



WORKING SAFELY WITH CO₂

By Analox Sensor Technology Ltd

Article summary: Gas analysis is essential to prevent risks to humans from carbon dioxide leaks.

Carbonated or fizzy drinks are widely available in many venues, from bars to restaurants to night clubs, from sports venues to airports to cinemas. However, anywhere supplying such drinks is doing so using carbon dioxide or CO₂, a toxic gas which is, in the event of a leak, dangerous to humans.

How CO₂ affects the human body

CO₂ is heavier than air, and therefore in the event of a leak in an enclosed space, such as a walk-in cooler or backroom, anyone entering can be put at risk. As little as 5% concentration of CO₂ can quickly cause problems. As an odorless and colorless gas, a human will not detect it, and the risks are exacerbated because rising levels of the gas affect the human body with symptoms that could easily be attributed to other factors.

Even small increases in the concentration of the gas can rapidly increase the risks to humans. Initially exposure to low level CO₂ can cause problems concentrating, an increased heart rate and breathing issues. Higher concentrations of the gas and longer exposure can lead to headaches or

dizziness. The risks to humans continue to escalate, with higher concentrations causing more severe reactions which can occur much more quickly.

Employers need to be aware of the risks to their employees from exposure to CO₂.

CO₂ is a gas that humans exhale. Because of this, people often believe the gas to be benign – they aren't aware of the risks it poses. As an odorless and colorless gas, there is little chance of anyone detecting it without appropriate equipment.

It is essential that all staff working with CO₂ are aware of the dangers should the gas leak and can identify early symptoms which could indicate raised levels of CO₂. They also should be protected by appropriate gas analysis equipment which can forewarn them of any risk. As well as gas monitoring being a vital health and safety measure where carbonated drinks are served, similar monitoring equipment should be fitted in breweries/wineries where CO₂ is a bi-product of the fermentation process.

It is a fact that effective gas analysis can prevent major problems.

The value of a CO₂ alarm

As CO₂ is undetectable by human senses, the only way to safely monitor CO₂ is by using fixed or portable alarm systems. Alarms are available that have been purposely designed for the hospitality industry. These are designed to last longer while operating in a harsher environment, and are protected against the effects of washing down, and against some of the corrosive chemicals in cleaning agents such as chlorine. The alarm monitors the level of CO₂ in the air.

The combination of systems being located in enclosed walk-ins and backrooms and CO₂ being heavier than air means that a leak will lead to rising levels of CO₂

if the gas is unable to disperse. The advice for wall-fixed CO₂ alarms is to install approximately 18 inches above floor level to ensure detection before people accessing the space are put at risk.

Portable alarms are suitable for many people working with CO₂, especially for those delivering the gas who may be entering walk-ins or backrooms at a number of different venues. Employers can ensure the safety of their own staff by supplying them with portable personal alarms. Again alarms have been designed specifically for the hospitality industry, and as well as monitoring high CO₂ levels, there are now products available which incorporate a man down alarm which will sound if the unit detects no movement for a set amount of time. This could prove vital in alerting others in the premises if a person has collapsed.

Reported incidents caused by carbon dioxide leaks

Across the world, a number of incidents are reported annually as a result of leaking CO₂. It is very likely that the number of incidents is actually higher than reported as some health issues triggered by inhaling CO₂ are impossible to attribute and therefore are not reported.

Here are a few examples of recent incidents.

In May 2011, a fast-food restaurant in Phoenix was evacuated because of hazardous CO₂ fumes emitting from leaking soda machines in the building's basement. The fumes had initially caused a pregnant employee to feel light-headed and dizzy, however after a time she collapsed. Other members of staff also experienced symptoms. Emergency services reported a CO₂ leak had caused the dangerous fumes, and were quoted as saying it was lucky that nobody became seriously ill.

In June 2011, staff and customers were evacuated from fast-food restaurant in Yorkshire in the United Kingdom when gas began leaking from a cylinder. No

one was hurt in the event, but emergency services were called and entered the building using breathing apparatus to disconnect the cylinder and ventilate the premises. In this case, the staff were alerted to the leak and able to act quickly to ensure that no one was hurt.

Awareness and Responsibility

Health and safety legislation differs around the world, but the simple fact is that employers have a duty of care to their employees to ensure they have safe conditions in which to work. The employer needs to be aware of the risks of working with CO₂, especially when it is stored in an enclosed space such as a walk-in cooler or enclosed backroom. It is paramount that employers ensure that all their staff, whatever their level and experience, understand the risks from working with CO₂, and know the symptoms which could indicate that the gas is leaking.

Installation of gas analysis equipment is a simple move which any proprietor can take to ensure that staff and customers are safe and lower their risk management.

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