

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

LENNTECH
WATER TREATMENT SOLUTIONS



ProMinent®

Graduated measuring ranges 0.01 – 200 mg/l, special measuring range up to 1,000 mg/l

The proven diaphragm-covered standard sensor for free chlorine CLE3 is used to monitor or control all types of clear water, for example in the disinfection of potable water. The variant CLE3.1 is especially suitable for an excess of combined chlorine, providing the most accurate results in the calculation of combined chlorine from the measurement of total chlorine and free chlorine.

Sensors CLB2 and CLB3 are easy-to-operate, low-cost chlorine sensors without a diaphragm for clear water without pollution.

Sensor CLO1 is particularly suitable for in-line electrolysis processes where unwanted compounds may be formed; sensor CLO2 is also ideal for hot water disinfection.

Sensor CBR1 can be used in contaminated water, even for high pH values of up to 9.5, for example in the disinfection of cooling water.

Sensor CLR1 has been optimised for the disinfection or washing of foodstuffs and tolerates contaminated water and chlorine concentrations of up to 1,000 mg/l.

Your benefits

- Five different sensor ranges and numerous different versions deliver the following benefits: Use with a wide range of water qualities (pH, salt content, temperature, chemical and contamination load), use in combination with many disinfection processes: chlorine gas, sodium hypochlorite, calcium hypochlorite, electrolysis, use in a wide measuring range of 0.01 to 1,000 mg/l.
- Precise, real-time amperometric measurement for efficient process control (short response time)
- Amperometric measuring means no clouding or discolouration
- Stable zero point
- Integrated temperature compensation eliminates faults caused by influence of temperature
- For sensors with diaphragm-covered measuring electrodes: Reduced dependence on flow, substances in water and film-forming media. Diaphragm-covered measuring electrodes embedded in an electrolyte ensure long service life. This maintains optimum measuring conditions regardless of process conditions. Low-cost maintenance thanks to easy diaphragm cap changes.

Field of application

Chlorine measurement in potable, swimming pool, cooling, industrial, process, rinsing and waste water as well as seawater and salt water

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Technical Data

Sensor for Free Chlorine CLE 3-mA

Standard sensor for measuring free chlorine in clear water. For operation on controllers with 4-20 mA input

Your benefits

- Measured variable: free chlorine, no significant cross sensitivity to combined chlorine (chloramines)
- Diaphragm-covered sensor (encapsulated) minimises faults caused by changing flow or ingredients in the water

Measured variable	free chlorine
Reference method	DPD1
pH range	5.5 ... 8.0
Temperature	5 ... 45 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGM or DLG III)
Supply voltage	16...24 V DC (two-wire technology)
Output signal	4...20 mA ≈ measuring range, temperature-compensated, uncalibrated, not electrically isolated
Selectivity	Free chlorine as against combined chlorine, even if there is not an excess of it
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, disinfectants with organic chlorine, e. g. based on cyanuric acid, are unsuitable
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	D1C, DAC, AEGIS II
Typical applications	CLE 3-mA-0.5 ppm: potable water; CLE 3-mA-2.0/10 ppm: swimming pools (surfactant-free).
Resistance to	Salts, acids, alkalis. Not surfactants
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CLE 3-mA-0.5 ppm	0.01...0.5 mg/l	792927
CLE 3-mA-2 ppm	0.02...2.0 mg/l	792920
CLE 3-mA-5 ppm	0.05...5.0 mg/l	1033392
CLE 3-mA-10 ppm	0.10...10.0 mg/l	792919
CLE 3-mA-20 ppm	0.20...20.0 mg/l	1002964
CLE 3-mA-50 ppm	0.50...50.0 mg/l	1020531
CLE 3-mA-100 ppm	1.00...100.0 mg/l	1022786

Chlorine sensors complete with 100 ml of electrolyte

A mounting kit, order no. 815079, is required for initial fitting of the chlorine sensors in the in-line probe housing DLG III.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLE 3.1-mA

Sensor for the measurement of free chlorine in clear water with higher selectivity towards combined chlorine. For use on controllers with 4-20 mA input

Your benefits

- Measured variable: free chlorine, no cross sensitivity to combined chlorine (chloramines), even if there is an excess of it
- Diaphragm-covered sensor (encapsulated) minimises faults caused by changing flow or ingredients in the water

Measured variable	Free chlorine (hypochlorous acid HOCl) with high levels of combined chlorine; for determining the combined chlorine with a DAC controller and sensor for total chlorine type CTE 1-mA
Reference method	DPD1
pH range	5.5 ... 8.0
Temperature	5 ... 45 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGM or DLG III)
Supply voltage	16...24 V DC (two-wire technology)
Output signal	4...20 mA ≈ measuring range, temperature-compensated, uncalibrated, not electrically isolated
Selectivity	Free chlorine as against combined chlorine, even if there is an excess of it
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, disinfectants with organic chlorine, e. g. based on cyanuric acid, are unsuitable
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	D1C
Typical applications	Potable water with higher volumes of combined chlorine, swimming pools. To determine the combined chlorine from the difference: Total chlorine minus free chlorine in the controller DAC.
Resistance to	Salts, acids, alkalis. Not surfactants
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CLE 3.1-mA-0.5 ppm	0.01...0.5 mg/l	1020530
CLE 3.1-mA-2 ppm	0.02...2.0 mg/l	1018369
CLE 3.1-mA-5 ppm	0.05...5.0 mg/l	1019398
CLE 3.1-mA-10 ppm	0.10...10.0 mg/l	1018368

Chlorine sensors complete with 100 ml of electrolyte

A mounting kit, order no. 815079, is required for initial fitting of the chlorine sensors in the in-line probe housing DLG III.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLE 3-DMT

Standard sensor for measuring free chlorine in clear water. For operation on ProMinent transmitters type DMT

Your benefits

- Measured variable: free chlorine, no significant cross sensitivity to combined chlorine (chloramines)
- Diaphragm-covered sensor (encapsulated) minimises faults caused by changing flow or ingredients in the water

Measured variable	free chlorine
Reference method	DPD1
pH range	5.5 ... 8.0
Temperature	5 ... 45 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGM or DLG III)
Supply voltage	3.3 V DC (5 P)
Output signal	0...1 V DC, uncalibrated, not temperature compensated, not electrically isolated
Temperature measurement	About the integrated Pt 1000. The temperature compensation is carried out in DMT.
Selectivity	Free chlorine as against combined chlorine, even if there is not an excess of it
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, disinfectants with organic chlorine, e. g. based on cyanuric acid, are unsuitable
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	DMT
Typical applications	CLE 3-mA-0,5 ppm: potable water; CLE 3-mA-2.0/10 ppm: swimming pools (surfactant-free).
Resistance to	Salts, acids, alkalis. Not surfactants
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CLE 3-DMT-5 ppm	0.01...5.0 mg/l	1005511
CLE 3-DMT-50 ppm	0.10...50.0 mg/l	1005512

Chlorine sensors complete with 100 ml of electrolyte

A mounting kit, order no. 815079, is required for initial fitting of the chlorine sensors in the in-line probe housing DLG III.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLE 3-CAN-P

Standard sensor for measuring free chlorine in clear water. For use on controllers with CAN-bus connection

Your benefits

- Measured variable: free chlorine, no significant cross sensitivity to combined chlorine (chloramines)
- Diaphragm-covered sensor (encapsulated) minimises faults caused by changing flow or ingredients in the water
- Operation on the CAN-bus with all the associated benefits

Measured variable	free chlorine
Reference method	DPD1
pH range	5.5 ... 8.0
Temperature	5 ... 45 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in the DGM or DLG III)
Supply voltage	Via CAN interface (11 - 30 V)
Output signal	Uncalibrated, temperature compensated, electrically isolated
Selectivity	Free chlorine as against combined chlorine, even if there is not an excess of it
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, disinfectants with organic chlorine, e. g. based on cyanuric acid, are unsuitable
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	DULCOMARIN®
Typical applications	Potable water, swimming pool water.
Resistance to	Salts, acids, alkalis. Not surfactants
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CLE 3-CAN-P-10 ppm	0.01...10.0 mg/l	1083209

Chlorine sensors complete with 100 ml of electrolyte

A mounting kit, order no. 815079, is required for initial fitting of the chlorine sensors in the in-line probe housing DLG III.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLE 3.1-CAN-P

Sensor for the measurement of free chlorine in clear water with higher selectivity towards combined chlorine. For use on controllers with CAN-bus connection

Your benefits

- Measured variable: free chlorine, no cross sensitivity to combined chlorine (chloramines) even if there is an excess of it
- Diaphragm-covered sensor (encapsulated) minimises faults caused by changing flow or ingredients in the water
- Operation on the CAN-bus with all the associated benefits

Measured variable	free chlorine with high levels of combined chlorine; for determining the combined chlorine with a DULCOMARIN® and sensor for total chlorine type CTE 1-CAN
Reference method	DPD1
pH range	5.5 ... 8.0
Temperature	5 ... 45 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGMa or DLG III)
Supply voltage	Via CAN interface (11 – 30 V)
Output signal	Uncalibrated, temperature compensated, electrically isolated
Selectivity	Free chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, disinfectants with organic chlorine, e. g. based on cyanuric acid, are unsuitable
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	DULCOMARIN®
Typical applications	Potable water with higher percentages of combined chlorine;Swimming pool. To determine the combined chlorine from the difference: Total chlorine minus free chlorine in the controller DULCOMARIN®.
Resistance to	Salts, acids, alkalis. Not surfactants
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CLE 3.1-CAN-P-10 ppm	0.01...10.0 mg/l	1083584

Chlorine sensors complete with 100 ml of electrolyte

A mounting kit, order no. 815079, is required for initial fitting of the chlorine sensors in the in-line probe housing DLG III.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLO 1-mA

Sensor for the measurement of free chlorine in clear water even when using electrolysis processes for disinfection, up to 45 °C (1 bar) or 8 bar (25 °C). For operation with controllers with 4-20 mA input. Also suitable for use in film-forming water with optional “hydrodynamic cleaning”.

Your benefits

- Measured variable: free chlorine, no significant cross-sensitivity to combined chlorine (chloramines)
- Use with return of the sample water to the process line
- Use at higher pressures
- Minimisation of faults by electrolysis systems in which the electrodes are immersed directly into the sample water (without diaphragm) by open sensor (no diaphragm) and gold electrodes
- Measurement of free chlorine up to pH 9
- Also suitable for use in film-forming water with optional “hydrodynamic cleaning”.

Measured variable	free chlorine
Reference method	DPD1
pH range	5.0 ... 9.0
Temperature	5 ... 45 °C
Max. pressure	8.0 bar (25 °C)
Intake flow	30...60 l/h (in DGM or DLG III), constant flow as flow-dependent signal
Supply voltage	16...24 V DC (2-wire)
Output signal	4...20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, electrolysis without diaphragm with electrodes in the process
Installation	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the tubes with the INLI fitting
Sensor fitting	DLG up to 1 bar/55 °C; DGM up to 6 bar/30 °C; INLI up to 7 bar/40 °C
Measuring and control equipment	D1C, DAC, AEGIS II
Typical applications	Swimming pools, uncontaminated potable water and process water, and can also be used together with diaphragm-free electrolysis processes. Can also be used in conjunction with hydrodynamic cleaning even in biofilm-forming water, or water containing lime, iron or manganese.
Resistance to	Surfactants, films with using hydrodynamic cleaning
Measuring principle, technology	Amperometric, 3 electrodes, without diaphragm

	Measuring range	Order no.
CLO 1-mA-2 ppm	0.02...2.0 mg/l	1033871
CLO 1-mA-10 ppm	0.10...10.0 mg/l	1033870

DULCOTEST® Sensors for Free Chlorine

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Sensor for Free Chlorine CLO 1-CAN-P

Sensor for the measurement of free chlorine in clear water even when using electrolysis processes for disinfection, up to 45 °C (1 bar) or 8 bar (25 °C). For use on controllers with CAN-bus connection. Also suitable for use in film-forming water with optional “hydrodynamic cleaning”.

Your benefits

- Measured variable: free chlorine, no significant cross-sensitivity to combined chlorine (chloramines)
- Use with return of the sample water to the process line
- Use at higher pressures
- Minimisation of faults by electrolysis systems in which the electrodes are immersed directly into the sample water (without diaphragm) by open sensor (no diaphragm) and gold electrodes
- Measurement of free chlorine up to pH 9
- Also suitable for use in film-forming water with optional “hydrodynamic cleaning”.

Measured variable	Free chlorine
Reference method	DPD1
pH range	5.0 ... 9.0
Temperature	5 ... 45 °C
Max. pressure	8.0 bar (25 °C)
Intake flow	30...60 l/h (in DGM or DLG III), constant flow as flow-dependent signal
Supply voltage	11...30 V (via CAN interface)
Output signal	digital (CANopen), uncalibrated, temperature-compensated, galvanically isolated
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, electrolysis without diaphragm with electrodes in the process
Installation	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the tubes with the INLI fitting
Sensor fitting	DLG up to 1 bar/55 °C; DGM up to 6 bar/30 °C; INLI up to 7 bar/40 °C
Measuring and control equipment	DULCOMARIN® 3, DULCOMARIN® II only with hardware after 06.02.2014 from software version 3035 or later
Typical applications	Swimming pools, uncontaminated potable water and process water, and can also be used together with diaphragm-free electrolysis processes. Can also be used in conjunction with hydrodynamic cleaning even in water that forms biofilms, or containing lime, iron or manganese.
Resistance to	Salts, acids, lyes, surfactants, films of dirt, films when using hydrodynamic cleaning
Measuring principle, technology	Amperometric, 3 electrodes, without diaphragm

	Measuring range	Order no.
CLO 1-CAN-P-10 ppm	0.10...10.0 mg/l	1083134

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLO 2-mA

Sensor for the measurement of free chlorine in clear water even when using electrolysis processes for disinfection, up to 70 °C or 8 bar (25 °C). For operation with controllers with 4-20 mA input. Also suitable for use in film-forming water with optional “hydrodynamic cleaning”.

Your benefits

- Measured variable: free chlorine, no significant cross-sensitivity to combined chlorine (chloramines)
- Use with return of the sample water to the process line
- Use at higher pressures/temperatures
- Minimisation of faults by electrolysis systems in which the electrodes are immersed directly into the sample water (without diaphragm) by open sensor (no diaphragm) and gold electrodes
- Measurement of free chlorine up to pH 9
- Also suitable for use in film-forming water with optional “hydrodynamic cleaning”

Measured variable	free chlorine
Reference method	DPD1
pH range	5.0 ... 9.0
Temperature	5 ... 70 °C
Max. pressure	8.0 bar (25 °C)
Intake flow	30...60 l/h (in DGM or DLG III), constant flow as flow-dependent signal
Supply voltage	16...24 V DC (2-wire)
Output signal	4...20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, electrolysis without diaphragm with electrodes in the process
Installation	Bypass: open outlet or return of the sample water into the process line, inline: direct installation into the tubes with the INLI fitting
Sensor fitting	DLG up to 1 bar/55 °C; DGM up to 1 bar/60 °C; INLI up to 2 bar/70 °C. Prerequisite: constant flow
Measuring and control equipment	D1C, DAC, AEGIS II
Typical applications	Hot water up to 70 °C, combating legionella, uncontaminated potable water and industrial service water, can also be used together with diaphragm-free electrolysis processes.
Resistance to	Surfactants, films with using hydrodynamic cleaning
Measuring principle, technology	Amperometric, 3 electrodes, without diaphragm

	Measuring range	Order no.
CLO 2-mA-2 ppm	0.02...2.0 mg/l	1033878

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLB 2-μA

Cost-effective, simple sensor for the measurement of free chlorine in clear water, even with a changing media temperature. Use even when electrolysis processes are used for disinfection at up to 45 °C/3 bar. For operation with the Compact controller DCCa

Your benefits

- Measured variable: free chlorine, no significant cross sensitivity to combined chlorine (chloramines)
- Cost-effective due to its simple construction without separate wear parts
- Simple, cost-effective maintenance without handling of the diaphragm caps
- Minimisation of faults by electrolysis systems without diaphragm in which the electrodes are immersed directly into the sample water by an open sensor (no diaphragm)
- Measurement of free chlorine up to pH 9 and use at high pressure of up to 8 bar by the absence of a diaphragm

Measured variable	free chlorine
Measuring range	0.05 – 5.0 mg/l, can be used for short-term shock chlorination up to 10 mg/l
Reference method	DPD1
pH range	5.0 ... 9.0
Temperature	5 ... 45 °C
Max. pressure	3.0 bar
Intake flow	30...60 l/h (in DGMA), constant flow needed as flow-dependent signal
Supply voltage	Only for compact controllers
Output signal	Non-amplified primary current signal, not temperature-compensated, uncalibrated, not electrically isolated
Temperature measurement	Pt 1000, integrated, calculation in the compact controller
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, electrolysis without diaphragm with electrodes in the process
Installation	Bypass: open sample water outlet, inline: direct installation into the pipework
Sensor fitting	DGM, DLG III
Electrical connection	Fixed cable, 1 m, 6 wires with cable end sleeves
Measuring and control equipment	Compact controller
Typical applications	Swimming pools, potable water, can also be used with membrane-free chlorine production electrolysis processes, even with varying media temperatures.
Resistance to	surfactants
Measuring principle, technology	Amperometric, 3 electrodes, without diaphragm

	Measuring range	Order no.
CLB 2-μA-5 ppm	0.05...5.0 mg/l	1038902

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLB 3-μA

Cost-effective, simple sensor for the measurement of free chlorine in clear water when the media temperature is constant. Use even when electrolysis processes are used for disinfection at up to 45 °C/3 bar. For operation with the Compact controller DCCa

Your benefits

- Measured variable: free chlorine, no significant cross sensitivity to combined chlorine (chloramines)
- Cost-effective due to its simple construction without separate wear parts
- Simple, cost-effective maintenance without handling of the diaphragm caps
- Minimisation of faults by electrolysis systems without diaphragm in which the electrodes are immersed directly into the sample water by an open sensor (no diaphragm)
- Measurement of free chlorine up to pH 9 and use at high pressure of up to 8 bar by the absence of a diaphragm

Measured variable	free chlorine
Measuring range	0.05 - 5.0 mg/l: linear, can be used for shock chlorination up to 10.0 mg/l
Reference method	DPD1
pH range	5.0 ... 9.0
Temperature	5 ... 45 °C constant temperature needed, as temperature-dependent signal
Max. pressure	3.0 bar
Intake flow	30...60 l/h (in DGMA), constant flow necessary, as flow-dependent signal
Supply voltage	Only for compact controllers
Output signal	Non-amplified primary current signal, not temperature-compensated, uncalibrated, not electrically isolated
Temperature measurement	None
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, electrolysis without diaphragm with electrodes in the process
Installation	Bypass: open sample water outlet, inline: direct installation into the pipework; fixed or replaceable (replaceable fitting)
Sensor fitting	DGM, DLG III
Electrical connection	Fixed cable, 1 m, 4 wires with cable end sleeves
Measuring and control equipment	Compact controller
Typical applications	Swimming pools, potable water, can also be used with membrane-free chlorine production electrolysis processes.
Resistance to	surfactants
Measuring principle, technology	Amperometric, 3 electrodes, without diaphragm

	Measuring range	Order no.
CLB 3-μA-5 ppm	0.05...5.0 mg/l	1041696

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CBR 1-mA

Sensor for free chlorine and bromine in contaminated water, also suitable for high pH values of up to 9.5. For use with controllers with 4-20 mA input

Your benefits

- Measured variable: free chlorine as well as free and combined bromine (bromamines)
- Diaphragm-covered sensor minimises faults caused by changing flow or ingredients in the water
- Resistance to films of dirt and biofilms by electrolyte with antimicrobial effect and large-pore diaphragm
- Use at high pH value of up to 9.5 by optimisation of the electrolyte diaphragm system

Measured variable	free chlorine, free bromine, combined bromine, DBDMH (1,3-dibrom-5,5-dimethyl-hydantoin)
Reference method	DPD1
pH-range	5 ... 9.5
Temperature	1 ... 40 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGM, DLG II)
Supply voltage	16...24 V DC (2-wire)
Output signal	4...20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, bromide + hypochlorite, DBDMH
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	D1C, DAC, AEGIS II
Typical applications	Cooling water, process water, waste water, water with higher pH values (stable pH), contaminated swimming pool water. Contaminated swimming pool water. In swimming pools to determine the combined chlorine from the difference: Total chlorine minus free chlorine. Raw water for drinking water treatment.
Resistance to	Salts, acids, alkalis, surfactants, dirt films
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CBR 1-mA-0,5 ppm	0.01...0.5 mg/l*	1038016
CBR 1-mA-2 ppm	0.02...2.0 mg/l*	1038015
CBR 1-mA-5 ppm	0.05...5.0 mg/l*	1052138
CBR 1-mA-10 ppm	0.10...10.0 mg/l*	1038014

* Measuring range based on chlorine. When measuring bromine, the lower and upper limit of the measuring range are increased by the factor 2.25, therefore for example CBR 1-mA-0.5ppm: 0.02 ...1.1 ppm.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor for Free Chlorine CLR 1-mA

Sensor for free chlorine above 10 ppm in contaminated washing water for use with controllers with 4-20 mA input

Your benefits

- Measured variable free chlorine for high concentrations of up to 1,000 ppm
- Diaphragm-covered sensor prevents faults caused by changing flow or ingredients in the water
- Resistance to films of dirt by pore-free diaphragm

Measured variable	free chlorine
Reference method	DPD1
pH range	5.5 ... 8.0
Temperature	5 ... 45 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGM, DLG II)
Supply voltage	16...24 V DC (2-wire)
Output signal	4...20 mA = Measuring range, temperature-compensated, uncalibrated, not electrically isolated
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm
Installation	Bypass: open sample water outlet
Sensor fitting	DLG III
Measuring and control equipment	D1C
Typical applications	Salad, vegetable and poultry washing water, contaminated process and waste water.
Resistance to	Salts, acids, alkalis, surfactants, dirt films
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CLR 1-mA-200 ppm	10.0...200 mg/l	1047978

Important note: Measuring range from 10.0 ... 1,000 mg/l on request

A mounting kit, order no. 815079, is required for initial fitting of the chlorine sensors in the in-line probe housing DLG III.

DULCOTEST® Sensors for Free Chlorine

Reliable online measurement of free (effective) chlorine – with the versatile DULCOTEST® sensors.

Sensor für freies Chlor CBR 1-CAN-P

Sensor for free chlorine and bromine in contaminated water, also suitable for high pH values of up to 9.5. For use on controllers with CAN-bus connection.

Your benefits

- Measured variable: free chlorine as well as free and combined bromine (bromamines)
- Diaphragm-covered sensor minimises faults caused by changing flow or ingredients in the water
- Resistance to films of dirt and biofilms by electrolyte with antimicrobial effect and large-pore diaphragm
- Use at high pH value of up to 9.5 by optimisation of the electrolyte diaphragm system

Measured variable	free chlorine, free bromine, combined bromine, DBDMH (1,3-dibrom-5,5-dimethyl-hydantoin)
Reference method	DPD1
pH range	5 ... 9.5
Temperature	1 ... 40 °C
Max. pressure	1.0 bar
Intake flow	30...60 l/h (in DGM, DLG II)
Supply voltage	11...30 V DC (via CAN interface)
Output signal	digital (CANopen), uncalibrated, temperature-compensated, galvanically isolated
Selectivity	Free chlorine as against combined chlorine
Disinfection process	Chlorine gas, hypochlorite, electrolysis with diaphragm, bromide + hypochlorite, DBDMH
Installation	Bypass: open sample water outlet
Sensor fitting	DGM, DLG III
Measuring and control equipment	DULCOMARIN® 3, DULCOMARIN® II only with hardware after 06.02.2014 from software version 3035 or later
Typical applications	Cooling water, process water, waste water, water with higher pH values (stable pH). Contaminated swimming pool water. In swimming pools to determine the combined chlorine from the difference: Total chlorine minus free chlorine. Raw water for drinking water treatment.
Resistance to	Dirt films, biofilms, surfactants
Measuring principle, technology	Amperometric, 2 electrodes, membrane-covered

	Measuring range	Order no.
CBR 1-CAN-P-10ppm	0.01...10.0 mg/l	1083135



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