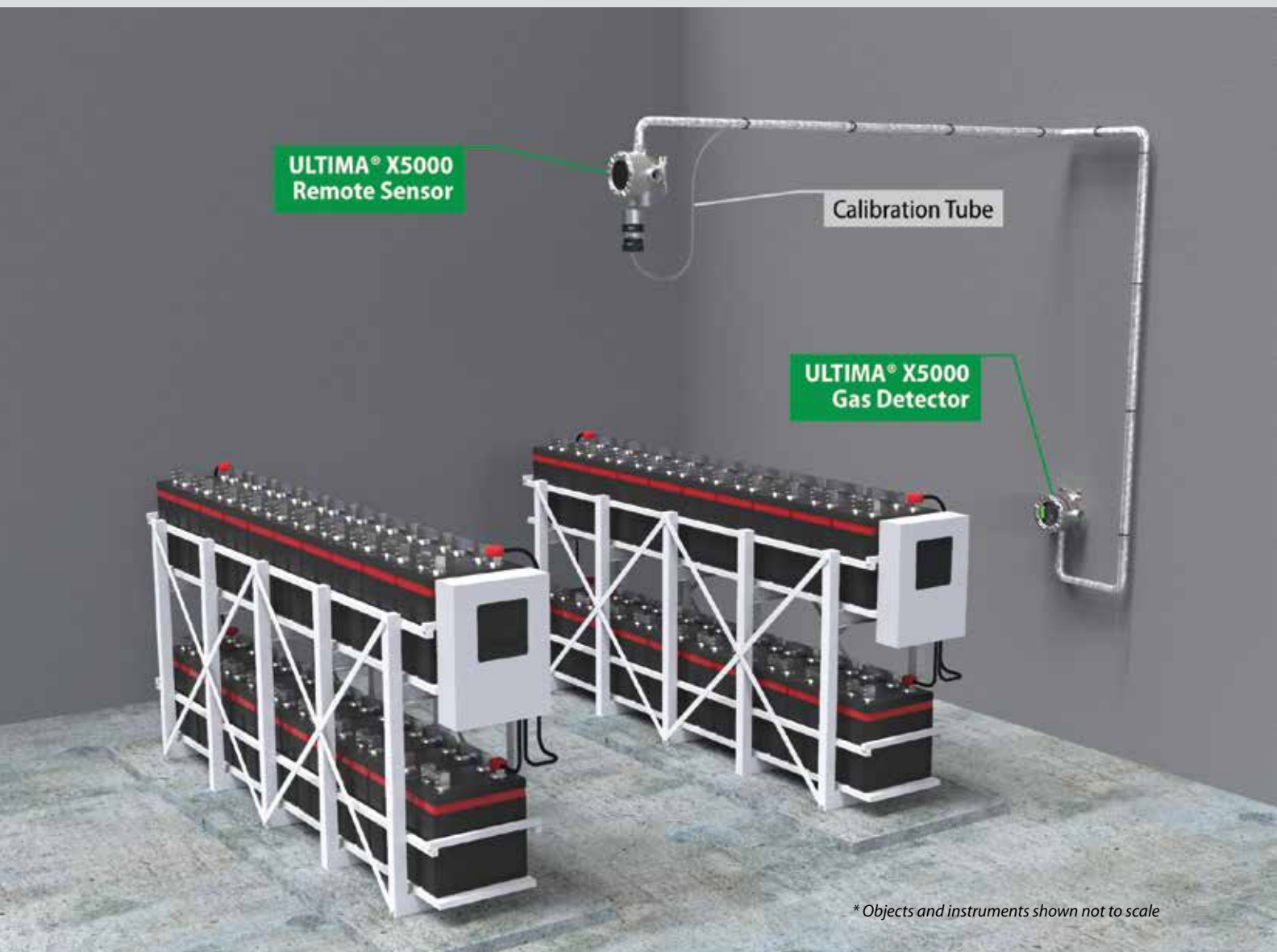


Hydrogen Monitoring in Battery Backup Applications



WE KNOW WHAT'S AT STAKE.

Hydrogen Monitoring in Battery Backup Applications



Battery back-up installations for equipment such as telecommunication stations and computers are normally situated in small rooms with little ventilation. This confined space provides an excellent opportunity for hydrogen to accumulate and reach combustible levels.

The batteries are continuously being charged to ensure maximum efficiency. A byproduct of the recharging process is hydrogen gas, which is produced by the chemical reaction and should be contained inside the battery. Backup batteries are normally of the lead acid type, however some are liquid based, gel cells, or even sealed type batteries. No matter which of these battery types they are, hydrogen is generated while being charged. Sometimes, however, the batteries leak. Since they are extremely light, hydrogen molecules rise rapidly and can pool at the roof or ceiling of the battery room, which may result in an explosive condition.

For reliability, safety and compliance with local building codes and NFPA 111, it is important to have continuous monitoring for hydrogen gas in these applications.

In most instances, the sensor/transmitter is mounted on the ceiling, while the monitoring panel is mounted outside the room. Any build-up will cause an alarm and/or initiate ventilation.

A second common application is in warehouses where battery powered forklifts are used. Charging stations are commonly lined up in areas where a large number of vehicles can be charged simultaneously. Due to the size and number of batteries, dangerous levels of H₂ can accumulate.

An MSA transmitter, when outfitted with an electrochemical sensor, provides a continuous reading of the hydrogen concentration. Since hydrogen has a 4% by volume Lower Explosive Limit (LEL), this gives the end user an indication of a very small leak (< 1% LEL) that can be investigated and remedied. In addition to this low-level measurement, a catalytic bead sensor can be used to monitor larger leaks that could result in an explosive atmosphere (0-100% LEL or higher).

There are two main factors to take into consideration when mounting the sensors:

- Relative density of hydrogen is 0.069, making it lighter than air. Therefore sensors should be mounted at or near the ceiling, away from any source of fresh air, which may dilute the sample.
- Remote sensors are normally used, with panels being mounted away from the hydrogen source.

The volume of space that exists from 18" below the ceiling to the ceiling is often considered a classified area according to the NFPA, requiring a sensor installed in the area to have an explosion-proof rating. This sensor is connected to a transmitter or controller which can either be explosion-proof as well, or can be installed in a non-classified, general-purpose area. A hose can be run from the sensor to the user interface for calibration and/or gas check purposes.

The transmitter or controller can be configured to send a signal to a Building Management System, or can be used as a stand-alone system to initiate actions such as opening vents or louvers, and activating ventilation fans. Considering most of these applications are usually unmanned, the gas concentration can be communicated to an end user's internal network for notification purposes.



Ultima® X5000 Gas Monitor

Designed to provide thorough, continuous monitoring of many hazardous gases, the ULTIMA X5000 is powered by a series of best in class sensors and its performance is guaranteed by the industry's most comprehensive warranty coverage.

- Multi-sensor configuration allows for the use of dual sensing technologies to provide layers of protection
- Patented SafeSwap allows sensors to be replaced in hazardous areas without area declassification
- Unique touch-screen interface makes it simple to navigate without additional tools
- Bluetooth wireless technology allows you to check status, modify settings, and more with the X/S Connect app
- Explosion-proof housing



TG5000 Gas Monitor Single- or Dual-Sensor Unit

The TG5000 Gas Monitor employs MSA's Ultima X5000 technology to detect combustible gases, including hydrogen, as well as other toxic gases.

- Same display features as Ultima X5000: OLED and bright status LEDs
- Multiple sensor mounting options
- Bluetooth capability allows you to access sensors remotely up to 75 ft (23 m) away with the X/S Connect app



GasGard® XL Controller

Monitor up to eight remote gas sensors with the highly accurate wall-mounted GasGard XL Controller.

- Large, multi-language LCD display provides real-time readings and offers full-system diagnosis
- Housed in durable, fire-retardant ABS plastic
- Controller features a buzzer that sounds up to 85 dB
- Convenient upload system enables event-log transfer via ethernet or USB



MSA—The Safety Company

Our business is safety. We've been the world's leading manufacturer of high-quality safety products since 1914. MSA products may be simple to use and maintain, but they're also highly sophisticated devices and protective gear—the result of countless R&D hours, relentless testing and an unwavering commitment to quality that saves lives and protects millions of hard working men and women each and every day. Many of our most popular products integrate multiple combinations of electronics, mechanical systems and advanced materials to help ensure that users around the world remain protected in even the most hazardous of situations.

Our Mission

MSA's mission is to see to it that men and women may work in safety and that they, their families and their communities may live in health throughout the world.

MSA: WE KNOW WHAT'S AT STAKE.

Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice.

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