




Yin Yin Moe
YESTERDAY AT 9:24 PM



Do batteries emit gas? ^

In addition, **overcharging a lead acid battery can produce hydrogen sulfide gas**. This gas is colorless, poisonous, flammable, and has an odor similar to rotten eggs or natural gas. The gas is heavier than air and will accumulate at the bottom of poorly ventilated spaces.

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LEAD ACID, LITHIUM-ION, AND LITHIUM BATTERIES

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LEAD ACID, LITHIUM-ION, AND LITHIUM BATTERIES

Lead acid batteries vent little or no gas



How to safeguard against the explosions of Tubular/SMF batteries



How to safeguard against the explosions of Tubular/SMF batteries is a problem to understand and take the safeguards to prevent it.

We've all heard tubular or SMF batteries explode more frequently in inverter and UPS applications.

People are generally unaware that these explosions can kill them, as the explosion causes sharp plastic and lead nails mixed with acid to hit people with force, causing burns, amputations, or even death.<https://www.unikbatteries.com/what-are-the-reasons-for-blasting-of-tubular-lead-acid-batteries>



A lot of accidents have occurred; some are reported in the press, and others are not.

What causes these accidents needs to be understood very clearly.

1. The Inverters used with Tubular batteries can cause a blast if the inverter charging circuit overcharges the battery beyond its charging limits or the charging limit of the Inverter and UPS is set at higher limits than the battery can take. All tubular or SMF battery has the limitation of charging voltage being cut off. Suppose that setting is not done in Inverter or UPS according to the battery installed with that particular voltage. In that case, the battery can bulge initially and can explode ultimately.

2. Most UPS and inverter manufacturers give switches at the back of their products for settings of different types of batteries, but this is not sometimes known to the customer and seller. They don't care to set the switch before installing the battery and Inverter/UPS, which leads to the overcharging or undercharging of the battery. The overcharging causes bulging and blasts and undercharging reduce the backup time of the inverter and UPS. Also, the local UPS and Inverter manufacturer is making the product without much awareness, which also become one reason for battery

blast.



3. The proper distilled water is to be used when refilling the battery as this also causes the problem for the storm as the charging takes place, the chemical reaction takes place in the battery which creates various types of gases in the battery

which can become the cause of significant explosion in the storm.

4. The Vent Plugs cleaning also becomes one of the significant causes of explosions as people who have installed batteries in the vicinity are not aware that when the battery is charged or discharged, the vent plugs are meant for evaporation of those gases. If those get choked, then these can cause an explosion. These vent plugs need to be cleaned regularly, and if possible, the battery vent plugs are to be removed once in 6 months. After cleaning, they can be installed again, but this has to be done by the battery professional only so that no untoward accident happens.



5. Temperature to be maintained around the battery placement as high temperature also becomes one of the reasons for battery explosion as the battery being charged and discharged the battery is getting heated inside. If the temperature outside is also very high, it can cause the bulging of the battery or explosion at times.

6. Proper ventilation where the product is placed is also essential, as the gases are released in the atmosphere when the battery is charged or discharged. Hence, one has to see that those gases are removed in the open air rather than accumulated in a closed-door space, as these are poisonous gases and can be hazardous to the health of human beings.

7. Time-to-time servicing of the Inverter/UPS is also essential by the technical people so that they can check that proper charging voltage is maintained by the Invert/UPS and can check the battery voltages and adequate cleaning of the battery and other routine maintenance of the product.

8. No cigarettes or burning of any material around is allowed as the inverter/UPS batteries emit a lot of poisonous gases, and the lighting of cigarettes or any kind of flames around them can cause an explosion, so one should keep these away.

Conclusion

Tubular or SMF batteries are exploding more often in inverter and UPS applications. This causes sharp plastic and lead nails mixed with acid to hit people hard, causing burns, amputations, or even death. Inverters with tubular batteries can cause a blast if the charging circuit overcharges the battery beyond its charging limits or if the charging limits are set higher than the battery can take. Additionally, the local UPS and inverter manufacturers are making the products without much awareness, and the proper distilled water should be used when refilling the battery. Explosions in batteries are caused by a chemical reaction inside the battery that makes different gases. Vent plugs must be cleaned regularly and removed every 6 months, and temperatures must be maintained around the battery placement. Proper ventilation where the product is placed is also important, and technical personnel must regularly service the inverter or UPS. Smoking or burning any kind of material around the batteries can cause explosions, so one should keep these away.

7. Trouble Shooting Table

Proceed as follows for quick detection of common faults.

DC loads must be disconnected from the batteries and the AC loads must be disconnected from the inverter before the inverter and/or battery charger is tested.

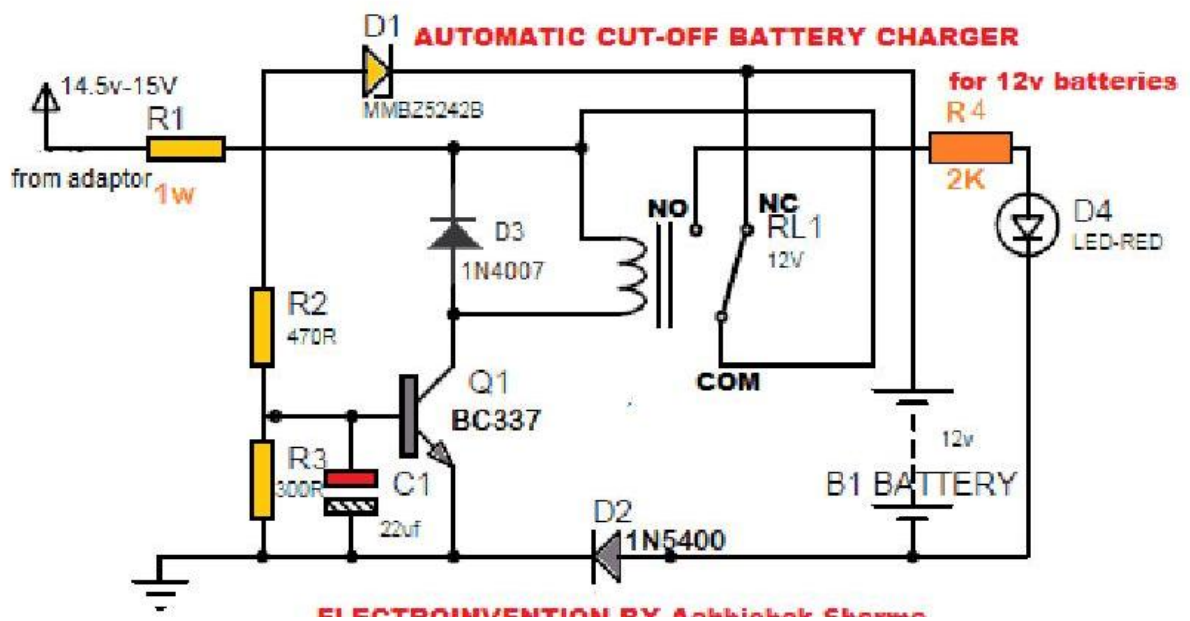
Consult your Victron Energy dealer if the fault cannot be resolved.

Problem	Cause	Solution
The inverter fails to operate when switched on	The battery voltage is too high or too low	Ensure that the battery voltage is within the correct value.
The inverter fails to operate	Processor in no function-mode	Disconnect mains voltage. Switch front switch off, wait 4 seconds. Switch front switch on.
The alarm LED flashes	Pre-alarm alt. 1. The DC input voltage is low	Charge the battery or check the battery connections.
The alarm LED flashes	Pre-alarm alt. 2. The ambient temperature is too high	Place the inverter in a cool and well-ventilated room, or reduce the load.
The alarm LED flashes	Pre-alarm alt. 3. The load on the inverter is higher than the nominal load	Reduce the load.
The alarm LED flashes	Pre-alarm alt. 4. Voltage ripple on the DC input exceeds 1.25Vrms	Check the battery cables and terminals. Check the battery capacity; increase if necessary.
The alarm LED flashes intermittently	Pre-alarm alt. 5. Low battery voltage and excessive load	Charge the batteries, reduce the load or install batteries with a higher capacity. Use shorter and/or thicker battery cables.
The alarm LED is on	The inverter did cut out following a pre-alarm	Check the table for the appropriate course of action.
The charger is not functioning	The AC input voltage or frequency is out of range	Ensure that the input voltage is between 185Vac and 265Vac, and that the frequency matches the setting.

Problem	Cause	Solution
The battery is not being charged fully	Incorrect charging current	Set the charging current at between 0.1 and 0.2x battery capacity.
	A defective battery connection	Check the battery terminals.
	The absorption voltage has been set to an incorrect value	Adjust the absorption voltage to the correct value.
	The float voltage has been set to an incorrect value	Adjust the float voltage to the correct value.
	The internal DC fuse is defective	Inverter is damaged.
The battery is overcharged	The absorption voltage has been set to an incorrect value	Adjust the absorption voltage to the correct value.
	The float voltage has been set to an incorrect value	Adjust the float voltage to the correct value.
	A defective battery	Replace the battery.
	The battery is too small	Reduce the charging current or use a battery with a higher capacity.
	The battery is too hot	Connect a temperature sensor.
Battery charge current drops to 0 when the absorption voltage is reached	Alt. 1: Battery overtemperature (> 50°C)	<ul style="list-style-type: none"> • Allow battery to cool down • Place battery in a cool environment • Check for shorted cells
	Alt 2: Battery temperature sensor faulty	<p>Unplug battery temperature sensor from the MultiPlus.</p> <p>Reset the MultiPlus by switching it off, then wait for 4 seconds and switch it on again.</p> <p>If the MultiPlus now charges normally, the battery temperature sensor is faulty and needs to be replaced.</p>

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1. *Connecting the wrong battery terminals in an inverter/UPS - India Invertersays:*
August 18, 2023 at 10:05 am
[...] To avoid these problems, it is important to ensure the battery terminals are connected correctly. The battery's positive terminal should be connected to the positive terminal of the inverter/UPS, and the negative terminal of the battery should be connected to the negative terminal of the inverter/UPS.<https://suvastika.com/how-to-safeguard-against-the-explosions-of-tubular-or-smf-batteries/> [...]
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2. *The Dangers of Tubular Lead Acid Battery Explosions and How to Prevent Themsays:*
August 5, 2023 at 10:24 am
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