APPLICATION GUIDE

BATTERY STATION GAS DETECTION

Continuous monitoring of hydrogen gas at lead acid battery charging stations.

Peace of mind. Guaranteed.

Equipment powered by lead-acid batteries—such as warehouse forklifts—typically use heavy-duty battery banks that are arranged in indoor charging stations, allowing multiple batteries to be charged at once. Some batteries, including lead acid batteries, produce flammable hydrogen (H_2) gas as part of the normal charging process. The amount of hydrogen produced varies depending on the size and number of batteries and can increase with overcharging, excessive heat and other factors. As the hydrogen level builds, the risk of fire and explosion increases, which is a serious safety concern.

The best way to monitor hydrogen levels is with a fixed gas detection system permanently installed in the battery charging area. Gas level readings can be used to trigger alarms, turn on the ventilation system and call emergency response.

Critical Environment Technologies' cGas-SC Self-Contained Controller with an ESH-A remote hydrogen sensor offers the features and functionality to ensure a safe, non-explosive environment.

Battery charging stations vary in size, layout and setup. To help ensure a safe working environment a fixed gas detection system should be installed as follows. One fixed remote ESH-A-CH2-100 with a catalytic hydrogen sensor with a detectable range of 0 - 100% LEL will provide coverage of 5,000 ft^2 (465 m^2) a radius of 40 ft (12 m). The remote sensor should be mounted on or near the ceiling above the battery charging area, where hydrogen gas will concentrate. Care should be taken to make sure the sensor is away from ventilation fans and any rapidly moving air.

The ESH-A continuously transmits a 4 - 20 mA analog signal to the CGAS-SC-RS-L2 Controller which shows the corresponding gas level

GAS DETECTION SOLUTION

- cGas-SC Self Contained Controller
- ESH-A Remote Sensor

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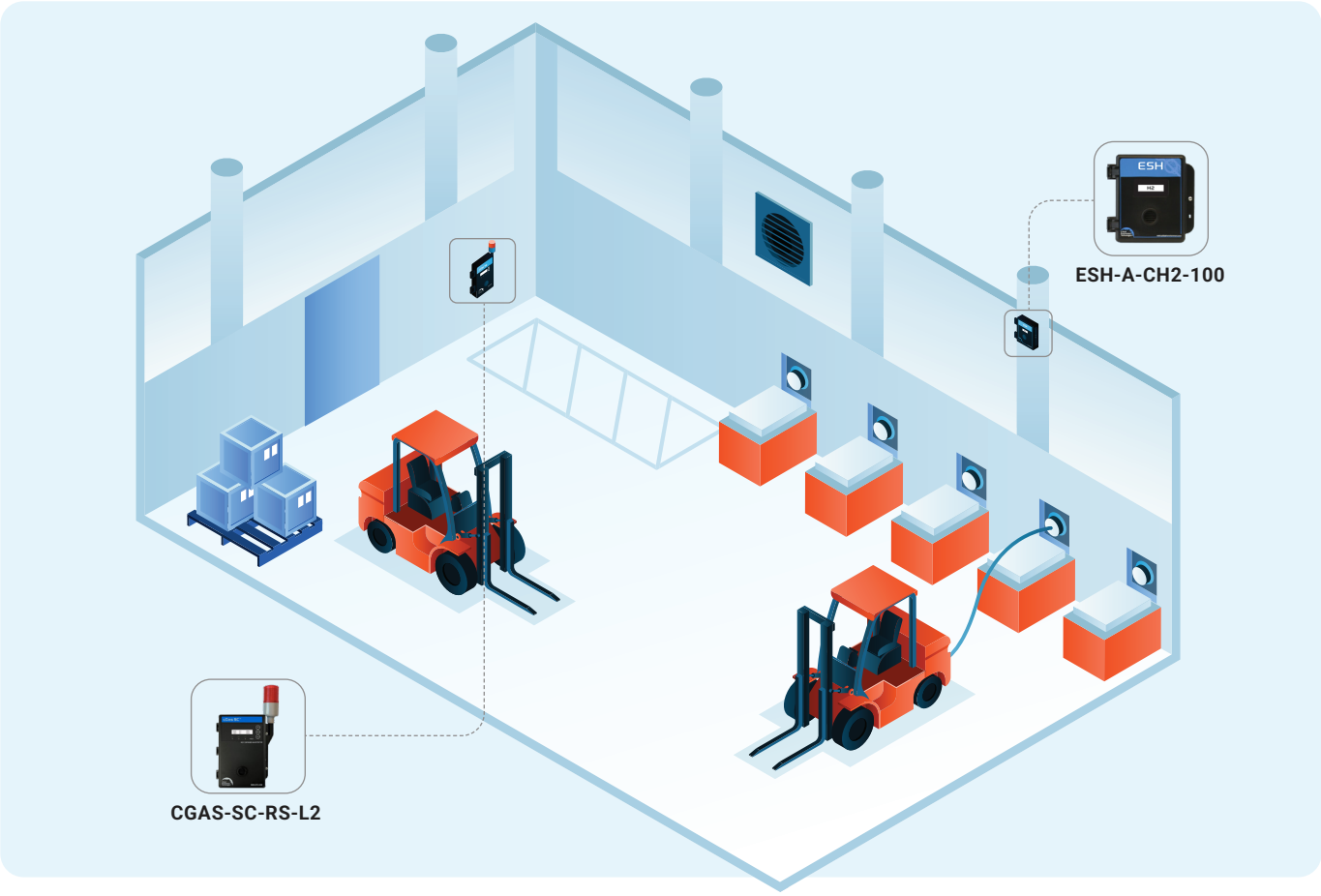

readings. The cGas-SC with a side mounted strobe, should be mounted at viewing height in a suitable area so the display is easy to read. The distance between the cGas-SC and ESH-A should be no more than 200 ft (61 m).

The cGas-SC Controller has three gas alarm setpoints and two dry contact relays rated 5A@240VAC. Alarm level 1, 2 and 3 may also be referred to as LOW, MID and HIGH. Depending on the application, all three may be used or just the LOW and HIGH. The LED lights on the front of the enclosure will turn red in sequence from LED 1 to 3, corresponding with the level of alarm. If the device goes into low alarm, LED 1 will turn red and relay 1 will be triggered, activating the exhaust fans to clear the area of the gas and bring the gas concentration down to an acceptable level. If the ventilation system is inadequate or malfunctioning and the level of hydrogen reaches the third setpoint, the system will go into HIGH alarm. All 3 LEDs will turn red; the second relay will trigger the internal buzzer and side mounted strobe (if installed) and any remote horn/strobes connected to the cGas-SC to turn on.

The cGas-SC is available with two 4-20 mA outputs (Option -2AO) for VFD control and/or interface with a Building Automation System (BAS) which, in turn, can trigger alarms and other safety procedures as appropriate.

The cGas-SC comes standard with an internal audible alarm and is available with an optional extra loud buzzer that can be ordered and installed at the time of purchase. If enabled, the OK button can be used to silence the internal and any remote horns/strobes temporarily and clear any latched relays. The cGas-SC and ESH-A come standard in a water / dust tight enclosure. The cGas-SC and ESH-A 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 warmup period.