

Peace of mind. Guaranteed.

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

Equipment powered by lead acid batteries, such as forklifts used in a warehouse, have heavy duty battery banks that are commonly lined up in an indoor charging station formation where many machines can be charged at one time. Most batteries, including lead acid batteries produce flammable hydrogen gas as part of the normal charging process. The amount of hydrogen that is 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.

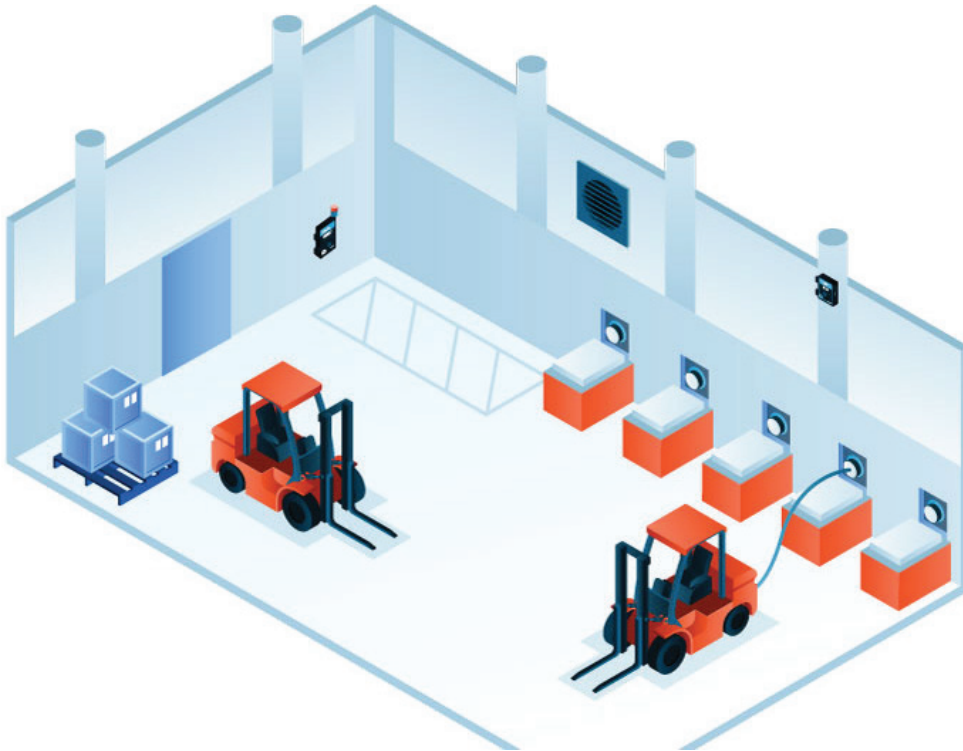
The best way to monitor hydrogen levels is with a fixed gas detection system permanently installed in the battery charging area. Gas level readings can be used to trigger alarms, turn on the ventilation system and call emergency response.

Critical Environment Technologies' [cGas-SC](#) Self Contained Controller with an [ESH-A](#) with a Hydrogen sensor offers the features and functionality to ensure a safe, non-explosive environment.



Continuous Monitoring of Hydrogen (H₂) in Lead Acid Battery Charging Stations

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 465m² / 5,000ft², a radius of 12 m / 40 ft. 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 will continuously transmit a 4 - 20 mA analog signal to the cGas-SC Controller which will show the corresponding gas level readings. The cGas-SC with a side mounted strove, should be mounted at viewing height in a suitable area so the display is easy to read. Wiring between the devices should be 4-conductor, 16 to 18 gauge, stranded, shielded and installed in conduit. The distance between the cGas-SC and ESH-A should be no more than 61m / 200ft.

The cGas-SC Controller has three gas alarm setpoints and two dry contact relays rated 5A @ 240 VAC. 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 can be ordered with two 4-20 mA outputs (Option -2AO) that can be used 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 (default is 2 minutes) and clear any latched relays. The cGas-SC and ESH-A come standard in a water / dust tight enclosure with copper coating to reduce RF interference. 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 warm up period.