

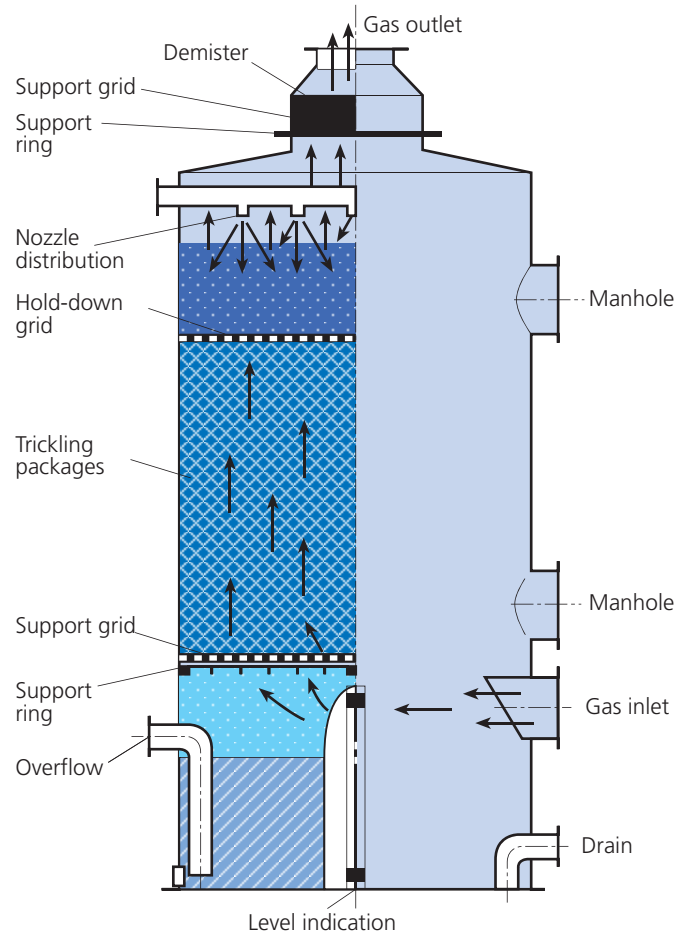
## Application Report

# pH Measurement During Drinking Water Treatment

## Aeration of raw water

### ■ Background

The water which is introduced into our drinking water system must meet the most versatile requirements concerning hygiene but also certain corrosion requirements to protect the water pipes. To produce drinking water of the required quality, there are many different treatment processes depending on the origin of the water.



**Principle of a trickling tower**

## ■ Procedure

A broadly used procedure is the open aeration of the raw water. The raw water can contain disturbing, corrosive carbon dioxide, which is driven off by aeration. Depending on the origin of the water, also iron and manganese compounds are oxidized and then filtered.

In that process the raw water is sprayed through pumps and distributed over large surface packages in so-called trickling towers. To increase the efficiency, the aeration space can be blown with air from below in a counterflow process:



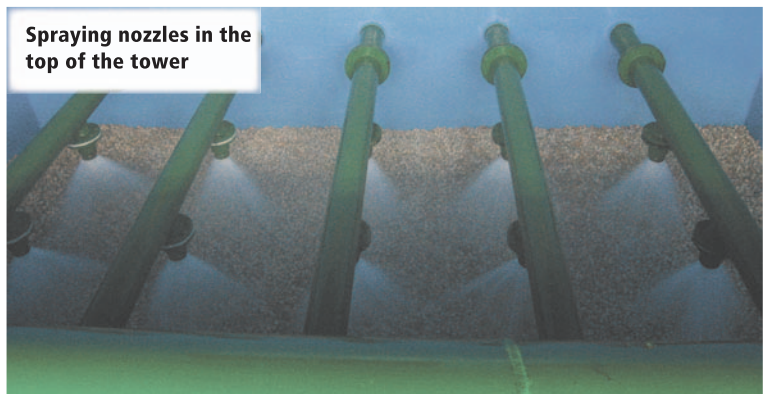
Aeration pumps



Raw water pipes to  
aeration tower



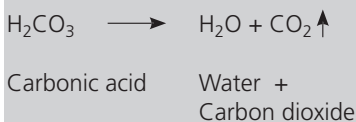
Spraying nozzles in the  
top of the tower





## ■ Measurement requirements

When the raw waters have an excess of carbon dioxide and are not in a lime / carbon dioxide equilibrium, the pH value of the raw water must be increased. The water is ventilated to saturate it with oxygen and reduce the solubility of the carbon dioxide. Thus, the carbon dioxide, which is partially dissolved as carbonic acid when in equilibrium, is driven off.



This increases the pH value. The raw water typically has a pH of approx. 6.5 which shall be increased to pH = 7.5. To optimize the energy input of the pumps, the pH value is continuously measured after the aeration process. At each aeration tower the aeration pumps (and thus the amount of air) are controlled via the pH value.

- Highest reliability
- Optimal process control
- Low cost of ownership

Required measuring equipment:

The pH value is measured through a bypass line in the open outlet at the existing hydrostatic pressure. Depending on the number of measuring points, transmitters of the Stratos series can be used or multichannel measurements using Protos analyzers can be taken.

The transparent flow cell allows easy visual inspection of the measurement and at the same time it integrates the electrolyte reservoir. Continuously introduced electrolyte ensures the required accuracy and a long service life of the electrode.



Inlet  
Outlet



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## ■ Applied Components

Stratos 2402 pH

Flow-through fitting ARF 105

pH combination electrode SE 538

Sensor cable ZU 0318

Temperature probe SE 803

Cable for temperature probe ZU 0551

Buffer solutions pH 4,01 ZU 0200 and  
pH 7,0 ZU 0201