RPUPS1248R

v.1.0

RPUPS 54V/12V/5A

RACK mounted buffer power supply for up to 12 cameras IP and NVR.

EN

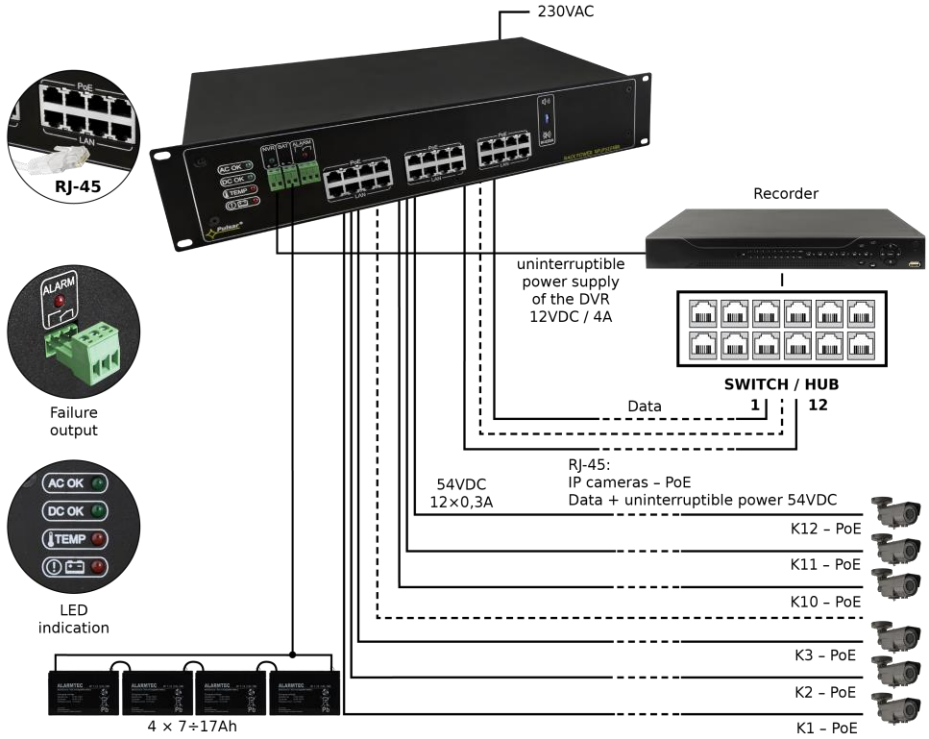
Edition: 3 from 15.11.2017

Supercedes the edition: 2 from 30.03.2017

Features:

- DC 54V/12x0,3A 48V uninterruptible power supply for powering 12 IP cameras (15,4W / channel)
- DC 12V/4A uninterruptible power supply for powering of the recorder
- 12 outputs independently protected by 0,5A polymer fuses PTC
- the recorder output is protected with a 5A PCT polymer fuse
- wide range of mains supply AC: 176÷264V AC
- built-in power factor correction system (PFC)
- high efficiency 82%
- battery charging and maintenance control
- excessive discharging (UVP) protection
- battery output protection against short circuit and reverse connection
- designed for 10Mbit/s and 100Mbit/s network
- acoustic indication of failure
- battery charge current: 0,5A (batteries 4×7Ah / 4×17Ah)
- Approximate backup time: 8h 15min
- LED optical indication: AC, DC, LoB, TEMP, ALARM, NVR
- control of voltage presence at the PoE outputs
- power over pairs: 4/5(+), 7/8(-)
- the ALARM technical output of collective failure
  - relay type, activated by:
    - 230V AC power loss
    - low battery voltage (<46V)
    - activation of the output fuse in the camera power supply circuit
    - activation of the output fuse in the recorder
    - power supply circuit too high temperature of the PSU (>70°C)
    - the PSU failure
- protections:
  - SCP short-circuit protection
  - OVP overvoltage protection
  - overvoltage protection
  - overload protection OLP
- forced cooling (fan)
- warranty – 2 year from the production date

Sample application of the RACK power supply unit.



CONTENTS:

1. Technical description.

1.1. General description.

The **RPUPS1248R** buffer power supply unit is designed for uninterrupted power supply of up to 12 cameras IP and recorder. The PSU has two circuits: first **12x0,3A / 54V DC** for both cameras and **1x4A / 12V DC** for supplying the recorder**.** Current efficiency of the PSU amounts to:

Output current 12x0,3A / 54V DC + 4A / 12V DC recorder + 0,5A battery charging

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 17Ah 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 PSU is fitted with 12 outputs protected independently with melting fuse 0,5A of the first output for the recorder is protected with a 5A polymer fuse PTC. The power is carried over the spare pairs (4/5 & 7/8), which, according to the Ethernet network standard, are not used for data transmission (data transmission uses 1/2 and 3/6 data pairs). The power supply is fitted with the **ALARM** output of collective failure. In case of failure, relay contacts are switched automatically, which is accompanied by acoustic and optical indication (the corresponding led goes on). The power supply construction is based on the switch mode PSU with high energy efficiency and is located in an enclosure adapted for mounting in standard **RACK** 19” cabinets.

The PSU can not be used in Gigabit Ethernet networks, where all twisted pairs are involved in the transmission of data!

1.2. Block diagram.

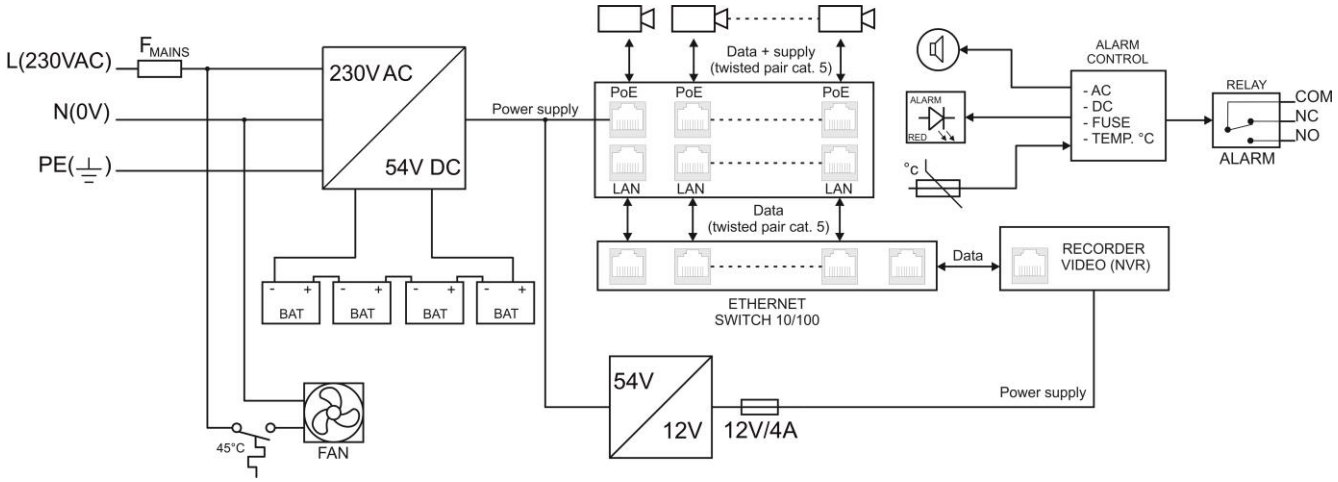


Fig.1. The block diagram of the PSU.

1.3. Description of PSU components and connectors.

Table 1. Components of the front panel of the power supply.

Element no. [Fig. 2, 3]	Description
①	**AC OK** – green LED, indicating the presence of 230V voltage
②	**DC OK** – green LED, indicating the presence of DC voltage
③	**TEMP** – red LED, indicating too high temperature of the power supply (>70°C)
④	**LoB** – red LED, indicating too low battery voltage (<46V)
⑤	**LED NVR** – Green LED voltage indication at the recorder output
⑥	**LED ALARM** – red LED failure indication
⑦	**NVR** – independently secured outputs for the recorder
⑧	**BAT** – output batteries (4x12V)
⑨	**ALARM** – technical output of collective failure – relay

⑩	**LAN** – Network inputs (Ethernet) – for connecting the network switch
⑪	**PoE** – Network outputs (Ethernet + power supply) – for camera IP connection
⑫	**BUZZER, micro switch,** turning ON / OFF of acoustic indication ON switch in the top position, indication ON ON switch in the down position, indication OFF
⑬	**230V AC INPUT**, power socket 230V AC, power cable 1,5m included
⑭	**F_{MAINS},** fuse in the supply circuit 230V AC, T 6,3A/250V

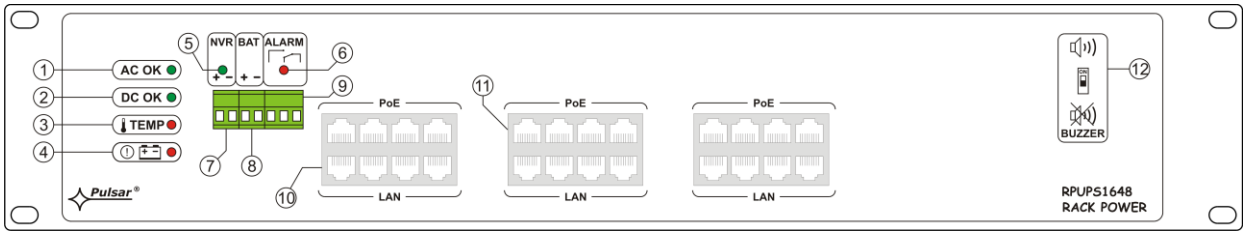


Fig. 2. The front power of the power supply unit.

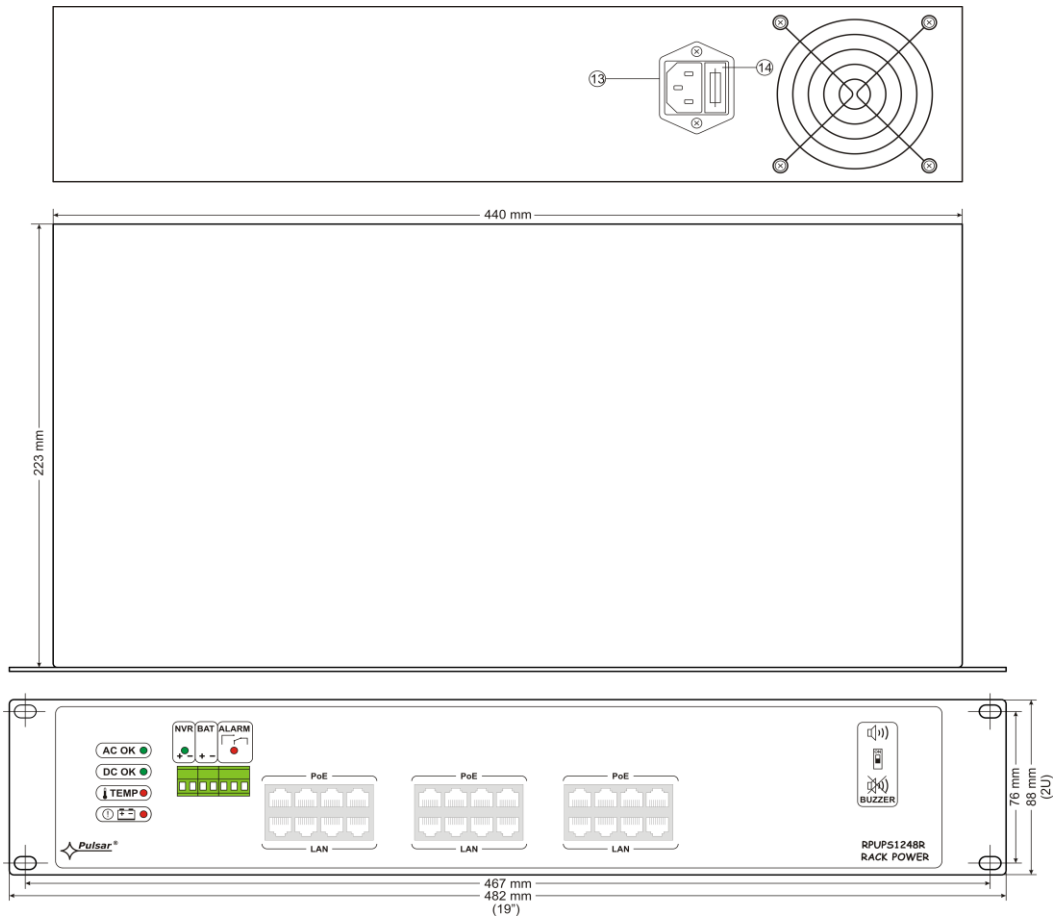


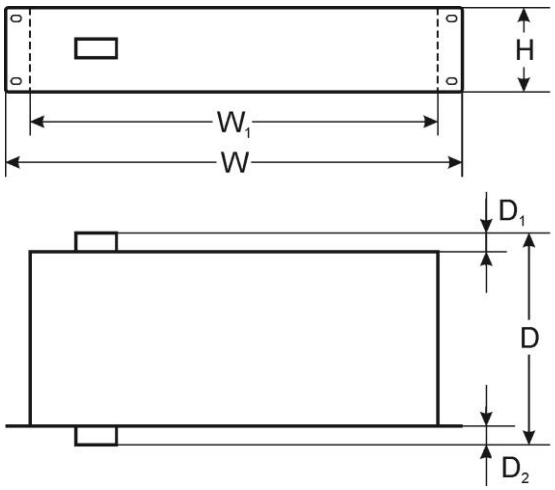
Fig.3. The view of the PSU.

1.4. Specifications.

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

Electrical parameters (tab. 2).

Mains supply	176÷264V AC
Current up to	1,5A@230V AC max.
Supply power	264W max.
Efficiency	82%
Power factor PF	>0,95@230V AC
Output voltage PoE for cameras Output voltage NVR – recorder	44V ÷ 54V DC – buffer operation 38V ÷ 54V DC – battery-assisted operation 12V DC – maintained regardless of the state of battery charge
Output current for cameras	**12 x 0,3A (Σ I = 3,5A max.)**
Output current for recorder	**4A**
Battery charge current (batteries 4×7Ah / 4×17Ah, connect batteries in series)	0,5A max. (+/-5%)
Approximate backup time	8h 15min
Ripple voltage – cameras output	150 mV p-p max.
Ripple voltage – recorder output	100 mV p-p max.
PSU current consumption	150 mA
Short-circuit protection SCP	cameras: 12 x PTC 1A, polymer fuse recorder: 1 x PTC 5A, polymer fuse
Overload protection OLP	105% ÷ 150% of the PSU power, automatic return
Overvoltage protection OVP	>62V (activation requires disconnecting the load or supply for about 20 s.)
Battery circuit protection SCP and reverse polarity connection	glass fuse
Surge protection	varistors
Optical indication of operation:	LED: AC, DC, LoB, TEMP, ALARM, NVR
Acoustic operation indication:	Piezoelectric indicator ~75dB/0,3m
The ALARM technical output of collective failure	Relay type: 1A@ 30V DC / 50V AC
The $\mathbf{F_{MAINS}}$ fuse in the 230V power supply circuit	T 6,3A



Mechanical parameters (tab. 3).

Mounting dimensions	W=19”, H=2U, D=267
Dimensions	W=482, W_1=442, H=88, D=267, D_1=32, D_2=10 [+/- 2mm]
Fixation	four-point butt mounting to RACK profiles – the set include 4 M6 screws + cage nuts
Net / gross weight	6,0kg / 6,4kg
Enclosure	Steel plate RAL 9005, black
Connectors	230V AC input: the IEC C14 socket with a fuse, power cable 1,5m (included) Technical output **ALARM**: Φ0,5-2,1 (AWG 24-12) 0,5-1,5mm^2 Power supply output of the **NVR** recorder: Φ0,5-2,1 (AWG 24-12) 0,5-1,5mm^2, power cable 2m (included) **PoE** cameras power supply output: socket RJ45 8P8C Battery output **BAT**: 6,3F-2,5
Notes	Forced cooling (fan)

Operation safety (tab.4).

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 MΩ, 500V/DC

Operating parameters (tab.5).

Environmental class	II
Operating temperature	-10ºC...+45ºC
Storage temperature	-20ºC...+60ºC
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

2. Installation.

2.1. Requirements.

The PSU RACK 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 do +45°C.

During normal operation the total current consumption of the receivers cannot exceed I=3,5A. The maximum current drawn by the recorder should not exceed 4A.

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.

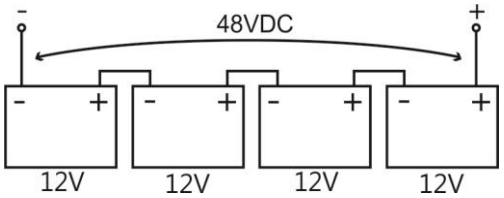
1. Before installation, cut off the voltage in the 230V power-supply circuit.

2. Mount the power supply in a RACK 19" cabinet as shown below:

- Mount M6 cage nuts

- Secure the enclosure with 4xM4 screws

3. Connect the battery in series to the +BAT- terminals:
   - battery output (+): terminal BAT+
   - battery output (-): terminal BAT-



4. Connect the network cables (Ethernet) to the PoE, LAN module: supply voltage is present only at the PoE sockets and the devices should be connected to them. Connect the Ethernet signal from the network switch to LAN connectors. Pin assignment of the LAN and POE sockets is shown in the Figure 4:

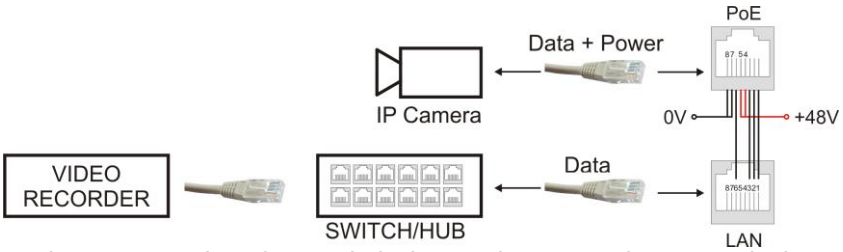


Fig. 4. Connection of network devices to the LAN and POE terminals.

5. Connect the power supply of the recorder to the NVR connector.
6. If needed, the following technical connections can be made:
- ALARM – technical output of collective failure
7. Connect the ~230V AC power cord with the IEC C13 plug (included) to the 230V AC power supply and turn on the power (~230V).
8. Check the PSU operation indicator.

3. Operating status indication.

3.1. LED indication.

The PSU has 6 LED lights at the front panel:

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

GREEN LED:
- on – DC voltage at the output of the switch mode PSU
- off – no DC voltage at the output of the switch mode PSU

RED LED:
- ON – too high temperature of the switch mode power supply (>70°C)
- OFF – standard temperature of the switch mode power supply

RED LED:
- on – battery voltage <46V
- off – battery voltage >46V

RED LED:
- on – failure
- off – no failure

GREEN LED:
- on – DC voltage in the NVR output
- off – no DC voltage in the NVR output

3.2. Technical output.

The power supply is fitted with the **ALARM** output of collective failure (relay type). A collective failure can be triggered by the following events:

- 230V AC mains power failure
- polymer fuses PTC activation
- Failure of the switch mode power supply
- Too high temperature of the switch mode power supply (>70°C)
- Low battery voltage (<46V)

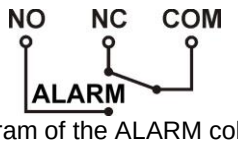


Fig. 5. Electrical diagram of the ALARM collective output of failure.

CAUTION! In Fig. 5 the set of contacts shows a potential-free status of the relay, which corresponds to power supply failure.

3.3. Acoustic indication.

A collective failure is indicated by the piezoelectric indicator, 1 beep every second. The acoustic indication can be turned off by changing the ON / OFF position of the switch •)) .

switch in the up position, indication ON

switch in the down position, indication OFF

4. Operation and use.

4.1. Overload or short circuit of the PSU output.

The power supply outputs PoE, NVR are protected against short circuit by polymer fuses PTC. If the output voltage value exceeds the acceptable threshold Imax (105% - 150% @25°C of the PSU power) there will be an automatic disconnection of the output voltage. Disconnect the load from the power supply output for approximately 1 minute to restore output voltage (the time needed to cool down the PTC fuse).

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 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. 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 separately.

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