Hydrogen Monitoring **in Data Centers**

The Safety Company

Application

In this digital age, the amount of data transmitted every second across the internet is staggering. Streaming media, cloud computing, business transactions and web browsing all combine to stress the infrastructure of existing networks to its breaking point. Yet the system is expected to be available at all times.

As a result, companies including banks, telecommunication firms, government organizations and retail businesses employ data centers that house the equipment necessary to keep data flowing and guarantee autonomy by using batteries for uninterruptable power.

The batteries in the data center 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. 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.

Solution

Combustible gas detection placed in potential hydrogen collection areas can provide gas concentration information, enabling the user to take corrective action before an explosive condition exists. With two available sensing technologies offering vastly different measuring ranges, a system can be established to provide an indication of an extremely small concentration, as well as an extremely dangerous concentration.

An MSA transmitter, when outfitted with an electrochemical cell, provides a continuous reading of the hydrogen concentration in the range of 0 to 1,000 parts per million (ppm). 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).

Implementation

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 Automation System, or can be used as a stand-alone system to initiate actions such as opening vents or louvers, and activating ventilation fans. Since data centers are usually unmanned, the gas concentration can be communicated to an end user's internal network for notification purposes.

MSA Data Center Monitoring Units

Ultima® X Gas Monitor

Designed to provide thorough, continuous monitoring of many hazardous gases, these indoor/outdoor monitors offer excellent performance with MSA quality craftsmanship.

- Multi-sensor configuration (X3) allows for the use of dual sensing technologies to provide layers of protection
- Patented sensor disconnect-under-power feature allows sensors to be replaced in hazardous areas without area declassification
- Interchangeable smart sensors eliminate the need for reconfiguration

TRIGARD® Gas Monitoring System

The TRIGARD System employs MSA's precision craftsmanship to detect combustible gases, including hydrogen, as well as other toxic gases.

- Simple push-button calibration
- Single circuit board increases reliability
- Sturdy NEMA 4X design
- Multiple sensor mounting options

GasGard® XL Monitor

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
- Sensor features a buzzer that sounds up to 85 dB
- Convenient upload system enables event-log transfer via ethernet or USB

ID 07-0062-MC / June 2013

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