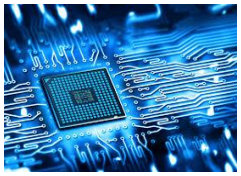
VRLA BATTERY NO BREAK AUTONOMY

TDS-037 Issue 01 Ziztel Technical Bulletin



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

This technical data sheet details the battery configuration required to support no break autonomy in a Ziztel PAGA / MBS package. The system is based on use of industry standard valve regulated lead acid VRLA accumulators which provide reasonable life in a range of different service conditions.

The size of battery assigned depends on the prospective load which for purposes of simplifying the calculation is rolled up into the power amplifier consumption figures in three modes of operation : Quiescent, Speech, Alarm tone. In high nose areas the PAGA will support flashing beacons which have to be factored into the battery sizing calculation.

BACKGROUND

A high integrity broadcast system relies on a secure power supply input to ensure continued operation in event of primary AC mains supply failure. Ziztel are able to incorporate no break autonomy by integration of a battery system delivered as part of the overall PAGA / MBS package. The battery technology employed is VRLA valve regulated lead acid which provides reasonable life time, is simple to maintain and has significantly reduced environmental impact when compared to Ni CAD Battery technology.

The Ziztel MBS / PAGA package is primarily designed to operate from 48 VDC (although for special applications 24 V or 60 VDC is available) which gives a good compromise between the management of the high currents required on a 24 VDC system and the danger of operating voltages above 60 VDC. A no break supply is therefore configured to deliver nominal 48 VDC and this is usually realised by the specification of four x 12 V accumulators wired as a series 'string'. In some circumstances the string could be made from eight x 6 V accumulators where very high Ampere Hour capacity is required.

Battery supply integration

The battery supply package comprises of the following parts:-

a) PB-600-48 battery charger which float charges the battery string during quiescent. The unit incorporates temperature compensation to maximise battery life time and charges the battery string via a protection fuse which is co-located adjacent to the battery pile +ve terminal.

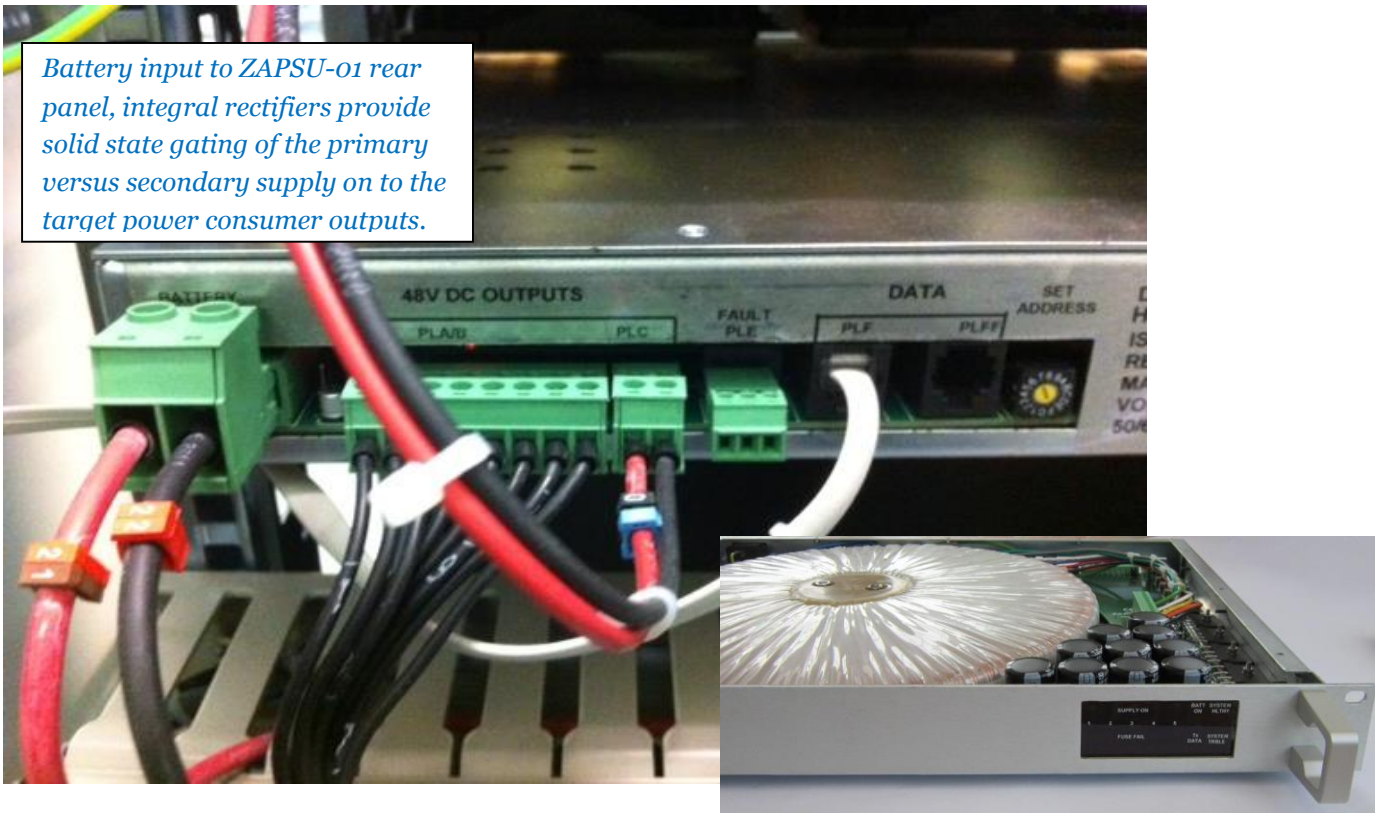
ZIZTEL LIMITED
email: sales@ziztel.com web: www.ziztel.com tel: +44 (0) 115 9202888
mail: 96 Rolleston Drive, Arnold, Nottingham, NG5 7JP United Kingdom

All text, drawings and photography contained within this data sheet are the property of Ziztel Ltd and are Subject to copyright. Information may neither be transmitted or copied to third parties without the express written consent of Ziztel Ltd.Ziztel Ltd have a policy of continuous product improvement and contents here in are liable to change without notice.

b) VRLA battery pile which is sized to meet the required no break autonomy period. The pile is usually made up of four 12 V accumulators which as standard are rated at 80 AH (Ampere Hour). *See also Technical data sheets TDS 005 and TDS006.*

c) Either ZAPSU-01, ZAPSU-02 or PSM-01. The rack primary supply is derived from AC supply with no break secondary supply provided by the battery set. It is important to note that the target PAGA system is not dependent on the battery during normal operation i.e. when primary supply is present. Ziztel provide the following options for mains conversion / battery interface :-

1) ZAPSU-01 is a linear AC to DC convertor within built rectifier sticks enabling auto changeover to the directly connected battery string.



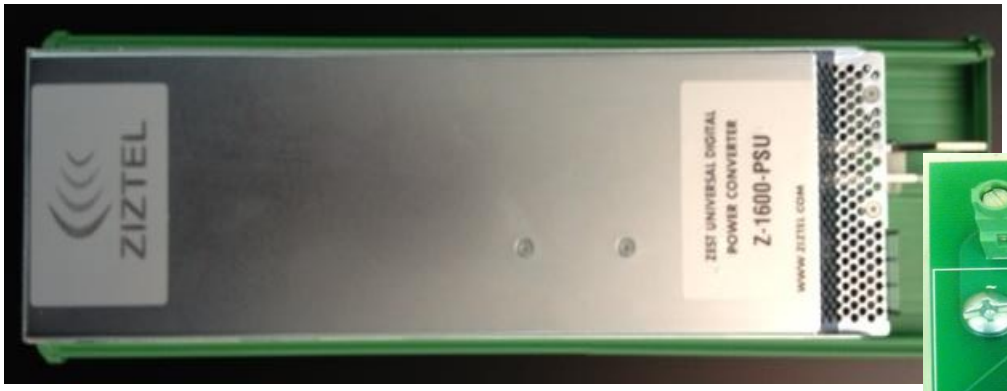
Battery input to ZAPSU-01 rear panel, integral rectifiers provide solid state gating of the primary versus secondary supply on to the target power consumer outputs.

ZIZTEL LIMITED
email: sales@ziztel.com web: www.ziztel.com tel: +44 (0) 115 9202888
mail: 96 Rolleston Drive, Arnold, Nottingham, NG5 7JP United Kingdom
All text, drawings and photography contained within this data sheet are the property of Ziztel Ltd and are Subject to copyright. Information may neither be transmitted or copied to third parties without the express written consent of Ziztel Ltd.Ziztel Ltd have a policy of continuous product improvement and contents here in are liable to change without notice.

2) ZAPSU-02 power unit has identical rectifier gating facilities as that included in ZAPSU-01. The ZAPSU-02 is a switch mode digital design enabling higher power density and improved Power Factor.

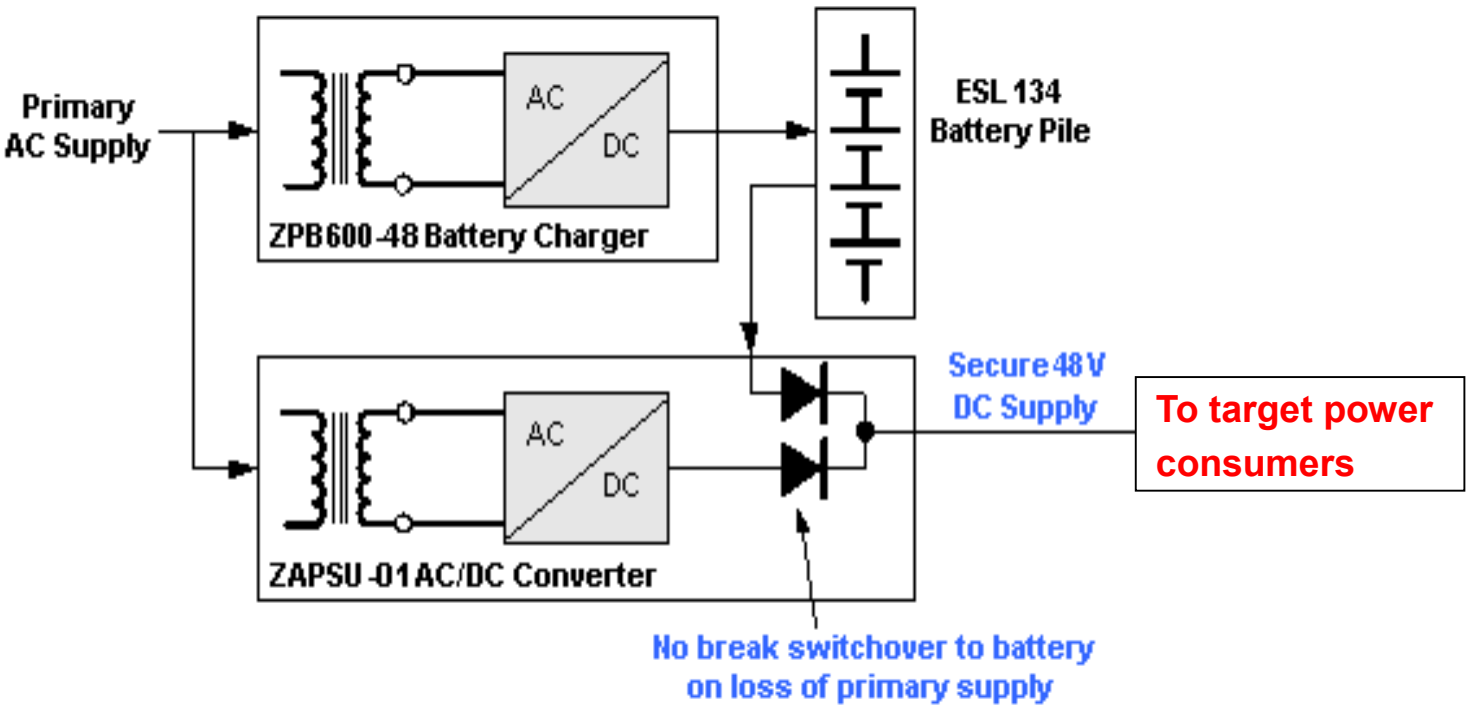
Battery input to ZAPSU-01 rear panel, integral rectifiers provide solid state gating of the primary versus secondary supply on to the target power consumer outputs.

3) PSM-01 is a DIN rail mount module that enables up to two Ziztel AC to DC Compact power convertors to be gated with a battery pile enabling no break autonomy in event of primary AC mains supply isolation.



The PSM-01 module accepts mains supply from the compact convertor and battery string enabling gating of the primary and secondary supply

ZIZTEL LIMITED
email: sales@ziztel.com web: www.ziztel.com tel: +44 (0) 115 9202888
mail: 96 Rolleston Drive, Arnold, Nottingham, NG5 7JP United Kingdom
All text, drawings and photography contained within this data sheet are the property of Ziztel Ltd and are Subject to copyright. Information may neither be transmitted or copied to third parties without the express written consent of Ziztel Ltd.Ziztel Ltd have a policy of continuous product improvement and contents here in are liable to change without notice.



Above diagram shows typical battery charger / primary AC to DC power conversion, the same arrangement is adopted in all three products i.e. ZAPPSU-01, 02 and PSM-01. In all cases there is no dependence on the presence of the battery pile or battery charger when running on the primary power supply. So the battery or charger can be taken out of service and system operation is maintained as normal from the primary supply AC to DC convertor. Similarly there is no dependence on the ZAPSU-01 convertor to maintain battery charge voltage.

The mandatory protective devices are excluded on the above diagram to simplify the drawing; normally fuse links are fitted adjacent to the battery positive terminal to protect lines to the power consumers and the battery charger.

Battery Sizing versus Autonomy period

The battery capacity is measured in Ampere Hours. The greater the Ampere hour the greater the support time for a given load. The physical size of the battery grows with increased Ampere Hour capacity.

To simplify battery Ampere Hour (AH) calculation Ziztel have the following current consumption Ampere hour figures which can be used to select the required battery capacity for a) acoustic devices and b) visual warning devices.

Each 350A Class G loudspeaker network amplifier fitted into the central rack

Quiescent AH	Speech AH	Alarm tone AH
0.5	3.0	10.0

Each flashing beacon visual annunciator connected to the central rack

Quiescent AH	Emergency Speech AH	Alarm tone AH
0	1.2	1.2

ZIZTEL LIMITED
email: sales@ziztel.com web: www.ziztel.com tel: +44 (0) 115 9202888
mail: 96 Rolleston Drive, Arnold, Nottingham, NG5 7JP United Kingdom
All text, drawings and photography contained within this data sheet are the property of Ziztel Ltd and are Subject to copyright. Information may neither be transmitted or copied to third parties without the express written consent of Ziztel Ltd.Ziztel Ltd have a policy of continuous product improvement and contents here in are liable to change without notice.

The AH Ampere Hour *includes* the factoring for battery aging and recharge efficiency. The management sub system consumption is also included in the above figures.

Default battery autonomy time

Battery autonomy support time is according to specification, where autonomy time is not specified the following default times are included unless detailed otherwise in our proposal.

Quiescent time ¼ hour

Talk time ¼ hour

Alarm time ¼ hour

Based on the above no break times a system fitted with 9 x amplifiers (i.e. a fully populated 350ASR sub rack) will require following battery assignment:-

Quiescent AH	Speech AH	Alarm tone AH
1.1	6.75	22.5.0

Battery AH is therefore 1.1 + 6.75 + 22.5 = 30.35 AH power amplifiers

System could also include 10 x flashing beacons

Quiescent AH	Emergency Speech AH	Alarm tone AH
0	3.0	3.0

Battery AH is therefore 3.0 + 3.0 = 6 AH flashing beacons

Total battery AH required is 30.35 + 6 = 36.35 AH

By lessening the no break autonomy times the battery AH requirement can be reduced proportionally, increasing no break times increments the battery AH requirement pro rata.

ZIZTEL LIMITED
email: sales@ziztel.com web: www.ziztel.com tel: +44 (0) 115 9202888
mail: 96 Rolleston Drive, Arnold, Nottingham, NG5 7JP United Kingdom
All text, drawings and photography contained within this data sheet are the property of Ziztel Ltd and are Subject to copyright. Information may neither be transmitted or copied to third parties without the express written consent of Ziztel Ltd.Ziztel Ltd have a policy of continuous product improvement and contents here in are liable to change without notice.