# Technical Documentation

## Fibox 4 FTC-PStx

### 1. Overview

The Fibox 4 FTC-PStx is a completely stand-alone, portable fiber optic oxygen meter with integrated flow-through cell. The 6 mm steel tube of the integrated flow-through measurement cell can easily be connected to perfused systems and different sampling ports of the process line. Gases and liquids can be pumped through the Fibox 4 FTC-PStx enabling easy control of oxygen at different stages of production processes. Oxygen measurements are temperature compensated using an integrated Pt100 temperature sensor. The oxygen meter with integrated flow-through cell is available for wide, trace and ultra-trace measurement ranges. Fibox 4 FTC-PStx is delivered pre-calibrated so measurements can be started right away. This ensures a worry-free workflow while conducting most accurate oxygen measurements.


| Device | Measurement Range |
|---|---|
| Fibox 4 FTC-PSt3 | Wide range: 0 – 100 % $O_2$, detection limit 15 ppb |
| Fibox 4 FTC-PSt6 | Trace range: 0 – 5 % $O_2$, detection limit 1 ppb |
| Fibox 4 FTC-PSt9 | Ultra-trace range: 0 – 200 ppmv gaseous $O_2$, detection limit 0.5 ppm |

**Features:**

- Pre-calibrated, ready-to-use
- Temperature compensation with integrated Pt100 temperature sensor
- Measures dissolved and gaseous $O_2$ (PSt9 gaseous only)
- Portable, stand-alone device with display, battery and data logger
- Splash proof, robust housing
- Compatible with PreSens Measurement Studio 2 (PMS2)

## 2. Sensor Characteristics

| | PSt3 | | PSt6 | | PSt9 |
|---|---|---|---|---|---|
| **Specifications** | **Gaseous & Dissolved $O_2$** | **Dissolved $O_2$** | **Gaseous & Dissolved $O_2$** | **Dissolved $O_2$** | **Gaseous $O_2$** |
| Measurement range | 0 – 100 % $O_2$<br>0 – 1000 hPa | 0 – 45 mg/L<br>0 – 1400 µmol/L | 0 – 4.2 % $O_2$<br>0 – 41.4 µmol/L | 0 – 1.8 mg/L<br>0 – 56.9 µmol/L | 0 – 200 ppm |
| Limit of detection | 0.03 % $O_2$ | 15 ppb | 0.002 % $O_2$ | 1 ppb | 0.5 ppm |
| Resolution | ± 0.01 % $O_2$ at 0.21 % $O_2$<br>± 0.1 % $O_2$ at 20.9 % $O_2$<br>± 0.1 hPa at 2 hPa<br>± 1 hPa at 207 hPa | ± 0.14 µmol/L at 2.83 µmol/L<br>± 1.4 µmol/L at 238.1 µmol/L | ± 0.0007 % $O_2$ at 0.002 % $O_2$<br>± 0.0015 % $O_2$ at 0.2 % $O_2$<br>± 0.007 hPa at 0.023 hPa<br>± 0.015 hPa at 2.0 hPa | ± 0.010 µmol/L at 0.03 µmol/L<br>± 0.020 µmol/L at 2.8 µmol/L | 10 ± 0.5 ppm<br>100 ± 0.8 ppm<br>200 ± 1.5 ppm |
| Accuracy | ± 0.4 % $O_2$ at 20.9 % $O_2$<br>± 0.05 % $O_2$ at 0.2 % $O_2$ | | ± 1 ppb or ± 3 %; whichever is higher | | ± 2 ppm or ± 5 %; whichever is higher |
| Measurement temperature range | 0 to +50 °C | | 0 to +50 °C | | 0 to +40 °C |
| Response time ($t_{90}$) | < 6 sec. | < 40 sec. | < 6 sec. | < 40 sec. | < 3 sec. |
| **Properties** | | | | | |
| Compatibility | Aqueous solutions, ethanol, methanol | | | | Gas phase only |
| No cross-sensitivity with | pH 1 – 14<br>$CO_2$, $H_2S$, $SO_2$<br>Ionic species | | | | $CO_2$, $SO_2$ |
| Cross-sensitivity | Organic solvents, such as acetone, toluene, chloroform or methylene chloride<br>Chlorine gas | | | | Organic vapor, Chlorine gas |
| Sterilization procedure | Ethylene oxide (EtO) | | | | - |
| Cleaning procedure | 3 % $H_2O_2$<br>Acidic agents (HCl, $H_2SO_4$), max. 4 – 5 % at room temperature | | | | - |
| Calibration | Two-point calibration with oxygen-free environment (nitrogen, sodium sulfite) and air-saturated environment | | Two-point calibration in oxygen-free environment (nitrogen) and a second calibration value optimally between 1 and 2 % oxygen | | Two-point calibration in oxygen-free environment (nitrogen 6.0) and a second calibration value optimally between 100 and 200 ppm gaseous oxygen |
| Storage Stability | 2 years provided the sensor material is stored in the dark (-10 to +60 °C) | | | | |