



HPSB 5048C

v.1.0

HPSB 54V/5A/4x17Ah

Buffer switch power supply unit.

EN**

Edition: 2 from 24.10.2016

Supersedes the edition: 1 from 18.03.2016

GREEN POWER



Features:

- DC 54V/5A uninterruptible power supply*
- fitting battery: 4x17Ah/12V
- wide range of mains supply: 176÷264V
- built-in power factor correction system (PFC)
- high efficiency 85%
- battery charging and maintenance control
- excessive discharging (UVP) protection
- jumper selectable battery charge current 0,5A/1A/2A
- battery output full protection against short-circuit and reverse polarity connection
- LED indication
- protections:
 - SCP short-circuit protection
 - OVP overvoltage protection
 - overvoltage protection (AC input) against sabotage
 - overload protection (OLP)
 - overheat protection OHP
- forced cooling - built-in fan
- 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 stabilised voltage of **48V DC (+/-15%)**. The PSU provides voltage of **U=54V DC**. Current efficiency:

1. Output current 4,5A + 0,5A battery charge*

2. Output current 4A + 1A battery charge*

3. Output current 3A + 2A battery charge*

Total device current + battery: 5A max .

In case of power decay 230V, a battery back-up is activated immediately. The PSU is constructed based on the switch mode PSU, with high energy efficiency. The PSU is housed in a metal enclosure (colour RAL 9003) which can accommodate a 4x17Ah/12V battery. A micro switch indicates door opening (front cover).

The power supply housing has space for additional modules (fuse blocks, voltage regulators and DC/DC converters). Optional power supply configurations are available at the website: www.pulsar.pl

* Refer to chart 1

1.2 Block diagram (fig.1)

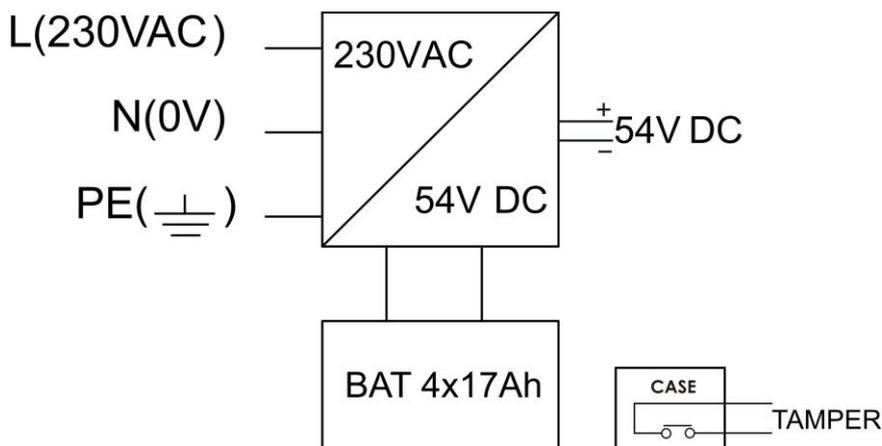


Fig.1. The block diagram of the PSU.

1.3 Description of PSU components and connectors.

Table 1. Elements of the PSU.

Element no. [Fig. 2]	Description
[1]	PSU module
[2]	Connectors PSU: L-N power supply connector 230V AC,  Protection connector PE V+, V- DC power output B+, B- battery output
[3]	green LED indicates AC power
[4]	P1 potentiometer, output voltage adjustment
[5]	Battery outputs: red: +, black: -
[6]	TAMPER, contact of sabotage protection (NC)
[7]	Additional connector for LED indication
[8]	Selection jumper for charging current:  Ibat =0,5A,  Ibat=1A,  Ibat=2A Description:  jumper installed,  jumper removed

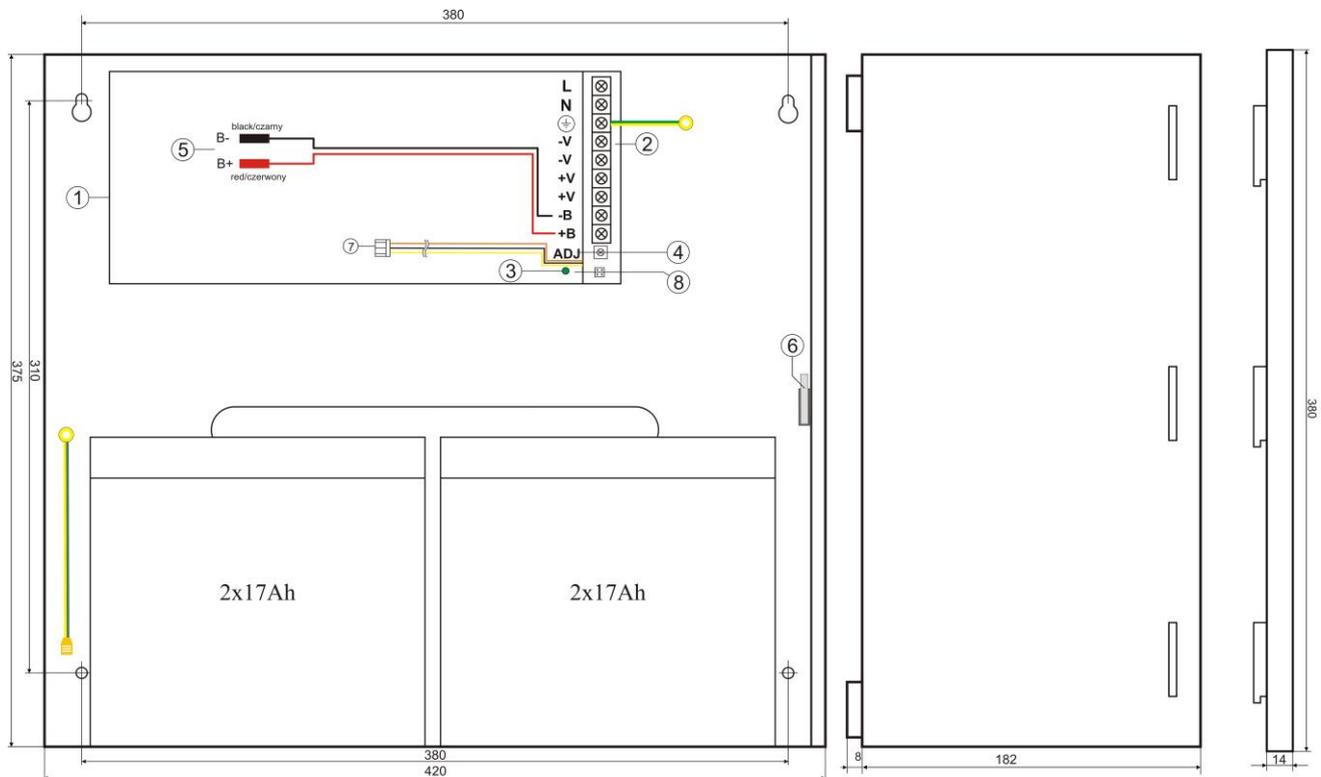


Fig.2. The view of the PSU.

1.4 Specifications:

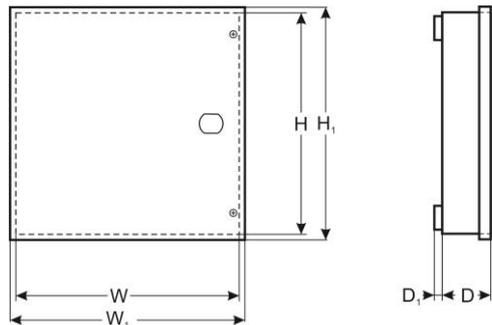
- electrical parameters (tab.2)
- mechanical parameters (tab.3)
- operation safety (tab.4)
- operating parameters (tab.5)

Table 2. Electrical parameters

PSU type	A (EPS - External Power Source)
Mains supply	176÷264V AC 50Hz
Current up to	1,5A@230VAC max.
Supply power	270W max.
Efficiency	85%
Power factor PF	>0,95 @230V AC
Output voltage	44V± 54V DC – buffer operation 38V± 54V DC – battery-assisted operation
Output current $t_{AMB}<30^{\circ}C$	4,5A + 0,5A battery charge - refer to chart 1 4A + 1A battery charge - refer to chart 1 3A + 2A battery charge - refer to chart 1
Output current $t_{AMB}=40^{\circ}C$	3A + 0,5A battery charge - refer to chart 1 2,5A + 1A battery charge - refer to chart 1 1,5A + 2A battery charge - refer to chart 1
Voltage adjustment range	48÷56VDC
Ripple	150mV p-p max.
Current consumption by PSU systems	110mA
Battery charge current	0,5A, 1A or 2A- jumper selectable
Short-circuit protection SCP	electronic, automatic return
Overload protection OLP	105-150% of the PSU power, automatic return
Battery circuit protection SCP and reverse polarity connection	melting fuse
Surge protection	varistors
Oversvoltage protection OVP	62V (activation requires disconnecting the load or supply for about 20 s.)
Excessive discharge protection UVP	$U<38V (\pm 5\%)$ – disconnect of connection battery
Sabotage protection: - TAMPER output indicating enclosure opening	- microswitch, NC contacts (enclosure closed), 0,5A@50V DC (max.)
LED indication: - AC diode indicating AC power status - DC diode indicating DC power status at the PSU output	- red, normal status – on, failure: off - green, normal status – on, failure: off

Table 3. Mechanical parameters

Dimensions	W=420 H=375 D+D ₁ =183+14 [+/- 2 mm] W ₁ =425, H ₁ =380 [+/- 2 mm]
Fixation	see figure 2
Fitting battery	4x17Ah/12V (SLA) max. 370x175x165mm (WxHxD) max
Net/gross weight	7,40/ 7,90 kg
Enclosure	Steel plate DC01, thickness: 1,0mm, colour: RAL 9003
Closing	Cheese head screw x 2 (at the front), lock assembly possible
Connectors	Power supply: $\Phi 0,63-2,50$ (AWG 22-10) Outputs: $\Phi 0,63-2,50$ (AWG 22-10), Battery output BAT: $\Phi 6/1,5\text{mm}^2$ TAMPER output: wires
Notes	The enclosure does not touch the assembly surface so that cables can be led. Forced cooling - built-in fan.

**Table 4. Operation safety**

Protection class PN-EN 60950-1:2007	I (first)
Protection grade PN-EN 60529: 2002 (U)	IP20
Electrical strength of insulation: - between input and output circuits of the PSU (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

Table 5. Operating parameters

Operating temperature	-10°C...+40°C (see: chart 1)
Storage temperature	-20°C...+60°C
Environmental class	II
Relative humidity	20%...90%, without condensation
Vibrations during operation	unacceptable
Impulse waves during operation	unacceptable
Direct insulation	unacceptable
Vibrations and impulse waves during transport	According to PN-83/T-42106

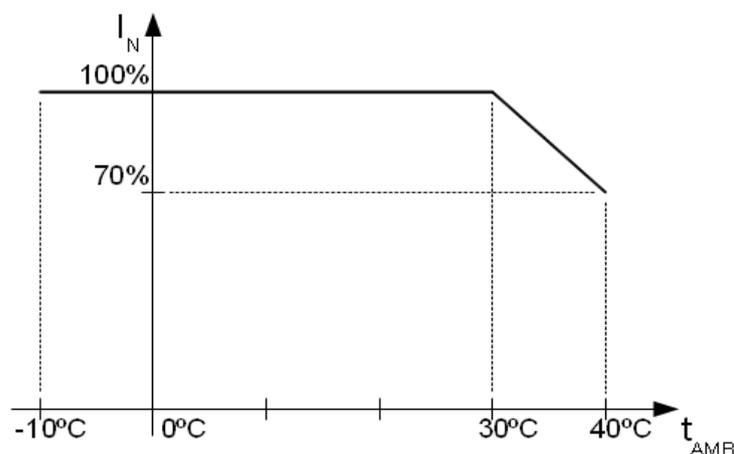


Chart 1. Acceptable output current from the PSU depending on ambient temperature.

2. Installation.

2.1 Requirements.

The buffer PSU shall be mounted by a qualified installer with appropriate permissions and qualifications for 230V/AC installations and low-voltage installations (required and necessary for a given country). The device shall be mounted in confined spaces, according to the environment class II, with normal air humidity (RH=90% max. without condensation) and the temperature from -10°C to +40°C. The PSU shall work in a vertical position that guarantees sufficient convectional air-flow through ventilating holes of the enclosure.

Before installation, prepare a PSU load balance:

- 1. Output current 4,5A + 0,5A battery charge***
 - 2. Output current 4A + 1A battery charge***
 - 3. Output current 3A + 2A battery charge***
- Total device current + battery: 5A max .**

As the PSU 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 (usually through assigning an appropriate fuse in the fuse-box). The electrical system shall follow valid standards and regulations.

2.2 Installation procedure.

1. Before installation, cut off the voltage in the 230V power-supply circuit.

- 2. Mount the PSU in a selected location and connect the wires.
- 3. Connect the power cables (~230Vac) to L-N clips of the PSU. Connect the ground wire to the clip marked by the earth symbol PE (PSU module connector). Use a three-core cable (with a yellow and green PE protection wire) to make the connection. Lead the cables to the appropriate clips through the insulating bushing of the connection board.

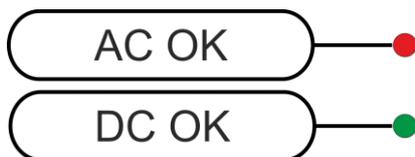


The shock protection circuit shall be performed with a particular care, i.e. the yellow and green wire coat of the power cable shall stick to one side of the terminal - marked with ⚡ symbol on the PSU enclosure. Operation of the PSU without the properly made and fully operational shock protection circuit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

- 4. Connect the receivers' cables to the terminals V+ (+), V-(-) of the PSU module.
- 5. Connect the power (~230V)
- 6. Check the PSU output voltage:
 - the PSU voltage without load should amount to U=54V DC.
- 7. Connect the battery (mind the colours):
 - battery output (+V): BAT+ cable / red,
 - battery output (0V): BAT – cable / GND / black.
- 8. Check the PSU operation indicator: green LED on the power supply module.
- 9. After installing and checking proper working, the enclosure can be closed.

3. Operating status indication.

The PSU is equipped with two diodes on the front panel:



RED LED:

- on – the PSU is supplied with 230V AC
- off – no 230V AC supply

GREEN LED:

- on – DC voltage in the AUX output of the PSU
- off – no DC voltage in the AUX output of the PSU

* Refer to chart 1

4. Operation and use.

4.1 Overload or short circuit of the PSU output (SCP on)

In case of overload, the output voltage is automatically shut off, and so is the LED indicator. The restoration of the voltage takes place immediately after the failure (overload) is over.

4.2 Disconnection of discharged battery.

The PSU is equipped with the discharged battery disconnection system. During the battery-assisted operation, reducing voltage below 38V 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 rate, its interior is recommended to be cleaned with compressed air. In case of fuse replacement, use a replacement of the same parameters.

**WEEE LABEL**

Waste electrical and electronic equipment must not be disposed of with normal household waste. According to the European Union WEEE Directive, waste electrical and electronic equipment should be disposed of separately from normal household waste.



CAUTION! *The power supply unit is adapted for cooperation with the sealed lead-acid batteries (SLA). After the operation period they must not be thrown but recycled according to the applicable law.*

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