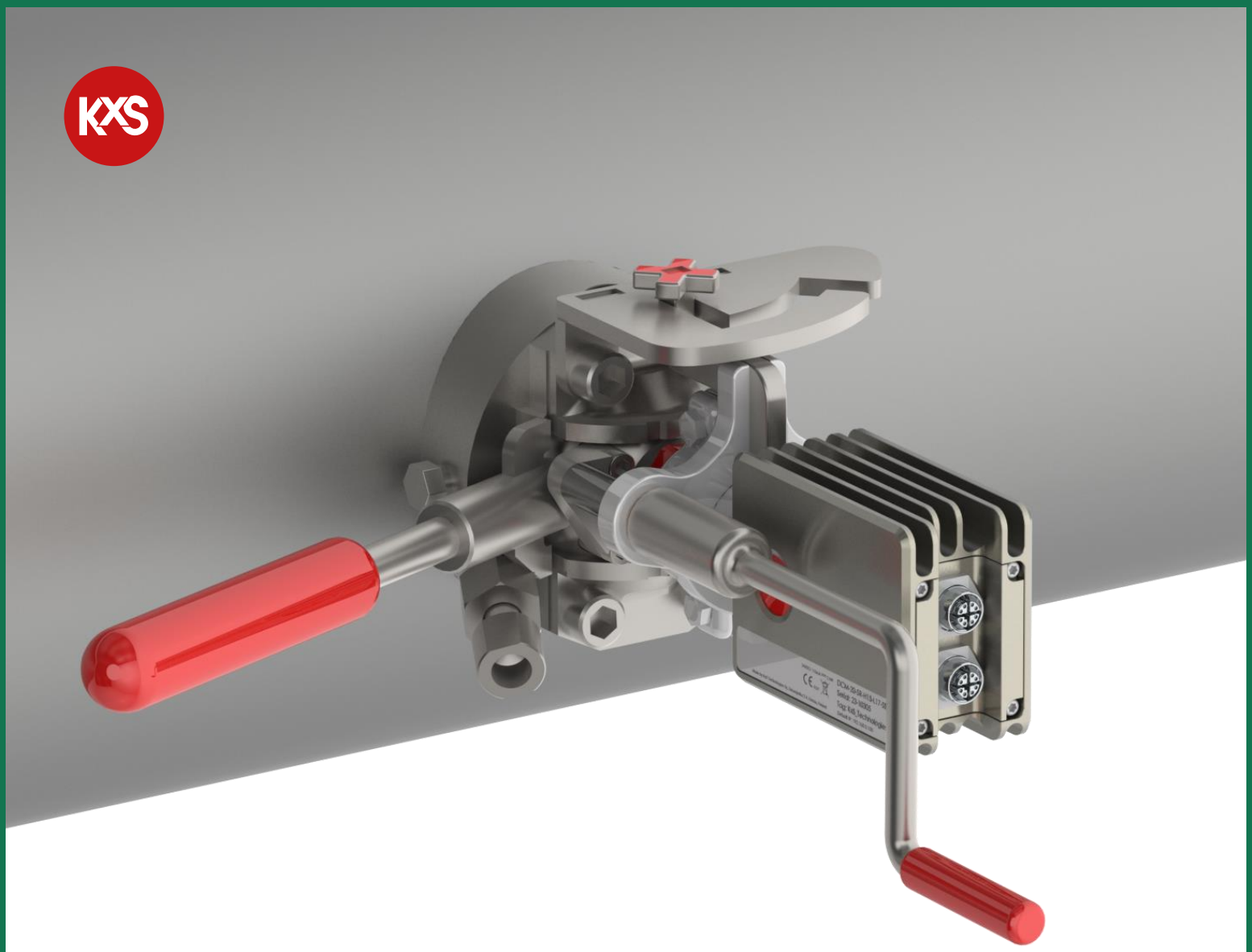

Excellence in
measurement
performance and safety

KxS Retractable refractometer DCM-20 PASVE® for Kraft chemical pulp mills

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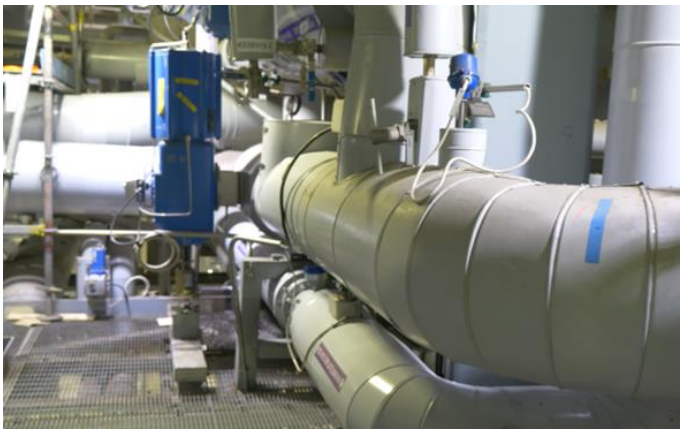
Technology that is built on over 40 years of industry-leading experience

KxS retractable refractometer DCM-20 PASVE® is designed combining KxS's 40 years' extensive experience in the pulp industry.

The retractable refractometer features the proprietary PASVE® isolation valve, an industry standard since the 1980s with over 60,000 units installed worldwide. The DCM-20 PASVE® design provides secure connection to the process and maximum operator safety without process shutdown in inline dry solids content measurements in kraft chemical pulp mill applications.

The DCM-20 PASVE® provides a full measurement range of 0-100 %, 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

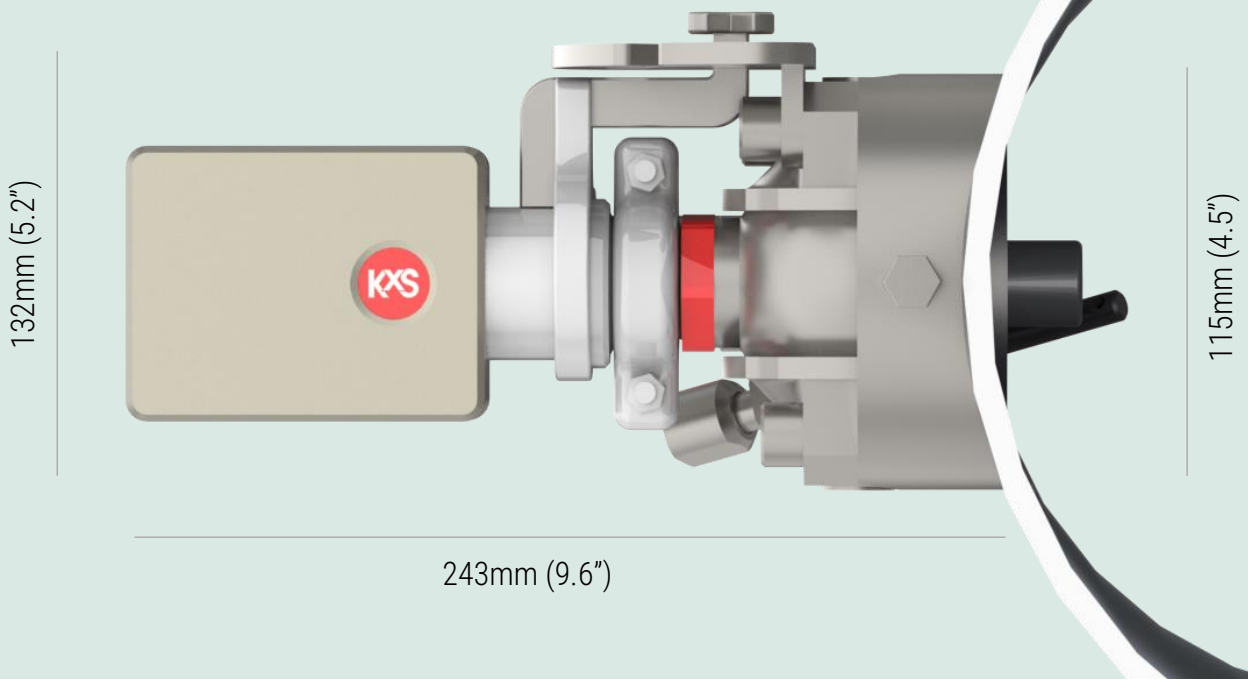
- Weak liquor from pulp washers
- Black liquor to evaporators
- Black liquor to recovery boiler
- Green liquor TTA in causticizing
- Fiber line filtrates in Brown Stock Washing
- Starch in paper sizing
- Waste water

Key features

- Quadruple/Triple safety locking
- Scalable to process line size from 2” and larger
- Industry standard PASVE® with a custom-made isolation valve for KxS Technologies
- Proven PASVE ® isolation valve design: 40 years and 60 000 unit references
- Standard measurement window wash nozzle with steam or high-pressure hot water
- Compact dimensions for installation flexibility and safe operation
- Sensor weight 2.0kg (4.9lbs)

Optimal footprint, easy installation

- Sensor weight 2.0kg (4.9lbs)
- True stand-alone sensor
- Optional Modular Connection Unit and Web HMI

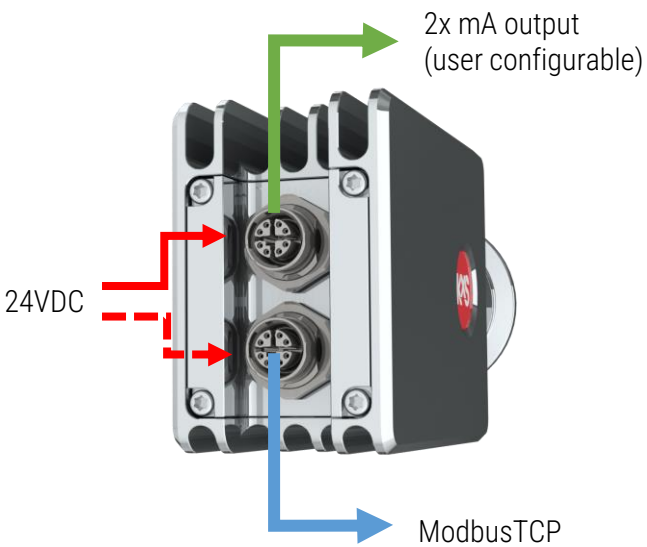


Digital and analog M12 connectors

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

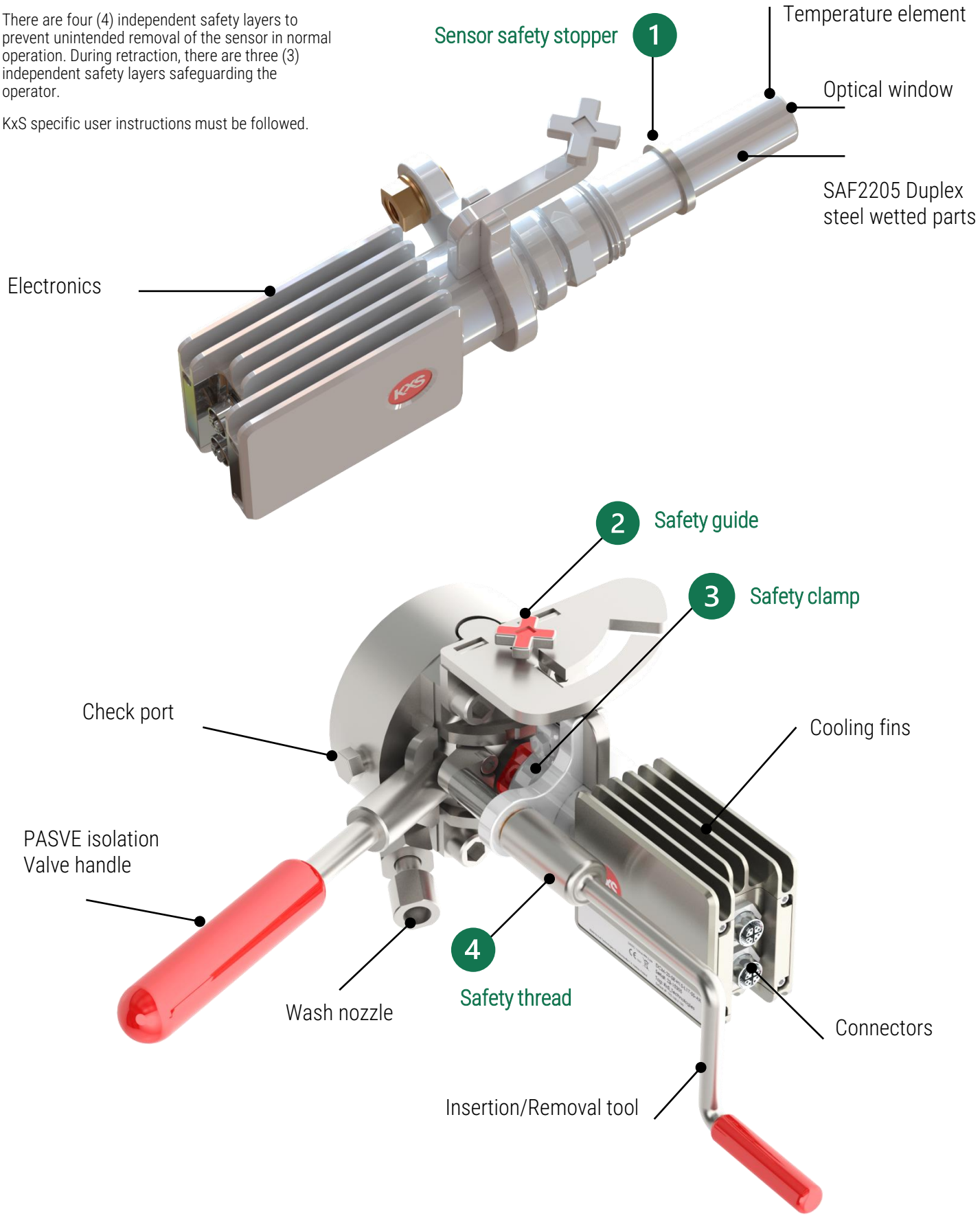


Safety features

Safety is the pivotal feature of the DCM-20 PASVE® retraction unit

There are four (4) independent safety layers to prevent unintended removal of the sensor in normal operation. During retraction, there are three (3) independent safety layers safeguarding the operator.

KxS specific user instructions must be followed.

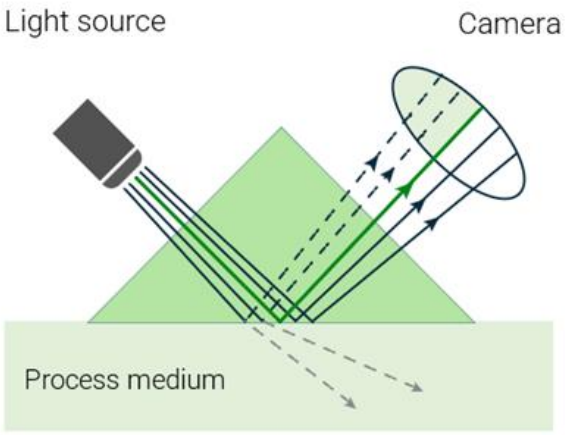


Optical refractive index measurement principle

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

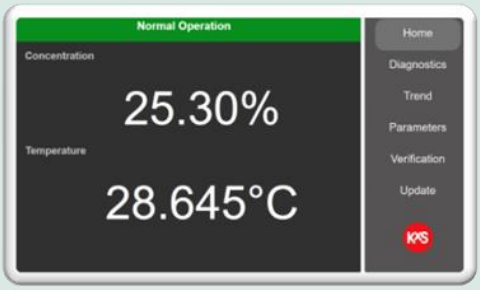
The DCM-20 measures refractive index and displays temperature-compensated concentration units in % by weight, density g/l or any engineering unit.

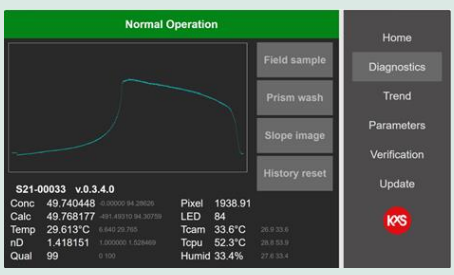
External displays with different sizes are available for connection through the sensor digital port. Computer, tablet or mobile phone with a web browser serves as user interface for accessing sensor diagnostics and settings.

Advanced optical image detection with proprietary pattern recognition.

Modular Connection Unit with wash relays

Web HMI





KxS Retractable refractometer DCM-20 PASVE® specifications

Refractive Index range:	Standard range, nD=1.3200...1.5300 (equals by definition to 0...90%wt) High range, nD=1.35….1.5800 (20…100%wt)
Output units:	Conc% / g/l / refractive index unit RIU
Measurement precision:	± 0.05%wt
Measurement accuracy:	± 0.0002 refractive index unit RIU
Speed of response:	1 sec. undamped
Optics:	No mechanical adjustments and digital measurement with 4000-pixel camera, 589 nm wavelength (sodium D-line), light emitting diode (LED), built-in Pt-1000 temperature sensor (linearization according to IEC 751)
Temperature compensation:	Automatic, individual zero-point calibration
Calibration:	NIST traceable calibration, verification with standard RIU liquids
Wetted parts:	SAF 2205 EN 1.4462 and SAF2507/EN 1.4410 Stainless steel, Sapphire optical window, PTFE gasket Sensor housing: AISI316/EN 1.4404 Stainless Steel
Process connection:	Union-L 1” sensor connection
Process pressure:	40 bar, 580 psi
Process temperature:	-40°C (-40°F)...180°C (356°F) continuous process temperature
Ambient temperature:	-40°C (-40°F)...65°C (149°F)
Sensor protection class:	IP67, Nema 4X
Installation:	Indoor/Outdoor, unclassified area, pipe size larger than 2”/50mm
Sensor weight:	2.0 kg, 4.2 lbs
PASVE isolation valve weight:	6.0 kg, 13.2 lbs

Outputs and connections:

Digital M12 connector:	24VDC power supply, Modbus TCP for user interface and PLC connection, normal 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, normal cable length 10 m(33 ft), max, 200 m(660 ft). Max. load 1000 Ohm
Sensor Power consumption:	max. 2.5W
Options:	Modular Connection Unit enclosure with optional display/user interface Independent 7” or 15” Web HMI, full color touch screen interface, Optícal window wash with steam or high pressure water. Direct integration with Rockwell’s PLC for Ethernet IP communications

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