

# ESK012, S423/C/OPT

## Optical probe of dissolved oxygen and water temperature



- *Luminescent optical method for measuring the concentration of dissolved oxygen*
- *Accurate measurement without the need for regular calibration*
- *When measuring, the sensor does not consume oxygen and therefore does not require the flow of water around the sensor*
- *The ESK012 rod probe and the suspended probe use the same S423/C/OPT sensor*
- *Quick installation of the ESK012 rod probe in the correct measuring position using the adjustable stainless steel holder DE2*
- *Suspended version of the probe with S423/C/OPT sensor and 10 m long cable*
- *RS485 communication interface under MODBUS RTU protocol compatible with FIEDLER units*
- *Internal sensor for measuring water temperature*
- *Supply voltage in a wide range from 10 to 24 VDC*

### Features and benefits

- Robust mechanical design of the ESK012 rod probe - stainless steel tube with a diameter of 40 mm and a length of 1750 mm (probe ESK012 from 500 to 4000 mm can be supplied on request).
- The suspended design of the S423/C/OPT probe with a 10 m long cable allows the probe to be hung behind this cable. The cable is terminated with a 5-pin M12 connector with IP67 protection.
- The probe are placed in the measured medium at an inclination (30 to 45 degrees) to prevent the accumulation of gases on the surface of the luminophore measuring head.
- The luminescent method of measurement does not consume oxygen during the measurement and therefore the probe does not require the flow of the measured medium around the measuring head.
- Unlike the commonly used Clark electrochemical probes, the optical probe does not need to change the electrolyte and there is no gradual decay of the anode due to ongoing chemical reactions.
- The probe does not require calibration by the user - automatic autocalibration takes place during each measurement.
- After 2-3 years of operation, the luminophores in the exchangeable measuring head may be depleted. By fitting a new measuring head, the correct function of the sensor is restored. When replacing the measuring head, it is necessary to calibrate the sensor.

### Application

The S423/C/OPT probe is used for the optical measure of oxygen in pure and process waters.

- Wastewater treatment plants
- Measure of oxygen in primary, industrial, recirculating water
- Fishing

### Operating principle

The principle of measurement is based on the effect of dynamic luminescence quenching by molecular oxygen.

The S423/C/OPT sensor works on the principle of measuring the intensity of radiation on the luminescent layer of the measuring head caused by a short light pulse of high energy generated by the sensor electronics. Oxygen atoms absorb the energy of the pulse, which would otherwise be emitted in the form of photons by the luminophore atoms, and therefore the concentration of dissolved oxygen in the measured solution is inversely proportional to the measured intensity of the luminescent radiation.

The sensor also regularly measures the intensity of the low-energy reflected light luminophore (which does not cause luminescence) and uses this measured value during the sensor's own autocalibration.

Unlike Clark-type electrochemical probes, optical probes do not require regular calibrations, do not need to change electrolyte or clean the chemically worn anode.

## Rod probe ESKO12

The rod probe is supplied including a 3 m long connecting cable, which is terminated on the probe side with a 7-pin connector and on the other side has loose wires.



- 1 +Unap (red)
- 2 NC
- 3 NC
- 4 NC
- 5 RS485-B (green)
- 6 RS485-A (yellow)
- 7 GND (black)

The ESKO12 rod probe is usually attached to the measuring point using an adjustable stainless steel holder DE2.

The DE2 holder is two-part and, in addition to adjusting the inclination, also allows the probe in the holder to be moved, for example, according to the current water level or when cleaning the sensor from coarse dirt.



**De2**  
probe holder

## Suspended probe S423/C/OPT

The hanging probe is supplied as standard with a 10 m long cable, which has a 5-pin M12 / 5F industrial connector fitted at the end.



- 1 +Unap (red)
- 2 GND (black)
- 3 RS485-A (yellow)
- 4 RS485-B (green)
- 5 shields (black)

Even when hanging the sensor by the cable, it is necessary to ensure the oblique position of the sensor so that air bubbles do not stick to the measuring head.



## Luminophores head CAP423

The manufacturer's recommended replacement time for the probe head is 1 to 3 years, depending on the degree of depletion of the luminophores layer. It must never come into contact with organic solvents such as acetone, chloroform, benzene and toluene. Likewise, chlorine gas can irreversibly damage the head and thus affect the accuracy of the measurement.

The head with the luminophor is screwed on the body by the probe and therefore the replacement of the head is relatively simple. It is recommended to calibrate the probe after each head replacement..



## Technical parameters

<b>Measuring range:</b>	0.00 to 20.00 mg / l
<b>Accuracy:</b>	+/- 0.2 mg / l
<b>Response rate:</b>	reaching 90% of the value in <60 sec
<b>Measurement frequency:</b>	min 1 measurement / sec
<b>Interface:</b>	RS485, Modbus RTU protocol, com. address 10
<b>Channel assignment:</b>	K1 - water temp. (resolution 0.1°C), K2 - diss. oxygen (0.01 mg/l)
<b>Working temperature range:</b>	-10 to +60 °C
<b>Maximum working pressure:</b>	5 bar
<b>Dimensions ESKO12 (diameter x length):</b>	40x1750 mm
<b>Probe material:</b>	stainless steel, Tecaform
<b>Diameter of the luminophore:</b>	10 mm
<b>Weight of the ESKO12 rod probe:</b>	2200 g
<b>Weight of the hanging probe S423/C/OPT:</b>	1150 g
<b>Probe cable length S423/C/OPT:</b>	10 m, M12
<b>Supply voltage:</b>	12 to 24 V DC
<b>Temperature compensation:</b>	internal NTC
<b>Protection:</b>	IP68

