



USER MANUAL

EN

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HPSG2-12V5A-B

v1.0

**HPSG2 13,8V/5A/7Ah buffer,
switch mode power supply unit Grade 2**



Features:

- compliance with norm EN50131-6:2017 in grade 1, 2 and II environment class
- compliance with norm (KD) EN60839-11-2:2015+AC:2015 standard and I environment class
- supply voltage ~200 – 240 V
- uninterrupted voltage of DC 13,8 V/5 A
- battery charging current jumper selectable
- fitting battery 7Ah/12V (SLA)
- high efficiency (up to 85%)
- deep discharge battery protection (UVP)
- LED optical indication
- START function of manual switch to battery power
- dynamic battery test
- battery circuit continuity control
- battery voltage control
- battery charging and maintenance control
- **EPS technical output for AC** power failure - relay
- **APS technical output** indicating battery failure - relay
- **FPS technical output** indicating fuse activation - relay
- battery output protection against short circuit and reverse connection
- protections:
 - SCP short circuit protection
 - OLP overload protection
 - OVP overvoltage protection
 - surge protection
 - antisabotage protection: unwanted enclosure opening
- Warranty: 2 years

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1. Technical description.**1.1. General description.**

The buffer power supply is designed in accordance with the requirements of the (I&HAS) EN50131-6:2017 grade 1,2, II environmental class and EN60839-11-2:2015+AC:2015, I environmental class. Power supplies units are intended for an uninterrupted supply of I&HAS and KD devices requiring stabilized voltage of 12 V DC ($\pm 15\%$).

Table 1. Displaying parameters of the power supply:

PSU's name	Output voltage	Charging current	Output current		Total output current with charging
			In standby mode for grade 1, 2 EN50131-6	For general purpose application	
HPSG2-12V5A-B	13,8 V	0,5 / 1 A	$\Sigma=0,58$ A	4 / 4,5 A	5 A

In case of power failure, a battery back-up is activated immediately. The PSU is housed in a metal enclosure which can accommodate a 7Ah/12V (SLA) battery. The enclosure is equipped with a microswitch indicating cover opening.



PSU module should be configured properly, depending on application, to work in burglary and assault signalling systems or access control. For this purpose, appropriate charging current should be selected (taking into account battery capacity and required charging time).

1.2. Block diagram (Fig.1).

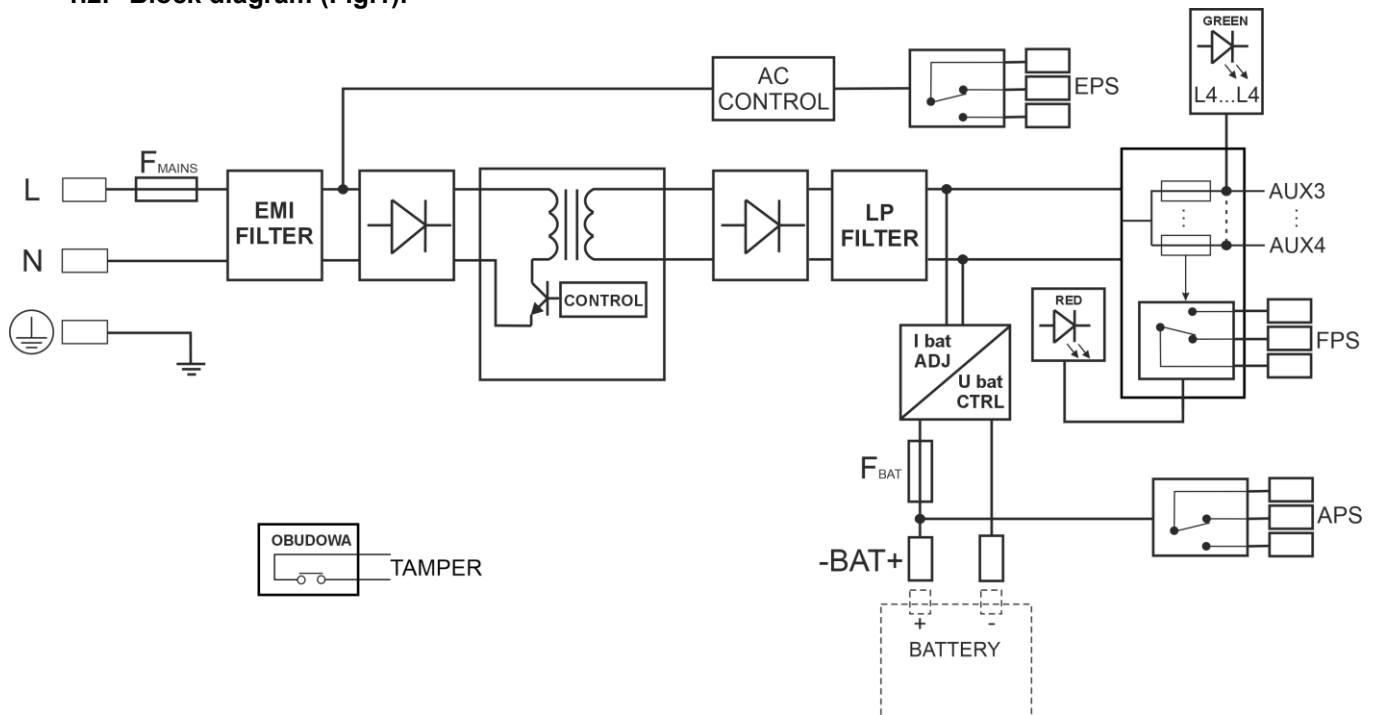


Fig. 1. Block diagram of PSU.

1.3. Description of PSU components and connectors

Table 2. Elements and connector of PSU (see Fig. 2).

Element no.	Description
[1]	LED indicating presence of DC voltage at outputs
[2]	Optical LED indication connector
[3]	Selection jumper for charging current: • $I_{BAT} = \text{■}$, $I_{BAT} = I1$ • $I_{BAT} = \text{□}$, $I_{BAT} = I2$
[4]	START button (launching from battery)
[5]	The output of the PSU AUX3... AUX4 Battery terminals (-BAT+)
[6]	Technical outputs: APS – technical output indicating battery failure - relay EPS – technical output for AC power failure - relay FPS technical output indicating fuse activation - relay
[7]	L-N power supply connector ~230 V, – connector for connection of a protective conductor
[8]	Main fuse F MAINS
[9]	F3..F4 output fuses
[10]	Battery fuse F BAT
[11]	LED (red) indicating failure of one of the outputs (fuse activation) AUX3 ÷ AUX4

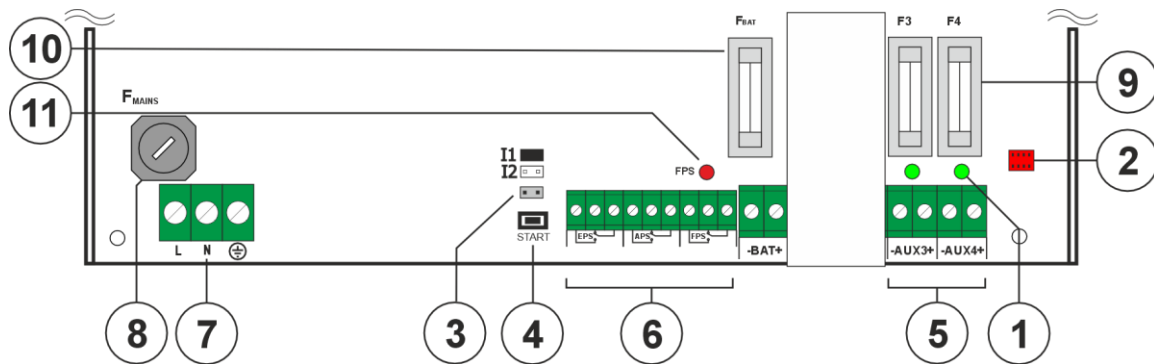


Fig. 2a. View of power supply module.

Table 2. View of PSU (see Fig. 3).

Element nr	Description
[1]	PSU module
[2]	Cable grommet
[3]	TAMPER ; microswitch of antisabotage protection (NC)
[4]	Battery connectors: +BAT = red, - BAT = black

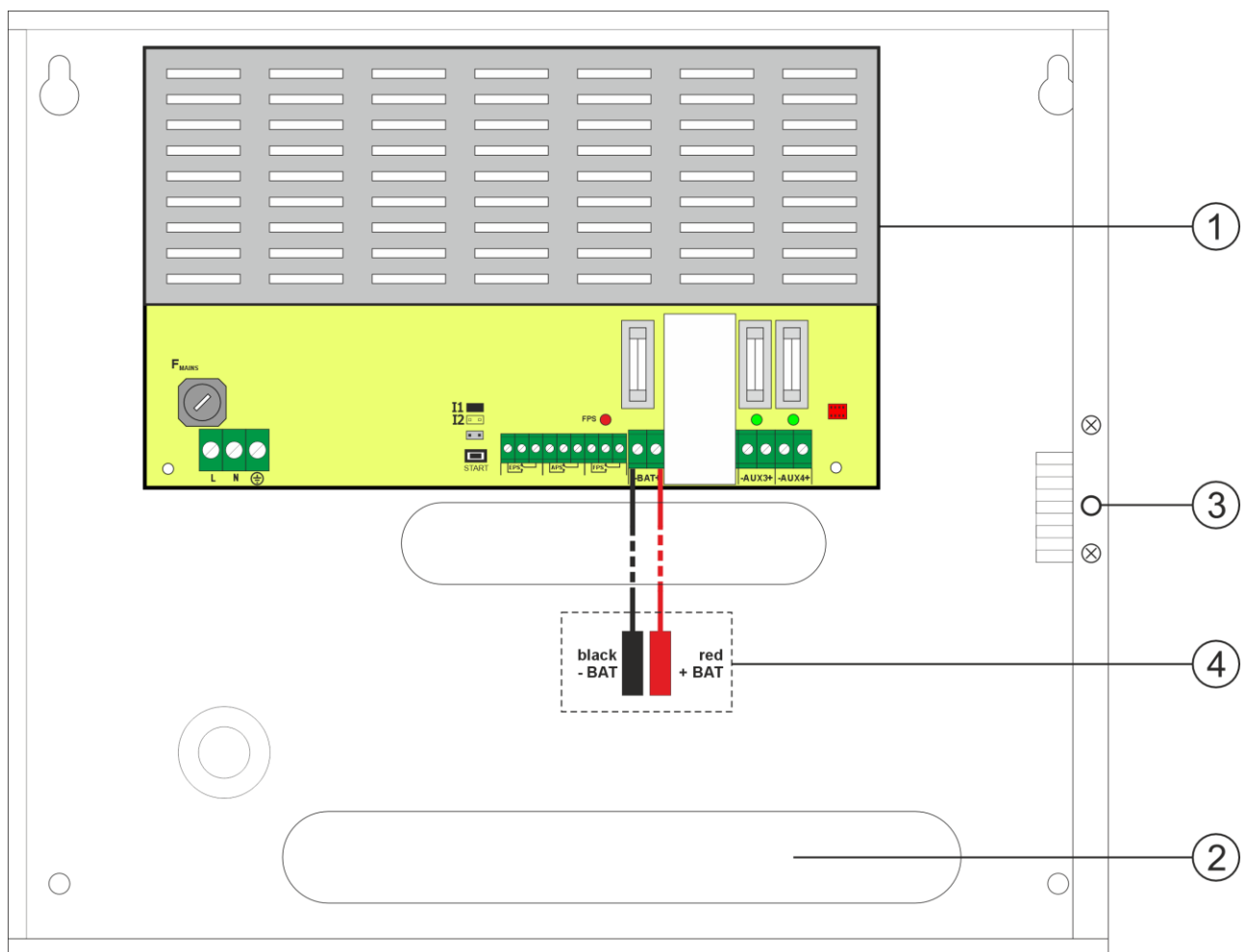


Fig. 3. View of PSU.

1.4. Specifications:

- electrical parameters (tab. 3)
- mechanical parameters (tab. 4)
- operation safety (tab. 5)
- operating parameters (tab. 6)

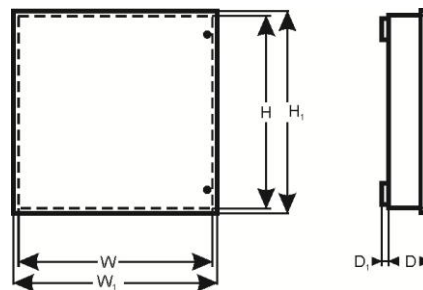


Table 3. Electrical parameters.

PSU type (EN 50131-6)	A (EPS - External Power Source), II environment class
Supply voltage	~ 200 – 240 V
Current consumption	0,7 A
Power frequency	50/60 Hz
Inrush current	40 A
Output power PSU	69 W
Total output current with charging	5 A
Efficiency	85%
Output voltage	11 – 13,8 V - buffer operation 10 – 13,8 V - battery-assisted operation
Ripple voltage (max.)	100 mV p-p
Current consumption by PSU systems during battery-assisted operation	50 mA
Battery capacity	7-9 Ah/ 12 V (SLA)
Charging current (jumper selectable)	0,5 / 1 A
Overload protection (OLP)	105 – 150% of power supply, automatic recovery
Over voltage protection (OVP)	>19 V (activation requires disconnecting the load or supply for about approx. 1 min.)
Battery circuit protection SCP and reverse polarity connection	- glass fuse F _{BAT} (in case of a failure, fuse-element replacement required – under power supply cover)
Fuses: - F _{BAT} - F ₃₋₄	T6,3A/250V F5A/250V
Deep discharge battery protection UVP	U<9,5 V (± 5%) – disconnection of battery circuit
Technical outputs: - EPS; output indicating AC power failure - APS; output indicating battery failure - FPS; output indicating failure of one of outputs, relay type	- relay type: 1A@ 30 V DC/50 V AC
Optical indication	- LEDs on PCB of power supply unit - LED indicators on power supply's cover (see section 3.1)
Terminals: Mains supply: AUX3-AUX4 outputs:	0,5 – 2,5 mm ² (AWG 26 – 12)
Technical output:	0,5 – 1 mm ² (AWG 26 – 18)
Battery outputs:	Battery wires 6,3F – 45cm, angle muffs ML062
TAMPER	Wires, 40cm
Notes	Convictional cooling

Table 4. Mechanical parameters.

Enclosure dimensions (W x H) [±2mm]	300 x 258
Enclosure dimensions: (W ₁ x H ₁ x D ₁ + D) [±2mm]	305 x 263 x 77 + 8
Fixing (W x H):	267 x 226
Space for battery (W x H x D)	200 x 120 x 70
Net/gross weight	2,2 / 2,3 [kg]
Enclosure	Steel sheet DC01 0,7mm
Closing	Cap screw (at the front, lock assembly possible)

Table 5. Operation safety.

Protection class EN 62368-1	I (first)
Protection grade EN 60529	IP20
Electrical strength of insulation: - between input and output circuits of the PSU - between input circuit and protection circuit - between output circuit and protection circuit	4000 V DC min. 2500 V DC min. 500 V DC min.
Isolation resistance: - between input circuit and output or protection circuit	100 MΩ, 500 V DC

Table 6. Operating parameters.

Environmental Class EN 50131-6	II
Environmental Class EN 60839-11-2	I
Operating conditions	-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	According to PN-83/T-42106

2. Installation.

2.1. Requirements.

Buffer power supply is designed to be installed only by qualified installer with necessary permits and authorisations (required in installation country) to connect (interfere) with the ~230 V mains supply. Unit should be mounted in confined spaces, in accordance, with normal relative humidity (RH=90% maximum, without condensing) and temperature from -10°C to +40°C. Device must be mounted in a vertical position with cable glands facing downwards. Mounting in any other position is not permitted. Ensure free convective airflow around enclosure. In order to meet the EU requirements, follow the guidelines on: power supply, enclosures and shielding: - according to application.

As power supply is designed for a continuous operation and is not equipped with a power-switch, therefore, an appropriate overload protection in power supply circuit should be provided. 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.

2.2. Installation procedure.

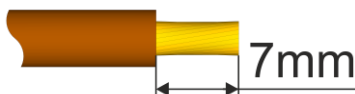


CAUTION!

Before installation, cut off voltage in 230 V power-supply circuit. To switch power off, use an external switch, in which distance between contacts of all poles in disconnection state is not less than 3mm.

It is required to install in the supply circuits, in addition to power supply, circuit breaker with 6 A nominal current.

1. Install the device in the selected location and route the connection cables through the cable glands. Then tighten the cable glands (unused cable glands should be sealed).
2. Connect power cables (~230 V) to L-N clips of PSU. Connect ground wire to clip marked by earth symbol PE (⏚). Use a three-core cable (with a yellow and green protection wire (⏚)) to make connection). Lead the power cables to the relevant terminals of the power supply via an isolation conduit. The wires should be stripped to a length of 7 mm.



Shock protection circuit shall be done with a particular care: yellow and green wire coat of power cable should be connected to terminal marked with the grounding symbol on PSU enclosure. Operation of PSU without the properly made and fully operational shock protection circuit is UNACCEPTABLE! It can cause damage to equipment or an electric shock.

3. If needed, connect the device cables to the technical outputs:
 - EPS; technical output of AC network absence indication
 - APS; technical output indicating battery failure
 - FPS; technical output indicating fuse failure
4. Connect equipment to the appropriate output terminals of power supply (positive connector +V, negative connector -V).
5. Use the I_{BAT} jumper to set the battery charging current, taking into account the battery parameters and the required charging time.
6. Mount the battery in the battery compartment of the enclosure. Connect the batteries with the PSU paying special attention to the correct polarity and type of connections.
7. Switch on 230 V supply. The LED on the power supply PCB should light up.

Output voltage of the PSU, without load U = 13,8 V DC.

During battery charge, voltage can amount to U = 11 - 13,8 V DC.

8. Perform a power supply test: check the technical outputs as follows:
 - **cutting off the 230 V current:** EPS technical outputs will change status into opposite after about 30s
 - **battery disconnection:** APS technical output will change status after a battery test have been completed (~5min)
 - **dismantling of one of AUX fuses:** red FPS LED lights up, FPS technical output will change status.

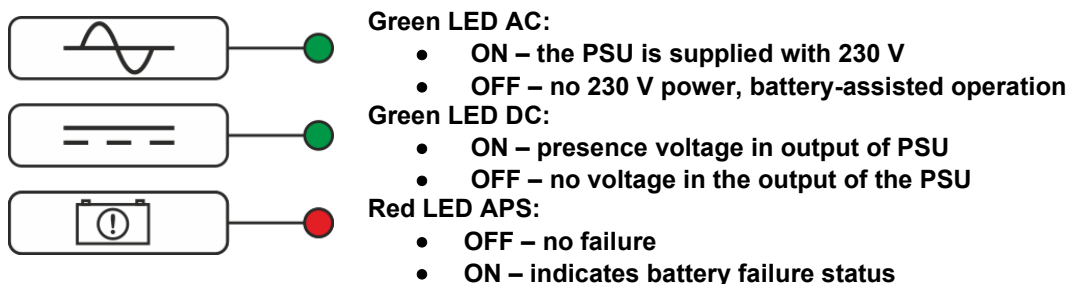
3. Operating status indication.

The power supply unit features LED status indication.

3.1. Optical indication.

Presence of voltage at output of the PSU is indicated by the green LED L3 ÷ L4. Failure (fuse damage) is indicated by shutting illuminating the red LED FPS. Status of the PSU (fuse damage **AUX3 ÷ AUX4**) can be remotely controlled via the FPS technical output.

In addition, the front panel of the power supply features additional indication:



3.2. Technical outputs.

The PSU is equipped with indication outputs:

- **FPS – fuse failure indication output**

The output indicates a failure of at least one of the AUX3–AUX4 output fuses. In case of fuse failure, relay is switched immediately.

- **EPS FLT - output indicating 230 V power loss.**

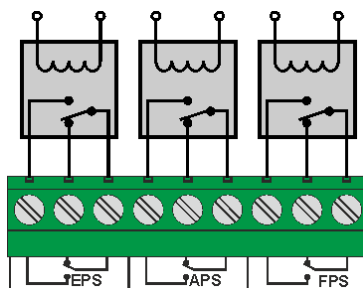
The output indicates 230 V power failure. In case of power failure, contacts of relay change over after about 30 seconds.

- **APS FLT - output indicating battery failure.**

The output indicates the PSU failure. In case of failure, contacts of relay change over. PSU failure can be caused by the following events:

- defective or low battery
- battery fuse failure
- no continuity in the battery circuit
- battery voltage below 11,5 V during battery-assisted operation

A battery failure is detected within a maximum of 5 minutes - after each battery test.



CAUTION! The figure set of contacts shows a potential-free status of relay, which corresponds to power supply failure.

3.3. Standby time.

Battery-assisted operating depends on battery capacity, charging level and load current. To maintain an appropriate standby time, current drawn from the PSU in battery mode should be limited. Required battery capacity can be calculated using following formula:

$$Q_{AKU} = \text{standby time} \cdot (I_{WY} + I_z)$$

where:

- Q_{AKU} – minimum battery capacity [Ah]
- I_{WY} – power supplies output current (drawing by the load)
- I_z – PSU current consumption (including optional modules) [A] (Table 4)

Total current of the receivers + battery charging current mustn't exceed maximum current of power supply.

3.4. Battery charging time.

The PSU has a battery circuit charged with direct current. The current selection is done with use of the I_{BAT} jumpers. The table below shows how long does it take to charge a (fully discharged) battery up to min. 80% of its nominal capacity.

Table 7. Approximate battery charging time up to the capacity of 0,8.

Battery	Charging current	
	0,5 A	1 A
7Ah	13h	7h

3.5. Running PSU on battery backup.

Power supply allows you to run on battery backup when necessary. To do this, press the START button on PCB.

4. 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 the case of significant dust rate, its interior is recommended to be cleaned with compressed air. In the case of a 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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