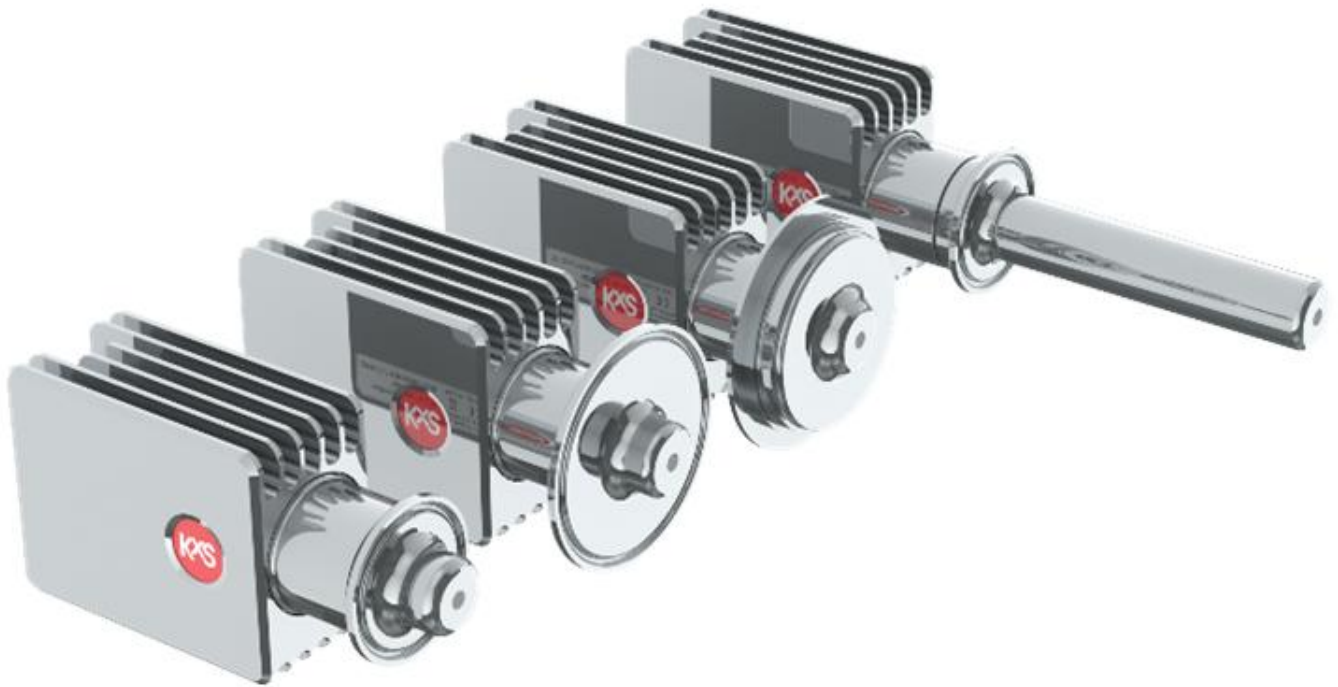




Excellence in hygienic
refractive index
measurement



KxS Inline Brix refractometer DCM-20 for food and beverage process control

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

KxS Inline Brix refractometer DCM-20 is engineered for precise, real-time Brix and concentration measurements in the food and beverage applications.

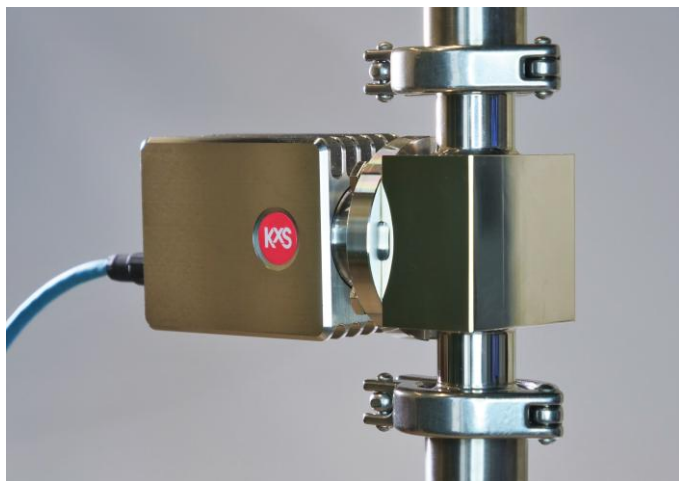
DCM-20 consists of a compact, or probe sensor and it comes with a variety of food industry process connections and flow cells for easy connectivity.

DCM refractometer provides a full measurement range of 0-100 Brix, utilizing two independent 4-20mA outputs and a digital Ethernet output for connectivity to automatic process control systems.

For enhanced functionality, an optional HMI unit offers a local display and interface, ensuring user-friendly operation.

Applications

- Define liquid product interfaces in beverage and dairy filling lines
- Achieve and ensure product quality in sugar dissolving, juice blending and jam vessels
- Correlate membrane filtration efficiency in protein separation in Reverse Osmosis and Ultra Filtration systems
- Optimize steam feed in dairy evaporation processes
- And more



Other typical applications

- Dairy processing
- Tomato paste production
- Yeast extraction
- Sugar syrup preparation

Installation

Single-piece flow cell in straight pipe sections designed for high pressure installations



Varinline connection



Tank installation with long probe design



0.5" Pharma flow cell with mini-clamp



Innovative straight pipe connection

Our straight pipe connection innovation transforms how you handle pipe installations, offering significantly better flow velocity on measurement window compared to traditional elbow-mounted systems, and ease of mounting.

Here is why the straight pipe connection stands out:

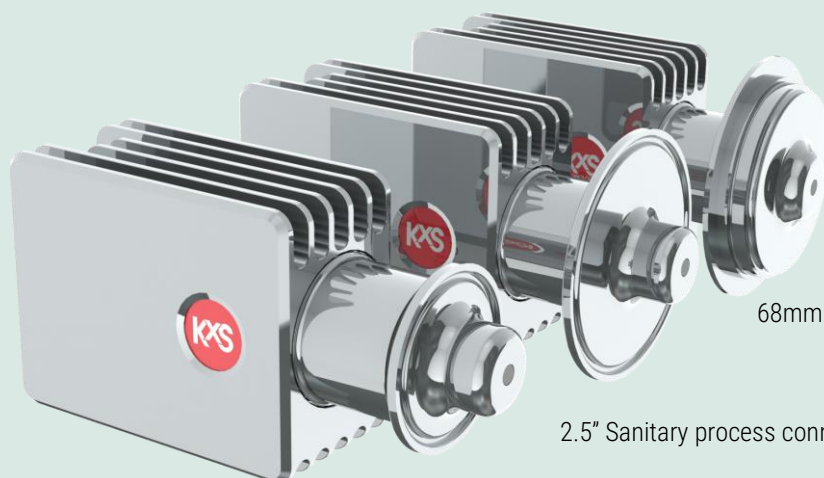
- Ensures significantly better flow velocity on measurement window compared to traditional elbow-mounted systems
- Minimizes turbulence and pressure drop
- Say goodbye to the complex elbow-mounted installations. The straight pipe connection simplifies the mounting point selection and process
- Superior drainage, unlike elbow connection, which can trap residues

Single-piece flow cells

- Scalable to process line size



Hygienic process connections



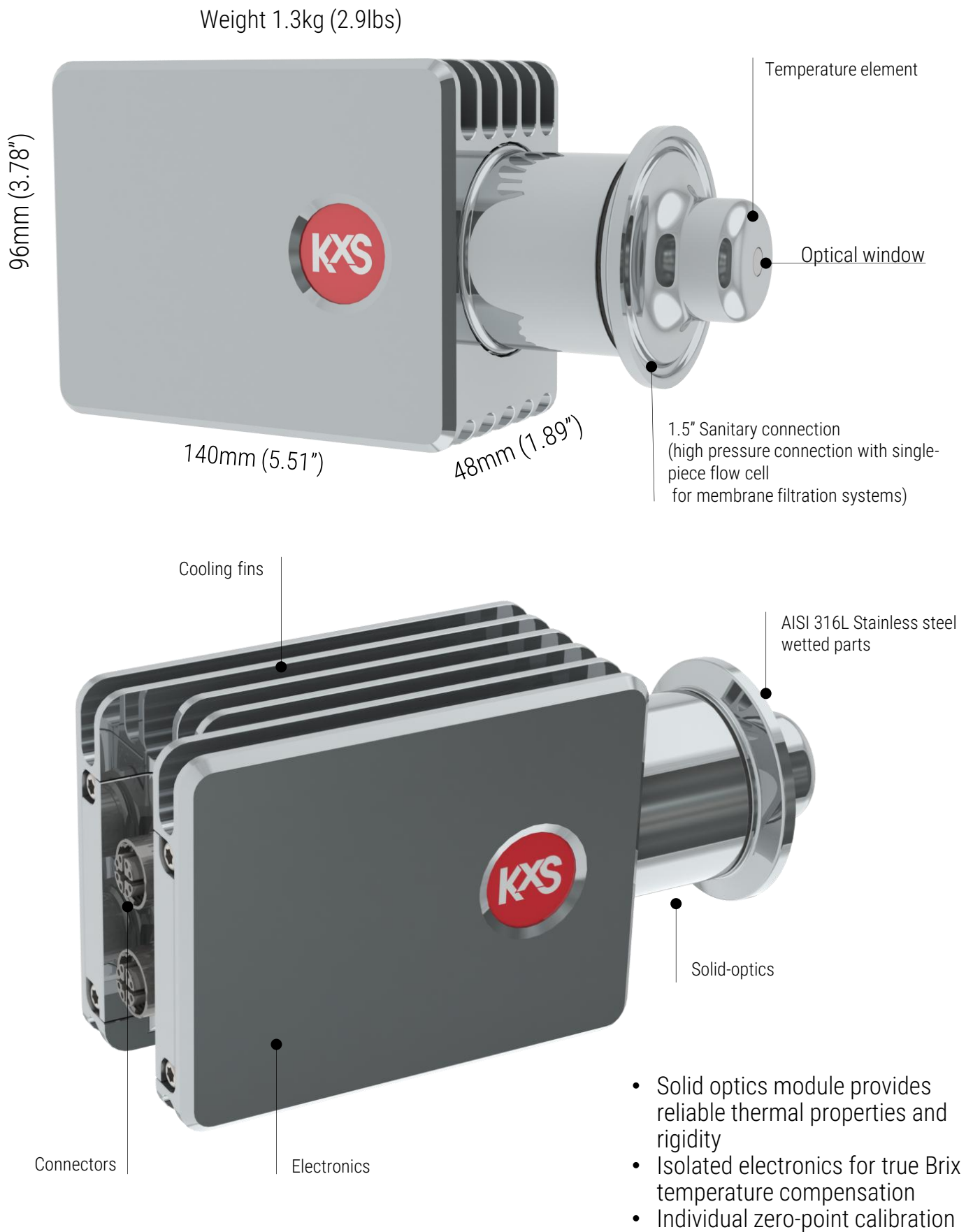
All wetted parts, including sensor, flow cell, and process connection are with 3A Sanitary Symbol authorization and certified by European Hygienic Engineering and Design Group (EHEDG), ensuring compliance with the food industry standards.

68mm VARINLINE®

2.5" Sanitary process connection

1.5" Sanitary process connection
(55 bar, 800psi with single-piece flow cell)

Key design features

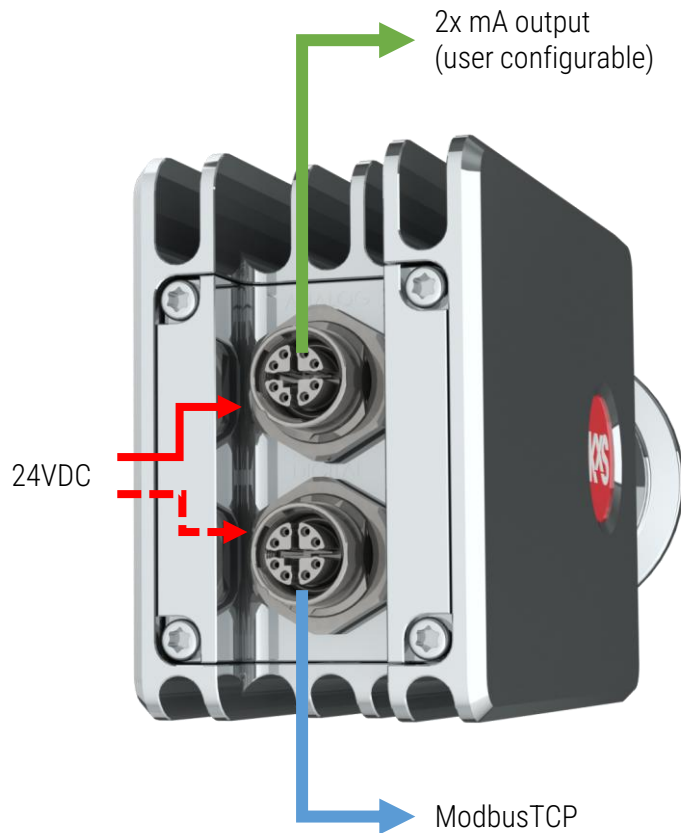


Digital and analog M12 connectors

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

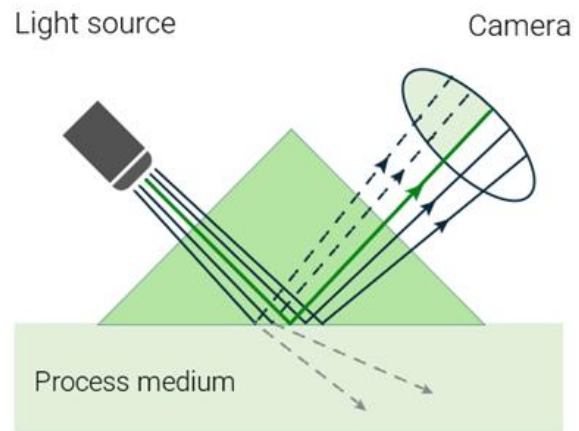


Optical refractive index measurement principle

KxS process refractometers DCM (digital concentration monitoring) employ the physical phenomenon of Refractive Index to define liquid concentration.

Optical concentration measurement is based on Snell's law and the critical angle of total reflection to provide precise readings.

Light is emitted from an LED and directed towards the interface between an optical window and the liquid being measured. As the concentration of the liquid changes, specific angles of the light are totally reflected and partially reflected back, producing light and shadow interface that is captured by a digital camera sensing element.



This interface is detected by the light-activated camera pixels and converted into refractive index (RI).

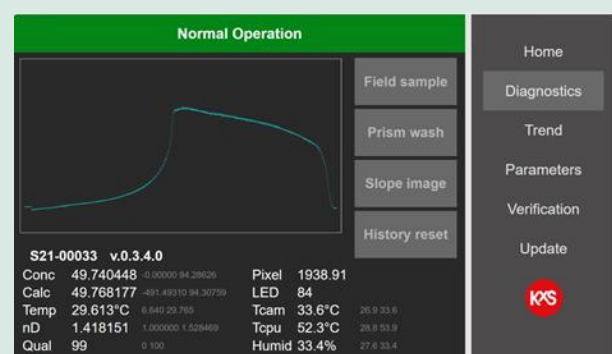
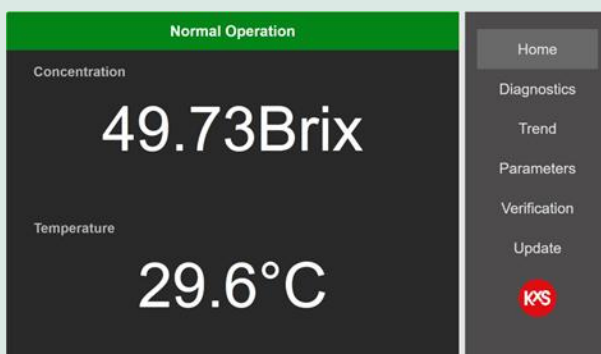
The RI values can be directly used or further translated into any concentration units, such as percentage by weight. This method ensures that measurement signals are provided instantaneously, allowing for real-time process control.

User interface

The DCM-20 measures refractive index and displays temperature-compensated concentration units in Brix, % by weight, total solids or any engineering unit. All measurement functions are integrated in the sensor in a stand-alone setup, no transmitter is required.

However, external displays with different sizes are available for connection through the sensor digital port. Computer, tablet or mobile phone with a web browser serves as user interface for accessing sensor diagnostics and settings.

Advanced optical image detection with proprietary pattern recognition.



KxS Inline Brix refractometer DCM-20 specifications

Refractive Index range:	Full range, nD=1.3200...1.5300 (equal by definition to 0...100%wt)
Output units:	Brix / Conc% / g/cm ³ / refractive index unit RIU
Measurement repeatability:	± 0.01 Brix/%wt
Measurement accuracy:	± 0.10 Brix in full range 0....100 Brix, 20....90°C ± 0.03 Brix in range 0....30 Brix.
Speed of response:	1 sec. undamped
Optics:	No mechanical adjustments and digital measurement with 4000 pixel camera, 589 nm wavelength light emitting diode (LED), built-in Pt-1000 temperature sensor (linearization according to IEC 751)
Temperature compensation:	Automatic, instrument individual zero-point calibration
Calibration:	NIST traceable calibration, verification with standard RI liquids
Wetted parts:	AISI316L EN 1.4435 Stainless steel, Sapphire optical window Optional: Alloy 20, Hastelloy C-276/Titanium
Sensor housing:	AISI316 Stainless Steel
Hygienic design:	3-A Sanitary Standard 46-04 symbol authorization and EHEDG (European Hygienic Equipment Design Group) Type EL Class I certified.
Process connection:	1.5" and 2.5" sanitary connection, Varinline® and APV tank bottom flange Optional flow cell housing connections with sanitary or DIN/ANSI flanges
Process pressure:	-1...55 bar, -14.5...800 psi (depending on process connection)
Process temperature:	-15°C (5°F)...100°C (212°F) continuous process temperature Withstands 130 °C Clean-in-Place CIP and Steam-in-Place SIP sequences
Ambient temperature:	-15°C (5°F)...65°C (149°F)
Sensor protection class:	IP67, Nema 4X
Installation:	Indoor/Outdoor, unclassified area
Sensor weight:	1.3 kg, 2.9 lbs

Outputs and connections:

Digital M12 connector:	24VDC power supply, Modbus TCP for user interface and PLC connection, standard 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, standard cable length 10 m(33 ft), max, 200 m(660 ft). Max. load 1000 Ohm
Sensor Power consumption:	max. 2.5W
Options:	Single-piece flow cells for 1" ...4" process lines Modular Connection Unit enclosure with optional display/user interface Independent 7" or 15" Web HMI, full color touch screen interface, measurement window wash with steam or high-pressure water Direct integration with Rockwell's PLC for Ethernet IP communications ATEX/IECEx approval for Ex ec mc IIC t4 Gb/Gc

