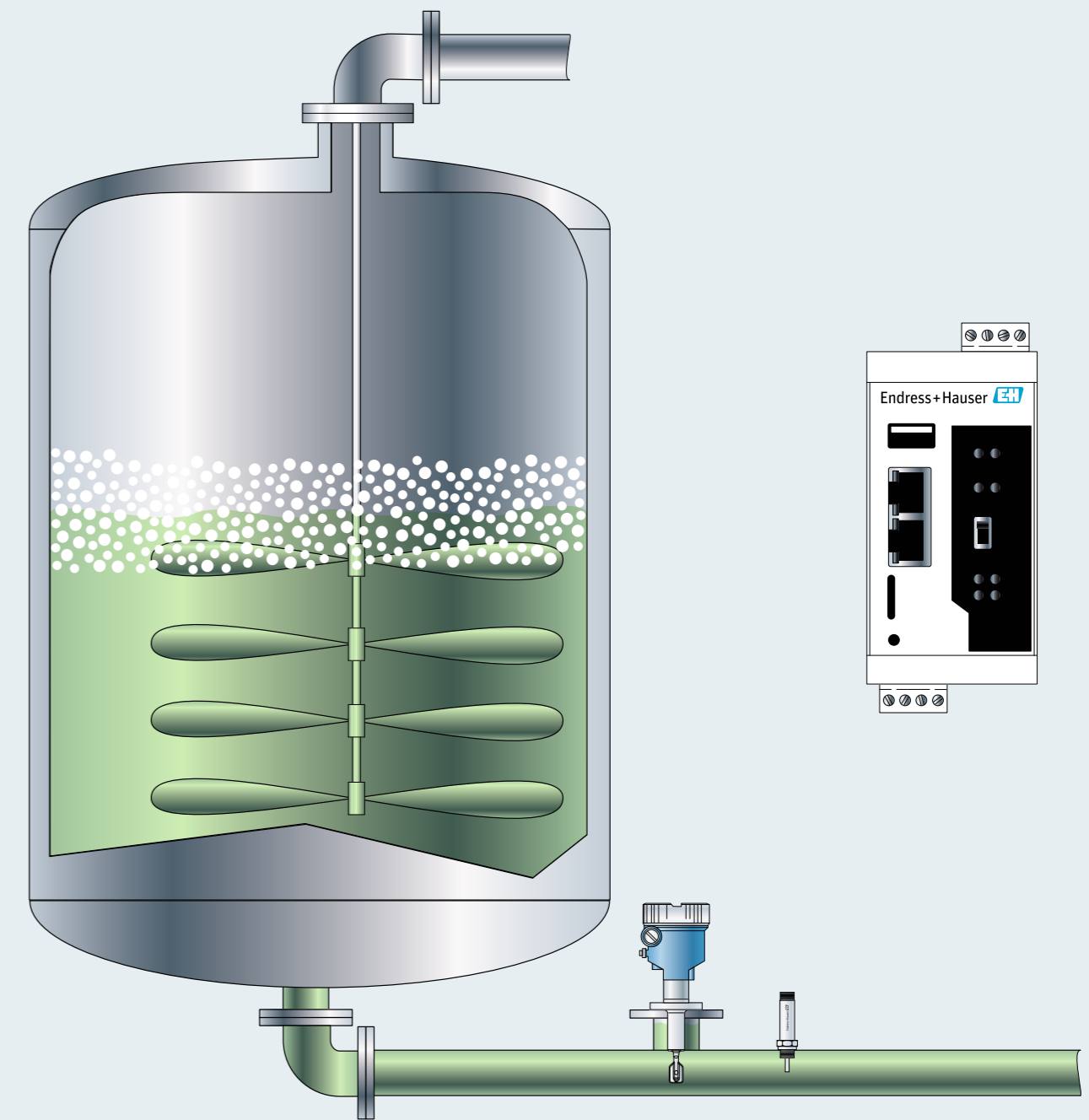
Concentration in batch reactor

Your challenges

- Gas injection during reaction
- Moving and aggressive media
- Process temperatures from +20 °C to +80 °C

Our solution

The combination of density calculator QML51, Liquiphant FTL51B or Liquiphant FTL62 and a temperature sensor enables precise measurement of dissolved substance concentrations and ensures reliable control of chemical reactions. Pre-installed concentration tables for aqueous electrolytes according to Laliberte-Cooper allow fast setup via web server. The coated Liquiphant FTL62 withstands aggressive media and fouling and is independent of media properties such as conductivity or dielectric constant.



Mining, Minerals & Metals

Density calculator QML51, combined with a Liquiphant vibronic sensor and a temperature sensor, offers robust performance for demanding applications in the Mining, Minerals & Metals industry.

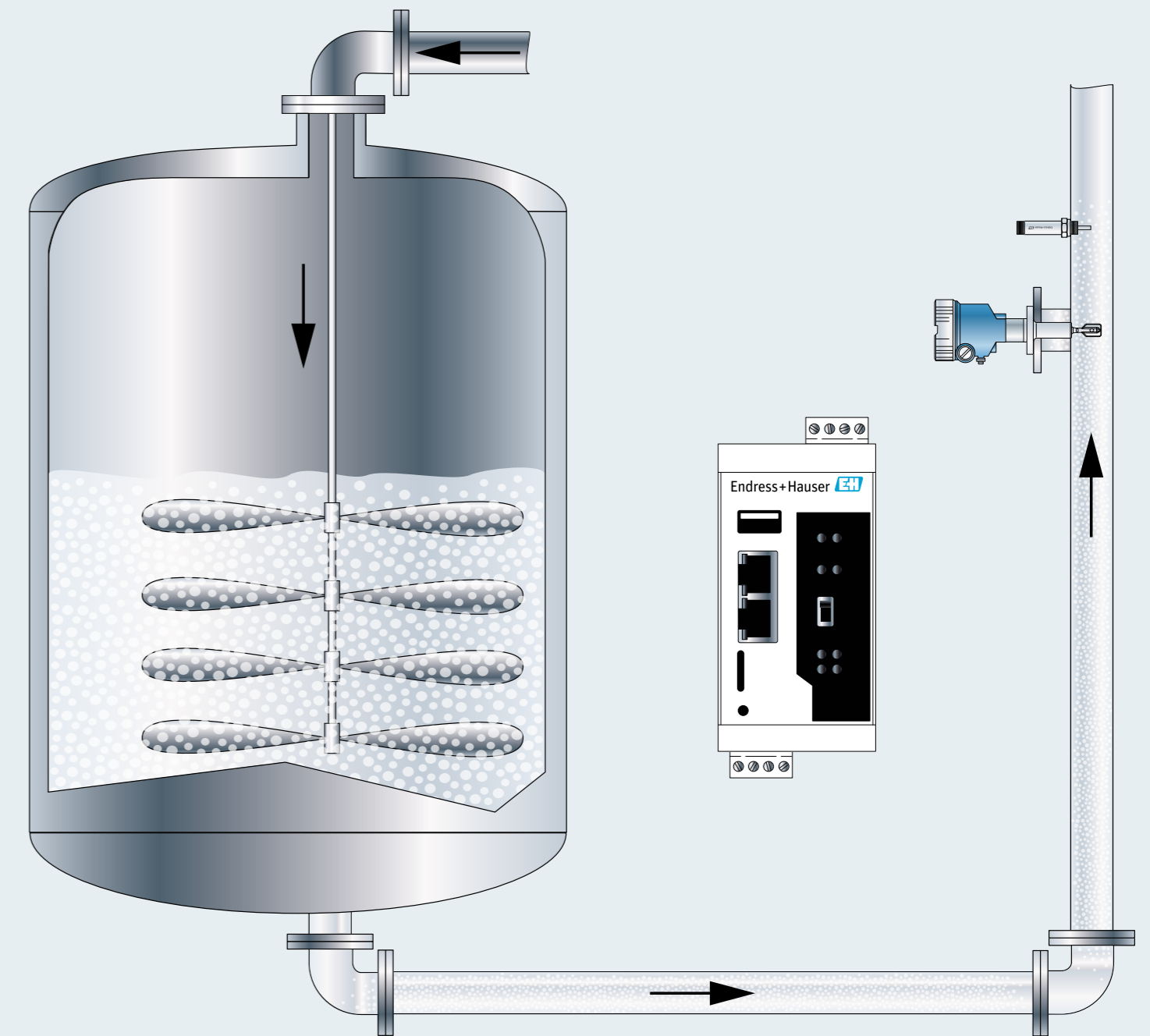
Lime milk concentration

Your challenges

- Abrasive components in the medium
- Harsh process conditions
- Risk of sensor build-up
- Fluctuating process temperatures (up to +80 °C)

Our solution

In mining processes involving lime milk with solid particles, reliable concentration measurement is essential to maintain process stability. The combination of density calculator QML51, Liquiphant FTL51B or Liquiphant FTL62 and a temperature sensor enables reliable density-based concentration monitoring. Robust against abrasive media and build-up, Liquiphant vibronic sensors ensure consistent performance in harsh environments.



Food & Beverage

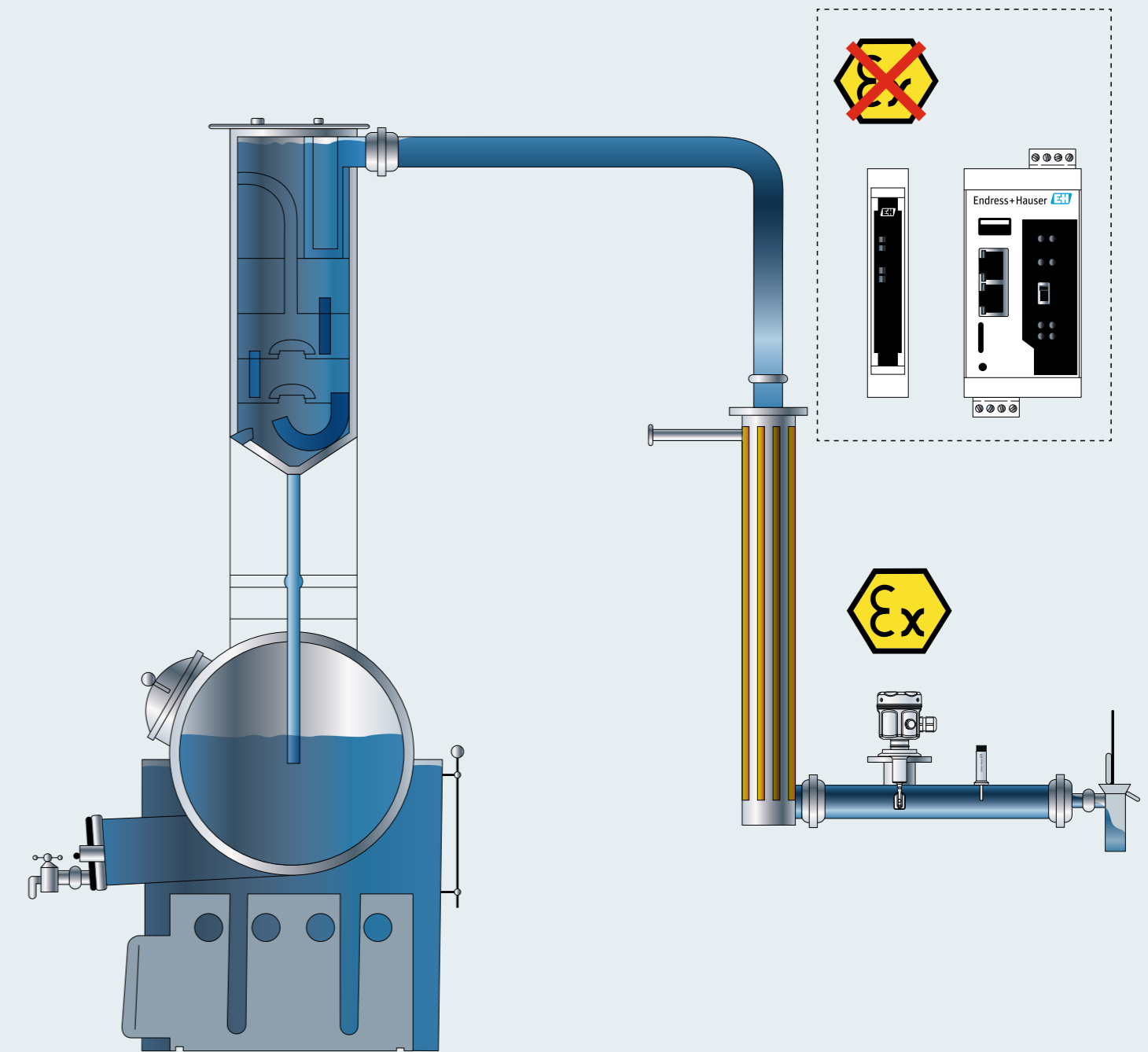
Combined with Liquiphant FTL63 and a temperature sensor, density calculator QML51 meets all relevant hygienic standards and ensures reliable operation under demanding conditions such as foam, turbulence or fluctuating temperatures.

Your challenges

- Operation in hazardous (Ex) areas
- Accurate measurement of alcohol content
- Process temperatures up to +80 °C

Our solution

Density calculator QML51 combined with Liquiphant FTL63 and a temperature sensor enables precise inline measurement of alcohol concentration in storage and blending tanks. It replaces manual samplings with continuous, temperature-compensated density measurements, ensuring consistent product quality. International explosion protection certificates of Liquiphant FTL63 allow safe use in closed tanks. To simplify setup, pre-installed alcohol concentration tables are selectable.



Food & Beverage

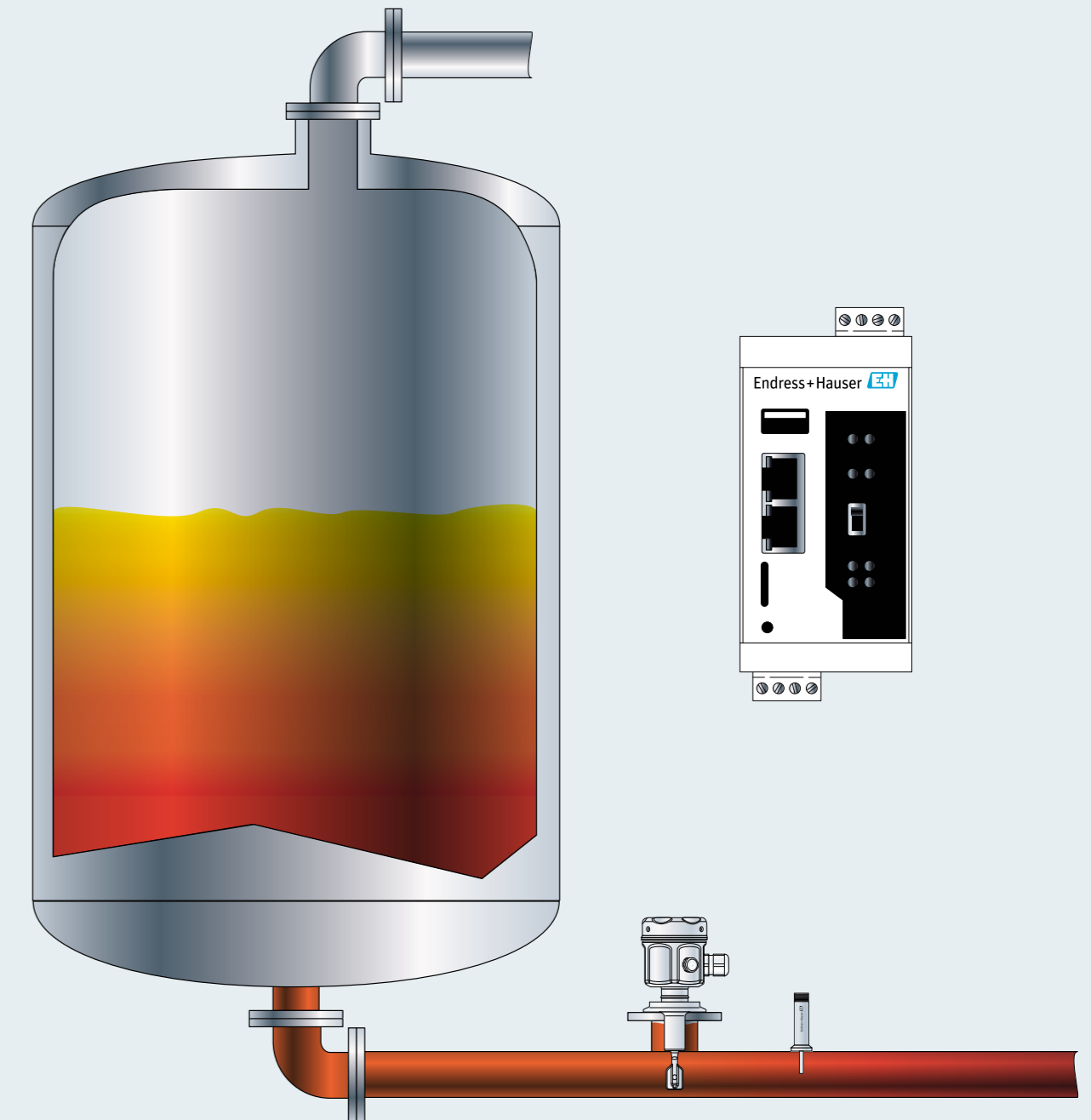
Combined with Liquiphant FTL63 and a temperature sensor, density calculator QML51 meets all relevant hygienic standards and ensures reliable operation under demanding conditions such as foam, turbulence or fluctuating temperatures.

Your challenges

- Fast reaction time required during medium changes
- Variations in viscosity
- High flow rates

Our solution

Density calculator QML51, combined with Liquiphant FTL63 and a temperature sensor, provides accurate media detection directly in the process. It reliably distinguishes between sugar-based syrups (e.g. lemonade), syrups with artificial sweeteners and pure water. The media detection function is selectable via web server, eliminating the need for manual configuration of calculation parameters. Additionally, pre-installed sugar concentration tables (ICUMSA SPS-4) enable fast setup for concentration measurement during soft drink production.



Life Sciences

In combination with Liquiphant FTL63 and a temperature sensor, density calculator QML51 supports hygienic standards and is suitable for cleaning-in-place (CIP) and sterilization-in-place (SIP), making it ideal for Life Sciences processes.

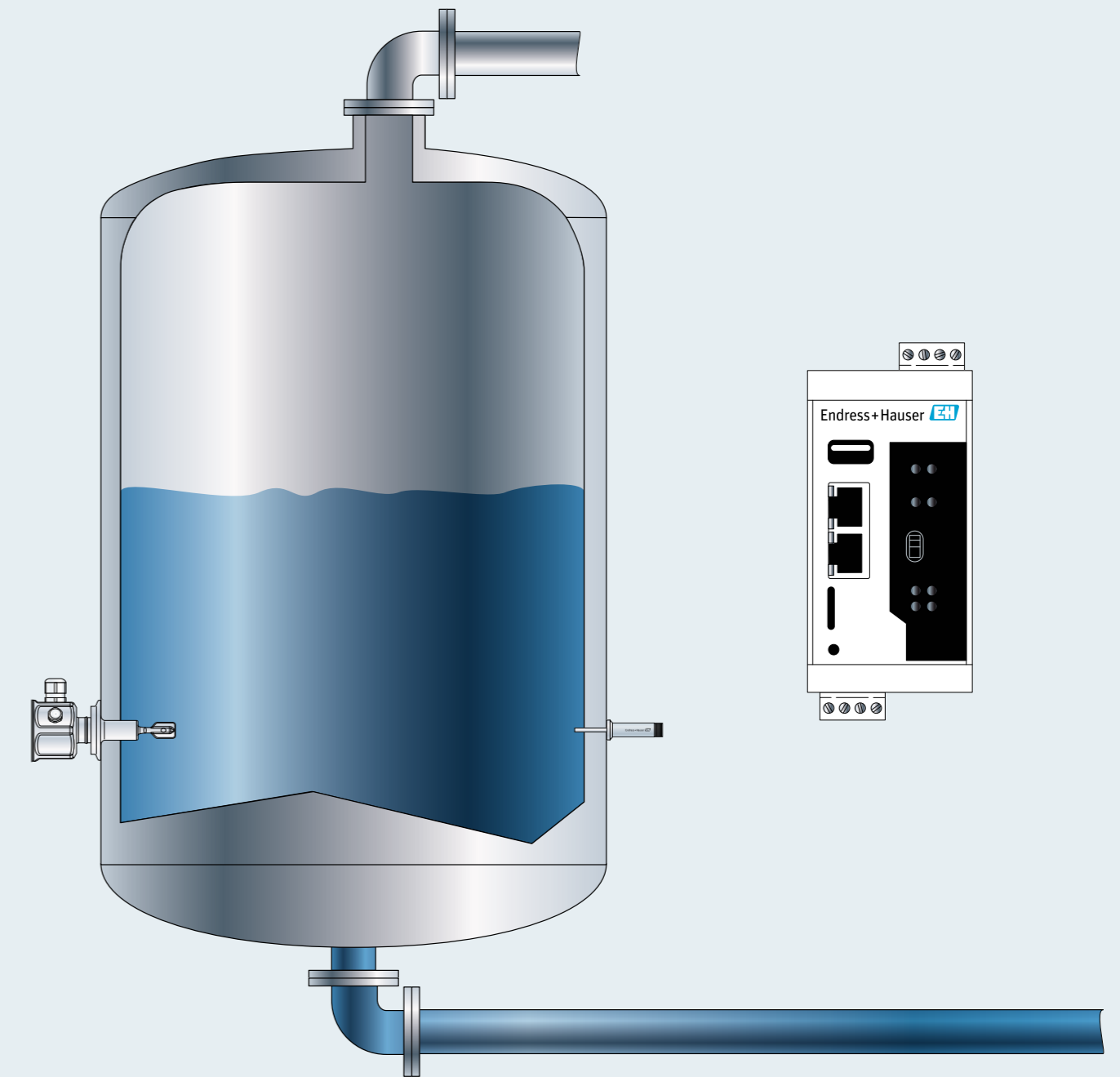
Buffer and media preparation

Your challenges

- Moving media with varying densities
- Hygienic requirements
- Cleaning-in-place (CIP) and sterilization-in-place (SIP)
- Process temperatures up to 60 °C

Our solution

In buffer and media preparation, accurate concentration measurement is critical for consistent formulation and reliable processes. The combined use of density calculator QML51, Liquiphant FTL63 and a temperature sensor enables precise inline density monitoring, even with temperature fluctuations and media changes. The hygienic design of Liquiphant FTL63 supports CIP/SIP cleaning, and helps minimize downtime.



Product overview

Density calculator QML51

Density calculator QML51 combines proven vibronic technology with modern digital features to deliver precise, real-time density data tailored to your process needs.



Input

Four input channels (2x PFM for Liquiphant sensor, 2x 4 ... 20 mA (HART) for temperature or pressure sensor)

Operation

- Ethernet connectivity for access via web server and extended process data output via Modbus TCP/OPC UA
- Guided commissioning and predefined industry-standard concentration tables for alcohol, sugar and electrolytes (OIML IST-90, ICUMSA SPS-4, Laliberte-Cooper)

Approvals

- International Ex approvals for sensors and barriers
 - FCM compliance and material certificates for sensors
 - High security standards
-

Matching point level switches

Selecting the right Liquiphant sensor for your application



Density calculator QML51 operates in conjunction with Liquiphant sensors equipped with integrated density electronics (FEL60D). Depending on the industry and process environment, the appropriate Liquiphant can be selected to ensure reliable performance:



Liquiphant FTL51B:

Versatile model for applications across industries

- International Ex approvals
- Highly resistant to build-up and corrosion



Liquiphant FTL62:

Designed for chemically aggressive and abrasive media

- International Ex approvals
- Coating materials: ECTFE, PFA and enamel



Liquiphant FTL63:

Ideal for hygienic and sensitive processes

- Polished, hygienic design
- Certified according to EHEDG and 3-A; material compliance with EC1935/2004, FDA and GB4806; cGMP and ASME BPE compliant

Visit us on social media

