

pH



Non-Invasive pH Sensors

Calibration free, ready-to-use & real conditions:

Look into any transparent vessel

- Variety of disposables
- Bags & single-use bioreactors
- Micro-liter to production scale



PreSens
PRECISION SENSING

Non-Invasive pH Sensors



The non-invasive pH sensors are optimized for physiological solutions and culture media. These sensor spots are mounted in transparent vessels made of plastics or glass for example. Plastic vessels with integrated pH sensors are ready-to-use as they are beta-irradiated and calibration-free. The pH is measured in a non-invasive and non-destructive manner from outside.

Features

- On-line monitoring without sampling
- Non-invasive & non-destructive measurement
- Calibration free
- Integrated in beta-irradiated disposables
- Applicable for micro-liter scale to production scale
- Optimized for culture media and physiological solutions



Sensor Spots

Sensor Spots (SP) are the most versatile version of non-invasive pH sensors. They are attached to the inner surface of any transparent vessel.

Examples are

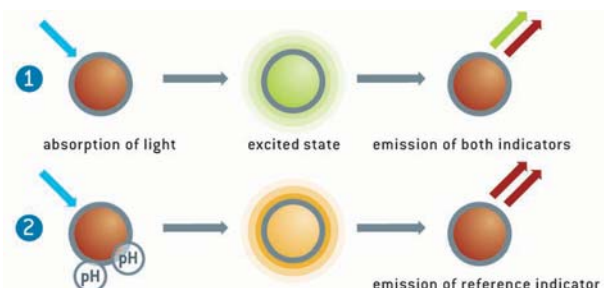
- Shake flasks & spinners
- Tubes & petri dishes
- Cultivation bags

The transmitter with its optical fiber can be fixed opposite the sensor spot using our accessories (see our accessories brochure) which can be adapted for nearly all kinds of vessels.



Flow-Through Cell

The flow-through pH minisensor (FTC) is a miniaturized fiber optic chemical sensor integrated in a flow-through cell. It is connected to the transmitter by an optical fiber. The volume of liquid inside the FTC cell is about 250 micro-litres. The standard flow cell can be easily connected via Luer-Lock adapters to external tubing. The FTC is beta-irradiated and calibration-free.



Measurement Principle

The Patented Dual Lifetime Referenced (DLR) Method

The patented DLR method enables internally-referenced measurements. A combination of different fluorescent dyes detects intensity changes in the time domain. It is essential for the calibration-free measurements and the easy parallelisation of measurement through the identical calibration of large numbers of sensor spots.

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Examples for Applications

Pharma Industry: pH Monitoring in Bags

Bags and single-use bioreactors are in the process of revolutionising the way biopharmaceuticals are manufactured. Our non-invasive pH sensors are the tools to make the cultivation vessels fully disposable. As non-invasive DO sensors are also available, the two key parameters oxygen and pH can be controlled on-line.



On-line Measurement in Perfusion Systems

Beta-irradiated and calibration-free pH and DO flow-through sensors can be integrated into perfusion systems. This allows for the easy control of process parameters in perfusion reactors. Typically Luer connectors are used, though different sizes for larger or smaller flow rates are available.



Bioprocess Development: pH Monitoring in Shaking Flasks

The pH is one of the major issues in the cultivation of cells, yeast or bacteria. Shaking flask cultures are widely applied in academic and industrial bioprocess development. As adequate methods for real monitoring of pH were not available, cumbersome at-line sampling was used. The combination with non-invasive oxygen sensors in shaking flasks provides new insights into metabolic activity and changes in metabolic pathways.



Customized Micro Reactors and Ports

pH and DO sensor spots are mounted in customized micro reactors. They can be delivered beta-irradiated and calibration free. Integration into a variety of polymeric surfaces is possible. Immobilisation on ports which are integrated into the reactors at the customer's facilities is a second application.

Is your application missing?
Contact us and we will find your
customized solution!

Specifications*	
Measuring range	5.5 – 8.5 pH
Response time (t90) at 25 °C	30 sec
Resolution at pH = 7	± 0.005 pH
Accuracy at pH = 7	± 0.05 sensor spot calibration ± 0.10 sensor batch calibration
Drift at pH = 7	> 0.005 pH per day (sampling interval of 1 min.)
Temperature range	from 5 °C to 50 °C
Properties*	
Compatibility	aqueous solutions, ethanol, methanol (max. 10 % V/V), pH 2 – 10
Cross-sensitivity	reduced to ionic strength (salinity); a high concentration of small fluorescent molecules in the visible range can interfere
Storage stability	18 months provided the sensor is stored in the dark
Calibration	pH spots are pre-calibrated; re-calibration is possible
Sterilization	pH spots are delivered either beta-irradiated or untreated; re-sterilization is not recommended

* provided pH spots are used without further handling in physiological solutions

Transmitters & Accessories



pH-1 mini

Single-channel, temperature compensated pH meter for use with non-invasive pH sensors.



Coaster CFG

The coaster CFG is used for shake flasks.



pH-4 mini

4-channel pH meter for use with non-invasive pH sensors.



SOA adapter

The stick-on adapter SOA is used for transparent vessels with planar surface.



pH-10 mini

10-channel pH meter for use with non-invasive pH sensors.



ARC adapter

The adapter for round containments ARC is used for spinner flasks or similar vessels.

Technical data can change without prior notice.

Bring to light what's inside. Ask our experts:

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