



PSBOC1552455

v.1.1

PSBOC 27,6V/5,5A/OC

**Enclosed buffer switch mode power supply unit
with automatic operation control.**

EN**

Edition: 4 from 30.10.2013

Supersedes edition: 3 from 05.06.2013



Features:

- 27,6VDC/5,5A uninterrupted supply
 - wide range of supply voltage 176÷264VAC
 - high efficiency 84%
 - battery charge and maintenance control
 - deep discharge battery protection (UVP)
 - battery charging current 0,5/2A
 - battery output protection against short circuit and reverse polarity connection
 - LED indication
 - FAC technical output indicating AC power loss – OC and relay type
 - FPS technical output indicating PSU failure – OC and relay type
 - FLB technical output indicating battery low – OC and relay type voltage
 - protections:
 - SCP short-circuit protection
 - OVP over voltage protection
 - surge protection
 - OLP overload protection
 - warranty – 2 year from the production date
-

CONTENTS:

1. Technical description.
 - 1.1 General description
 - 1.2 Block diagram
 - 1.3 Description of PSU components and connectors
 - 1.4 Specifications
2. Installation.
 - 2.1 Requirements
 - 2.2 Installation procedure
3. Operating status indication.
 - 3.1 LED indication of operating status
 - 3.2 Technical outputs
4. Operation and use.
 - 4.1 Overload or short circuit of the PSU output
 - 4.2. Battery-assisted operation
 - 4.3. Maintenance

1. Technical description.

1.1 General description

A buffer PSU is intended for an uninterrupted supply to devices requiring stabilized voltage of **24V DC (+/-15%)**. The PSU provides voltage of **U=27,6V DC** with current capacity:



1. Output current 5A + 0,5A battery charging
 2. Output current 3,5A + 2A battery charging
- Total device current + battery: 5,5A max.**

In the case of power failure from prime supply, the unit is instantly switched to battery assisted operation. The power supply unit features: short circuit, overload, surge and over voltage protections.

1.2 Block diagram. (fig.1).

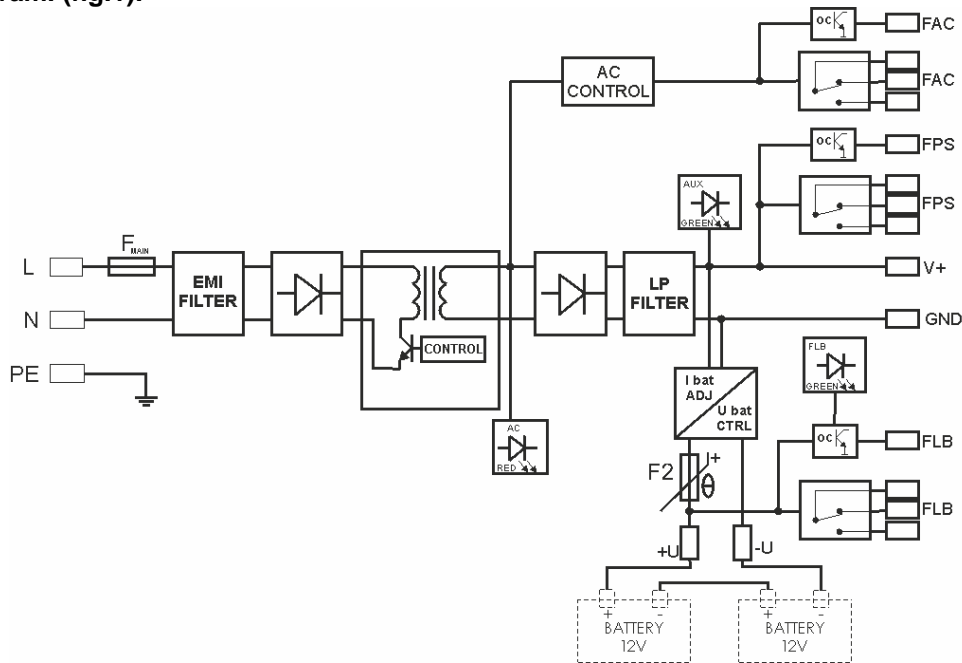







Fig.1. Block diagram of the PSU.

1.3 Description of PSU components and connectors.

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

Element no.	Description
[1]	LED indicating presence of AC power
[2]	LED indicating presence of DC power
[3]	LED indicating correct battery voltage
[4]	FAC - AC absence technical output – relay type
[5]	FPS - output indicating DC absence/PSU failure – relay type
[6]	FLB - output indicating battery low voltage – relay type
[7]	FAC - AC absence technical output – OC type
[8]	FPS - output indicating DC absence/PSU failure - OC type
[9]	FLB - output indicating battery low voltage - OC type
[10]	V_{ADJ} - potentiometer, DC voltage adjustment
[11]	+V , -V - DC supply output
[12]	L-N 230V/AC power connector,  PE protection connector
[13]	Battery connectors: +BAT =red, - BAT = black
[14]	LED indication on the front panel
[15]	Battery charging current selection <ul style="list-style-type: none"> •  Ibat =0,5 A •  Ibat =2 A Legend:  dip switch installed  dip switch removed

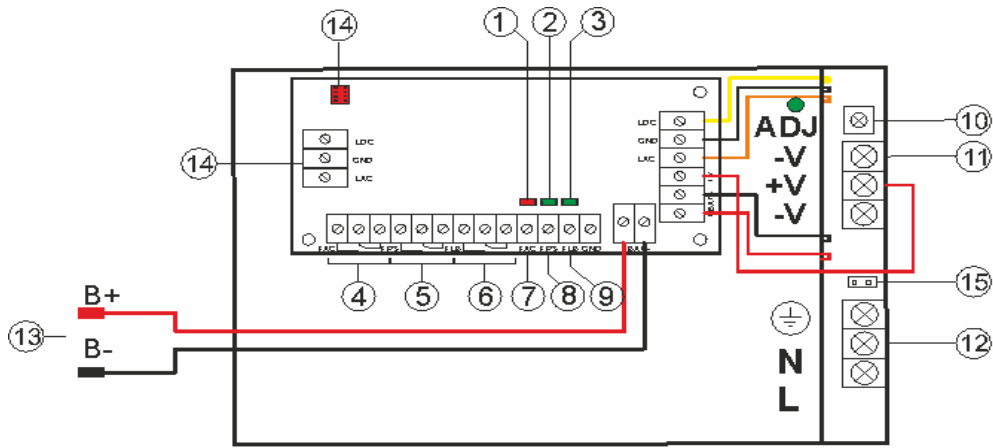


Fig. 2. The view of the PSU.

1.4 Specifications:

- electrical specifications (tab.2)
- mechanical specifications (tab.3)
- operation safety (tab.4)
- operating specifications (tab.5)

Electrical specifications (tab. 2).

Mains supply	176 ÷ 264V AC
Current consumption	1,4A@230VAC max.
PSU power	155W max.
Efficiency	84%
Output voltage	22V ÷ 27,6V DC – buffer operation 19V ÷ 27,6V DC – battery-assisted operation
Output current	5A + 0,5A battery charge 3,5A + 2A battery charge
Output current $t_{AMB} < 30^{\circ}C$	5A + 0,5A battery charge – see chart 1 3,5A + 2A battery charge – see chart 1
Output current $t_{AMB} = 40^{\circ}C$	3,3A + 0,5A battery charge - see chart 1 1,8A + 2A battery charge - see chart 1
Voltage adjustment range	24 ÷ 28V DC
Ripple voltage	150 mV p-p max.
Current consumption by PSU systems	50 mA
Battery charging current	0,5A/2A jumper selectable
Short-circuit protection SCP	electronic, automatic recovery
Overload protection OLP	105-150% of power supply, automatic recovery
Battery circuit protection SCP and reverse polarity connection	polymer fuse
Surge protection	varistors
Surge over voltage protection OVP	>16V (automatic recovery)
Deep discharge protection UVP	$U < 19V (\pm 5\%)$ – disconnection of the battery terminal
Technical outputs: - FAC; output indicating AC power failure - FPS; output indicating DC absence/PSU failure - FLB output indicating battery low voltage	- relay type: 1A@ 30VDC/50VAC, time lag: approx. 10s. - OC type, 50mA max., normal status: L (0V) level, failure: hi-Z level, time lag: 10s. - relay type: 1A@ 30VDC/50VAC - OC type, 50mA max., normal status: L (0V) level, failure: hi-Z level - relay type: 1A@ 30VDC/50VAC - OC type, 50mA max., normal status: (UBAT >23V): L (0V) level, failure: (UBAT <23V): hi-Z level

Temperature characteristics.

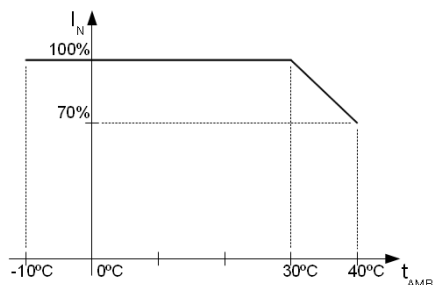


Chart 1.
Acceptable output current from the PSU depending on ambient temperature.

Mechanical specifications (tab. 3).

Enclosure dimensions	199 x 110 x 50 +23 [mm] (LxWxH) (+/- 2)
Net/gross weight	0,89kg / 0,94kg
Connectors	power supply, technical outputs: $\Phi 0,63 \pm 2,5$ I/O PCB : $\Phi 0,41 \pm 1,63$ BAT battery outputs: 6,3F-2,5/40cm, Led indication output: 3-pin 5 mm

Operation safety (tab.4).

Protection class PN-EN 60950-1:2007	I (first)
Degree of Protection PN-EN 60529: 2002 (U)	IP20
Electrical strength of insulation: - between PSU input circuit and output circuits (I/P-O/P) - between input circuit and PE protection circuit (I/P-FG) - between output circuit and PE protection circuit (O/P-FG)	3000 V/AC min. 1500 V/AC min. 500 V/AC min.
Insulation resistance: - between input circuit and output or protection circuit	100 M Ω , 500V/DC

Operating specifications (tab.5).

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 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 device shall be mounted in a metallic enclosure (a cabinet, an intended case). In order to fulfil LVD and EMC requirements, the rules for: power-supply, encasing and screening shall be followed, according to application. The PSU provides voltage of **U=27,6V** DC with current capacity:



1. Output current 5A + 0,5A battery charging
 2. Output current 3,5A + 2A battery charging
- Total device current + battery: 5,5A max.

2.2. Installation procedure.

1. Before installation of the power supply unit, make sure that 230VAC power is cut off.
2. Mount the unit in the intended location.
3. Connect the 230VAC power cables. Connect the PE cable (yellow-green) to an appropriate PSU terminal (marked with \perp - earth symbol).



The shock protection circuit shall be performed with a particular care, i.e. the yellow and green wire coat of the power cable shall stick to one side of the 'PE' terminal. Using the PSU without a properly made and fully operational shock protection circuit is UNACCEPTABLE! It can cause a device failure or an electric shock.

4. Connect load/loads to proper output connectors of the power supply (positive pole is marked as +V, negative pole as -V)
5. Connect the technical outputs to the central or other device.
6. Connect the battery in accordance with the signs (colours).
7. Once the tests and operation control have been completed, the enclosure/cabinet can be locked.

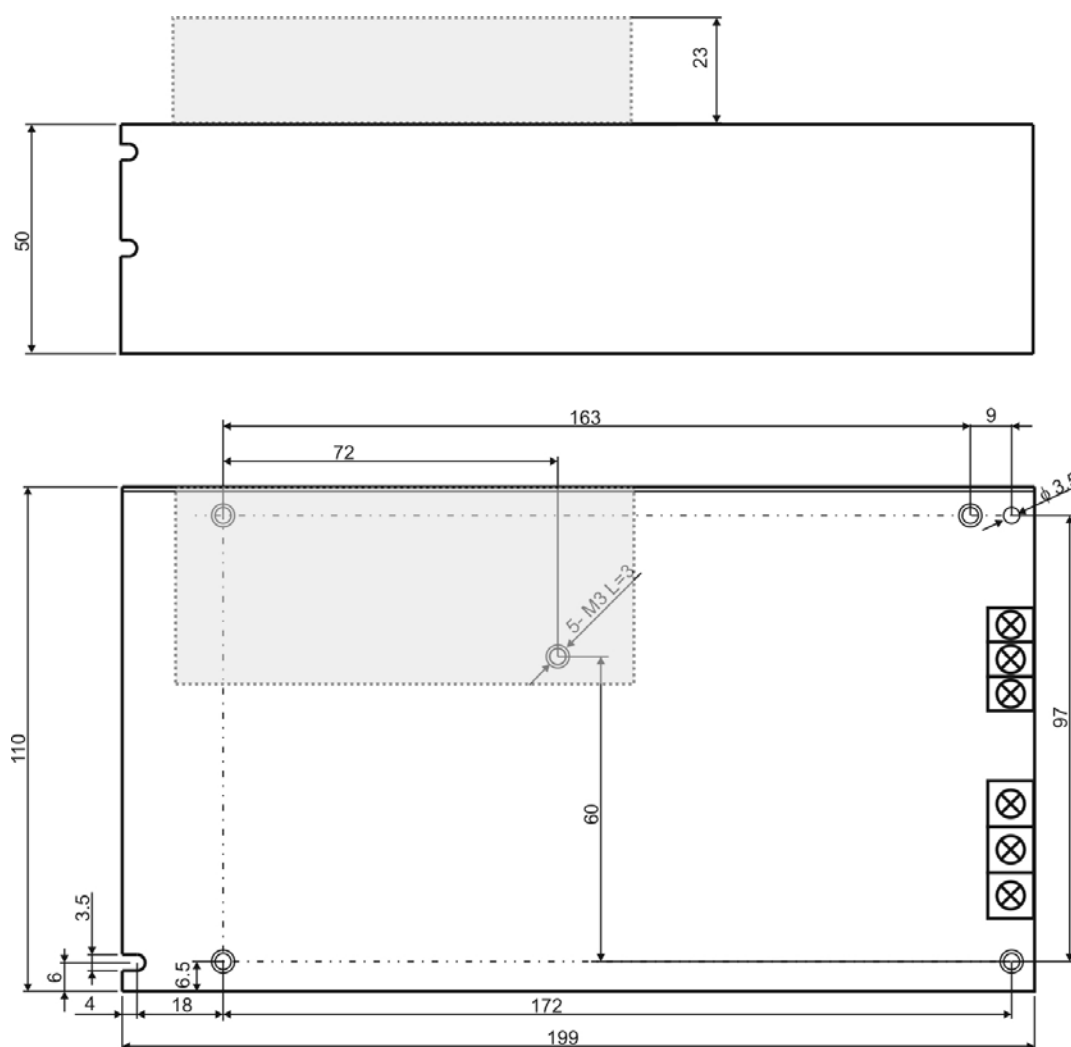


Fig 3. Mechanical view of the PSU.

3. Operating status indication.

3.1 LED indication

The PSU is equipped with 3 LEDs on the PCB board:

- red LED (Fig.2, element 1) normal status (AC power): permanently illuminated. AC power absence is indicated by the AC diode going out.

Caution! LED indicates power absence if the outage lasts >10s.

- green LED (Fig.2, element 2) indicates DC power at the PSU output. Under normal status the diode is permanently illuminated. In case of a short circuit or an overload, the diode is off.

- green LED (Fig.2, element 3) indicates battery voltage level. Under normal status ($U_{BAT} > 23V$) the diode is permanently illuminated. In case of decrease of battery voltage ($U_{BAT} < 23V$) the diode is off.

3.2 Technical outputs

The PSU has indication outputs:

- **FAC - absence of AC supply output:**

- OC type output that indicates AC power loss. Under normal status, with 230V AC supply, the output is connected to ground (L level – 0V). In case of power loss, the PSU will switch the output into high impedance state hi-Z after approx. 10s.

- relay output indicating the absence of AC supply. In case of power loss, the PSU module will switch the relay contacts after approx. 10 seconds.



CAUTION! In Fig.2. the contact set in the potential-free status corresponds to a state with no AC power (AC power failure).

- **FPS – technical output indicating absence of DC voltage at the PSU:**

- OC type output indicating the PSU failure. In normal state (during correct operation) the output is connected to ground (L level – 0V). In case of absence of DC voltage at the output (e.g. short circuit), the output is switched into high impedance state – hi-Z.

- relay output. In case of a failure, the contacts of the relay change over.



CAUTION! In the Fig.2. the set of contacts shows a potential-free status of the relay which corresponds to a state with no DC power (PSU failure).

- **FLB – technical output indicating battery voltage:**

- OC type output. Under normal status ($U_{BAT} > 23V$) the output is connected to ground (L level – 0V). In case of decrease of battery voltage ($U_{BAT} < 23V$) the output is switched into high impedance state – hi-Z.

- relay output. In case of a battery voltage drop $U_{BAT} < 23V$, the contacts of the relay change over.



CAUTION! In the Fig.2. the set of contacts shows a potential-free status of the relay which corresponds to a state with low battery level ($U_{BAT} < 23V$).

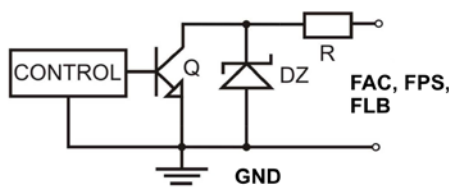


Fig. 4. Electrical diagram of OC outputs.

4. Operation and use.

4.1 Overload or short circuit of the PSU module output

In case of an overload or a short circuit at the PSU output, the output voltage is automatically cut off. The voltage is restored automatically after removing the failure (overload).

4.2 Battery-assisted operation.

In case of a main power outage, the device is immediately switched into a battery-assisted operation.



The PSU is equipped with the discharged battery disconnection system. During the battery-assisted operation, reducing voltage below 19V at the battery terminals will cause battery disconnection.

4.3 Maintenance

Any and all maintenance operations may be performed following the disconnection of the PSU from the power supply network. The PSU does not require performing any specific maintenance measures. However, in case of significant dust ingress, it is recommended to clean the PSU with compressed air.

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.

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.

GENERAL WARRANTY CONDITIONS

1. Pulsar K. Bogusz Sp.j. (the manufacturer) grants a two-year 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, Poland
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