



# APPLICATION REPORT

Health & Wellness

## Free chlorine monitoring for a thermal spa resort

- Efficient dosing of a hypochlorite-based sanitizer to effectively prevent contamination and health risks in thermal pools
- pH compensated free chlorine ( $\text{Cl}_2$ ) measurement for a reliable and automated disinfection process
- Use of a compact, pre-configured measuring system with a membrane-free disinfection sensor, pH sensor, temperature sensor and integrated flow cell monitoring

### 1. Background

Thermes de Balaruc, located in Balaruc-les-Bains in southern France, is a thermal spa complex of some 16,000 m<sup>2</sup>. It features various basins for a wide range of bath spa therapies. The thermal water is sourced locally and renowned for its health care effects and regenerating properties.

### 2. Measurement requirements

Reliable disinfection of the thermal pools is paramount to the health and safety of the spa visitors. Chlorination with a hypochlorite-based agent is a well-established method to kill bacteria and other contaminants in swimming pool water. However, its effectiveness is highly correlated with the pH value, which in turn varies with temperature. High pH levels reduce the effectiveness of chlorination. Low pH levels of 5 maximise it but are harmful to human skin and eyes and can have a corrosive effect on the pool surface. A pH value between 6.8 and 7.4 is therefore generally considered ideal in order to maximise the effectiveness of the chlorine and at the same time prevent skin irritation and corrosion.



Thermes de Balaruc

In order to automate the chlorination process and achieve precise dosing in line with actual demand, the thermal spa operator was looking for an integrated solution for monitoring free chlorine that also takes pH and temperature into account and monitors the flow rate. The measuring system was to provide a high level of safety with low operating and maintenance costs.

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## 3. KROHNE solution

As the spa operator was already successfully using electromagnetic flowmeters from KROHNE for thermal water measurement, he decided to carry out a test installation with the OPTISYS CL 1100 measuring system. The potentiostatic, amperometric disinfectant measuring system is designed to measure free chlorine in swimming pools and thermal baths.

The measuring system is operated as a bypass installation. In this way, the customer can monitor all relevant parameters at a central location. The compact multi-parameter analysis panel is a plug-and-play unit. It comes pre-wired, combining transmitter, valves and flow cells, a sensor for free chlorine, a pH sensor for pH compensation, a temperature sensor and a float for flow monitoring in one measuring system. The sensor for free chlorine is membrane-free and has two gold electrodes, which enables particularly robust and long-term stable measurement. Thanks to automatic sensor cleaning, the sensor operates trouble-free with reduced maintenance costs.



Bypass measurement for monitoring free chlorine in a thermal bath pool

## 4. Customer benefits

By simultaneously measuring free chlorine, pH value and temperature, the KROHNE measuring system enables safe and cost-efficient dosing of disinfectants and pH neutralisers. Thanks to its fast response time, it provides all the necessary information for reliable pump control and thus contributes to optimum water quality and increased safety for spa visitors. All measured values are transmitted to the control room via a 4...20 mA output. In addition, the measuring system is equipped with a float that triggers an alarm via a relay if there is no flow, which further increases the integrity of the entire process.

Unlike conventional systems, which require multiple measuring points distributed throughout the system, this compact unit combines all measurements in one place, which simplifies operation and reduces the complexity of the application. The membrane-free sensor with automatic sensor cleaning feature minimises maintenance and operating costs. There is no need for regular membrane or electrolyte replacement of the  $\text{Cl}_2$  sensor.

The performance and ease of use of the measuring system convinced the operator. After several months of successful testing, the customer decided to also equip the dosing units of six other thermal pools with the OPTISYS CL 1100. KROHNE can not only supply and commission the measuring system but can also provide numerous after-sales services at the customer's request – from system optimisation during operation and service training for calibrating pH sensors to the management of wearing parts and consumables.

## 5. Product used

### OPTISYS CL 1100

- Potentiostatic amperometric disinfectant measuring system for  $\text{Cl}_2$ ,  $\text{ClO}_2$  and  $\text{O}_3$  in water and wastewater applications
- Available with membrane-free chlorine sensor and automatic sensor cleaning, valves, flow cells, temperature sensor, pH sensor
- Pre-installed and tested; for bypass lines



### Contact

Would you like further information about these or other applications?  
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