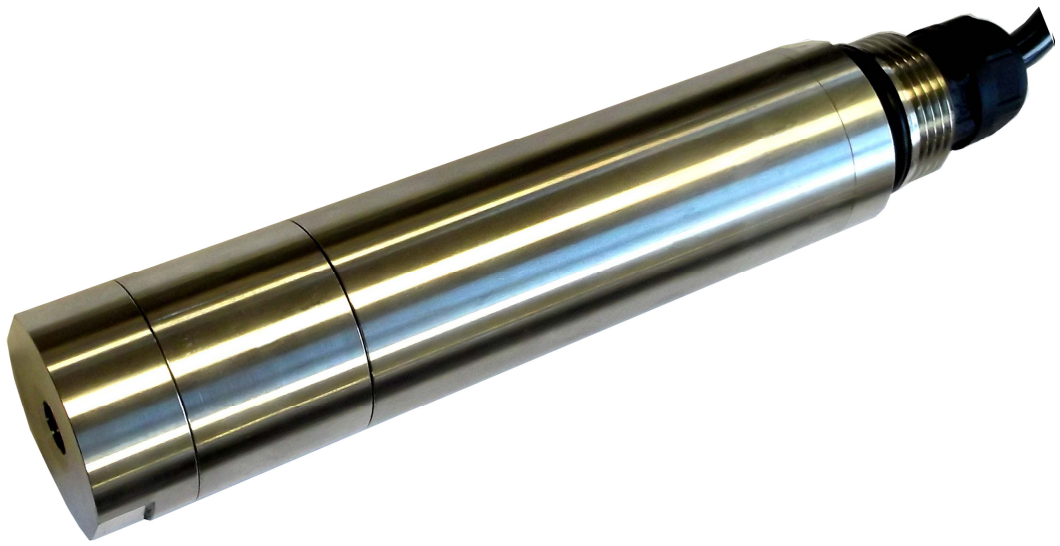
Chemitec

S423/C/OPT
SONDA OSSIGENO OTTICA
OPTICAL OXYGEN PROBE



MANUALE TECNICO / TECHNICAL MANUAL

P/N: .....

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Techingenium

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The **S423/C/OPT probe** is used for the optical measure of oxygen in pure and process waters. The principle of measurement is based on the effect of dynamic luminescence quenching by molecular oxygen.

Applications

- Measure of oxygen in wastewater
- Measure of oxygen in primary, industrial, recirculating water

Features and benefits

- Reliable concentration measurement using optical measuring process
- Dynamic luminescence measuring method
- AISI 316 or Black rigid PVC sensor body
- Interchangeable cap for luminophore's replacement
- No mechanically moving parts
- Immediate installation and easy manteinance
- Ability to set salinity and barometric pressure for the compensation of the oxygen value

Operating principle

The collision between the luminophore in its excited state and the quencher (oxygen) results in radiationless deactivation and is called collisional or dynamic quenching. After collision, energy transfer takes place from the excited indicator molecule to oxygen which consequently is transferred from its ground state (triplet state) to its excited singlet state. As a result, the indicator molecule does not emit luminescence and the measurable luminescence signal decreases.
A relation exists between the oxygen concentration in the sample and the luminescence intensity as well as the luminescence lifetime which is described in the Stern-Volmer-equation (**1**). Here, τ_0 and τ are the luminescence decay times in absence and presence of oxygen (I_0 and I are the respective luminescence intensities), $[O_2]$ the oxygen concentration and KSV the overall quenching constant.

Principle of dynamic luminescence method:

$$I_0/I = T_0/T = 1+Ksv*O_2$$

$$I=f(O_2) \qquad T=f(O_2)$$

Where:

I: *Luminescence intensity in presence of oxygen*

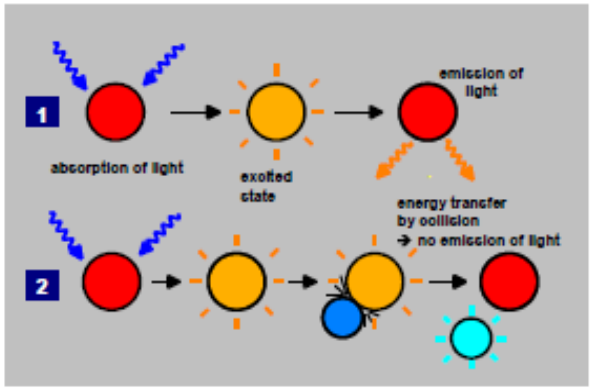
I_0: *Luminescence intensity in absence of oxygen*

τ: *Luminescence decay time in presence of oxygen*

τ_0: *Luminescence decay time in absence of oxygen*

KSV: *Stern-Volmer constant (quantifies the quenching efficiency and therefore the sensitivity of the sensor)*

$[O_2]$: *Oxygen content*



Principle of dynamic quenching of luminescence by molecular oxygen

(1) Luminescence process in absence of oxygen
(2) Deactivation of the luminescent indicator molecule by molecular oxygen

Composition of the supply

1

2

The supply consists of a single package containing the following parts:

1. 1 S423/C/OPT Optical Oxygen Probe with a 10 m cable
2. 1 Technical Manual for instructions

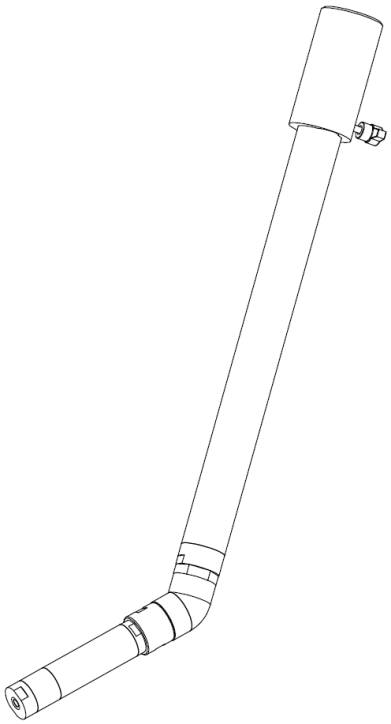
Electric installation

Turn off the instrument, connect the cables of the probe to the terminal block of the meter. Please observe the colors shown on the sticker located under the electronic cover of the instrument or refer to the chart below.
The measuring sensor is supplied with 10m cable kit, for connections at greater distances do not exceed 1000m cable. Do not run the cable near high power cables or inverter in order to avoid problems of noise on the measurement.

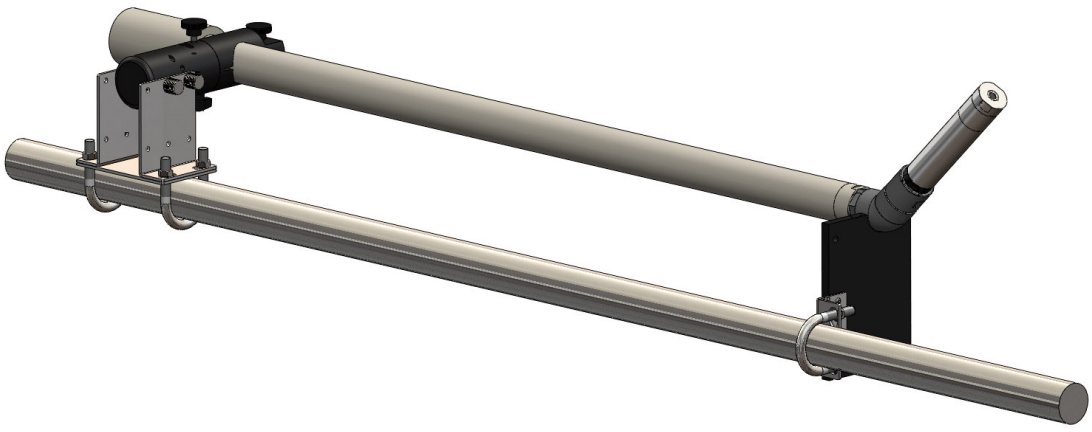
RED	+12V …24V
BLACK	GROUND
YELLOW	A+ RS485
GREEN	B- RS485

Hydraulic installation

The S423/C/OPT probe is supplied with a circular ip67connector for the connection to the 42 and 50 series units, and can be provided with the appropriate probe holder S315 / O, available in various tube lengths.



Together with the probe holder is provided a device for positioning the probe at 45°.
It is also possible to equip the assembly with a swivel system that provides the ability to get almost any configuration, as well as easier cleaning and maintenance of the system (see figure below).



Calibration of the sensor

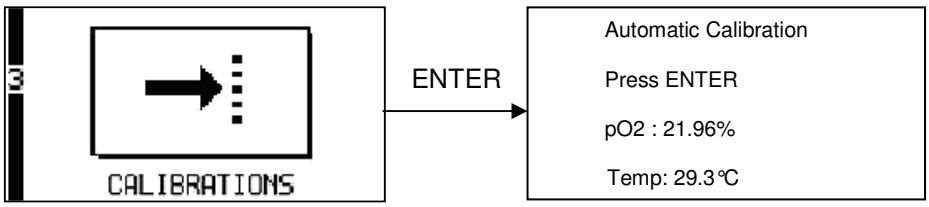
This program step allows the calibration of the oxygen sensor.
The calibration must necessarily be carried out:

- Every time the sensor cap 9400410134 or 9400410135 is replaced
- When starting after a long period of non-use
- Whenever discrepancies occur, according to a known value

For proper operation it is necessary, in addition to the cases mentioned above, to verify calibration or recalibrate the probe periodically.
The frequency of this operation will be determined by the user, taking into account the type of application and the type of electrode used.

NOTE

To perform a calibration in oxygen saturated solution immerse the probe in a container of clean water and wait 10 minutes for stabilization. Then continue with the Auto Calibration of the sensor



Wait for the values (O_2 and °C) to stabilize, then press ENTER; if the procedure is successful the display will show "Calibration OK"

If "Faulty Probe" is displayed, we recommend:

- To check the removable protection cap
- To assure the integrity of the membrane placed on the top of the probe
- To check the cable integrity, the correct connection to the instrument and on the probe.

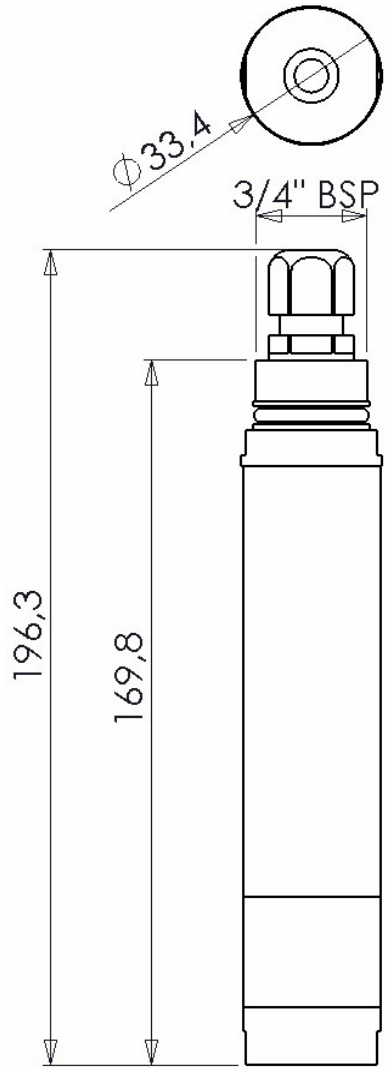
Precautions and warnings

Remove the black rubber protection cap from the probe before installing.
Warning: it is strictly recommended not to remove the interchangeable cap from the probe unless there is a malfunction of the probe itself due to the luminophore and is absolutely necessary to replace the glass containing the polymer (see figure below):

Furthermore, it is necessary to pay particular attention to the substances with which the part of the probe deputed to measurement can come into contact: for example, organic acids such as acetic acid does not affect the sensor. However, avoid the exposure of the luminophore in organic solvents such as acetone, chloroform, benzene and toluene.Chlorine gas can even destroy the sensor or otherwise affect the measurements.
Pay special attention to the formation of air bubbles: these may interfere with the oxygen measure. To overcome this problem, use the kit of inclination to 45° of the probe, so that the bubbles can slip upward.

S423/C/OPT Optical Oxygen Probe

Data Sheet

TECHNICAL DATA	DIMENSIONS
Materials : — AISI 316 Body (PVC Body optional) — Special Glass Optics — NBR and Sylicon O-Rings	
Thread: 3/4" BSP	
Measuring ranges: 0,00 to 20,00 mg/L 0-200%	
Measuring method: Optical measure by luminescence	
Accuracy: +/-0,1mg/L or +/-1 %	
Response: 90% of the value in less than 60 seconds	
Maximum refreshing time: < 1 second	
WorkingTemperature: -10÷60 °C	
Max Working Pressure: 5 bar	
Maximum absorption: 2W	
Mechanical Protection: IP68 Sensor+cable	
Cable: 10m integral	
Power Supply: 12…24Vdc	
Signal interface: RS-485 Modbus RTU Protocol	
Water move: No necessary move	
Compensation of temperature: Via internal NTC	
Luminophore diameter: 10mm	
Connector IP67: yes	

Order codes

9700830067	S423/C/OPT Optical Oxygen and Temperature Probe
9700831067	S423/C/OPT PVC Optical Oxygen and Temperature Probe
9700832067	S423/C/OPT 4-20mA Optical Oxygen and Temperature Probe
9700833067	S423/C/OPT 4-20mA PVC Optical Oxygen and Temperature Probe
9400410134	Luminescent membrane with AISI316 support for S423/C/OPT
9400410135	Luminescent membrane with PVC support for S423/C/OPT

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