HACH ULTRA

EXCELLENCE IN PROCESS ANALYTICS

Application Note

Beverage No. 06

CO_2 measurement in the brewery laboratory and in the process

- EBC accepted method - as validated in the inter laboratory validation trial performed in 2004
- Highest metrological performances - over existing methods in the market, with the best reproducibility properties as observed in the EBC trial
- Continuous measurement - able to perform stand alone process diagnostic
- Selective measurement - no influence or interference from other dissolved gases such as nitrogen used in some types of beer
- Wide measurement range - from 0.01 g/kg up to 10 g/kg
- Dual use – for lab and in the plant
- Rugged analyzer withstanding 10 bars - able to work right after the carbonation step, insensitive to large hydrostatic pressure changes
- Smart calibration choices - several calibration procedures available, in gas phase with a gas standard (at atmospheric or high pressure) or in liquid phase (Orbisphere CO_2 calibration kit)
- Long lasting calibration - the calibration lasts for more than one month

Why CO_2 in beer?

Carbon dioxide not only contributes to perceived "fullness" or "body" and enhances foaming potential; it also acts as a flavor enhancer and plays an important role in extending the shelf life of the product.

CO_2 effect is quite different from the classical perception of olfaction and taste since it is a mouth feeling, acting by contact of bubbles generated in the wall of the mouth and of the tongue.

Although in some cases a traditional technique of carbonation is to add an amount of wort with a fresh dose of yeast to the conditioning tank (krausened beer), the current technology is to inject the CO_2 on line.

Where to measure?

In the lab

The final product QC analyses are performed in the bottling lab.

The Orbisphere 3658 is used in combination with a package sampler that performs a quick and simple sampling operation from bottles and cans. The bottle closure is pierced and beer is pushed by means of an inert gas (nitrogen) without any carbon dioxide loss

The beer flows into the flow chamber of the Orbisphere 3658 where the CO_2 is measured. After less than one minute the analyzer gives the CO_2 content. Data can be transferred to any external data application with the enclosed software.

When not in use, the analyzer automatically activates a standby mode that allows a quick recovery (less than one minute) for the next analysis after minutes, hours, or days without additional calibration.

In the process



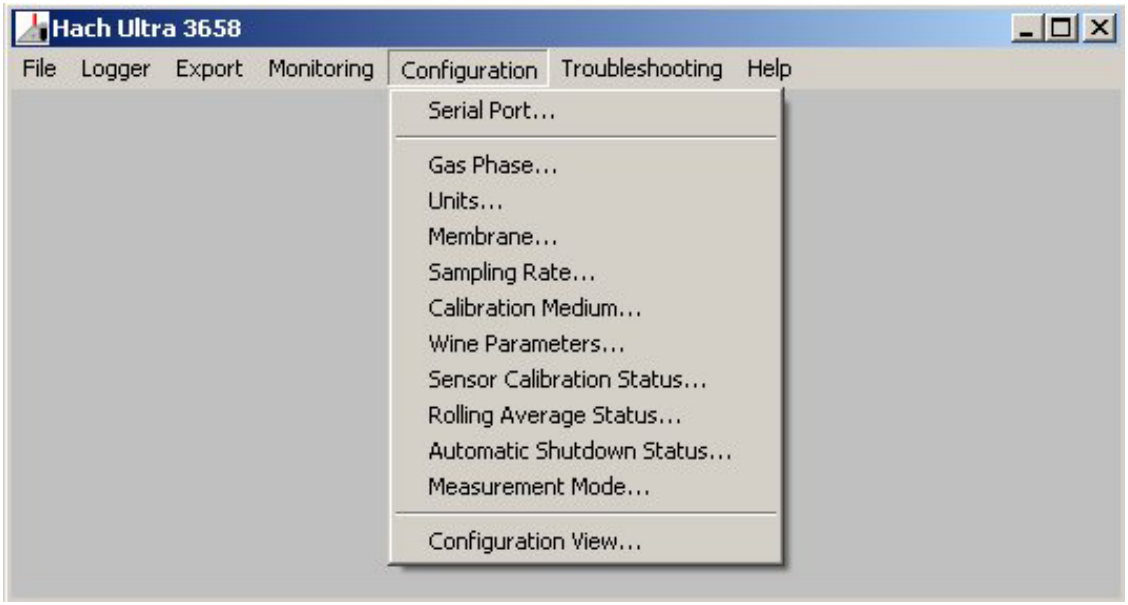
The justification of a portable CO_2 analyzer is to validate on line systems and also to check the CO_2 concentration all along the process where several effects can modify the beer carbonation.

Connect the analyzer to a sample valve and adjust the flow. In less than 2 minutes you will get the result that can be stored in the memory (up to 500 measurements). CO_2 can be measured at any location (tank, barrel, etc) up to 10 bars. The housing design is optimized to last for years.

If you would like to follow the process long term, start the Windows 3658 software and configure the analyzer in automatic data logging mode.

At the specified time interval, the CO_2 concentration, temperature and time are stored in the analyzer memory. You can graph the data to help you understand the critical steps of the process such as start ups and shutdowns.

With Hach Ultra 3658 you can download stored data and export them in your final quality or process data file.



Recommended systems components

Model	Description
3658/418	Portable CO_2 analyzer, sensor model 31478, RS232 (serial) output.
29972	Beverage package sampler for carbonated liquids without suspended particles.