Bürkert's OALAB simplifies chlorine measurement for industrial carbon filters

08 October 2024

Common in pharmaceutical, food and beverage applications, industrial high-rate granular activated carbon (GAC) filters remove chlorine from water supplies, safeguarding product quality and sensitive equipment downstream. Measuring their effectiveness relies on accurate monitoring at the inlet and outlet of the vessel, but many of the traditional solutions for this are slow and maintenance intensive. In contrast, Bürkert's OALAB Type 8906 water analysis system takes fast and precise measurements, increasing data accuracy while reducing recalibration and maintenance requirements.

Overcoming traditional GAC filter monitoring limitations

There are two aspects to monitoring a GAC filter. At the inlet, the amount of free chlorine from the water supply needs to be recorded, while at the outlet, the absence of chlorine (referred to as zero-chlorine) must be measured. To ensure product quality and protect assets downstream, operators rely on accurate data to plot trends and identify any potential problems with the filter. A fast reaction to any chlorine spikes or other issues is critical for reducing often costly impacts on the process and wider operations.

The problem is that the solutions used to monitor chlorine haven't offered the responsiveness required for this task. Traditional amperometric sensors rely on electrodes to detect chlorine, while colorimetric analysers mix samples with a reagent, allowing colour depth to be assessed. Both offer a T90 time of around 2 to

3 minutes – insufficient to facilitate fast operator decision-making. Every second lost increases the likelihood of damage to equipment or processes downstream.

Bürkert's OALAB Type 8906 water analysis system overcomes these limitations. Harnessing the amperometric cell technology of its installed MS02 Chlorine Cube, OALAB provides a T90 time of 30 seconds or less, with some users reporting almost instantaneous read outs. The increased speed of OALAB means operators can react faster to changes in chlorine levels, helping to reduce contamination risks and chlorine contact time for assets such as reverse osmosis (RO) or electro-deionisation systems downstream. It also ensures better decision-making regarding carbon filter capacity, programming changes, backwashes and maintenance.

Less maintenance and recalibration costs

The MS02 in OALAB is an inherently low maintenance solution compared to its competitors. Traditional amperometric sensors are notorious for heavy elements forming on the working amperometric electrodes, causing scaling and compromising their function. To remove build up, maintenance personnel are required to uninstall the electrode and scrape it with abrasive paper.

The MS02 has no such issues. A membrane above its cell stops heavy element deposits, helping operators avoid fiddly and time-consuming maintenance. When pitted against colormetric analysers, the MS02 has the advantage of requiring no reagents for detecting chlorine, so operators don't need to spend time reordering and replenishing reagents for the analyser.

Whether detecting free or zero-chlorine, long term accuracy is of paramount importance in a GAC monitoring application. Unfortunately, traditional amperometric sensors have multiple issues that can cause chlorine measurement drift. For example, the electrolyte used for pH buffering degrades over time, leaching into the

water and affecting results. It can also become poisoned at the inlet of the carbon filter, again reducing measurement accuracy.

The MS02 has no electrolyte, so is immune from poisoning and doesn't leach into water, safeguarding accuracy. Furthermore, at the outlet where zero-chlorine is measured, the MS02 is immune to polarization. This is because the MS02 is combined with an electrolyte filled chamber away from the measurement cell which provides a floating zero point. This avoids having to add a costly chlorine source to the process.

These advantages are evidenced by the fact that Bürkert customers have reported MS02 Chlorine Cubes working perfectly for over two years in drinking water applications with no maintenance or recalibration. Consequently, users can expect a significant reduction in operating expenditure (OPEX).

A standardised design with added flexibility

Importantly for integrators, OALAB is a plug and play solution, fully pre-mounted and wired. The system can measure pH, ORP (redox), conductivity, free chlorine, zero-chlorine, chlorine dioxide, turbidity, iron*, nitrate* and SAC (UV254) in an installation around 1-metre wide - saving considerable space compared to alternatives. Furthermore, it only requires 18 litres per hour for sampling, lowering volumes and reducing wastage.

OALAB also features an active data logger, while enabling remote monitoring and diagnostics. Consequently, operators can receive almost immediate technical support from Bürkert. Its ME43 industrial gateway is compatible with protocols such as Profinet, Ethernet and Modbus TCP.

Until now, traditional amperometric sensors and colorimetric analysers have placed multiple limitations on the monitoring of industrial GAC filters. Bürkert's OALAB with

the MS02 Chlorine Cube supersedes these technologies, providing a faster, more accurate solution that better protects products, equipment and profitability.

Image captions:

Image 1: OALAB is ready-made for chlorine monitoring in industrial high-rate granular activated carbon (GAC) filters.

Image 2: The short T90 times of OALAB allow operators to react faster to changes in chlorine levels.

About Bürkert

Bürkert Fluid Control Systems is one of the leading manufacturers of control and measuring systems for fluids and gases. The products have a wide variety of applications and are used by breweries and laboratories as well as in medical engineering and space technology. The company employs over 2,200 people and has a comprehensive network of branches in 35 countries world-wide.

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