Battery Room Hydrogen Monitors for NFPA 111 Compliance

Application Notice: Major Financial Institution Installs Battery Room 
\(H_2\) Monitoring Systems to Comply with Safety Regulations

Application: Battery Room Hydrogen Monitoring  
Industry: Financial Institution / Office Building  
Results Achieved:  
- Installed Hydrogen Monitoring System with Supervisory Notification  
- Reduced Insurance Costs

Battery Room Hydrogen Monitoring  
Systems to be Installed in Branch and Regional Locations

Application  
A Major financial institution upgraded their data center battery rooms for reliability, safety, and compliance with local building codes and NFPA 111.

Challenge  
Battery rooms at the financial institution had grown piecemeal as the data centers expanded. Safety systems were either nonexistent or inadequate to serve the larger stored energy capacities now present.

Newer stored energy system requirements force UPS users to upgrade existing battery rooms for compliance with local fire and building codes and NFPA 111, “Standard on Stored Electrical Energy Emergency and Standby Power Systems.”

During charging, lead acid batteries discharge Hydrogen that ignites easily and explodes when present in high concentrations. A Hydrogen flame is invisible and fires are extremely hazardous to personnel.

The bank required reliable Hydrogen detection to satisfy their insurance company and comply with NFPA 111, referenced in the local fire and building codes.

Solution  
A Sensidyne SensAlarm Plus gas monitoring system was installed with Hydrogen specific gas sensors. Ceiling mounted remote sensor heads monitored the lighter than air Hydrogen while the SensAlarm Plus enclosure was installed outside the entry door. The gas detection system integrated with battery charging equipment and ventilation fans. Installation was simplified due to easily remote mounted sensor heads that only required a 4-conductor cable connection.

Refer to NFPA 111 “Standard on Stored Electrical Energy Emergency and Standby Power Systems” and NFPA 70 “National Electrical Code” for additional Battery Room safety information.
SensAlarm Plus is a complete gas detection system in one enclosure. The system is fully equipped with strobe, horn, high-visibility four-digit LED Display and LCD Display / Interface. At the core of SensAlarm Plus is an advanced Intelligent Sensor platform with non-volatile memory for all key application variables and sensor data. A non-intrusive user interface enables operational customization and access to sensor life parameters, TWA alarms, calibration data and other information with date and time recording.

The SensAlarm Plus sensor head is universal in that it accepts all Sensidyne Plus sensors. Monitoring in high, low or adjacent locations is simplified by remote mounting the sensor head using 4 conductor cable. The automatic uploading of variables, alarm values and sensor information when a sensor is plugged in greatly simplifies installation and maintenance. Transportable calibration allows sensor calibration at the point of installation or in a workshop, then hot-swapping the sensor in the field.

SensAlarm Plus is the ideal gas monitoring solution for labs, gas cylinder storage, industrial work areas, control room protection or any other applications where users benefit from a packaged gas detection system that works with all SensAlert Plus sensors.
Ordering Guide

**INSTRUMENTS & ACCESSORIES**

- SensAlarm Plus Monitor .................................................. 820-0301-01
- SensAlarm Plus Monitor with 2nd Strobe .......................... 820-0301-03
- SensAlarm Plus Monitor with Battery Back-up ................ 820-0301-02
- SensAlarm Plus Monitor with Battery Back-up and 2nd Strobe ... 820-0301-04
- Remote Sensor Kit ........................................................... 820-0301-01

**SENSORS**

- Acetylene IR – 50% LEL ........................................ 823-0249-51
- Ammonia – 100 ppm .................................................. 823-0201-21
- Ammonia – 50 ppm .................................................... 823-0201-22
- Ammonia – 300 ppm .................................................. 823-0201-41
- Ammonia – 500 ppm .................................................. 823-0201-42
- Carbon Dioxide IR – 5.00% Vol .................................... 823-0205-52
- Carbon Monoxide – 100 ppm low interference to H₂ .... 823-0219-41
- Carbon Monoxide – 500 ppm low interference to H₂ .... 823-0219-43
- Carbon Monoxide – 1000 ppm low interference to H₂ ... 823-0219-45
- Carbon Monoxide – 100 ppm ..................................... 823-0219-23
- Carbon Monoxide – 500 ppm ..................................... 823-0219-22
- Chlorine (H₂S Resistant) – 5.00 ppm ......................... 823-0202-42
- Chlorine – 10.0 ppm ................................................ 823-0202-21
- Chlorine – 5.00 ppm ................................................. 823-0202-22
- Chlorine – 20.0 ppm ................................................ 823-0202-23
- Chlorine (H₂S Resistant) – 10.0 ppm ......................... 823-0202-41
- Chlorine (H₂S Resistant) – 5.00 ppm ......................... 823-0202-42
- Chlorine (H₂S Resistant) – 100 ppm ......................... 823-0202-43
- Chlorine Dioxide – 1.00 ppm .................................... 823-0203-51
- Combustibles IR – 100% LEL ...................................... 823-0211-31
- Combustibles Catalytic Bead, General – 100% LEL .... 823-0211-32
- Comb. Catalytic Bead H₂, ETO, Acetylene – 100% LEL ... 823-0211-33
- Ethylene Oxide (ETO) – 10.0 ppm ............................. 823-0245-21
- Fluorine – 10.0 ppm ................................................ 823-0215-21
- Fluorine – 25.0 ppm ................................................ 823-0216-22
- Hydrogen Chloride – 10.0 ppm .................................. 823-0208-21
- Hydrogen Chloride – 20.0 ppm .................................. 823-0208-22
- Hydrogen Cyanide – 20.0 ppm .................................. 823-0203-21
- Hydrogen Fluoride – 10.0 ppm .................................. 823-0207-21
- Hydrogen Fluoride – 20.0 ppm .................................. 823-0207-22
- Hydrogen Specific Electrochemical LEL – 100% LEL ... 823-0210-41
- Hydrogen Specific PPM – 1000 ppm ......................... 823-0210-21
- Hydrogen Sulfide – 100 ppm .................................... 823-0206-21
- Hydrogen Sulfide – 50 ppm ...................................... 823-0206-22
- Nitric Oxide – 100 ppm ........................................... 823-0242-21
- Nitrogen Dioxide – 10.0 ppm .................................... 823-0221-21
- Oxygen – 25.0% Vol ................................................ 823-0240-21
- Ozone (also PLUS 1.00 ppm) – 2.00 ppm ................. 823-0243-22
- Phosgene – 1.00 ppm ............................................... 823-0247-21
- Sulfur Dioxide, H₂S Filtered – 20.0 ppm .................... 823-0218-21
- Sulfur Dioxide, H₂S Filtered – 10.0 ppm .................... 823-0218-22

**Specifications**

**SENSORS**

Gas Sensors ... All Sensidyne Plus sensors

ToD: ............ Test-On-Demand available for specific toxic sensors.

**ELECTRICAL**

Design ............. Microprocessor based with nonvolatile memory. Automatically resumes operation after power failure.

Power ............. 100-240 VAC, 50/60 Hz or 20-30 VDC.

Battery .......... Optional battery back-up available

Outputs .......... 4-20 mA into 600 ohms; Optional RS-485, Modbus RTU Protocol,

Strobe .......... Red lens flashing strobe (NEMA 4X) standard with optional dual strobes with red and amber strobe.

Horn................. 95 dB piezo horn

Alarm Relays .... SPDT, 6 Amps @ 120VAC or 24VDC, User accessible SPDT Fault, Low & High Alarm Relays. Additional relays for Strobe & Sounder. Note: Alarm values stored in non-volatile memory.

**ENCLOSURE**

Material............ Fiberglass.

Description .... UL listed, NEMA 4X Rated

Type .............. Wall mount with tabs & threaded inserts.

Overall Size ...... 9.75 (W) by 20 (H) by 6.4 (D) Inches,

Alarm Relays ...... 3/4 inch EMT connector supplied (side).

Temperature ... -4° to 122°F (-20° to 50°C).

Humidity ........ 0-90 %RH, non-condensing.

Location ......... Indoor or Outdoor

Sensor Head ....... Sensor head enclosure and retaining ring are black anodized aluminum; splash guard, and most other accessories are made of PVC.

**DISPLAYS & CONTROLS**

LCD Display ...... Alphanumeric (Value, Gas, & Units).

LED Display ...... 4 Digit x 1.5 Inch Red LED (Value).

Indicators...... Power source LEDs (AC, DC and Battery), Alarm and corresponding to magnetic keypad LEDs: (1 & OK; 2 & << [Go Back]; 3 & |; 4 & ▼)

Security........ Password Protected Configuration Menu

Auto Config ....... System automatically senses the presence of optional modules and features

Reset/silence .... External push button switch for acknowledge (Alarm sequence 3A)

Annunciators .. Audible (+95db) & Visual single strobe with optional second strobe

**Note:** Refer to certification documents and datasheets for specific approval and configuration information.

Contact factory for additional sensor information or specifications.