



PSUPS20A12CRT

v.1.1

PSUPS 13,8V/12V/20A/17Ah

**Buffer power supply for up to 16 HD cameras and DVR
with recorder space + transmitters**

EN**

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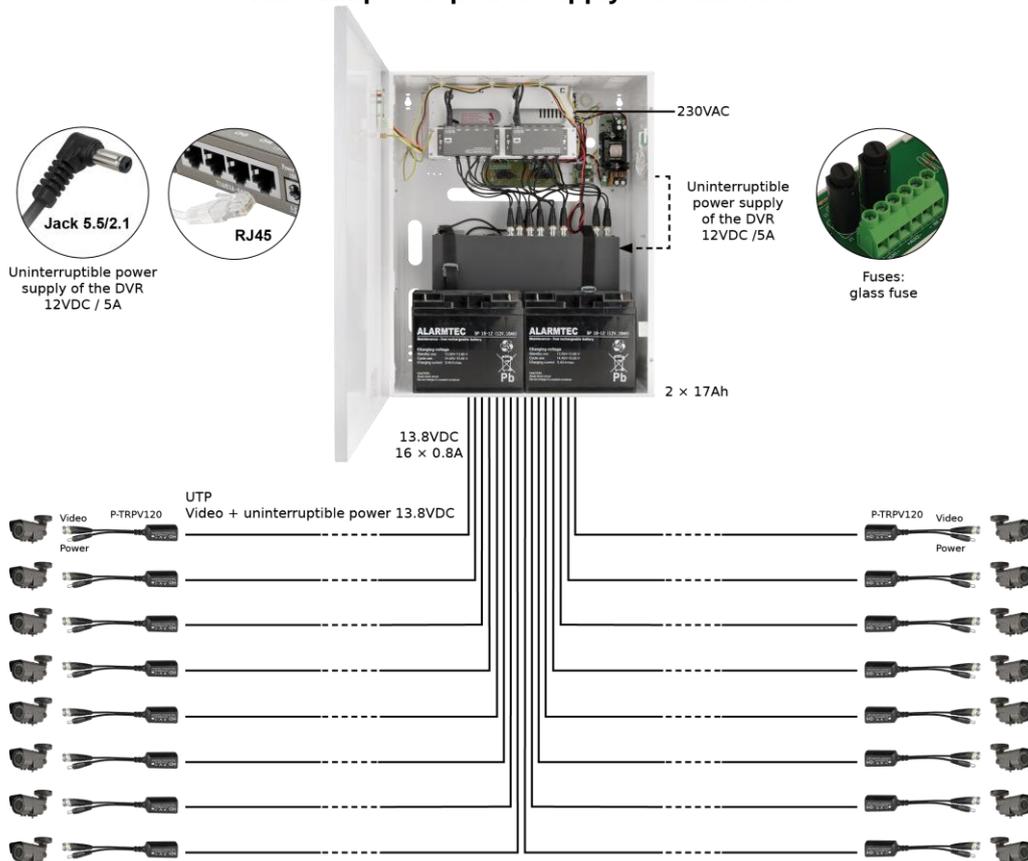
GREEN POWER CCTV



Features:

- DC 13,8V uninterruptible power supply of HD cameras
- DC 12V uninterruptible power supply of the recorder
- fitting battery 1 or 2x17Ah/12V
- recorder space 380 x 320 x 65
- wide range of mains supply AC 176÷264V
- high efficiency 85%
- 16 RJ45 0,8A outputs supplying HD and digital cameras
- 12V/5A output dedicated to supply the recorder
- battery output protection against short circuit
- battery charge and maintenance control and reverse polarity connection
- deep discharge battery protection (UVP)
- battery charging current 2A
- approximate backup time: 2h
- LED indication
- **the enclosure construction is compliant with the requirements of the General Data Protection Regulation GDPR (the possibility of installing two locks with different codes)**
- P-TRPV120 transmitters for connecting cameras are included: 12 pieces (a set includes)
- protections:
 - SCP short-circuit protection
 - OLP overload protection
 - OVP over voltage protection
 - surge protection
 - against sabotage
- warranty – 2 years from the production date

An example of power supply for cameras.



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1. Technical description.

1.1. General description.

A buffer PSU is intended for an continuous power supply to CCTV system devices requiring stabilized voltage of **12V DC (+/-15%)**. The PSU has two circuits: first **1x5A/12VDC** for supplying the recorder and **16x0,8A/13,8V DC** to power the cameras through the transmitter using the RJ45 connector and UTP cable. Current efficiency of the PSU amounts to:

Output current 16x0,8A + 5A recorder + 2A battery charging*
Total current of the receivers + battery 20A* max.

In case of 230V mains power loss, a battery back-up is activated immediately.

The approximate backup time is given assuming that all output ports are used (using typical devices and 34Ah batteries). The electricity consumption for own needs and the energy efficiency of the power intake track were taken into account. The exact description of how to perform the calculations can be found at: ["Approximate backup time - assumptions for calculations"](#).

The power supply unit is placed in a metal enclosure (color RAL 9003) with space 17Ah/12V batteries and a recorder. **The enclosure construction is compliant with the requirements of the General Data Protection Regulation GDPR (the possibility of installing two locks with different codes).** The enclosure is equipped with a micro-switch indicating unwanted opening of the door (faceplate).

1.2. Block diagram (fig.1).

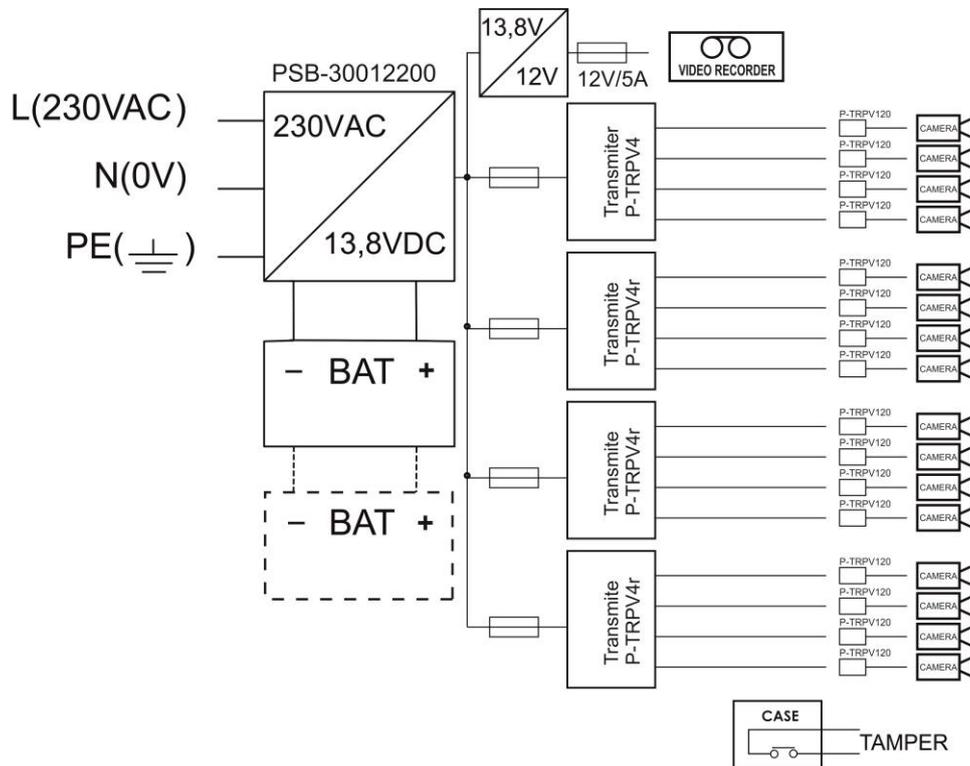


Fig.1. Block diagram of the PSU.

* See chart 1

1.3. Description of PSU components.

Table 1. The description of components of the fuse module and output filter.

Component no. [Fig. 2, Fig. 3]	Description
①	F1, F2, F3, F4 F5A melting fuses – camera protection
②	F_{AUX} F5A melting fuse recorder protection

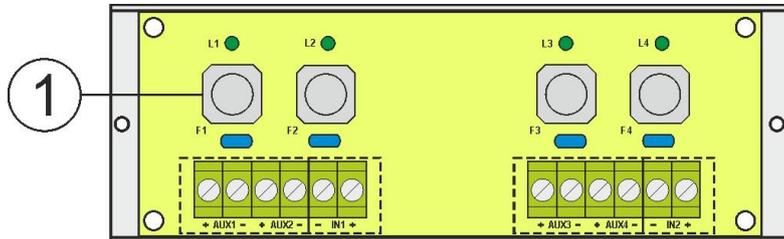


Fig. 2. Camera Security Module.

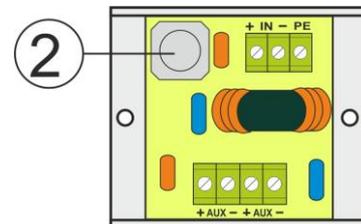


Fig. 3. Output filter.

Table 3. Description of the module's components and connectors.

Component no. [Fig. 4]	Description
①	PSU module
②	Connectors of the PSU:
	L-N 230V/AC power connector,  PE protection connector
③	green LED indicates DC power
④	P1 potentiometer , output voltage adjustment
⑤	Battery outputs: red: +, black: -
⑥	TAMPER , contact of tamper protection (NC)
⑦	Fuse module – cameras
⑧	DC/DC 50SE-SEP converter
⑨	Output filter
⑩	Cable for supplying recorder there is plug DC 2,1/5,5
⑪	The P-TRPV-4 transmitter module

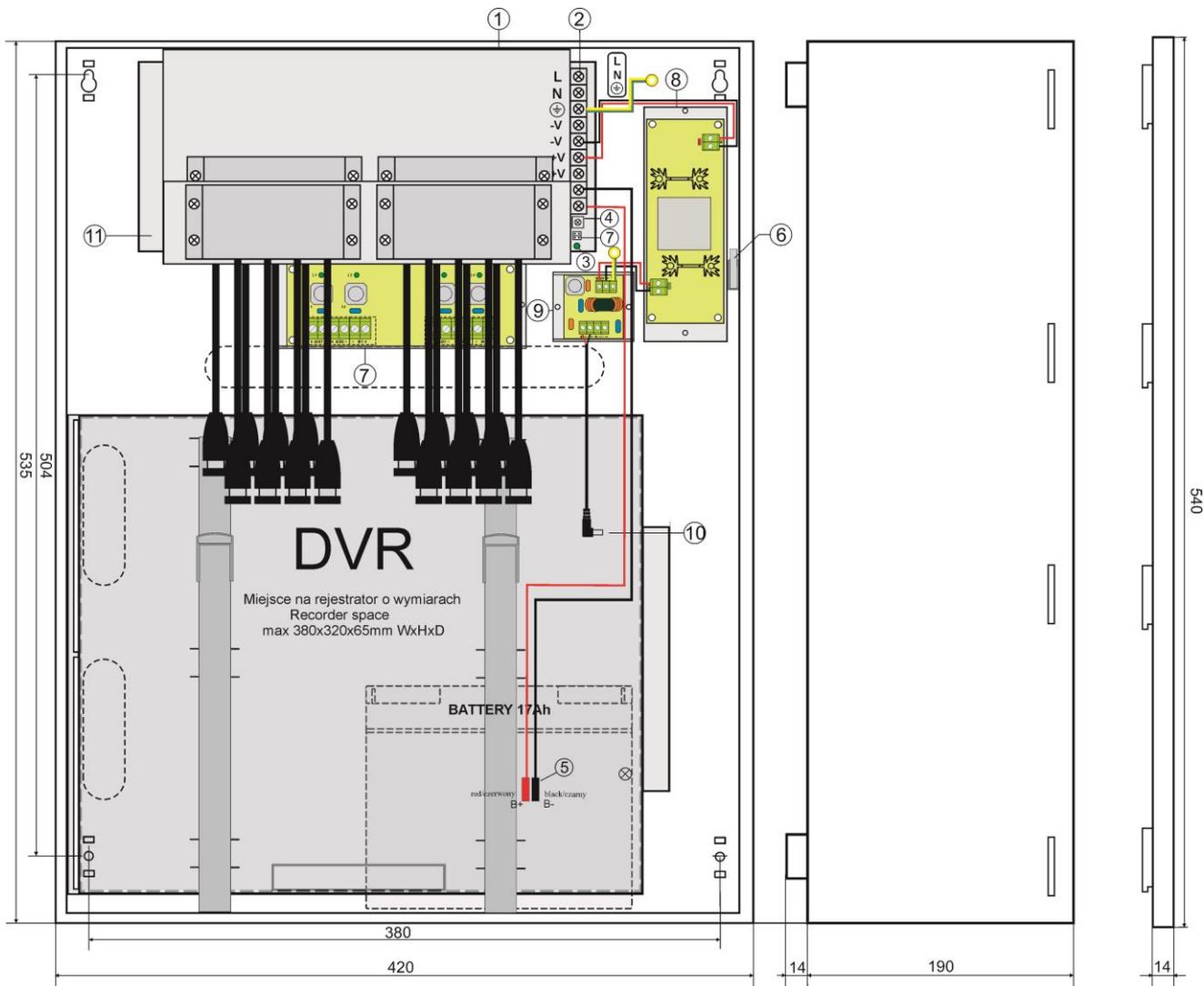


Fig.4. The view of the PSU.

1.4. Specifications:

- electrical specifications (tab.4)
- video parameters of the transmitter (tab.5)
- mechanical specifications (tab.6)
- operation safety (tab.7)
- operating specifications (tab.8)

Table 4. Electrical specifications.

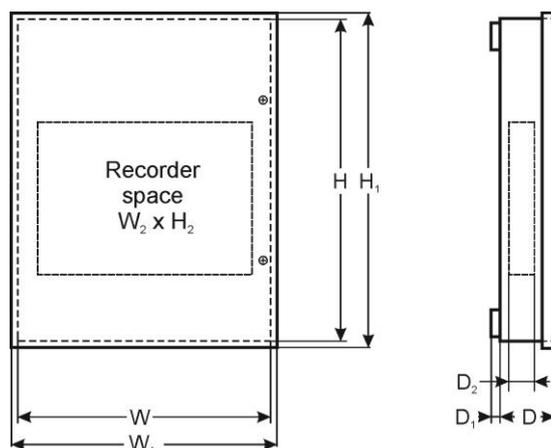
PSU type	A (EPS - External Power Source)
Mains supply	176÷264V AC / 50Hz
Current consumption	1,5A / 230V AC
PSU's power	264W
Efficiency	85%
Output voltage – Fuse base for fuse strips 16x	11V±13,8V DC – buffer operation 9,5V±13,8V DC – battery-assisted operation
Output voltage – recorder	12V DC maintained regardless of the state of battery charge
Output current t_{AMB}<30°C	16x0,8A + 5A recorder + 2A battery charging* Total current of the receivers + battery 20A* max. * see chart 1
Output current t _{AMB} =40°C	16x0,4A + 5A recorder + 2A battery charging* Total current of the receivers + battery 14A* max. * see chart 1
Output voltage adjustment range	12÷14V DC
Ripple voltage	120mV p-p max.
PSU current consumption	0,3A

* See chart 1

Battery charging current	2A
Approximate backup time	2h
Short-circuit protection SCP - circuit of cameras	F5A melting fuses in the fuse module
Short-circuit protection SCP - circuit of recorder	F5A melting fuse in the filter
Overload protection OLP	105% ÷ 150% of the PSU power, automatic recovery
Battery circuit protection SCP and reverse polarity connection	glass fuse 30A
Surge protection	varistors
Over voltage protection OVP	>16V (activation requires disconnecting the load or supply for about 20 s.)
Deep discharge protection UVP	U<10V (± 5%) – disconnection of battery terminal
Sabotage protection: - TAMPER output indicating enclosure opening	- micro-switches, NC contacts (enclosure closed), 0,5A@50V DC (max.)
Optical indication: front panel of the PSU - AC OK.; LED indicating the AC power status - DC OK.; LED indicating the DC supply at the PSU output	- red, normal status – on, failure: off - green, normal status – on, failure: off

Table 5. Video parameters of the transmitter.

Signal video	1,0V _{p-p} , 75Ω
Video transmission range (UTP 5e or higher)	HD-CVI (720p) - 450m; HD-CVI (1080p)-250m HD-TVI (720p / 1080p) - 250m AHD (720p / 960p)-350m; AHD (1080p)-250m
Video bandwidth	0 ... 50 MHz (-3 dB)
Impedance of the coaxial connector / connector type	75Ω / BNC plug (on the cable 100mm)
Impedance of the unbalanced connector / connector type	100Ω / gniazdo RJ45
Attenuation (loop-through)	-0,5dB / 5MHz
CMRR	60dB / 5MHz

**Table 6. Mechanical specifications.**

Dimensions	W=420, H=535, D+D ₁ =193+14 [+/- 2mm] W ₁ =425, H ₁ =540 [+/- 2mm]
The dimensions of the recorder compartment	W ₂ =380, H ₂ =320, D ₂ =65 [+/- 2mm]
The dimensions of the battery compartment	180 x 170 x 80mm (WxHxD) max
Fixing	See Fig. 3
Net/gross weight	11,8/12,5 kg
Enclosure	Steel plate DC01 1,0mm, colour RAL 9003
Closing	Cheese head screw x 2 (at the front) The possibility of installing two locks with different codes.
Connectors	Mains supply: Φ0,63-2,50 (AWG 22-10) Outputs for cameras: Φ0,63-2,50 (AWG 22-10) Recorder outputs: power cord 55cm, terminated with the DC 5,5/2,1 plug Battery outputs: 6,3F-2,5/40cm TAMPER output: wires
Additional accessories	P-TRPV120 transmitters for connecting cameras are included: 12 pieces
Notes	The enclosure does not adjoin the assembly surface so that cables can be led.

Table 7. 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 (network) circuit 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	100MΩ, 500V DC

Table 8. Operating specifications

Environmental class	II
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	Wg PN-83/T-42106

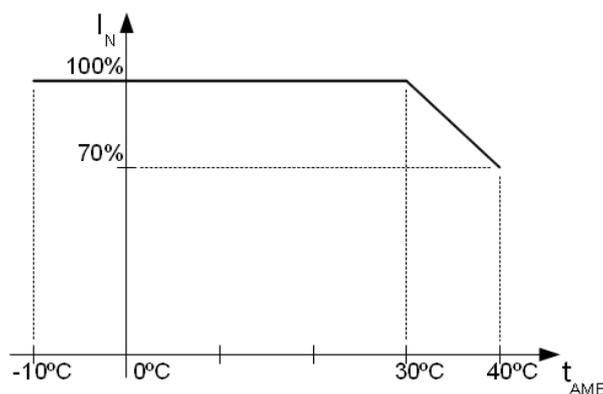


Chart 1. Acceptable output current from the PSU depending on ambient temperature.

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 PSU shall work in a vertical position that guarantees sufficient convective air-flow through ventilating holes of the enclosure.

The power supply load balance should be done before installation:

Output current 16x0,8A + 5A recorder + 2A battery charging*

Total current of the receivers + battery 20A 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 (most frequently through separating and assigning an appropriate fuse in the fuse-box). The electrical system shall follow valid standards and regulations.

* See chart 1

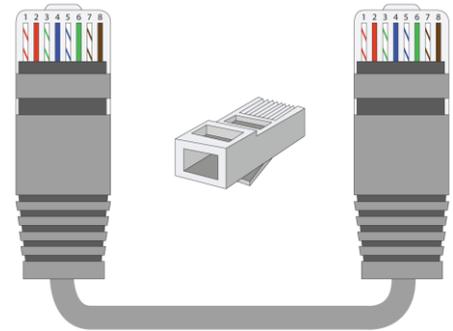
2.2 Installation procedure.

- 1. Before installation, make sure that the voltage in the 230V power-supply circuit is cut off.**
2. Mount the PSU in a selected location and connect the wires.
3. Connect the power cables (~230VAC) to L-N terminals of the PSU. Connect the ground wire to the terminal marked by the earth symbol – “⊕” on the plate. Use a three-core cable (with a yellow and green PE protection wire) to make the connection. Lead the cables to the appropriate terminals of the connection board through the bushing.

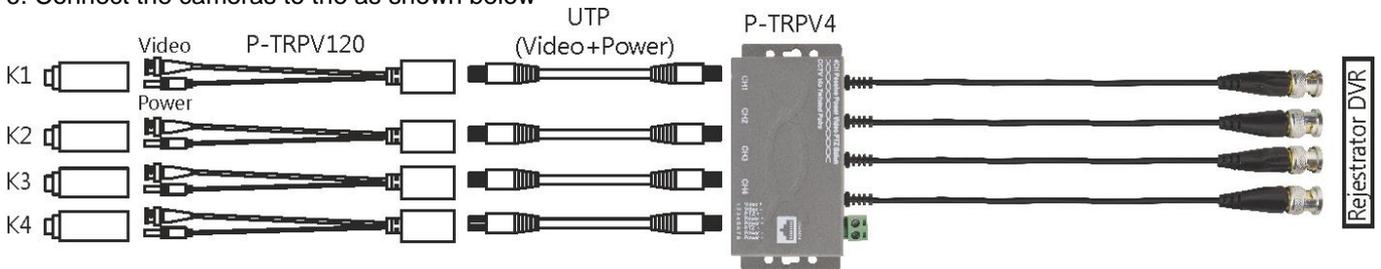


The shock protection circuit shall be performed with a particular care, i.e. the yellow and green wire coat of the power cable shall stick to one side of the terminal marked with the ‘⊕’ earth symbol in the PSU enclosure. Operation of the power supply without a properly made and fully operational shock protection circuit is UNACCEPTABLE! It can result in device damage or an electric shock.

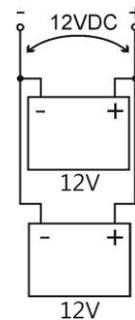
4. Mount the recorder in a designated area of the housing
5. Prepare UTP Cat. 5 cables for camera connection as shown below



6. Connect the cameras to the as shown below



7. Connect the power supply of the DVR (by default, the device is equipped with a cable terminated with the DC 5,5/2,1 plug).
8. Connect the BNC connectors to the recorder
9. Connect the power (~230V).
10. Check the PSU output voltage:
 - the PSU voltage without load should amount to U=13,8V DC.
11. Connect the battery:
 - battery output (+): BAT+ cable / red,
 - battery output (-): BAT – cable / GND / black.



To extend the battery life, use two 17Ah batteries connected in parallel. Batteries must be of the same type and batch number (connected by a cable with a cross-section of min. 2,5 mm²).

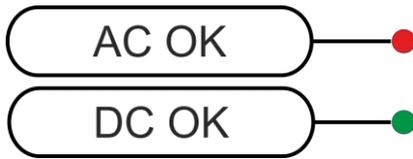
12. Check the PSU operation indicator: green LED (on the power supply module).
13. After installing and checking proper working, the enclosure can be closed.



CAUTION! Use only the R P-TRPV120 transmitters by PULSAR. Transmitters of other manufacturers may be powered with UTP cables twisted in the wrong pairs and may damage the unit.

3. Operating status indication.

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



RED LED:

- on – The PSU supplied with 230V AC voltage
- off – no 230V AC mains supply

GREEN LED:

- on – DC voltage at the AUX output
- off - no DC voltage at the AUX output

4. Operation and use.

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

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 once the failure (overload) is over.

4.2 Overload or short circuit of the recorder's module or CCTV camera module.

The modules of the recorder and CCTV cameras are protected against a short circuit by fuses (fuse-elements). In case of fuse replacement, use a replacement of the same parameters, in conformity with specific norms and power balance.

4.3 Battery-assisted operation.

The power supply is equipped with deep discharge battery protection (UVP). If the voltage at the battery terminals drops below 9,5V during battery-assisted operation, the batteries will be disconnected.

4.4 Parallel connection of batteries.

The power supply has space for two parallel connected batteries. With this connection, the following rules should be observed:

- Connect only new batteries: of the same manufacturer, type and the same capacity
- To minimize the rapid flow of current between the batteries, the batteries should be fully charged before connecting with external charger.
- In the case of low battery, replace always both batteries at the same time.

4.5 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 dust, clean the interior with compressed air. In case of fuse replacement, use a 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 separatel.



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.*

Pulsar

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