

# Inline Refractometer





## ► Never requires adjustment

Imagine a sensor which never needs adjusting or readjusting because it operates with its factory settings for its entire service life.



## ► Maintenance-free for 10 years

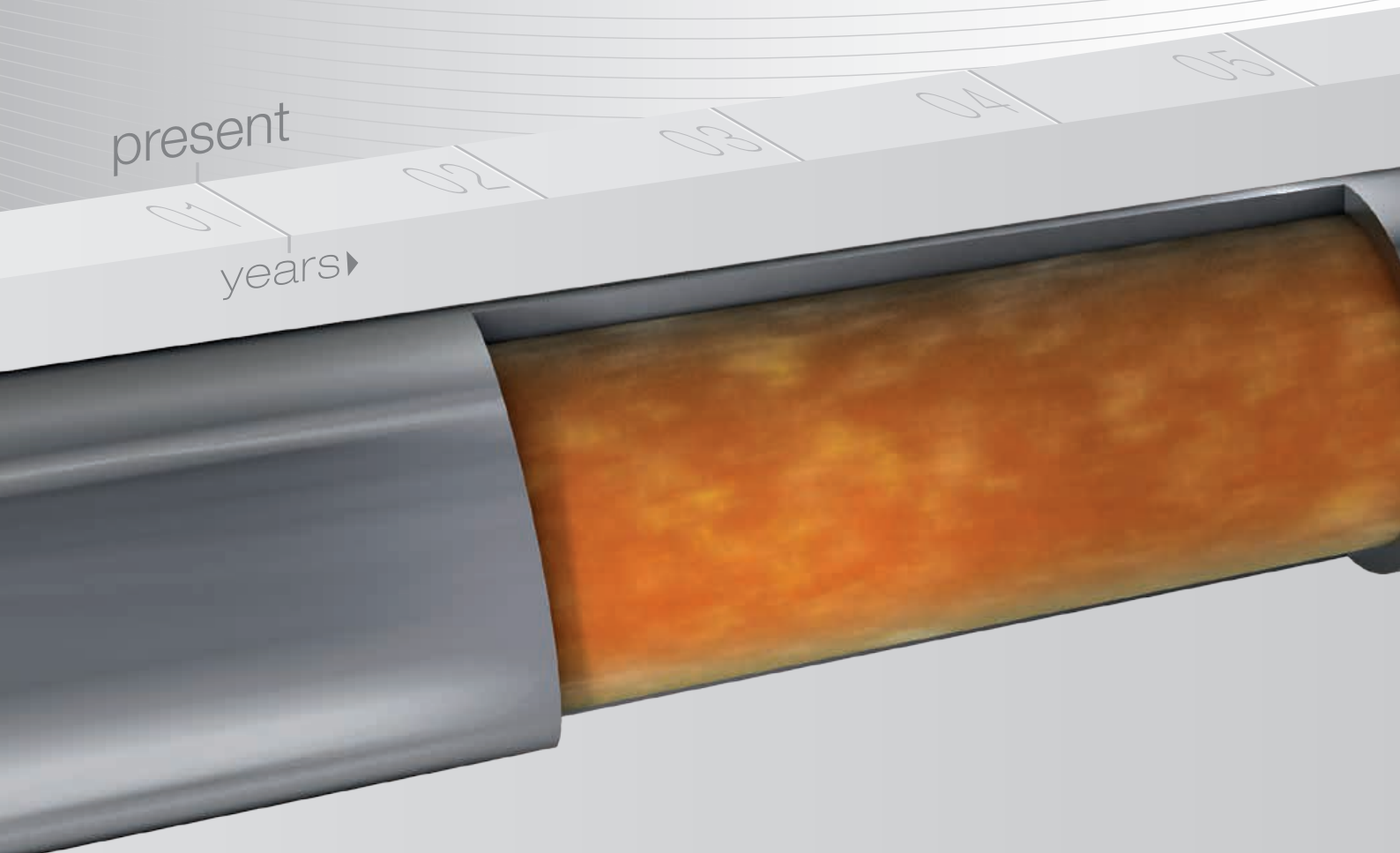
Imagine an inline measuring sensor which delivers concentration values around the clock and requires no maintenance for the first ten years of operation.

### Do you want hassle-free and precise inline measurements?

Choose the L-Rix 510 inline refractometer from Anton Paar. L-Rix 510 delivers refractive index and concentration results with extremely high accuracy across the full measuring range. Once installed, the sensor never needs adjustments and it doesn't need servicing for the first ten years of operation. The result: a lower cost of ownership and exacting accuracy you can rely on for years to come.

present

years ▶





## ► Enjoy high accuracy

The L-Rix 510 Smart Sensor is designed for hygienic applications and measures the concentration of fruit juices, syrups, pharmaceuticals, milk and sugar solutions. It gives you highly accurate results across the full measuring range.



## ➤ Ideal for pharmaceutical, food and beverage applications

L-Rix 510 meets the ASME Bioprocessing Equipment Standard and is EHEDG-certified. This makes it suitable for hygienic applications such as measuring concentrations in pharmaceuticals, food and pulp-containing beverages.

## ➤ Never needs adjusting

L-Rix 510 ships with a preset factory-calibration which it maintains throughout its service life and which never needs adjustment. Its industry-leading soldered optics need no fluid seals and provide years of continuous, flawless operation.

## ➤ Activates quickly after cleaning

L-Rix 510 has full CIP/SIP capability, reactivating quickly after a brief time-out interval for cleaning.

## ➤ Rely on decades of experience

Anton Paar builds on decades of experience in laboratory refractometry to provide an inline sensor which meets your highest requirements. Refractive index and concentration results from L-Rix 510 are directly comparable with the measurements from laboratory refractometers.

## ➤ One sensor does it all

L-Rix 510 gives you high accuracy across the full measuring range. It measures sugar concentrations from 0 to 100 wt. with the same high accuracy throughout the entire measuring continuum. With L-Rix 510 you have all the bases covered.

## ➤ Enjoy the benefits of inline measurement

L-Rix 510 installs inline to directly integrate into the production process and is unaffected by external light that enters through inspection windows. It's built to last with hands-off operation, never requiring adjustment or recalibration.





Ref. Index [nD]:  
**1.33317**  
Temp. 17.82 °C



USER



## ➤ Intelligent measurement

It's in the name: L-Rix 510 is a smart sensor which brings unmatched intelligence to your production monitoring process. Its intuitive touchscreen makes it easy to set up a wide variety of instrument parameters. L-Rix 510 meets NAMUR NE107 standards and provides user-friendly diagnostics based on standard status categories. It interfaces via analog output or fieldbus connections using PROFIBUS DP, Modbus TCP, PROFINET, DeviceNet or EtherNet/IP protocols. Modular and expandable, it can easily be adapted to support any number of changing communications protocols and display types.

### Where would you like to read your measurement results?

The choice is yours – three versions of the L-Rix 510 Smart Sensor are available:

## ➤ For use with mPDS 5

Two L-Rix 510 sensors can be simultaneously connected to Anton Paar's robust mPDS 5 evaluation unit, a powerful system that uses sensor data for comprehensive process control. This enables the transfer of output values from the sensors to mPDS 5 for analysis and graphical trending display.



## ➤ With built-in Operating Terminal (OT)

The L-Rix 510 sensor is available with a built-in operating terminal (L-Rix 510 OT) that displays measurement values and status information, enabling quick and easy readings and assessments. L-Rix 510 OT seamlessly integrates with PLC systems via analog or fieldbus communications.



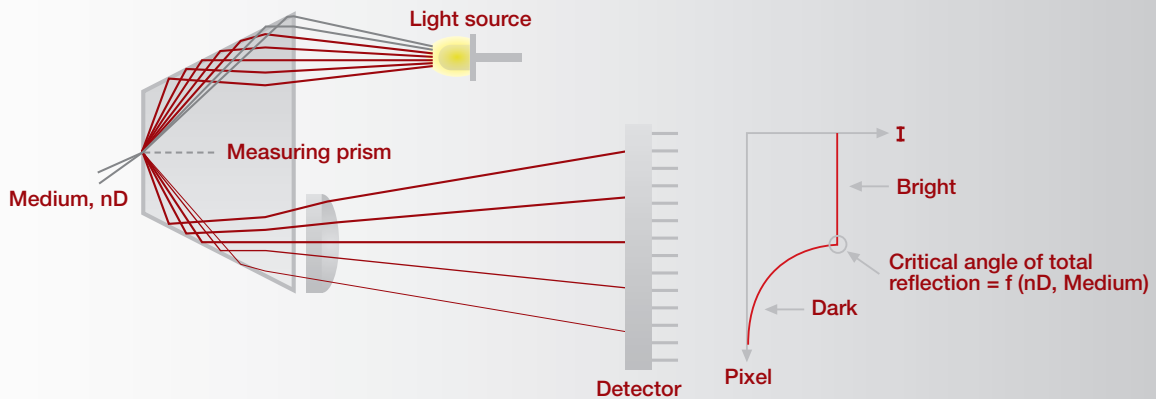
## ➤ With Remote Operating Terminal (ROT)

L-Rix 510 ROT displays measurement values on a remote operating terminal (ROT) that requires no evaluation unit. For convenient access to readings, the ROT can be placed up to 250 meters from the sensor location.



## ► The measurement principle

The L-Rix 510 inline sensor determines the refractive index of liquids based on the critical angle measurement as shown below. The refractive index is a direct measure of the concentration. The measuring prism serves as the interface between L-Rix 510 and the sample liquid. The light source illuminates the boundary layer between the prism and sample liquid. Depending on the angle, some light rays will be totally reflected, others only partially reflected and the majority of the light will be refracted into the liquid. A CMOS array detects the reflected light and measures the critical angle. This angle is used to determine the refractive index (specified as nD) and calculate the concentration.



| Specifications                 |   |
|--------------------------------|---|
| Refractive index               | Range: 1.3100 to 1.5400<br>Accuracy: nD ±0.0002 (equivalent to ± 0.1 % mass)<br>Repeatability: nD ±0.0001 (equivalent to ± 0.05 % mass) |
| Calibration                    | Anton Paar's proprietary calibration routine using high-purity water and commercial nD references                                       |
| Optical material               | Sapphire  |
| Detector                       | CMOS line sensor; 2048 elements   |
| Light source                   | LED 589 nm  |
| Temperature-control method     | Automatic temperature compensation; integrated Pt-100   |
| Ambient temperature range      | -20 °C to 40 °C   |
| Process temperature            | -20 °C to 100 °C<br>CIP/SIP up to 145 °C for 30 minutes   |
| Pressure range absolute        | 100 mbar to 16 bar (10 bar @ > 120 °C)  |
| Weight                         | approx. 7 kg  |
| Process wetted parts, standard | Stainless steel 1.4404 and 1.4542, gold, sapphire   |
| Degree of protection           | IP65; IP67 / NEMA 6P  |
| Approvals and certifications   | EHEDG (European Hygienic Equipment Design Group) certified<br>Hygienic design according to 3-A standard 46-02                           |
| Fluid seals                    | None  |
| Analog/digital communication   |   |
| Analog output                  | 2 x 4 to 20 mA  |
| Digital output                 | 1 x   |
| Digital input                  | 1 x   |
| Fieldbus communication         | PROFIBUS DP, PROFINET, Modbus TCP,<br>EtherNet/IP, DeviceNet  |
| Process connections            | Tuchenhagen VARIVENT® Type N,<br>Tri-Clamp® 3"  |

