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Continuous monitoring of carbon dioxide in beer fermentation rooms and bottling areas.

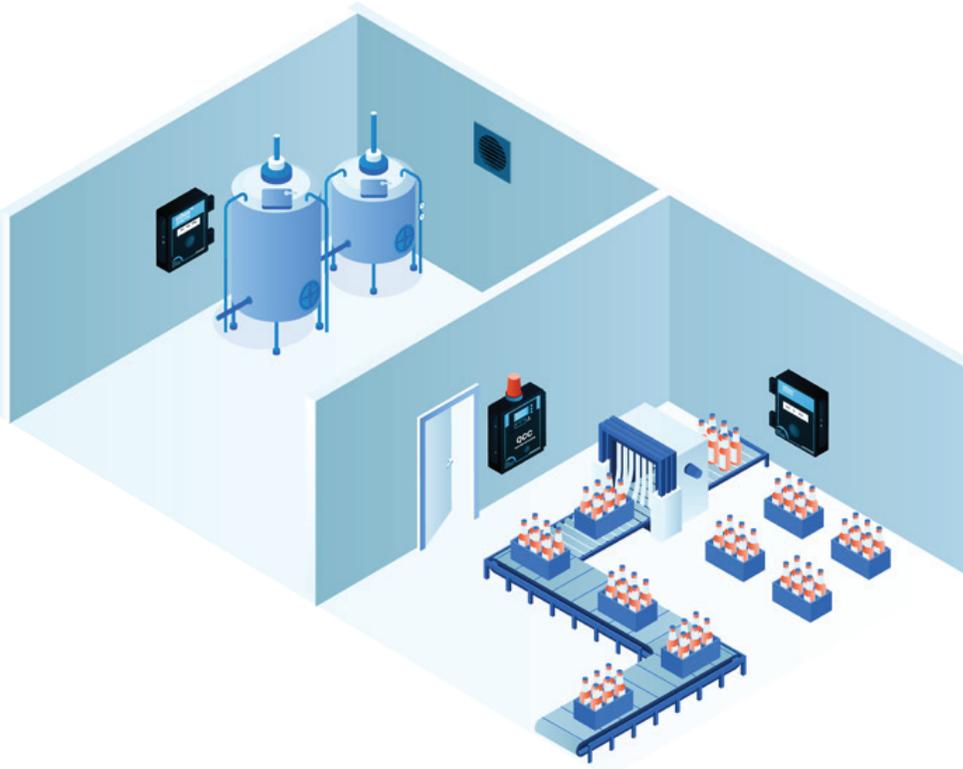
Areas of concern for high levels of Carbon dioxide (CO₂) in breweries include the fermentation room, inside the fermenters and in the bottling area. During fermentation a significant amount of CO₂ is generated and depending on the setup, may be ventilated or captured for use. Any CO₂ that escapes can collect in low lying areas, forming potentially hazardous pools of gas that can build up and displace Oxygen (O₂). Levels of O₂ and CO₂ should be checked prior to cleaning the fermenters by lowering a portable O₂ and CO₂ detector into the vessel to determine if it is safe to enter. Being odourless and colourless, the presence of CO₂ is not known until symptoms of exposure are experienced, unless gas detection equipment is used.

Using Critical Environment Technologies' **QCC** Quad Channel Controller with a **CGAS** Detector CO₂ Transmitter, along with a personal, portable O₂ detector is the solution. **CGAS** Detectors mounted inside the fermentation room and in the bottling area provide continuous monitoring for potential leaks of CO₂. The **QCC** Controller with a top mounted strobe mounted outside the room door provides a status of the air quality conditions inside the room prior to entry. If a CO₂ leak is detected, the top mounted strobe will activate and an audible alarm will sound. The designated relays will activate a preset response, such as turning on a remote alarm device, actuating the mechanical ventilation system and/or triggering another set response as required.



Continuous Monitoring of Carbon Dioxide (CO₂) in Beer Fermentation Rooms and Bottling Areas

Inside the fermentation room, there should be a CGAS Detector with an infrared CO₂ sensor mounted on the wall at the breathing zone height (4 - 6 feet from the floor). It should be close to the fermentation tanks where the possibility of a Carbon dioxide leak is most likely to occur. The measurement range for Carbon dioxide is 0 - 5% volume. With the optional splash guard installed, the CGAS Detector enclosure is water tight (IP54 rated) and will withstand water spray or wash down applications.



During the bottling process, CO₂ is used to pre-fill each bottle before it is filled with beer. Another CGAS Detector with a CO₂ infrared sensor should be mounted in the bottling area to monitor and protect workers on the bottling line.

The QCC Quad Channel Controller with a top mounted strobe should be mounted outside the fermentation room entry door. It will interface with the CGAS detector inside the room and will display the target gas levels for viewing prior to entering the room. The QCC is pre-programmed and field adjustable. Functions that can be set include relay assignment, time delays, logic control, sensor types and ranges, alarm set points, etc. The QCC should be configured to set off alarms and activate the

exhaust ventilation system, shut down the chillers or other alarm procedures as appropriate when a leak is detected. The QCC can accept inputs from up to 4 transmitters, using either an analog (4 - 20 mA) signal and/or Modbus® RS-485 digital communication. The CGAS Detector CO₂ transmitter is available with analog output (CGAS-A-CO2-5%) or Modbus output (CGAS-D-CO2-5%).

Remote visual and audible alarm devices such as the Remote Strobe / Horn (RSH-24V-R) should be set up inside each room and if there is another entrance to the room, a QCC-RDM Remote Display Module should be mounted outside the door of that entrance, to provide visual confirmation of gas level readings prior to entering the room.

The QCC and CGAS fixed system is fully set up, programmed, calibrated and tested prior to being shipped from the factory. It is ready to install upon arrival and operate following the warm up period.

The levels of O₂ and CO₂ should be checked prior to cleaning the fermenters by lowering a personal, portable O₂ and CO₂ detector into the vessel to determine if it is safe to enter. Follow local confined entry requirements and regulations.