



ML 1012

v.1.2

ML13,8V/1A

Buffer power supply module, linear.

EN

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Features:

- uninterrupted supply of 13,8VDC/1A
 - supply voltage: external transformer required 16-17VAC (e.g. AWT150)
 - linear voltage regulator
 - battery charging and maintenance control
 - battery output protection against a short circuit and reverse polarity connection
 - battery charging current 0,1A
 - LED indication
 - protections:
 - SCP short-circuit protection
 - OLP overload protection
 - OHP overheat protection
 - surge protection
 - warranty – 5 year from the production date
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1. Technical description**1.1 General description**

A buffer PSU module is intended for an uninterrupted supply to alarm systems devices requiring stabilised voltage of **12V DC (+/-15%)**. A linear stabilizing system, which has been used in the unit, provides voltage with a lower level of noise and a quicker response to interference when compared to a switched-mode regulator. The PSU module provides voltage of **U=13,8V DC** with current capacity:



1. Output current 1A (without a battery)
2. Output current 0,9A + 0,1A battery charge

Total current of the receivers + battery: 1A max.

In case of power decay, a battery back-up is activated immediately. **The battery is not protected against over-discharge (UVP)**. According to a given application, a proper module shall be used.



CAUTION! Using the module for supplying CCTV, KD, SSWiN devices (or others of similar purpose), requires implementing of the MZN 1 protection module in the DC power output's circuit.

1.2. Block diagram. (Fig.1)

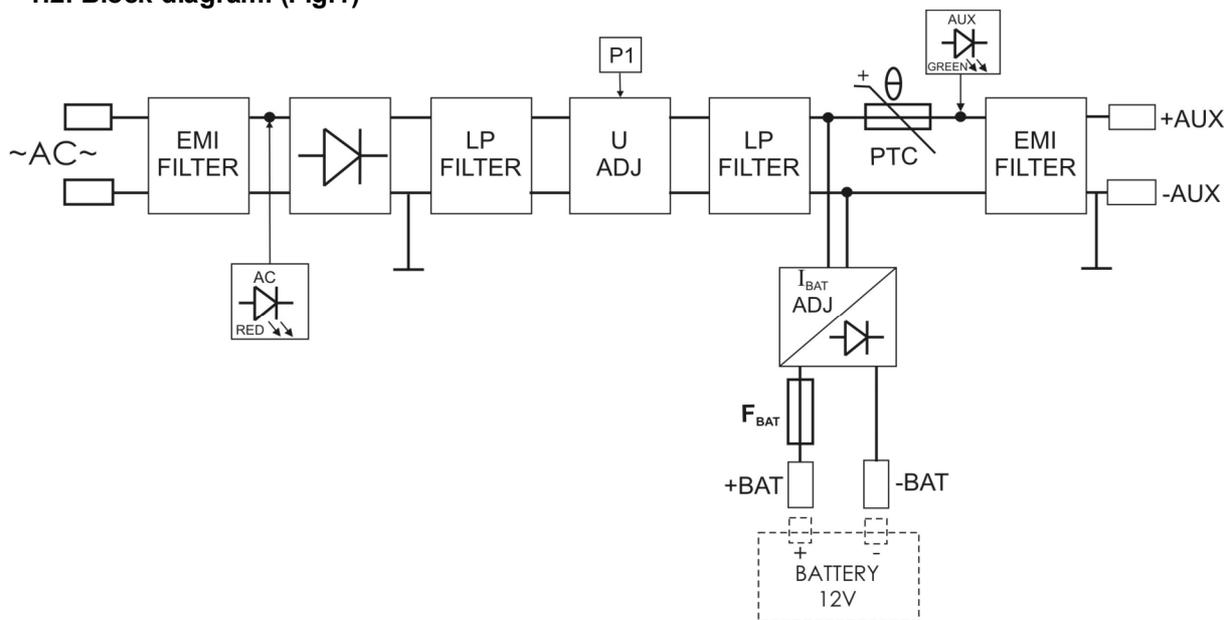


Fig.1. Block diagram of the PSU module.

1.3. Description of components and connectors

Table 1. Elements of the PSU pcb (see fig. 2).

Element no.	Description
[1]	P1 potentiometer, DC voltage adjustment
[2]	LED indication: AC – LED indicating presence of AC power AUX – LED indicating presence of DC output voltage
[3]	Connectors: ~AC~ - AC power input (see: transformer match) +AUX- DC power output (+AUX= Vcc, -AUX=GND)
[4]	Battery output of DC supply (+BAT= red, -BAT = black)
[5]	F _{BAT} fuse in the battery circuit

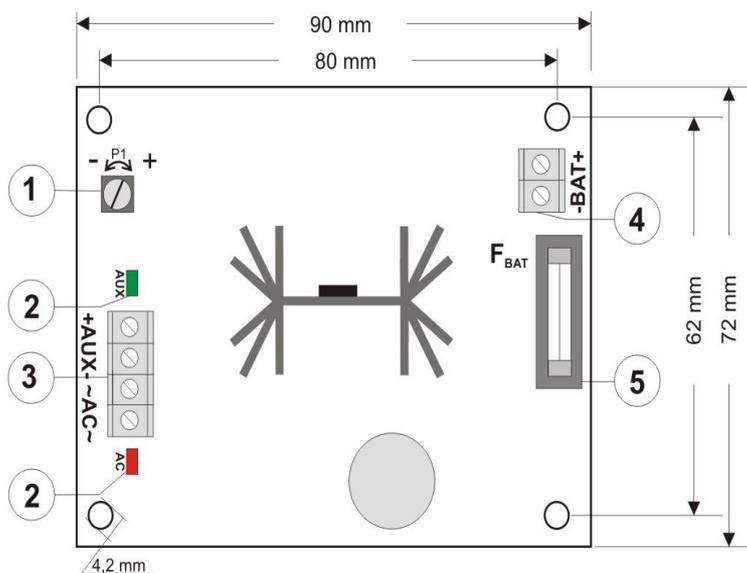


Fig. 2. The view of the PSU pcb.

1.4. Specifications:

- electrical specifications (tab.2)
- mechanical specifications (tab.3)
- operating specifications (tab.4)

Electrical specifications (tab. 2).

Module's supply voltage	16V±17V/AC
Current drawn from the transformer	1,9A max. (transformer's power 30VA min. e.g. AWT150)
Power frequency	50Hz
Module's power	14 W
Output voltage	12,8V± 13,8V DC – buffer operation
Output current	1A (without a battery) 0,9A + 0,1A battery charge
Output voltage escalation, decrease, and keeping time	70ms/70ms/16ms
Output voltage adjustment range	12,0V ÷ 14,5V
Ripple voltage	5 mV p-p max.
Current drawn by the PSU module systems	10 mA – battery-assisted operation
Battery charging current	0,3A (max.) 0,1A /24h (I _{sr} /24h) @ 7Ah/12V
Short-circuit protection SCP	200% ÷ 250% of PSU module power - current limiting and/or fuse damage in the battery circuit (fuse-element replacement required)
Overload protection OLP	110% ÷ 150% (@65 °C ±25°C) of PSU module power - current limiting with the PTC resettable fuse, manual restart (failure requires disconnection of the DC output circuit)
Battery circuit SCP and reverse polarity protections	2A- current limiting, F _{BAT} fuse (failure requires fuse-element replacement)
F _{BAT} fuse	F2A / 250V

Mechanical specifications (tab. 3).

Pcb dimensions	90 x 55 x 72 (WxLxH) [mm] (+/- 2)
Fixing	Dowel pins x 4 (PCB fi=4,2 mm)
Net/gross weight	0,12kg/0,15kg
Connectors	Outputs : Φ0,41±1,63 (AWG 26-14) BAT battery outputs: 6,3F-2,5, 30mm

Operating specifications (tab.4).

Operating temperature	-10°C...+40°C
Storage temperature	-20°C...+60°C
Relative humidity	20%...90%, without condensation
Vibrations during operation	unacceptable
Impulse waves during operation	unacceptable
Direct insolation	unacceptable
Vibrations and impulse waves during transport	PN-83/T-42106

2. Installation.**2.1 Requirements**

The buffer PSU module is to be mounted by a qualified installer, holding relevant permits and licenses (applicable and required for a given country) for 230V/AC interference and low-voltage installations. The unit should be mounted in confined spaces, in accordance with the 2nd environmental class, with normal relative humidity (RH=90% maximum, without condensation) and temperature from -10°C to +40°C. The PSU shall work in a vertical position that guarantees sufficient convective air-flow through ventilating holes of the enclosure.



- 1. Output current 1A (without a battery)**
- 2. Output current 0,9A + 0,1A battery charge**

Total current of the receivers + battery: 1A max.

As the PSU module is designed for a continuous operation and is not equipped with a power-switch, therefore an appropriate overload protection shall be guaranteed in the power supply circuit. Moreover, the user shall be informed about the method of unplugging (most frequently through separating and assigning an appropriate fuse in the fuse-box). The electrical system shall follow valid standards and regulations.

The device should be installed in the metallic enclosure (cabinet). In order to meet the UE requirements, the rules concerning: supply, development and shielding ought to be followed- accordingly to the application power supply 16-17VAC with galvanic isolation (transformer insulation). The power of the transformer shall be matched in accordance with the following chart $S=f(I)$ (chart1).

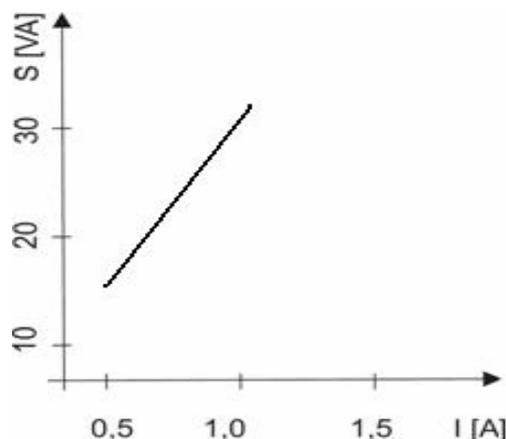


Chart.1. The dependence between the transformer's power - S and the output power of the PSU module - I_o .

2.2 Installation procedure



Before installation, make sure that the voltage in the 230V power-supply circuit is cut off.

1. Mount the enclosure (cabinet) and lay the cables.
2. Mount the module on dowel pins (the dowel pins shall be fixed prior to the installation of the enclosure/cabinet).
3. Deliver the output voltage from the AC transformer to the ~AC~ terminals.
4. Connect the receivers' cables to the +AUX, -AUX terminals of the terminal block on the PSU module's board.
5. Activate the ~230V/AC supply (the AC red diode and AUX green diode should be permanently illuminated).
6. Check the output voltage (the PSU module voltage without load should amount to 13,6V÷ 13,9V, during battery charging 12V-13,8V). If the value of the voltage requires adjustment, it should be set by the P1 potentiometer, monitoring the voltage at the AUX output of the PSU module.
7. Connect the battery in accordance with the signs: +BAT red to 'plus', -BAT black to 'minus'.
8. Once the tests and operation control have been completed, the enclosure/cabinet can be locked.

3. Operating status indication.

3.1 LED indication

The PSU module is equipped with two diodes indicating operating status:

- **AC- red diode:** under normal status (AC supply) the diode is permanently illuminated. The absence of AC supply is indicated by the AC diode going out.
- **AUX- green diode:** indicates the DC supply status at the output of the PSU module. Under normal status, the diode is permanently illuminated. In case of a short circuit or overload the diode is off.

4. Operation and use.

4.1 Overload or short circuit of the PSU module output

The AUX output of the PSU module is equipped with the PTC polyswitch-assisted protection. If the load of the PSU module exceeds 1,5A (load 110% ÷ 150% @25°C of the PSU module power), the output voltage is automatically cut off and indicated by the green diode going out. To restore the output power, cut off the output load for approximately 1 minute. In case of a short-circuit in the AUX, BAT output, (load 200% ÷ 250% of the PSU module power) or reverse battery connection, the F1 fuse in the battery circuit becomes permanently damaged and the restoration of the voltage at the BAT output requires the replacement of the fuse.

4.2 Battery-assisted operation.

In case of the main power outage, the device is immediately switched into a battery-assisted operation. In order to run the module from the battery only, connect the BAT connectors in accordance with the signs: + BAT red to 'plus' and, - BAT black to 'minus' of the battery.



The power supply module is not equipped with a discharged battery disconnection system (UVP).

4.3. Maintenance.

Any and all maintenance operations may be performed following the disconnection of the PSU from the power supply network. The PSU module does not require performing any specific maintenance measures. However, in case of a thick dust layer, clean the PSU only with compressed air. In case of a fuse exchange, use the replacement of the same parameters.



WEEE MARK

According to the EU WEE Directive – It is required not to dispose of electric or electronic waste as unsorted municipal waste and to collect such WEEE separately.

CAUTION! The power supply unit is adapted for a sealed lead-acid battery (SLA). After the operation period it must not be disposed of but recycled according to the applicable law.

THE GENERAL WARRANTY CONDITIONS

1. Pulsar K. Bogusz Sp.j. (the manufacturer) grants a five-years warranty for the equipment, counted from the device's production date.
2. The warranty includes free-of-charge repair or replacement with an appropriate equivalent (the selection is at the manufacturer's discretion) if the malfunction is due to the manufacturer, includes manufacturing or material defects, unless such defects have been reported within the warranty period (item 1).
3. The equipment subject to warranty is to be brought to the place where it was purchased, or directly to the main office of the manufacturer.
4. The warranty applies to complete equipment, accompanied by a properly filled warranty claim with a description of the defect.
5. Should the claim be accepted, the manufacturer is obliged to provide warranty repairs, at the earliest convenience, however not later than within 14 days from the delivery to the service centre of the manufacturer.
6. The repair period mentioned in item 5 may be prolonged, if there are no technical possibilities to carry out the repairs, or if the equipment has been conditionally accepted, due to the breaking warranty terms by the claimant.
7. All the services rendered by force of the warranty are carried out at the service centre of the manufacturer, exclusively.
8. The warranty does not cover the defects of the equipment, resulting from:
 - reasons beyond the manufacturer's control,
 - mechanical damage,
 - improper storage and transport,
 - use that violates the operation manual or equipment's intended use
 - fortuitous events, including lightning discharges, power failures, fire, flood, high temperatures and chemical agents,
 - improper installation and configuration (in defiance with the manual),
9. The warranty is void in any of the following circumstances:
 - construction changes
 - repairs carried out by any unauthorized service center
 - damage or removal of warranty labels
 - modifications of the serial number
10. The liability of the manufacturer towards the buyer is limited to the value of the equipment, determined according to the wholesale prices suggested by the manufacturer on the day of purchase.
11. The manufacturer takes no responsibility for the defects that result from:
 - the damaging, malfunctioning or inability to operate the equipment
 - defects that result from using the equipment outside its stated specifications and operating parameters failing to abide by the recommendations and requirements contained in the manual, or the use of the equipment.

Pulsar K. Bogusz Sp.j.

Siedlec 150, 32-744 Łapczyca, Polska
 Tel. (+48) 14-610-19-40, Fax. (+48) 14-610-19-50
 e-mail: biuro@pulsar.pl, sales@pulsar.pl
 http:// www.pulsar.pl, www.zasilacze.pl