

## APPLICATION NOTE Water & Wastewater

### Measuring the chlorine content in the emergency chlorination of waterworks

- Determining the chlorine content in drinking water for measuring free chlorine in the emergency chlorination of a waterworks
- 100% measurement availability thanks to low-maintenance, membrane-free sensor and automatic sensor cleaning
- Uninterrupted calibration by comparison to the laboratory value after DPD

#### 1. Background

Many municipal waterworks perform no permanent disinfection of drinking water. However, in many cases a process known as emergency chlorination takes place. The process is switched on in case of need, adding chlorine to the drinking water as a disinfectant.

#### 2. Measurement requirements

Emergency chlorination is special in that it is only very rarely required, which means that non-chlorinated water usually flows through the measuring systems. Conventional measurement technology is now often faced with the problem of biological fouling covering the membrane, making the sensor inoperative over time. For this reason, some operators use extra doses of chlorine from time to time in order to keep the instrumentation clear of such biological fouling, even though it is not actually necessary from the standpoint of drinking water quality. If no extra chlorine is added the sensors in the system must be regularly checked and mechanically cleaned. In some cases, it may be necessary to replace the membrane and then recalibrate the system.

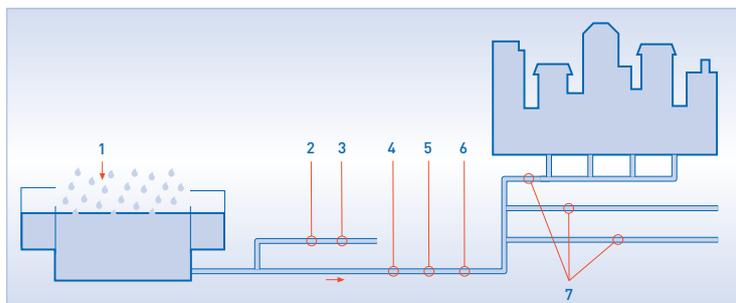
A particularly critical situation arises if the gradual deterioration of the sensor goes unnoticed and the membrane is only replaced when the metering system does not start properly when needed for emergency chlorination.

## APPLICATION NOTE

As soon as chlorine is added to the water, the legal limits must be monitored in the effluent (in Germany 0.1 mg/l according to the Drinking Water Ordinance). In order to monitor these limits as well as to ensure accurate measurement of the chlorine, online measuring technology is used in many instances. Unlike conventional sampling and laboratory evaluation, this technology continuously monitors measurement values.

In addition, conductivity, pH value, turbidity and flow rate of the water are measured at the outlet of the waterworks along with the chlorine content.

Schematic presentation of typical measuring points at the outlet of a waterworks

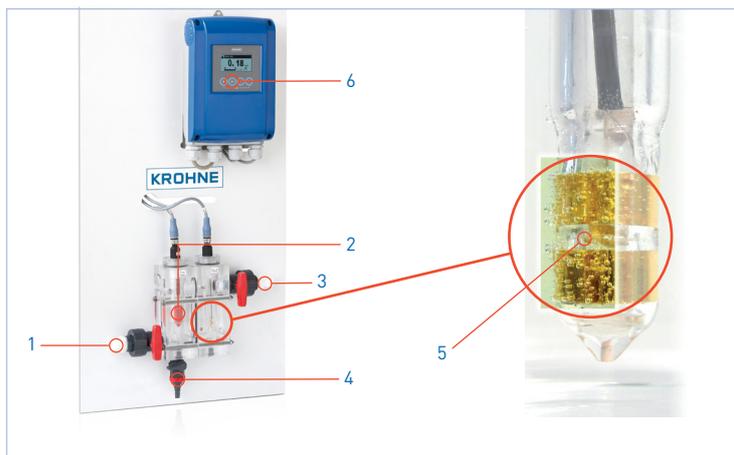


- 1 Adding chlorine to the fresh water tank
- 2 Chlorine content
- 3 pH
- 4 Conductivity
- 5 Flow rate
- 6 Turbidity
- 7 Water meter

Only measuring station 2 is described in this example. In addition to the measuring system monitoring the chlorine values in the process, in some cases a second measuring system can be used to control the dosing of the disinfectant (measuring station 1). To complement this, the typical measuring points at the outlet of the waterworks have been drawn in.

### 3. KROHNE solution

The OPTISYS CL 1100 measuring system with automatic sensor cleaning system and a membrane-free potentiostatic sensor at the outlet of the waterworks was used to monitor the chlorine values in the process. The measurement was done as a bypass measurement with an open outlet.



#### OPTISYS CL 1100

- 1 Inlet
- 2 Measuring cell with chlorine electrode, temperature measurement and flow monitoring
- 3 Outlet
- 4 Sampling point for system calibration
- 5 Automatic sensor cleaning system
- 6 Converter

### 4. Customer benefits

Unlike comparable sensors, the potentiostatic sensor in the OPTISYS CL 1100 measuring system has no membrane and thus no pores to get clogged by biological fouling (naturally-occurring in non-chlorinated water).

The sensor used in the OPTISYS CL 1100 features two gold electrodes on the outside, whose metallic surfaces are not affected by biological fouling. In addition, these electrodes are automatically cleaned on a daily basis, without the use of chemicals, thanks to automatic sensor cleaning.

The OPTISYS CL 1100 is thus always 100% ready to measure, even if no chlorine has been added for a longer period of time.

The measuring accuracy and suitability of the OPTISYS CL 1100 for measuring the chlorine content in drinking water has been certified by the IWW Rheinisch-Westfälisches Institut für Wasser (Institute for Water Resources Management) in Mühlheim, Germany.

### 5. Product used

#### OPTISYS CL 1100

- Measuring system for free chlorine, chlorine dioxide and ozon
- Ready-to-use measuring system for the measurement of free chlorine content featuring flow monitoring and automatic temperature compensation
- Automatic sensor cleaning system
- Flow-independent measurement above 30 l/h
- Simple calibration through comparison with laboratory value according toDPD
- Optional pH compensation with fluctuating pH values above 7.5 pH



## Contact

Would you like further information about these or other applications?  
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