xylem
Let's Solve Water

Tech note
O2 measurement

Measure O2: optical or amperometric?

HERE YOU WILL FIND THE RIGHT SOLUTION FOR YOUR APPLICATION

Optical and amperometric (electrochemical) sensors exist for the continuous measurement of dissolved oxygen or oxygen saturation. The selection depends essentially on the expected measuring range of the application and the maintenance effort.

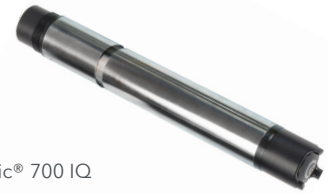
Product selection

Application	Wastewater, surface waters, aqua-culture, up to 20 mg/L or 200 %	Processes up to 60 mg/L or 600 %	Trace measurement, e.g. boiler feed water
Product	**FDO® 700 IQ** alternative FDO® 701 IQ for response time < 60 seconds	**TriOxmatic® 700 IQ** alternative TriOxmatic® 701 IQ for response time < 30 seconds	**TriOxmatic® 702 IQ**

The **FDO® 700 IQ** optical sensor is usually the first choice. The offered measuring range is sufficient and the effort for calibration and maintenance is zero or low.
Its response time is not a disadvantage, on the contrary:
In a "slow" process, such as nitrification, too high a sensitivity to small fluctuations in O2 concentration is a disadvantage, because it interferes too quickly with the regulation/control. If a faster response time is required, the **FDO® 701 IQ** version is the alternative.

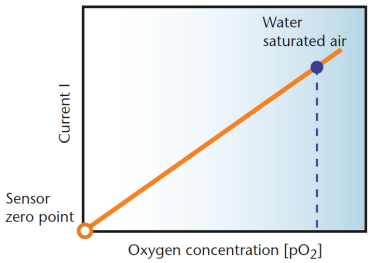

FDO® 700 IQ

For **TriOxmatic® 700 IQ** and **701 IQ**, argumentation regarding the response time is analogous. The clear difference to the optical sensors lies in the measuring range.
The **TriOxmatic® 702 IQ** version is ideal for trace measurements due to its high accuracy with a small measuring range.


TriOxmatic® 700 IQ

WTW
a xylem brand

Product comparison

	Optical sensor	Amperometric Sensor
Measuring priciple	With the optical method a fluorescent dye is stimulated in the membrane of the FDO® 700 IQ by a short wave length lightsource. By falling back into the passive state, long wave light is emitted, which is recorded as a measurement signal. If oxygen contacts the dye by diffusing through the membrane the period of back scattering light is shortened according to the oxygen concentration of the sample. In principle the measurement of the fluorescent signal comes back to a highly precise time measurement. D.O. sensors of the first generation had a handful of technical issues to cope with: • Sensor drift through watering impact of the membrane • Wearing of cye layer in the sensor through highly energetic blue light • Sensitivity of sensor towards air bubbles Through consequent development work the difficulties appearing with the first generation sensors could successfully be eliminated with the second generation models.	With the electrochemical method the O2 diffuses through the membrane of the TriOxmatic® sensor. The oxygen is transformed in a chemical reaction by using an electrolyte; thereby a current can be measured. The electrical current correlates to the oxygen concentration. Thus, the oxygen concentration can be displayed directly via the current consumption. For delivering precise results, the sensor will require the following conditions: • Flow • Continuous exchange of electrolytes • Clean membrane Linear dependancy of current towards the O2 concentration: 
Products	• FDO® 700 IQ • FDO® 701 IQ	• TriOxmatic® 700 IQ • TriOxmatic® 701 IQ • TriOxmatic® 702 IQ
Maintenance	• Cap replacement every 3-5 years • Cleaning as required with tab water and lint-free cloth	• Change of membrane and electrolyte twice a year or as required • Cleaning as required
Calibration	Calibration free	Calibration twice a year

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Do you have further questions?
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