



USER MANUAL

EN

Edition: 2 from 21.02.2023

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Power supplies PSDCG2 series

**Buffer power supply units, multi-output
enclosed Grade 2**



Features:

- compliance with norm EN50131-6:2017 in grade 1, 2 and II environmental class
 - compliance with norm (KD) EN60839-11-2:2015+AC:2015 standard and I environment class
 - supply voltage ~200 - 240 V
 - **DC 13,8 V** uninterruptible power supply
 - available versions with **4x1A, 8x1A** current efficiencies
 - high efficiency (up to 86%)
 - battery charging current jumper selectable
 - deep discharge battery protection (UVP)
 - optional equipment: set of external LED indicators: PKAZ168, mounting plates DIN4
 - LED optical indication
 - function START allows running PSU from battery power
 - dynamic battery test
 - battery circuit continuity control
 - battery voltage control
 - **EPS technical** output indicating power loss – relay type
 - **APS technical output** indicating battery failure – relay type
 - **FPS technical** output of fuse activation indication
 - battery charging and maintenance control
 - battery output protection against short circuit and reverse connection
 - protections:
 - SCP short circuit protection
 - OLP overload protection
 - OVP overvoltage protection
 - surge protection
 - warranty – 2 years from production date
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1. Technical description.

1.1. General description.



Power supply modules are intended for installation in an additional enclosure. In order to meet the requirements of IDS and AC standards, enclosure must be designed in accordance to security level with which compliance is established.

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. The power supplies units are intended for an uninterrupted supply of I&HAS and KD devices requiring stabilized voltage of 12 or 24 V DC ($\pm 15\%$).

Parameters of power supplies:

PSU's name	Output voltage	Charging current	Output current	Total output current with charge
PSDCG2-12V4x1A	13,8 V	0,5 / 1 A	4x1 A	5 A
PSDCG2-12V8x1A	13,8 V	1 / 2 A	8x1 A	10 A

In case of power failure, a battery back-up is activated immediately.

Depending on a required protection level of the alarm system in the installation place, the PSU efficiency and the battery charging current should be set as follows:

Grade 1, 2 - standby time 12h:

The 12h standby output current can be calculated from the formula:

$$I_{WY} = Q_{AKU} / 12 - I_z$$

where:

Q_{AKU} – minimum battery capacity [Ah]

I_z – PSU current consumption (including optional modules) [A] (table 3)



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.

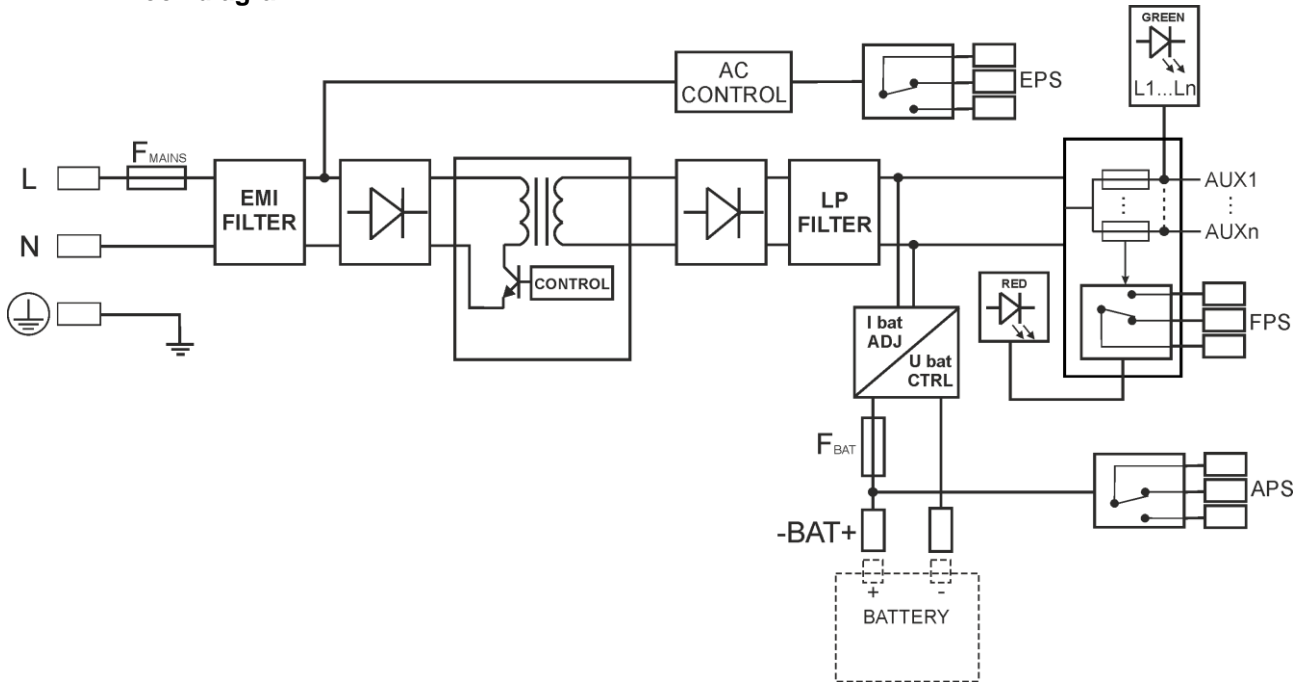


Fig. 1 Block diagram

1.3 Description of PSU components and connectors.

Table 1. Elements and connector of PSU (see Fig. 3a, 3b).

Element no.	Description
[1]	LED indicating presence of DC voltage at outputs
[2]	Connector for LED indicators
[3]	Selection jumper for charging current: <ul style="list-style-type: none"> • $I_{BAT} = \blacksquare$, $I_{BAT} = I1$ • $I_{BAT} = \square$, $I_{BAT} = I2$
[4]	START button (launching from battery)
[5]	PSU output: Outputs AUX1... AUXn Battery terminals (-BAT+)
[6]	Technical outputs: APS – technical output of battery failure EPS – technical output of AC power loss indication FPS output indicating failure of one of outputs, relay type
[7]	L-N power supply connector 230 V AC, – connector for connection of a protective conductor
[8]	Main fuse F MAINS
[9]	F1..Fn output fuses
[10]	Battery fuse F BAT
[11]	LED (red) indicating failure of one of the outputs (fuse activation) AUX1 ÷ AUXn

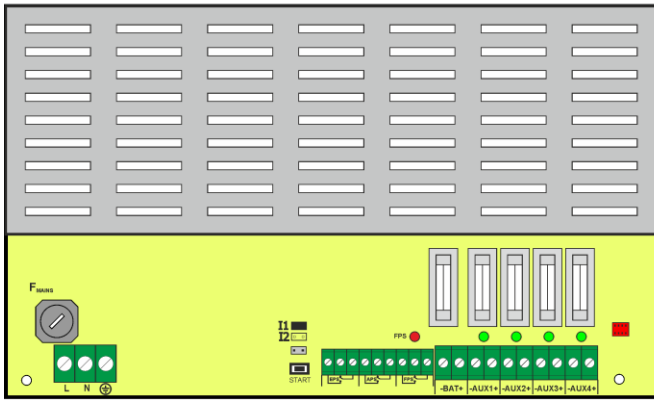


Fig. 2a. View of power supply module PSDCG2-12V4x1A

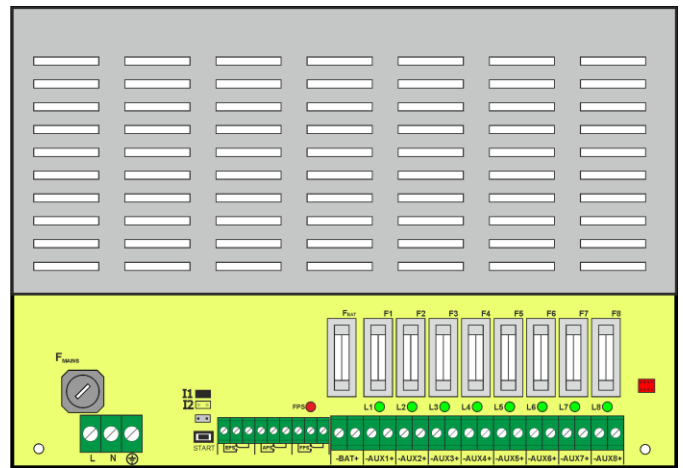


Fig. 2b. View of power supply module PSDCG2-12V8x1A

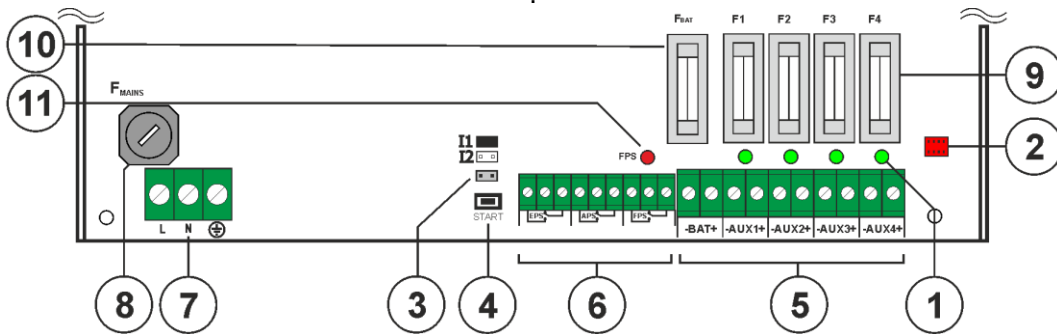


Fig. 3a. View of power supply module outputs PSDCG2-12V4x1A

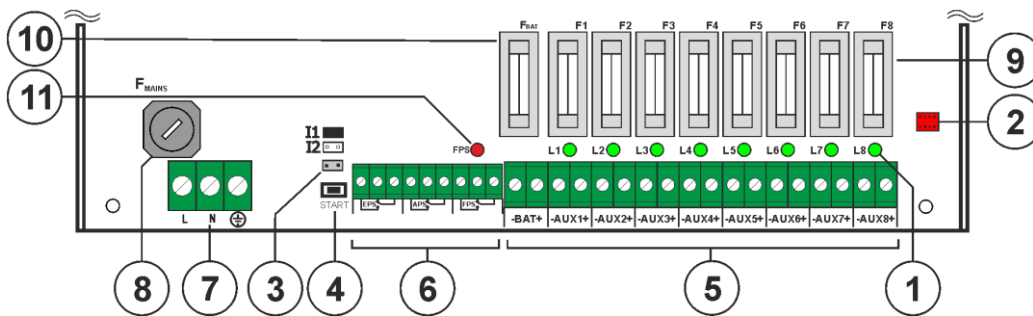


Fig. 3b. View of power supply module outputs PSDCG2-12V8x1A

1.4. Specifications:

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

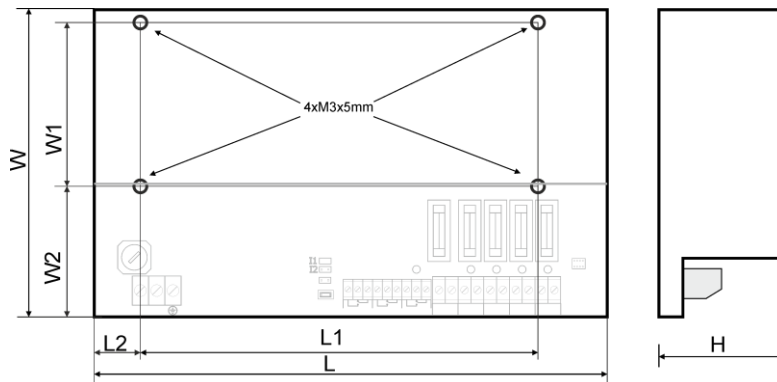


Fig.4 Dimensions of power supply unit

Table 3. Electrical parameters.

Model	PSDCG2-12V4x1A	PSDCG2-12V8x1A
PSU type EN50131-6	A, Grade 1,2, II environmental class	
Power supply	~ 200 - 240 V	
Current consumption	0,7A	1,3A
Power frequency	50/60 Hz	
Inrush current	40 A	
Output power PSU	69W	138W
Output current	4x1 A	8x1 A
Total output current with charging	5 A	10 A
Efficiency	85%	86%
Output voltage	11 - 13,8 V – buffer operation 10 - 13,8 V – battery-assisted operation	
Ripple voltage (max.)	100mV p-p	
Current consumption by PSU systems during battery-assisted operation	50mA	
Fitting battery	7 – 17 Ah	7 – 40 Ah
Charging current (jumper selectable)	I1: 0,5 A I2: 1 A	I1: 1 A I2: 2 A
Net/gross weight	0,5 / 0,6 kg	0,8 / 0,9 kg
Battery circuit protection SCP and reverse polarity connection	- F _{BAT} fuse (in case of a failure, fuse-element replacement required)	
Overload protection (OLP)	105-150% PSU power, automatically recovered	
Over voltage protection (OVP)	>19 V automatic recovery	
Deep discharge battery protection UVP	U<9,5 V (± 5%) – disconnection of battery circuit	
Optical indication	- LEDs on PCB of power supply unit: Green LED1...LED..n LEDs indicate power supply status on outputs: AUX1...AUX..n LED FPS on PSU's PCB – fuse damage indication	
LED optical indication output (intended for optional indication set PKAZ168)	LED AC – presence of AC voltage LED DC – presence of DC voltage in output of PSU APS FLT – battery failure	
Fuses: - F _{BAT} - F _{1...n}	T6,3A/250V F1A/250V (permissible up to F2A/250V)	T10A/250V
Enclosure dimensions (LxWxH) [±2mm]	200x120x48	204x141x52
Fixing (L ₁ xW ₁ xL ₂ xW ₂)	155,5x64x18x51,5	
Terminals: Mains supply: Outputs AUX1-AUXn:	0,5 – 2,5 mm ² (AWG 26 – 12)	
Technical outputs:	0,5 – 1 mm ² (AWG 26 – 18)	
Battery outputs:	Battery wires 6,3F – 45cm, angle muffs ML062	
Optional equipment:	optional equipment: set of external LED indicators: PKAZ168, mounting plates DIN4	

Table 4. 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.
Insulation resistance: - between input circuit and output or protection circuit	100 MΩ, 500 V DC

Table 5. Operating parameters.

Environment class EN 50131-6	II
Environment class EN 60839-11-2	I (first)
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	According to PN-83/T-42106

2. Installation.



Power supply modules are intended for installation in an additional enclosure. In order to meet the requirements of IDS and AC standards, enclosure must be designed in accordance to security level with which compliance is established.

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. The unit should be mounted in a metal enclosure (cabinet) in a vertical position so as to ensure free, convection air flow through the vents. 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.

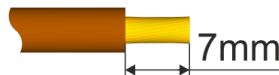


CAUTION!

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. Mount the PSU in a selected location and connect the wires.
2. Connect power cables (~230 V) to L-N clips of PSU. Connect ground wire to clip marked by earth symbol . Use a three-core cable (with a yellow and green protection wire  to make connection). Wires should be deisolated to a length of 7mm.



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
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 maximum battery charging current, taking into account charging capacity and required charging time.
6. Mount battery(s) in the battery compartment of enclosure. Connect the batteries with the PSU paying special attention to the correct polarity.
7. Switch on 230 V supply. LEDs on the PCB of power supply should light. Optionally, you can install additional PKAZ168 signaling module (chapter 3.1). After installing and checking proper working, enclosure can be closed.

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. Run PSU test: check LED and acoustic indication (see section 3.1) and technical output; through:
 - **cutting off 230 V current:** LED AC go out, 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) and red APS LED lights up
 - **dismantling of one of AUX fuses:** red FPS LED lights up, FPS technical output will change status

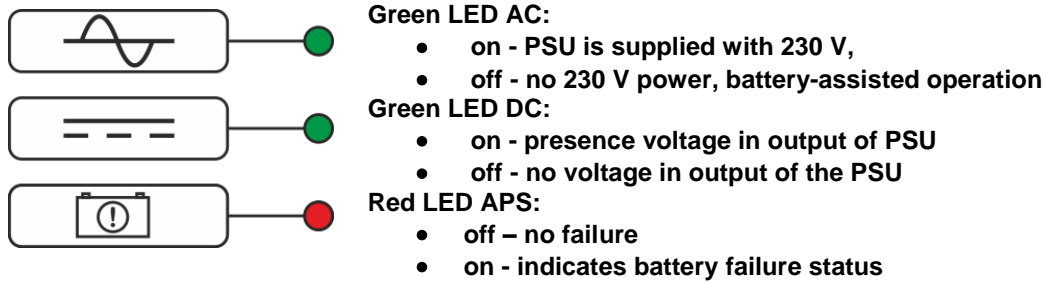
3. Operating status indication.

The power supply unit features LED status indication.

3.1 Optical indication.

The power supply unit features LED status indication. Presence of voltage at output of the PSU is indicated by the green LED L1 ÷ Ln. Failure (fuse damage) is indicated by shutting illuminating the red LED FPS. Status of the PSU (fuse damage **AUX1 ÷ AUXn**) can be remotely controlled via FPS technical output.

Moreover, signalling can be extended with optional PKAZ168 module:

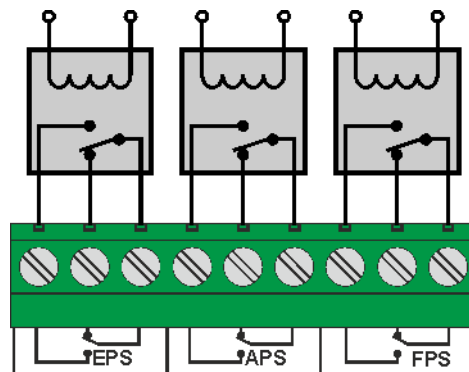


3.2 Technical outputs.

The PSU is equipped with indication outputs:

- **FPS** indicating fuse failure
Output indicates failure of at least one of AUX1-AUXn 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:

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

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 3)

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

Battery	Charging current		
	0,5A	1A	2A
7Ah	13h	7h	-
17Ah	31h	16h	8h
28Ah	-	26h	13h
40Ah	-	36h	18h

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. Operation and use.

4.1. Overload or short circuit of the PSU module output.


The AUX1 ÷ AUXn PSU outputs are protected against short circuit by glass fuses. Activation of the protection (glass fuse blowing) is indicated by shutting down green LED nearby appropriate outputs fuse on the PSU module and illuminating the red LED FPS. In case of damage, replace the fuse (compatible with the original). As a precaution, it is possible to use fuses with a higher current (up to 2 A) and a fast blow characteristic (F), which will increase the current-carrying capacity of the given output. However, this does not affect the overall current capacity of the power supply.

4.2. Operation of the PSU OVP system.

If the OVP system is activated, the output voltage is automatically cut off. Operation can be resumed after disconnecting the PSU from 230 V after approx. 1 minute.

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 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.

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