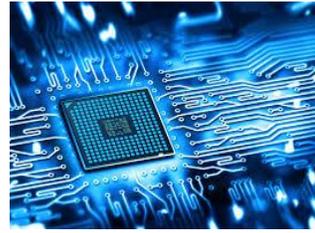


VRLA BATTERIES

TDS-005 Issue 01 Zitel Technical Bulletin



Thank you for your interest in Zitel - we are a UK based manufacturer of PAGA and Intercom products. Our systems are mainly designed for use in the Hazardous Oil, Gas and Petrochemical industries.

Zitel manufacture a range of equipment destined for use in life safety critical applications. A major requirement is to ensure continued system operation in event of primary AC mains supply failure. In such applications VRLA dry fit lead acid battery units are integrated into the package enabling no break autonomy and therefore maintaining continued system service for a pre defined period.

INTRODUCING THE ZITTEL VRLA BATTERY

Background

Zitel deliver products systems incorporating no break mains power supply input autonomy - from ZTL350 portable PAGA test set (DS076) through to large voice and alarm broadcast systems where integrated battery / charger packages ensure continued service in event of primary mains supply disconnection. The Zitel battery system of choice is based on valve regulated acid accumulator VRLA technology which over the last twenty years has developed into the market leading choice for telecommunication no break supplies. A VRLA battery (valve-regulated lead-acid battery), more commonly known as a **sealed lead acid battery** or **maintenance free battery**, is a type of lead-acid rechargeable battery. Due to their construction, they can be mounted in any orientation, and do not require constant maintenance. The term "maintenance free" is a misnomer however as VRLA batteries *still* require cleaning and regular functional testing. There are two primary types of VRLA batteries, gel cells and AGM. (Gel cells add silica dust to the electrolyte, forming a thick putty-like gel, these units are referred to as "silicone batteries"). AGM (absorbed glass mat) batteries feature fiberglass mesh between the battery plates which serves to contain the electrolyte. The AGM battery is the type employed in Zitel equipment. The VRLA battery system is designed to be *recombinant* and therefore eliminates the emission of gases on overcharge so room ventilation requirements are reduced and no acid fume is emitted during normal operation. The volume of free electrolyte that could be released on damage to the case or venting is very small. There is no need (nor possibility) to check the level of electrolyte or to top up water lost due to electrolysis, reducing inspection and maintenance.

Because of calcium added to its plates to reduce water loss, a VRLA battery recharges much quicker than a flooded lead acid battery.

VRLA battery summary:

- Have shorter recharge time than flooded lead-acid.
- Cannot tolerate overcharging: overcharging leads to premature failure.
- Discharge significantly less hydrogen gas.
- AGM batteries are by nature, safer for the environment, and safer to use.
- Can be used or positioned in any orientation.



ZITTEL LIMITED

email: sales@zittel.com web: www.zittel.com tel: +44 (0) 115 9202888
mail: 96 Rolleston Drive, Arnold, Nottingham, NG5 7JP United Kingdom

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Transportation

Batteries are generally removed from the host cubicle for transportation purposes, smaller battery piles are clamped in situ (example ZTL350 Battery unit). All sealed lead acid batteries are unregulated by DOT for transportation by truck, rail, ocean and air transportation because they meet the requirements of 49 CFR 173.159 (d).

Transport requirements are:-

1. The battery is securely packaged in such a way to (a) prevent the possibility of short circuiting the battery terminals (b) damage to the outer battery container.
2. The battery and outer most packaging is labelled *NONSPILLABLE VRLA BATTERY PILE*.

Storage

The battery pile is fully charged prior to despatch from the factory. The battery MUST receive a charge within three months of ex works delivery to avoid permanent damage to the battery. If the equipment is to be held in storage pending installation then arrangements must be made to float charge the battery pile. In the case of integral battery such as the ZTL350 portable PAGA test rig then this unit should be connected to the supplied charger when not in use.

Storage temperature -20 C to + 60 C.

Installation

Prior to connection to the target system the battery units are carefully unpacked and inspected for transit damage, a hair line crack in the outer case, for example, will leak corrosive electrolyte and ultimately lead to pre mature battery failure.



Use only insulated tools when working on battery unit installation, even small battery units are capable of supplying huge electric currents leading to potential fire, explosion, arc eye.



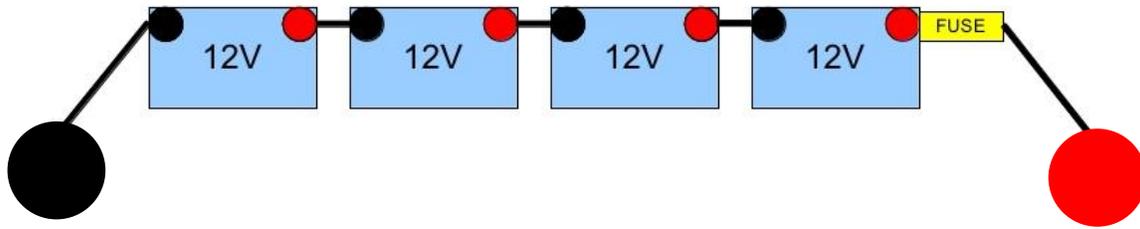
Battery unit subjected to short circuit terminals

ZIZTEL LIMITED

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Check that the battery is connected in accordance with project documentation. For most deliveries Ziztel use a 48 VDC supply rail necessitating series connection of four 12 V accumulators. It is vital that the battery links are installed as follows:-

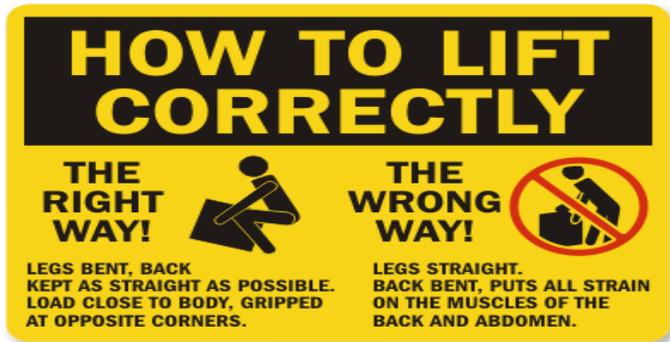


 positive terminal linked to  negative terminal in each case

The VRLA battery is designed to deliver its peak performance at an ambient temperature of +25 degrees centigrade with ideal operating temperature conditions of between +21 to +27 C, the battery system should not be charged at ambient temperatures above +50 degrees centigrade.

Safety

Battery units are heavy seek assistance when lifting the units into place.



VRLA are a Fire Hazard if installed incorrectly or battery terminals short circuited during installation - VRLA have very low internal resistance and are cable of delivering very high current. The protective fuse-s are removed from the equipment for transportation. Fuses must only be put into place after completion of all pre commissioning check. Never attempt installation of battery units with protection fuses already installed. Never defeat the protective fuses.

If a fuse requires replacement only a fuse link of the same type and rating can be used.



Battery termination should be tight and cable spade bolts torqued in accordance with the battery manufacturer's instructions. Do not over torque as the battery post could shear off. **Maintenance**

See Technical Bulletin TDS006 for information on general maintenance of the VRLA battery pile.

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