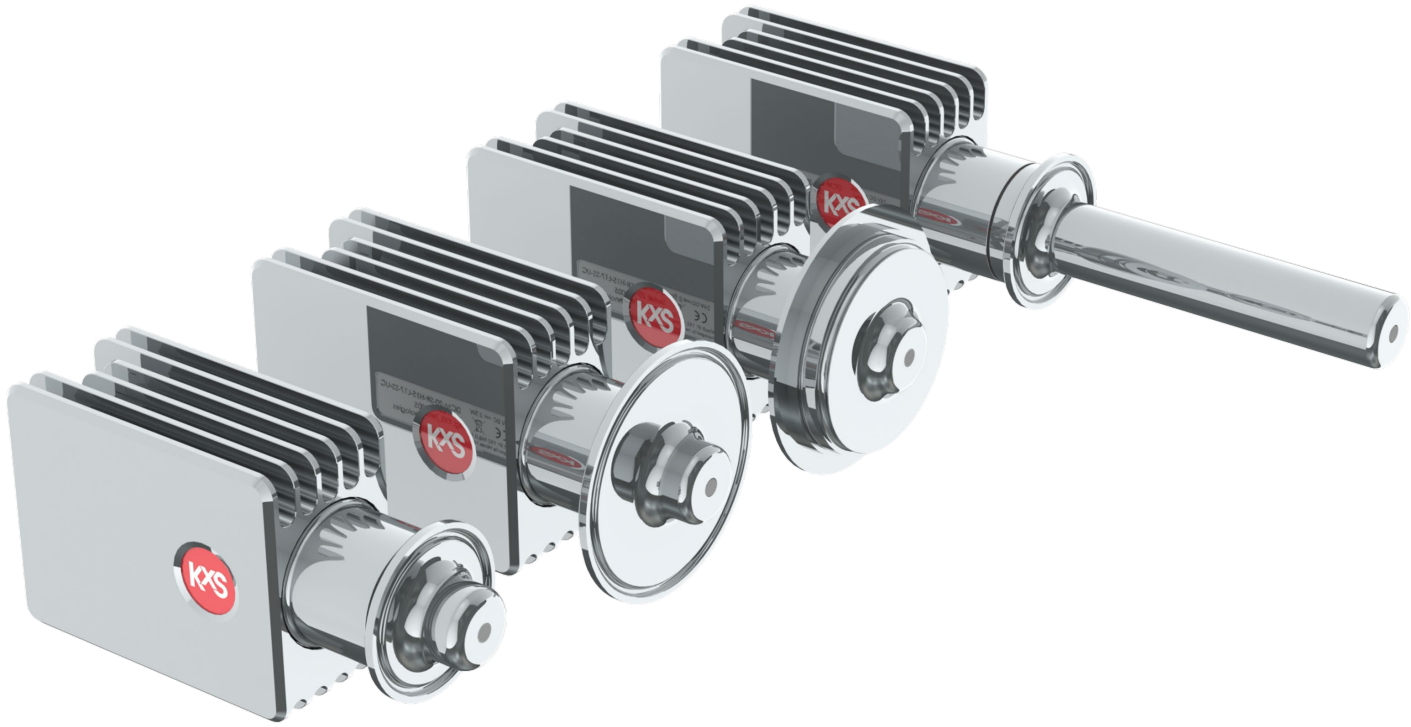
# Excellence in hygienic refractive index measurement



# KxS Inline Brix refractometer DCM-20 for food, beverage and dairy

# Technology that is built on over 40 years of industry-leading experience

KxS DCM-20 Inline Brix Refractometers are purpose-built for today's food, beverage and dairy production processes. The platform combines advanced optical design and application-driven engineering to deliver accurate 0-100 Brix, concentration and total solids (TS) measurement in batch and continuous processes.

DCM-20 refractometers meet the highest hygiene and food safety requirements. All wetted parts are with 3-A symbol authorization and EHEDG certified. This ensures the instrument integrates seamlessly into modern production lines where sanitary design is essential.

The DCM-20 platform includes compact and probe sensor models to match the full range of hygienic processing.

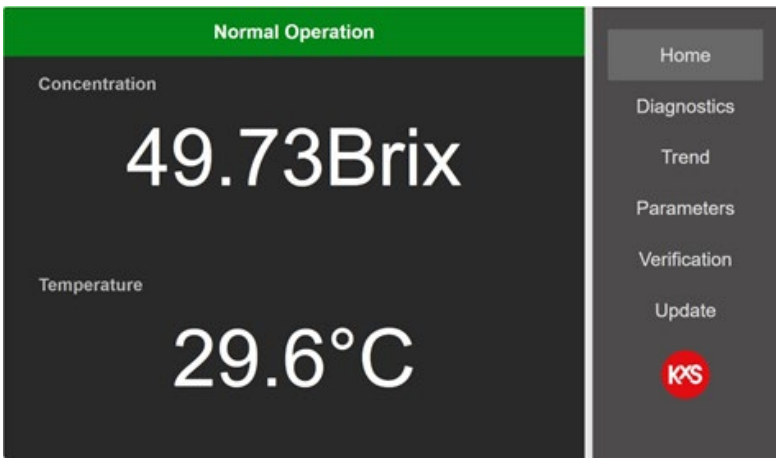
Compact models connect easily using 1.5" and 2.5" Sanitary or VARINLINE® fittings and can be paired with Single-Piece SFC Flow Cells to ensure optimal flow and resistance to prism fouling in small pipelines.

Probe models mount directly via Sanitary clamps or APV tank bottom flanges in larger pipelines, tanks, cookers, and crystallizers.

DCM-20 operates as a stand-alone intelligent instrument with dual 4–20 mA outputs and Modbus TCP for integration into any automation system. The built-in digital interface allows measurement, diagnostics and configuration through a web browser on a computer, tablet or mobile device — and no external transmitter is required.

For plants that prefer local visualization and interface, the Modular Connection Unit (MCU) provides a robust stainless-steel display and operator access.






## Proven performance across food, beverage and dairy applications

- **Dairy UF/RO systems:** whey protein and lactose concentration control up to 55 bar (800 psi) process pressure
- **Mixing, dilution and blending:** juice concentrate dilution, syrup standardization, sugar dissolving, filling-line and CIP interface detection
- **Effluent and side-stream monitoring:** verifying sugary discharge concentrations
- **Tomato processing**
- **Jam and jelly cooking:** precise endpoint control at target °Brix, consistent gel texture, reduced sugar overdosing and improved batch quality
- **Confectionery and fillings:** caramel, fondant, coatings and ingredient cooking
- **Yeast extraction and a broad range of food ingredient processes**
- And more

# Installation examples

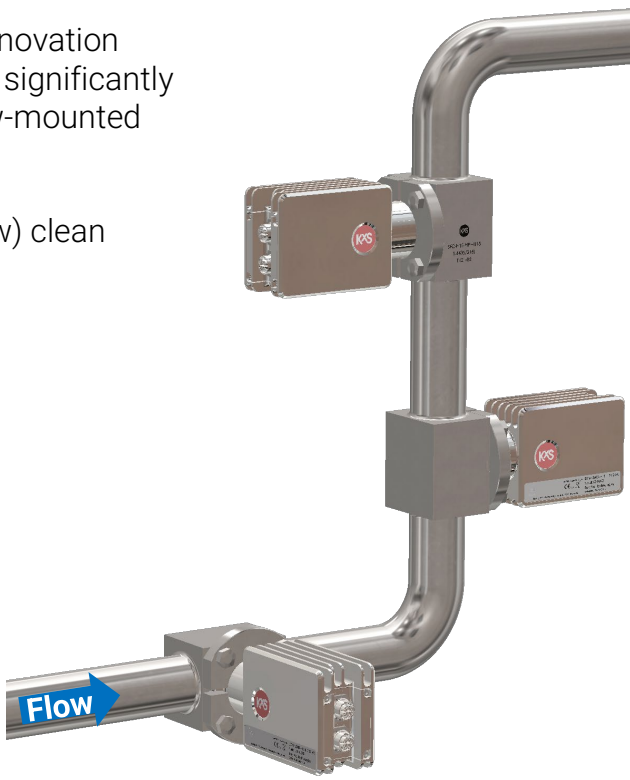
Single-piece flow cell SFC for straight pipe connection is innovation that transforms how you handle pipe installations, offering significantly better flow velocity on prism compared to traditional elbow-mounted systems.

- Best laminar flow = keeps prism (measurement window) clean
- Minimizes dead spaces and risk of contamination
- Pressure rating up to 55 bar (800 psi)
- Scalable to process line sizes from 1” to 6”



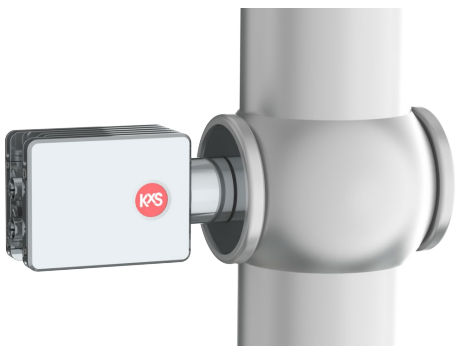







Say goodbye to the complex elbow-mounted installations. The straight pipe connection simplifies the mounting point selection for horizontal and vertical pipes.

## VARINLINE® pipe connection



## Sanitary clamp connection in vessels

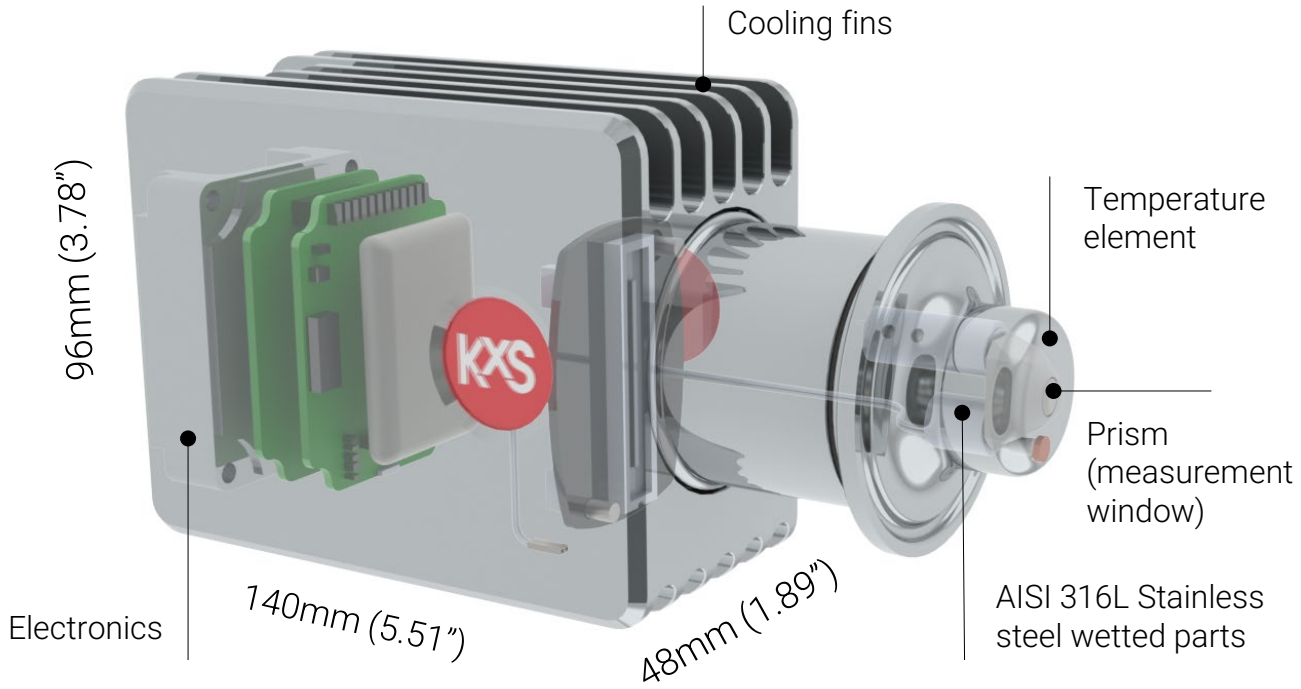


## 0.5” Pharma Single-Piece flow cell and Sanitary mini clamp



# Key design features

Compact sensor weight 1.3kg (2.9lbs)




- Solid optics module provides reliable thermal properties and rigidity
- Integrated temperature compensation ensures accurate Brix at any process temperature
- Exact factory zero-point calibration ensures high accuracy, even near 0%/Brix concentrations




Hygienic by design

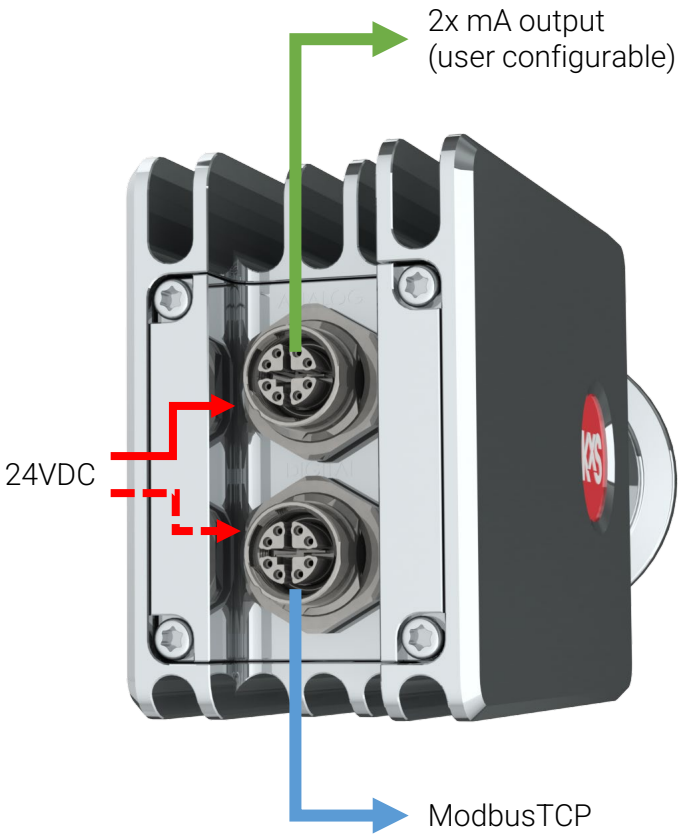
- Optional cleanroom sensor cover offers smooth, easy-to-clean surface, ensures superior surface cleanliness and minimizes risk of contamination in food and beverage production zones

# Digital and analog M12 connectors

The DCM-20 operates with a 24 VDC input power supply and offers flexible communication options, including analog (4-20 mA) and digital (Modbus TCP)

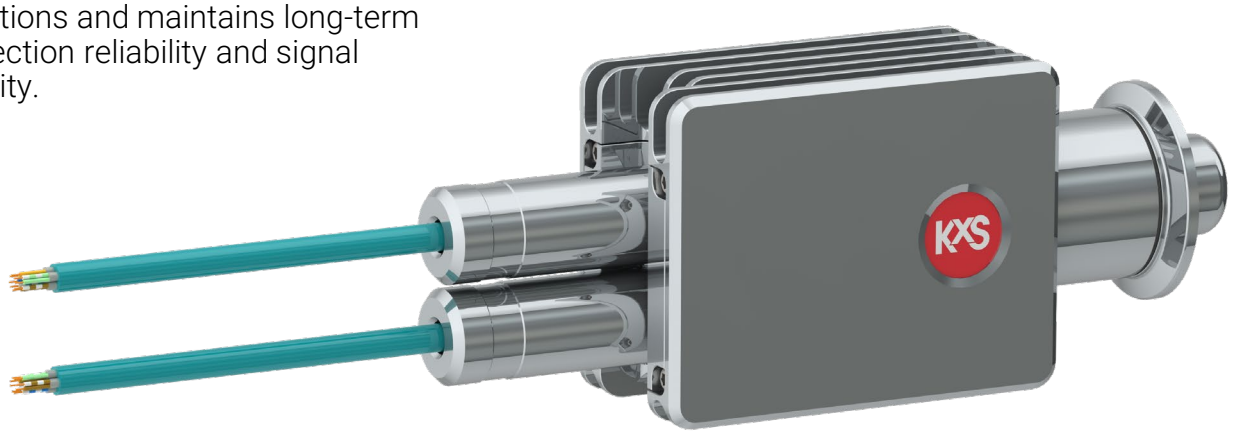
When using the analog signal, the digital port serves as a service port for configuration and diagnostics via a computer web browser, external display, or mobile device

All port options can be utilized simultaneously, providing seamless integration and monitoring capabilities.




# Covers protect cable connections

Connector covers provide robust protection for the sensor's cable connections, preventing ingress of water, dust and dirt e.g., during routine hosing and rinsing of facilities. Their hygienic design supports clean operations and maintains long-term connection reliability and signal integrity.



# KxS Inline Brix refractometer DCM-20 specifications

| | |
|---|---|
| Refractive Index range: | Full range, $n_D$=1.3200...1.5300 (equals by definition to 0...100 Brix/%wt) |
| Output units: | Brix; Conc%; Total Solids TS; Refractive Index RI |
| Measurement repeatability: | ± 0.01 Brix/%wt |
| Measurement accuracy: | ± 0.1 Brix in full range 0….100 Brix, 20….90°C (68…194 °F)<br>± 0.03 Brix in range 0….30 Brix |
| Speed of response: | 1 sec. undamped |
| Optics: | No mechanical adjustments and digital measurement with 4000-pixel CMOS camera<br>589 nm wavelength (sodium D-line), light emitting diode (LED)<br>Built-in Pt-1000 temperature sensor (linearization according to IEC 751)<br>Proprietary 6th generation image recognition algorithm for precise optical image detection |
| Temperature compensation: | Automatic, individual zero-point calibration for precision in near-zero, high-accuracy applications |
| Calibration: | NIST traceable calibration, verification with standard RI liquids |
| Wetted parts: | AISI316L EN 1.4435 or EN 1.4404 Stainless steel, Sapphire prism, PTFE prism gasket<br>Optional: Alloy 20, Hastelloy C-276/Titanium<br>Sensor housing AISI316 EN 1.4404 Stainless Steel |
| Hygienic design certification: | 3-A Sanitary standard 46-04 symbol authorization and EHEDG (European Hygienic Equipment Design Group) Type EL Class I certified |
| Process connection: | Single-piece SFC flow cell for 1”…6” process lines, optional flow cell housing connections with Sanitary or DIN/ANSI flanges; 1.5” and 2.5” Sanitary, VARINLINE®; APV tank bottom flange |
| Process pressure: | -1...55 bar (-14.5...800 psi) (depending on process connection) |
| Process temperature: | Compact sensor: -15°C (5°F)...100°C (212°F) continuous process temperature<br>Probe sensor: -15°C (5°F)...150°C (300°F) continuous process temperature<br>Withstand 130 °C Clean-in-Place CIP and Steam-in-Place SIP sequences |
| Ambient temperature: | Sensor -15°C (-40°F)...65°C (149°F); Modular Connection Unit MCU -10 °C (14°F)...45°C (113 °F) |
| Sensor protection class: | IP67, Nema 4X |
| Installation: | Indoor/Outdoor, unclassified area |
| Sensor weight: | Compact: 1.3 kg (2.9 lbs), Probe: 1.7 kg (3.75 lbs) |
| **Outputs and connections:** | |
| Digital M12 connector: | 24VDC power supply, Modbus TCP for user interface and PLC connection,<br>standard sensor cable length 10 m(33 ft), max 70 m(230 ft) |
| Analog M12 connector: | 24VDC power supply, 2 pcs independent 4-20 mA user configurable outputs,<br>standard cable length 10 m(33 ft), max, 200 m(660 ft). Max. load 1000 Ohm |
| Sensor Power consumption: | max. 2.6W |
| **Options:** | Modular Connection Unit MCU with enclosure, display/user interface and relays for prism wash<br>Independent 7” Web HMI, full color touch screen interface<br>Prism cleaning with steam, high-pressure water wash or mechanical washer<br>Cleanroom sensor cover –CG, Sensor cooling cover SP-10309<br>Direct integration with Rockwell’s Ethernet IP or Siemens Profinet PLC communications<br>ATEX/IECEx approval for Ex ec mc IIC t4 Gb/Gc |

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