

# Reference

## Chlorine dioxide in brewery, König Brauerei Duisburg

### The company

König Pilsener is being brewed for almost a century in the König brewery in Duisburg-Beeck.

The brewery itself can look back on almost 150 years of business, during which they grew from a small and strictly local manufacturer to one of the leading breweries in Germany. Today König is, amongst other well-known brands, a part of the Bitburger group.



### The problem

Fresh drinking water is treated with Chlorine dioxide concentrations specified in the German drinking water directive to protect it against biological contamination. The treated water is used for cleaning purposes in an automated cleaning process. The Chlorine dioxide concentration is being monitored in-line. As disinfectant, a Chlorine dioxide solution is prepared in disinfection tanks and maintained in a closed circulation system at 2mg/l of Chlorine dioxide. This solution is used to disinfect tanks and pipes in so-called CiP (cleaning in place) processes. If the concentration gets too high, it might corrode pipe and tank materials, while a lower concentration would make the cleaning process less effective. After cleaning, the tanks and pipes are rinsed with drinking water.



### The challenge

The upper limit of the drinking water directive must be observed when Chlorine dioxide is used in drinking water. Changes in the concentration must be detected immediately to prevent excess dosing. For the rapidly changing water volumes, a quick-responding measurement is needed to permit a fast control circuit and an exact dosing.

During the disinfection process, CO<sub>2</sub> gas from the tanks dissolves in the Chlorine dioxide solution, and the accumulated gas can lower the pH of the solution down to under pH 6. In the disinfectant tank the pH can alternate between pH 5 and 8. Both the pH fluctuations and the varying CO<sub>2</sub> concentrations must not affect or impair the measured values.



### Our solution

A Krypton K ClO<sub>2</sub> by Dr. A. Kuntze is used for the Chlorine dioxide measurement. The Krypton system uses a pressure-proof amperometric measurement with automatic electrochemical sensor cleaning. The metal electrodes are in direct contact with the water and respond fast to concentration changes. They are cleaned daily and automatically to maintain the original signal strength, drastically reducing maintenance requirements.

In a test on-site, the Krypton K ClO<sub>2</sub> proved noticeably less affected by the pH fluctuations than the previously used system. In parallel measurements, both systems were tested for measuring deviations at fast-sinking pH values. While the previously used system showed up to 30% of signal changes, the deviations observed with the Krypton system were acceptable.

### Customers Feedback

Over a period of almost a year, the Krypton K ClO<sub>2</sub> showed even more advantages than the stability at fast-changing pH values and CO<sub>2</sub> fluctuations. The maintenance requirements are drastically reduced, thanks to the automatic sensor cleaning manual maintenance of the sensor is no longer necessary. In fact, maintenance nowadays consists mostly of exchanging pressure-seals or sensors.

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