



PSBOC351225

v.1.1

PSBOC 13,8V/2,5A/OC

**Enclosed buffer switch mode power supply unit
with technical outputs.**

EN*

Edition: 9 from 01.03.2018

Supersedes edition: 8 from 01.06.2016



Features:

- 13,8VDC/2,5A uninterrupted supply*
- wide range of supply voltage 176÷264VAC
- high efficiency 74%
- battery charge and maintenance control
- deep discharge battery protection (UVP)
- battery charging current 0,5A
- battery output protection against short circuit and reverse polarity connection
- LED indication
- EPS technical output indicating AC power loss
 - OC and relay type
- PSU technical output indicating PSU failure
 - OC and relay type
- LoB technical output indicating battery voltage low
 - OC and relay type
- protections:
 - SCP short-circuit protection
 - OVP over voltage protection
 - surge protection
 - OLP overload protection
- warranty – 2 year from the production date

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1. Technical description.

1.1. General description

A buffer PSU is intended for an uninterrupted supply to devices requiring stabilized voltage of **12V DC (+/- 15%)**. The PSU provides voltage of **U=13,8V DC** with current capacity **I=2A + 0,5A battery charge***. In case of power decay, a battery back-up is activated immediately.



During normal operation, the total current drawn by the receivers may not exceed I=2A. Maximum battery charging current: 0.5A. Total device current + battery: 2,5A max.

* See chart 1

1.2. Block diagram. (fig.1).

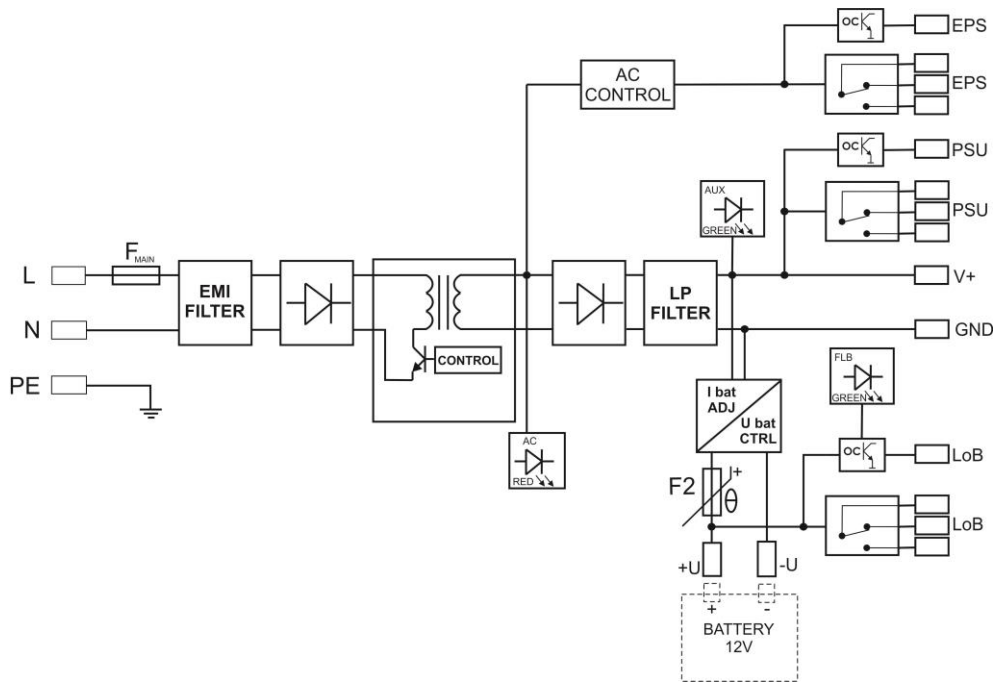


Fig.1. Block diagram of the PSU.

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]	EPS - AC absence technical output – relay type
[5]	PSU - output indicating DC absence/PSU failure – relay type
[6]	LoB - output indicating battery low voltage – relay type
[7]	EPS - AC absence technical output – OC type
[8]	PSU - output indicating DC absence/PSU failure - OC type
[9]	LoB - output indicating battery low voltage - OC type
[10]	+V , -V- DC supply output
[11]	L-N 230V/AC power connector, PE protection connector
[12]	Connector of extra LED indication
[13]	Battery connectors: +BAT =red, - BAT = black
[14]	V _{ADJ} - potentiometer, DC voltage adjustment

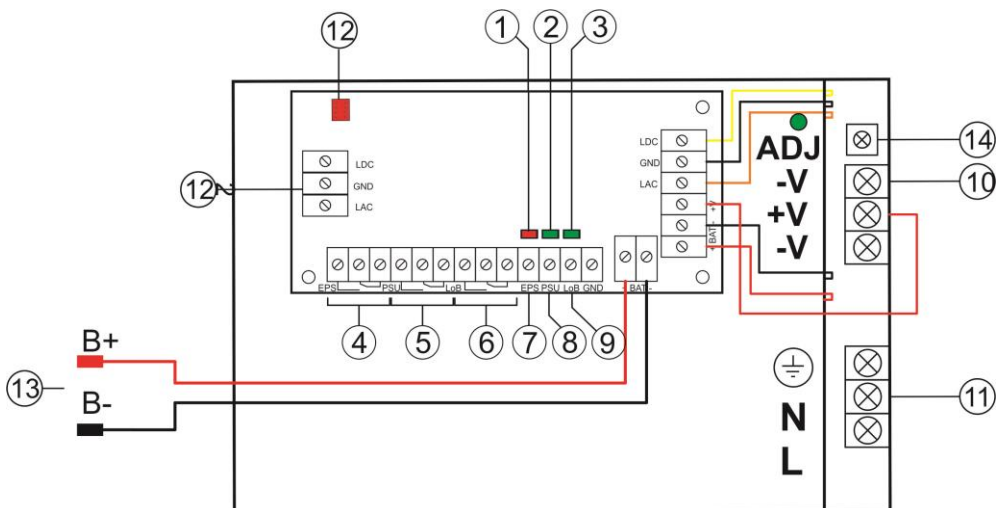


Fig. 2. The view of the PSU.

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	0,45A@230VAC max.
PSU power	35W max.
Efficiency	74%
Output voltage	11V± 13,8V DC – buffer operation 9,5V±13,8V DC – battery-assisted operation
Output current $t_{AMB}<30^{\circ}\text{C}$	2A + 0,5A battery charge – see chart 1
Output current $t_{AMB}=40^{\circ}\text{C}$	1,4A + 0,5A battery charge - see chart 1
Voltage adjustment range	12÷14V DC
Ripple voltage	120 mV p-p max.
Current consumption by PSU systems	60 mA
Battery charging current	0,5A
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	$U < 9,5 \text{ V } (\pm 5\%)$ – disconnection of the battery terminal
Technical outputs: - EPS; output indicating AC power failure - PSU; output indicating DC absence/PSU failure - LoB output indicating battery low voltage	- 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: L (0V) level, failure: hi-Z level - relay type: 1A@ 30VDC/50VAC, - OC type, 50mA max., normal status: ($U_{BAT} > 11,5\text{V}$): L (0V) level, failure: ($U_{BAT} < 11,5\text{V}$): hi-Z level The power supply unit does not feature a battery detection function.

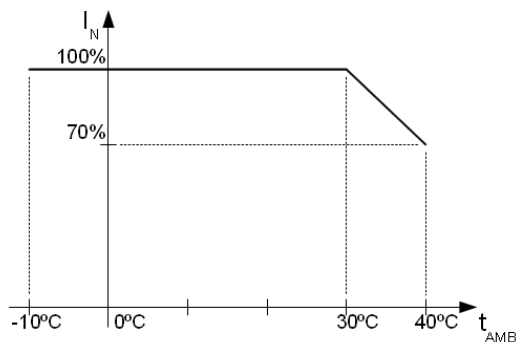
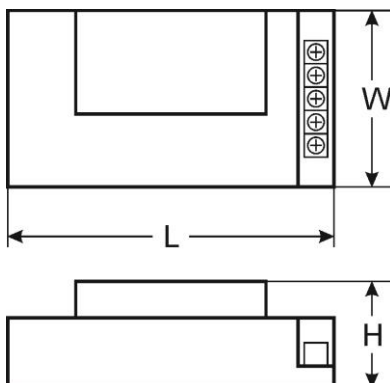
Temperature characteristics.

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

Mechanical specifications (tab. 3).

Dimensions	L=129, W=98, H=67 [+/- 2mm]
Net/gross weight	0,51kg / 0,54kg
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 connector

**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.



During normal operation, the total current drawn by the device may not exceed $I=2A$. Maximum battery charging current: 0,5A. Total current of the receivers + battery: 2,5A 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).

* See chart 1



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.

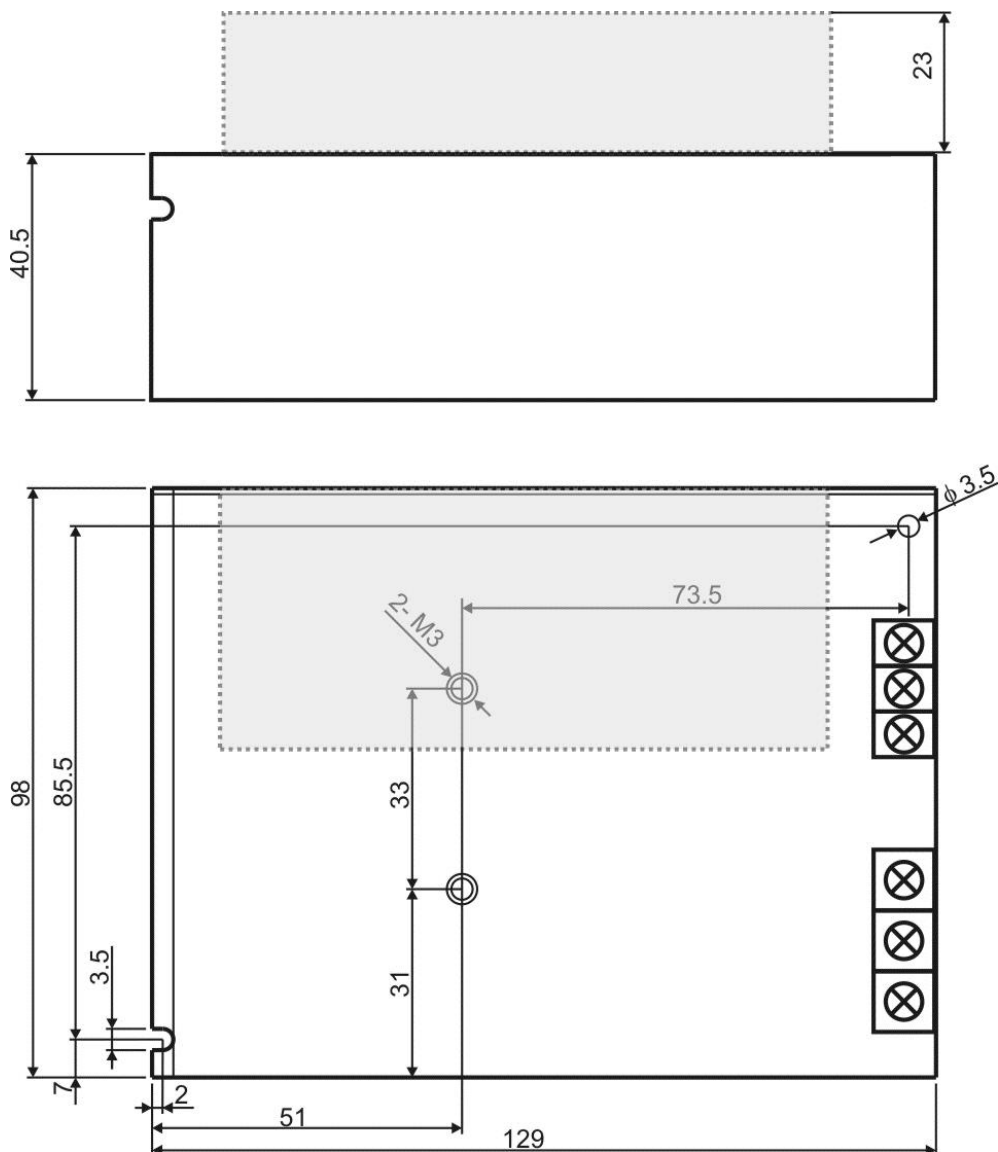


Fig 3. Mechanical view of the PSU.

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.

- 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 ($U_{BAT} > 11,5V$) the diode is permanently illuminated. In case of decrease of battery voltage ($U_{BAT} < 11,5V$) the diode is off.

3.2. Technical outputs

The PSU has indication outputs:

- **EPS - 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.

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



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

- **PSU – 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).

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

- OC type output. Under normal status ($U_{BAT} > 11,5V$) the output is connected to ground (L level – 0V). In case of decrease of battery voltage ($U_{BAT} < 11,5V$) the output is switched into high impedance state – hi-Z.

- relay output. In case of a battery voltage drop $U_{BAT} < 11,5V$, the contacts of the relay change over.

The power supply unit does not feature a battery detection function. In the case of no battery or non battery connected, the output is in the normal mode.



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 ($U_{BAT} < 11,5V$).

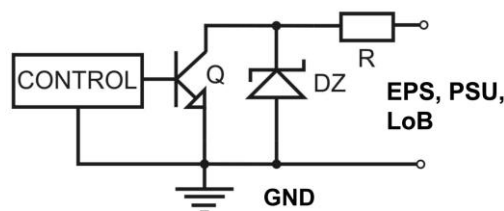


Fig. 4. Electrical diagram of OC outputs.

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 9,5V 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.

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