

SONGPL*TR5

v.1.0

EN

Edition: 1st from 15th of March 2012

Supersedes edition: _____



Features of the power supply unit:

- 13,8VDC/5A uninterruptible power supply
- high efficiency 73%
- controlling of battery charging and maintaining
- protecting of battery against excessive discharging (UVP)
- battery output is full protected against short circuit and reverse connection
- battery charging current 0,5A/1A/1,5A/2A changed with jumper
- START function of manual battery actuation
- checking the status of safety fuses of AUX
- LED optical signalisation
- FAC outlet for the signalling of the 230V network collapse
- FPS output of power supply unit failure, tripped by:
 - short-circuit (SCP)
 - overload (OLP)
 - failure of DC/DC voltage converter
- protections:
 - SCP short-circuit protection
 - OLP overload protection
 - OHP overheat protection
 - overvoltage protection

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1. Technical description.

1.1 General description.

The buffer power-supply is used for uninterrupted supply of alarm systems devices requiring stabilized voltage of 12V/DC (+/-15%). The power-supply provides voltage within the following range 13,8 V DC of current efficiency equal:



1. Output current 5,0A (without battery)
2. Output current 4,5A + 0,5A battery charging
3. Output current 4,0A + 1,0A battery charging
4. Output current 3,5A + 1,5A battery charging
5. Output current 3,0A + 2,0A battery charging

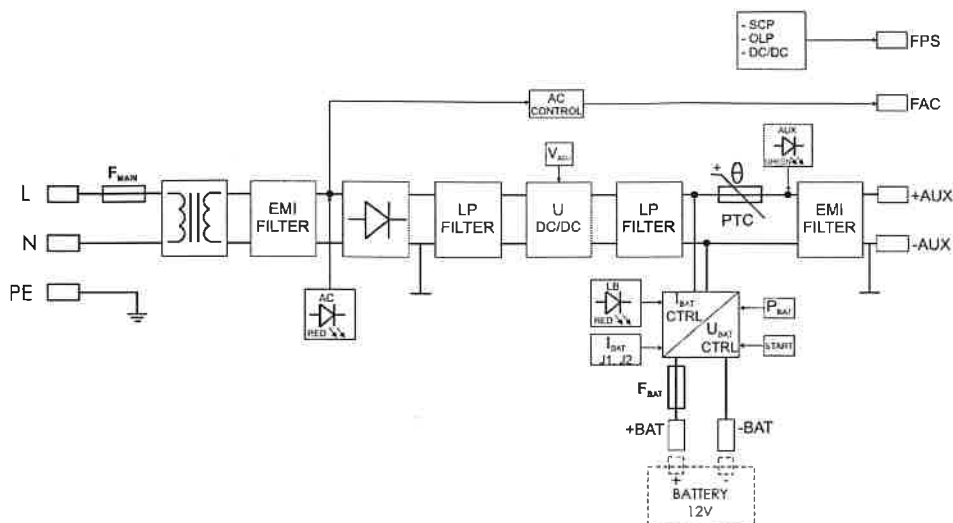
Total device current + battery: 5A max.

W In case of power voltage decay, prompt switching to battery supply occurs. Battery charging current – set on 1A.

The module is intended to be mounted in enclosures:

- AVZUPL*3427
- AVZUPL*3444
- AVZUPL*4044

1.2 Block diagram (fig.1)



1.3. Description of elements and connection links of the power-supply unit.

Table 1. Elements of the power supply pcb (refer to chart 2).

Element no.	Description
[1]	F _{BAT} fuse in the battery circuit
[2]	START pushbutton (power activation without AC supply)
[3]	P_{BAT}; jumper - configuration of UVP battery protection function - P_{BAT} = protection function (disconnection) of the battery off - P_{BAT} = protection function (disconnection) of the battery on Legend: dip switch installed dip switch removed
[4]	V _{ADJ} potentiometer, voltage adjustment DC
[5]	Connectors: +BAT- DC supply output of the battery (+BAT= red, -BAT=black) +AUX- DC supply output (+AUX= +U, -AUX=GND) FAC - AC absence technical output – OC type (open collector) level hi-Z = state: AC power supply failure level L = state: AC power supply FPS - technical output of power supply operation status – OC type (open collector) level hi-Z = state: failure level L = state: correct operation
[6]	Optical signaling of operation LED: AC - LED diode that indicates the presence of AC voltage LB - LED diode that indicates battery charging AUX – LED signaling presence of output voltage DC
[7]	I_{BAT}; jumper – battery charging current selection - J1= J2= I_{bat}=0,5 A - J1= J2= I_{bat}=1,0 A - J1= J2= I_{bat}=1,5 A - J1= J2= I_{bat}=2,0 A Legend: dip switch installed dip switch removed
[8]	Connector to an external optical signalization: AC and AUX.

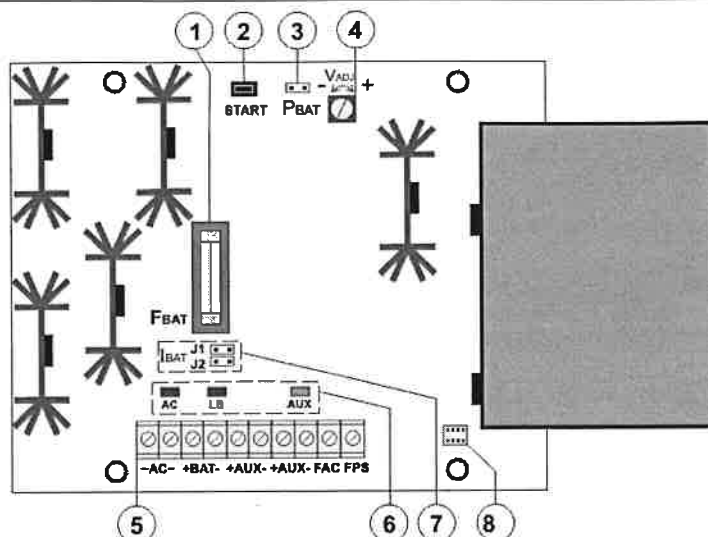


Fig.2. View of the power supply PCB.

Table 2. Elements of the power supply (refer to chart 3).

Element no.	Description
[1]	Separation transformer
[2]	Power-supply unit board (tab. 1, fig. 2)
[3]	Battery connectors +BAT = red, -BAT = black
[4]	F _{MAIN} witch in the Power supply circuit (230V/AC)
[5]	L-N power-supply connector 230V/AC,  PE protection connector

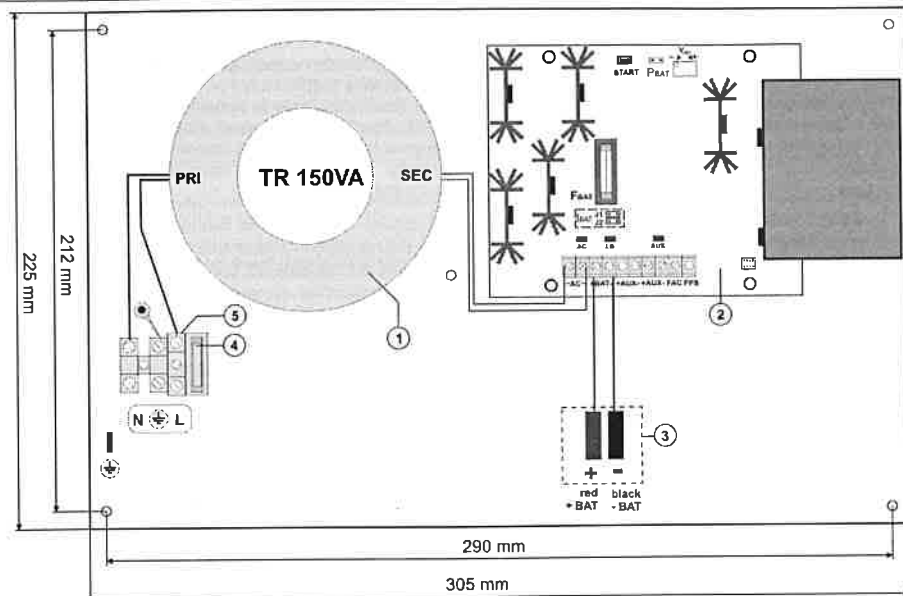


Fig.3. The view of the power supply.

1.4 Technical parameters:

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

Electrical parameters (tab. 3)

Supply voltage	230V/AC (-15%/+10%)
Current consumption	0,61 A max.
Power frequency	50Hz
Supply power	69 W
Efficiency	72%
Output voltage	11,0 V± 13,8 V DC – buffer operation 10,0 V± 13,8 V DC – battery assisted operation
Output current	5,0A (without battery) 4,5A + 0,5A battery charging 4,0A + 1,0A battery charging 3,5A + 1,5A battery charging 3,0A + 2,0A battery charging
Output voltage setting, escalation and keeping time	10ms / 30ms / 12ms
Voltage adjustment range	12,0 V± 14,5 V
Ripple voltage	40 mV p-p max.
Current consumption by PSU systems	17 mA – battery assisted operation
Battery charging current	0,5A / 1A / 1,5A / 2A – changed with jumper I _{BAT} (J1, J2)
Short-circuit protection SCP	200% ± 250% of supply power – limitation of current and/or fuse failure in the battery circuit (fuse-element replacement required)
Overload protection OLP	110% ± 150% (@25°C+55°C) of power supply – limitation with the PTC automatic fuse, manual restart (the fault requires the disconnection of the DC output circuit)
Protection of the battery circuit SCP and reverse polarity protection	6,3 A – current limitation, F _{BAT} fuse (failure requires replace of the fuse-element)
Excessive discharge protection UVP	U<10,0 V (± 5%) – disconnection of (- BAT) battery,

	configuration with jumper P _{BAT}
Technical outputs: - FAC; output indicating failure of AC power supply - FPS; technical output indicating operation status of the power supply	- OC type, 50mA max. normal status: level L (0V), failure: level hi-Z, 10s time lag. - OC type, 50mA max. normal status: level L (0V), failure: level hi-Z (automatically recovered after returning correct operation)
F _{BAT} fuse	T 6,3A / 250V
F _{MAIN} fuse	T 1,15A / 250V

Mechanical parameters (tab. 4).

Module dimensions	305 x 225 x 65 (345 x 272 x 160+8) (WxHxD) [mm] (+/- 2)
Fixation	290x212 (WxH)
Net/gross weight	3,35/3,50kg
Connectors	Power-supply: Ø0,41-2,5 Outputs: Ø 0,41-2,5 Battery output BAT: connectors Ø6 (M6-0-2,5)

Operation safety (tab.5).

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 power-supply (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

Operation parameters (tab.6).

Operation 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.**2.1 Requirements.**

The buffer power supply shall be mounted by the qualified installer having appropriate (required and necessary for a given country) permissions and qualifications for connecting (operating) 230V/AC installations and low-voltage installations. The device shall be mounted in closed rooms, according to the environment class II, of the normal air humidity (RH=90% max. without condensation) and the temperature within the range from -10°C to +40°C. The power supply shall operate in a vertical position so that free and convective air flow through ventilating holes of the casing is guaranteed.

The power-supply provides voltage within the following range 13,8 V DC about current efficiency:

1. Output current 5,0A (without battery)
2. Output current 4,5A + 0,5A battery charging
3. Output current 4,0A + 1,0A battery charging
4. Output current 3,5A + 1,5A battery charging
5. Output current 3,0A + 2,0A battery charging

Total device current + battery: 5A max.



As the power supply is designed for a continuous operation and is not equipped with a power-switch, therefore an appropriate overload protection in the power supply circuit shall be guaranteed. Moreover, the user shall be informed about the method of isolation of the power supply from the power voltage (usually through assignment and marking of an appropriate fuse in the fuse-box). The electrical system shall be made in accordance with valid standards and regulations.

2.2 Installation procedure.

1. Before installation is started, the voltage in the 230V power-supply circuit shall be isolated.
2. The power-supply shall be mounted in a selected location and connection cords shall be lead.
3. The power cables (~230Vac) shall be connected to L-N terminals of the power supply. The earth conductor shall be connected to the terminal marked by the earth symbol PE. The connection shall be made by means of a three-core cable (with a yellow and green PE protection wire). The power cables shall be lead to appropriate terminals of the connection board through bushing.



The circuit of the shock protection shall be performed with a particular care, i.e. the yellow and green protection wire of the power cable shall be connected from one side to the terminal marked by the symbol of $\oplus$ in the casing of the power-supply. Operation of the power-supply without the properly made and fully operational circuit of the shock protection is UNACCEPTABLE! It can result in failure of devices and electric shock.

4. Connect the conductors of consumers to the +AUX, -AUX terminals of the terminal box on the power-supply unit.
5. If necessary, connect the conductors from the equipment to the technical outputs:
 - FAC; status indication AC (alarm panel, controller, signaling unit, LED diode, etc.)
 - FPS; technical output of operation status of the power supply
6. Using the dip switch I_{BAT} (J1, J2) the maximum current the battery should be determine, regarding to the battery parameters.
7. Using the dip switch P_{BAT} determine whether the function of disconnecting the discharged battery $U < 10V$ (+/-5%) is to be on or off. **The battery protection is on if the dip switch P_{BAT} is removed.**
8. Activate the ~230V/AC supply (the AC red diode should be permanently illuminated, and AUX diode should be permanently illuminated)
9. Check the output voltage (the PSU voltage without load should be anywhere between 13,6 V+ 13,9 V, and during battery charging 11 V+ 13,8 V). If the value of the voltage requires adjustment, the setting should be made by means of the potentiometer V_{ADJ} , monitoring the voltage at the AUX output of the PSU.
10. Connect the battery in accordance with the indications: +BAT red to 'plus', -BAT black to 'minus', (the LB diode should go on and the lighting intensity should reduce with the charging time elapsed increasing).

3. The power supply operation indication.

3.1 Optical indication.

The is equipped with two diodes on the front panel:

The PSU is equipped with three diodes indicating operation status: AC, LB, AUX placed on the PCB of the power supply unit:

- **AC- red diode:** under normal status (AC supply) the diode is permanently illuminated. The absence of AC supply is indicated by the AC diode going off.
- **LB- red diode:** indicates the battery charging process; the intensity of illumination is dependent on the charging current.
- **AUX- green diode:** indicates the DC supply status at the output of the PSU. Under normal status, the diode is permanently illuminated and in the case of short-circuit or overload, the diode goes off.

3.2 Technical outputs:

The PSU is equipped with indication outputs.

- **FAC - absence of AC supply output:** - OC output type indicates the loss of AC supply. In a normal status - with the supply equal to 230V, the AC output is shorted to ground (state L - 0V), in case of power supply loss the PSU output is switched into hi-Z state (high impedance) activates the output after 10s.
- **FPS - technical output of the power supply:** OC output type indicates failure of the power supply. In a normal status (while correct operation), the output is shorted to ground (state L - 0V), in case of incorrect operation parameters (voltage, current, temperature) the output is switched into hi-Z state high impedance.

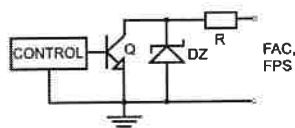


Fig. 4. Electrical diagram of OC outputs.

4. Service and operation.

4.1 Overloads or short circuits to the PSU.

The AUX output of the PSU is equipped with the PTC polymer fuse assisted protection. If the load of the PSU exceeds I_{max} (load $110\% \pm 150\%$ @ 25°C of the PSU power), the output voltage is automatically disconnected and this is indicated by the green diode going off. The voltage at the output may be restored by disconnecting the output load for the period of about one minute.

In the case of the short-circuit to the AUX, BAT output, (load $200\% \pm 250\%$ of the PSU power) or incorrect connection of the battery, the fuse F_{BAT} in the battery circuit becomes permanently damaged and the restoration of the voltage at the BAT output requires the replacement of the fuse.

4.2 Battery assisted operation.

In the case of power failure, in the unit will instantly switch to the battery assisted operation.

In order to activate the operation of the PSU from the battery itself, connect the BAT connectors in accordance with the indications: + BAT red to 'plus' and, - BAT black to 'minus' of the battery and press and keep depressed for five seconds the START pushbutton on the equipment board.



The PSU is equipped with the discharged battery disconnection system (UPV), the configuration of functions through the dip switch P_{BAT} . The battery protection is on if the dip switch P_{BAT} is removed.

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 the case of significant dust rate, its interior is recommended to be cleaned with compressed air. In the case of fuse replacement, only the substitutes in conformity to the original ones are allowed.

WEEE MARK



The waste electric and electronic products do not mix with general household waste.
There are separate collection system for used electric and electronic products in accordance with legislation under the WEEE Directive and is effective only with EU.

Notice: The power supply unit is adapted for cooperation with the sealed lead-acid battery (SLA). After the operation period it must not be thrown but recycled according to the applicable law.

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