

# Chlorine probes



## ENSURING CONSISTENTLY ACCURATE CHLORINE MEASUREMENT

Chlorine is a compound used directly or indirectly in various sectors such as paper, antiseptics, dyes, food, insecticides, paints, petroleum products, plastics, medicines, fabrics, solvents and many other consumer products. It is used to kill bacteria and other microbes in the drinking water supply and in swimming pools. Chlorine is used in bleaching wood pulp for paper making, while bleach is also used industrially to remove ink from recycled paper.

Free chlorine, chlorine dioxide and total chlorine are usually measured to monitor and control the disinfection of drinking water, recycled water or water in swimming pools. In fact, when chlorine is added to water, it reacts with the organic compounds and metals present in the liquid, forming combined chlorine. Combined chlorine is not active for disinfection.

## Probes for free chlorine

Free chlorine is chlorine which is present in water as hypochlorous acid (HOCl) or as hypochlorite ion (OCl<sup>-</sup>). Its measurement guarantees the available quantity of chlorine for disinfection or purification purposes. The most robust and reliable measurement technique is the use of a potentiostatic free chlorine sensor.

## FCL - Free chlorine

Sealed-cell chlorine sensor, 4-20 mA output with automatic temperature compensation. Guaranteed accuracy with a short response time courtesy of active amperometric measurement.

Suitable for the measurement of free inorganic chlorine at constant pH and for fresh water without surfactants, FCL has a reduced dependence on pH for free chlorine based on isocyanuric acid (organic free chlorine), fresh water and sea water in a range between 10 and 50uS/cm; surfactants are partially tolerated.



## Technical features

Inorganic free chlorine at constant pH  
**Measurement range** 0 – 0.5 ppm / 0 – 2 ppm /  
0 – 5 ppm / 0 – 10 ppm /  
0 – 200 ppm  
**pH range** 6 – 8  
**Pressure range** 0 – 1 bar

Inorganic free chlorine with reduced pH dependence  
**Measurement range** 0 – 2 ppm / 0 – 10 ppm  
**pH range** 4 – 9  
**Pressure range** 0 – 3 bar

Free chlorine based on isocyanuric acid  
(organic free chlorine)  
**Measurement range** 0 – 2 ppm / 0 – 5 ppm /  
0 – 10 ppm  
**pH range** 4 – 12  
**Pressure range** 0 – 0.5 bar

**Operating temp** 0 – 45°C

**Flow rate range** Approx 30 l/h

**Body material** PVC-U, PEEK, SS 1.4571 ; **Electrode** Silver chloride with gold ; **Membrane** PTFE

**Electrical connection** Cable not included ;

**Connector** Two-pole terminal

## FCL HP - Free high-pressure chlorine sensor

Sensor for the measurement of inorganic free chlorine with open measuring cell, 4-20 mA output and automatic temperature compensation. Guaranteed accuracy and short response time courtesy of active amperometric measurement. FCL HP can be used for the measurement of free inorganic chlorine at high pressure (up to 8 bar). Ideal for drinking water, wastewater, process water, sea water and swimming pools.



### Technical features

Measurement range 0 – 1 ppm / 0 – 5 ppm / 0 – 10 ppm

pH range 1 – 9

Operating temp 0 – 50°C / 0 – 70°C

Pressure range 0 – 8 bar

Flow rate Approx 30 l/h

Body material PVC-U, PEEK ; Electrode Gold ; Membrane PTFE

Electrical connection Cable not included ; Connector Two-pole terminal

## Chlorine dioxide probes

Chlorine dioxide is a neutral chlorine compound. It is very different from elemental chlorine, both in its chemical structure ( $\text{ClO}_2$ ) and in its behaviour. One of the most important qualities of chlorine dioxide is its high solubility in water, especially in cold water. Chlorine dioxide does not hydrolyse when it enters the water; a dissolved gas remains in solution. Chlorine dioxide is about 10 times more soluble in water than chlorine. It is not affected by the pH and has an excellent residual effect remaining active for hours or even days. It does not interact with ammonia and is effective even at cold temperatures.

Chlorine dioxide is today one of the most powerful disinfection methods in the water industry and is extremely effective in controlling legionella. Therefore the correct measurement of its concentration in water is essential because it guarantees an effective use of chlorine dioxide for disinfection purposes and other applications. Too low a dosage can be ineffective, while overdosing can cause the formation of particularly harmful hypochlorite in the tank.

## DCL - Chlorine dioxide

Sealed-cell chlorine dioxide sensor, 4-20 mA output with automatic temperature compensation. Guaranteed accuracy and short response time courtesy of active amperometric measurement. Suitable for drinking water and swimming pools.



### Technical features

Measuring range 0-2 ppm / 0 -10 ppm

pH range 1-11

Operating temp 0 – 45°C

Pressure range 0 – 1 bar

Flow rate Approx 30 l/h

Body material PVC-U ; Electrode Gold ; Membrane PTFE

Electrical connection Cable not included ; Connector Two-pole terminal

## DCL HP - High-pressure chlorine dioxide

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Open-cell chlorine dioxide sensor, 4-20 mA output with automatic temperature compensation. Guaranteed accuracy and short response time courtesy of active amperometric measurement. Suitable for the measurement of chlorine dioxide at high pressure. and commonly used for drinking water, wastewater, process water, swimming pools and seawater.



### Technical features

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Measurement range 0 – 1 ppm

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pH range 1 – 9

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Operating temp 0 – 50°C / 0 – 70°C

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Pressure range 0 – 5 bar / 0 – 8 bar

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Flow rate Approx 30 l/h

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Body material PVC-U, PEEK ; Electrode Gold ; Membrane PTFE

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Electrical connection Cable not included ; Connector Two-pole terminal

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## Total chlorine probe

Total chlorine is the combination of the free chlorine left in the water and the combined chlorine. Total chlorine sensors are commonly used in wastewater treatment plants to measure the residual disinfection power of effluent water.

## TCL - Total chlorine

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Total chlorine sensor with sealed cell, 4-20 mA output and automatic temperature compensation. Guaranteed accuracy and short response time courtesy of active amperometric measurement. Suitable for drinking water, swimming pools and sea water.



### Technical features

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Measurement range 0 – 2 ppm / 0 – 5 ppm / 0 – 10 ppm

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pH range 4 – 12 (linear decrease with around 5% when pH level increases by one)

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Operating temp 0 – 45°C

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Pressure range 0.5 bar

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Flow rate Approx 30 l/h

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Body material PVC-U, PEEK, SS 1.4571 ; Electrode Silver chloride with gold ; Membrane PTFE

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Electrical connection Cable not included ; Connector Two-pole terminal

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