METERS

O₂ ℃

Fibox 4 trace

The Fibox 4 trace is a stand-alone oxygen meter designed for easy handheld use. Its robust housing is splash-proof, and the controls were developed to be operated even while working under harsh conditions with heavy gloves on. The oxygen meter can adapt to dry or humid environmental conditions, and is temperature compensated. Additionally, it has automatic compensation for pressure and salinity. Fibox 4 trace can be operated with sensors type PSt3 (detection limit 15 ppb dissolved oxygen, 0 – 100 % oxygen), type PSt6 for the trace oxygen range (detection limit 1 ppb dissolved oxygen, 0 – 5 % oxygen), and also with type PSt9 for ultra-low oxygen measurements (detection limit 0.5 ppmv, 0 - 200 ppmv gaseous oxygen). With its integrated barcode reader the oxygen meter can identify and calibrate a sensor just in one scan. Its sensor management system allows to store data of up to 100 sensors. Fibox 4 trace has 16 GB internal memory which allows prolonged computer-independent operation. It is delivered with the PreSens Datamanagement software allowing data transfer to a PC for further analysis.

- Worry-free measurement due to unique sensor ID
- Measure from 1 ppb to 100 % oxygen with one device
- Easy calibration via barcode scan
- Compensation of temperature, pressure and salinity
- 16 GB internal memory
- Energy management for long term measurements
- Optional database supported software offers simultaneous control of multiple devices

TECHNICAL

Specifications	
Oxygen sensors	PSt3, PSt6, and PSt9 (optical SMA connector)
Temperature sensor	Pt100 temperature connector (sensor not included)
Temperature performance	from 0 °C to + 50 °C, resolution ± 0.1 °C
Power supply	4 AA nickel-metal hybrid cells (min. 2200 mAh) use only AC adapter (5 VDC / min. 1 A) supplied for recharging
Max. battery operating time	16 hrs. (3 sec. interval measurement, default LED intensity, display backlight OFF, at room temperature)
Temperature: operating / storage	from 0 °C to + 50 °C / from - 20 °C to + 70 °C
Relative humidity	up to 80 % (non condensing)
Dimensions	37 mm x 180 mm x 119 mm
Weight	0.65 kg (w/o batteries & protection kit) 0.78 kg (with batteries & protection kit)
Digital interface	USB interface (cable included)
Display	3.5 " color TFT, 320 x 240 pixel
Internal memory	16 GB memory (~ 40,000,000 data sets) export via included software

ACCESSORIES

Polymer Optical Fiber POF

A polymer optical fiber (POF) is needed to transfer excitation light to the sensor and the sensor response back to the meter. We offer different versions for different meters depending on their optical connector type. A POF enables non-invasive and non-destructive measurements to be made from the outside through the wall of a transparent or slightly colored container. The POF with SMA connector is compatible with meters of the Fibox, OXY-1 SMA, OXY-1 WM, OXY mini and pH-1 SMA series, as well as the CO2-1 SMA. The POF with ST connector is compatible with meters of the Microx 4 and OXY-1 ST series. Different standard lengths are offered, e. g. 2.5 m, and fibers with connectors on one or both ends are available, depending on your adapter or sensor application.

- Enables contactless measurement
- Versatile light guide
- Different lengths available

TECHNICAL

Specifications	SMA	ST
Dimensions	Optical diameter: 2 mm Outer diameter (incl. black cladding): approx. 2.7 mm Min. bending radius: 40 mm	Optical diameter: 1 mm Outer diameter (incl. black cladding): 2.2 mm Min. bending radius: 17 mm
Connector type	SMA conncetors on one or both ends available for use with SOA or ARC	ST connectors on one or both ends available for use with SOA or ARC-1 ST
Length of fiber	Available standard lengths 1.0, 2.5 and 5.0 m; for lengths of more than 5 m, please contact our service team	
Compatibility	All devices with SMA connector, e.g. Fibox, OXY-1 SMA, pH mini series, pCO$_2$ mini	All devices with ST connector, e.g. Microx 4 or OXY-1 ST series

SENSORS

O₂ Oxygen Sensor Spot SP-PSt6-NAU

Sensor spots are the most versatile version of non-invasive optical oxygen sensors. They can be attached to the inner surface of any transparent glass or plastic vessel like e. g. used for packaging. Oxygen is measured contactless through the transparent vessel wall. The SP-PSt6-NAU has a measurement range of 0 – 5 % oxygen, dissolved or in the gas phase. The oxygen sensitive coating is immobilized on a 125 µm flexible transparent polyester foil, which does not stand autoclaving.

• Non-invasive measurements through the vessel wall
• No consumption of oxygen
• Signal independent of flow velocity
• Measures oxygen in liquids as well as in gas phase

TECHNICAL

Specifications	Gaseous & Dissolved O_2	Dissolved O_2
Measurement range	$0 - 5$ % O_2 $0 - 41.4$ hPa	$0 - 2$ mg/L $0 - 56.9$ µmol/L
Limit of detection	0.002 % oxygen	1 ppb
Resolution	$\pm$ 0.0007 % O_2 at 0.002 % O_2 $\pm$ 0.0015 % O_2 at 0.2 % O_2 $\pm$ 0.007 hPa at 0.023 hPa $\pm$ 0.015 hPa at 2.0 hPa	$\pm$ 0.0003 mg/L at 0.001 mg/L $\pm$ 0.0006 mg/L at 0.09 mg/L $\pm$ 0.010 µmol/L at 0.03µmol/L $\pm$ 0.020 µmol/L at 2.8 µmol/L
Accuracy*	$\pm$ 1 ppb or $\pm$ 3 % of the respective concentration; whichever is higher	
Drift at 0 % oxygen	< 2 ppb within 30 days (sampling interval of 1 min.)	
Measurement temperature range	from 0 to + 50 °C	
Response time (t_{90})	< 6 sec.	< 40 sec.
Properties		
Compatibility	Aqueous solutions, ethanol, methanol	
No cross-sensitivity	pH 1 – 14 CO_2, H_2S, SO_2 Ionic species	
Cross-sensitivity	Organic solvents, such as acetone, toluene, chloroform or methylene chloride Chlorine gas	
Sterilization procedure	Ethylene oxide (EtO) Gamma irradiation	
Cleaning procedure	Cleaning in place (CIP, 2 % NaOH, + 80 °C, + 176 °F) 3 % H_2O_2 Acidic agents (HCl, H_2SO_4), max. 4 % – 5 % Ethanol Aqueous solutions	
Calibration	Two-point calibration with oxygen-free environment (nitrogen, sodium sulfite) and a second calibration value optimally between 1 % and 2 % oxygen	
Storage stability	60 months provided the sensor material is stored in the dark	

*after two-point calibration as described in the manual

ACCESSORIES

O₂ Permeation Cell OTR-PSt3 / -PSt6 / -PSt9

The measurement cell made of stainless steel is designed for improved leak tightness. The cell is divided into two chambers, each with two gas connectors. The upper chamber comprises an optical window, where the optical oxygen sensor is integrated. Depending on the investigated material film an OTR-PSt3 with a wide range oxygen sensor, OTR-PSt6 for trace oxygen measurements, or the OTR-PSt9 for ultra-trace measurements and assessment of high-barrier materials can be used. The test material is fixed between those two chambers. Then both chambers can be flushed independently with gas or liquid. In the upper chamber an oxygen-free environment is created while the lower chamber is filled with oxygen-rich medium. This way the oxygen transmission rate through the material can be detected with the oxygen sensor in the top chamber.

- OTR measurements in gas & liquids
- Investigate low barrier materials with OTR-PSt3
- OTR-PSt6 sensitive down to 1 ppb dissolved oxygen
- Ultra-low detection limit of 0.5 ppm gaseous oxygen with OTR-PSt9 – for high barrier materials

TECHNICAL

Specifications	
Oxygen sensors	SP-PSt3, SP-PSt6, or SP-PSt9
Measurement range	PSt3: > 100 cm^3 (STP)/(m^2 d bar) PSt6: 10^{-2} to 10^7 cm^3 (STP)/(m^2 d bar) PSt9: 10^{-3} to 100 cm^3 (STP)/(m^2 d bar)
Dimensions	Outer diameter approx. 118 mm Inner diameter approx. 90 mm
Weight	Approx. 2.9 kg
Gas volume in the upper chamber	116 cm^3
Permeation surface	68.1 cm^2
Material	Stainless steel
Gas connectors	4 swagelok valves: NPT-external thread 1/8 inch

GET IN CONTACT

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