

SONGPL*D25 -13,8V/2,5A

v.2.0

**Buffer, switching power supply module
with the AC absence indication output,
UVP battery protection,
in the casing for the DIN rail**
EN

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1. Technical description.

1.1. General description.

The buffer power-supply module is used for uninterrupted supply of devices requiring stabilized voltage of 12V/DC (+/-15%). The power-supply module provides voltage within the following range: $U = 11,0V \div 13,8 V$ DC of total current efficiency equal to $I_{max} = 2,5A$. In case of power voltage decay, prompt switching to battery supply occurs. The power-supply module has the following protections: short-circuit (SCP), overload (OLP), overheat (OHP). It is adapted for cooperation with the sealed lead-acid battery (SLA). The power supply module controls automatically the charging and maintenance process of the battery, what is more it is equipped with the BAT output protections: short-circuit and reverse polarity protection. The power-supply module is equipped with excessive discharge protection. In addition, the PSU module offers the technical output (Cx, NCx, NOx) used for controlling the AC supply status.

Information about types:

Model	Description
MSRD-13,8V/2,5A MSRD 2512	12V DC buffer (switching) power-supply module, with the total current capacity 2,5A and output voltage 11,0V-13,8V. Equipped with the AC supply absence indication system (battery assisted operation) and battery excessive discharge protection. For installation on the DIN rail (TS35 mm).

1.2. Block diagram (fig.1).

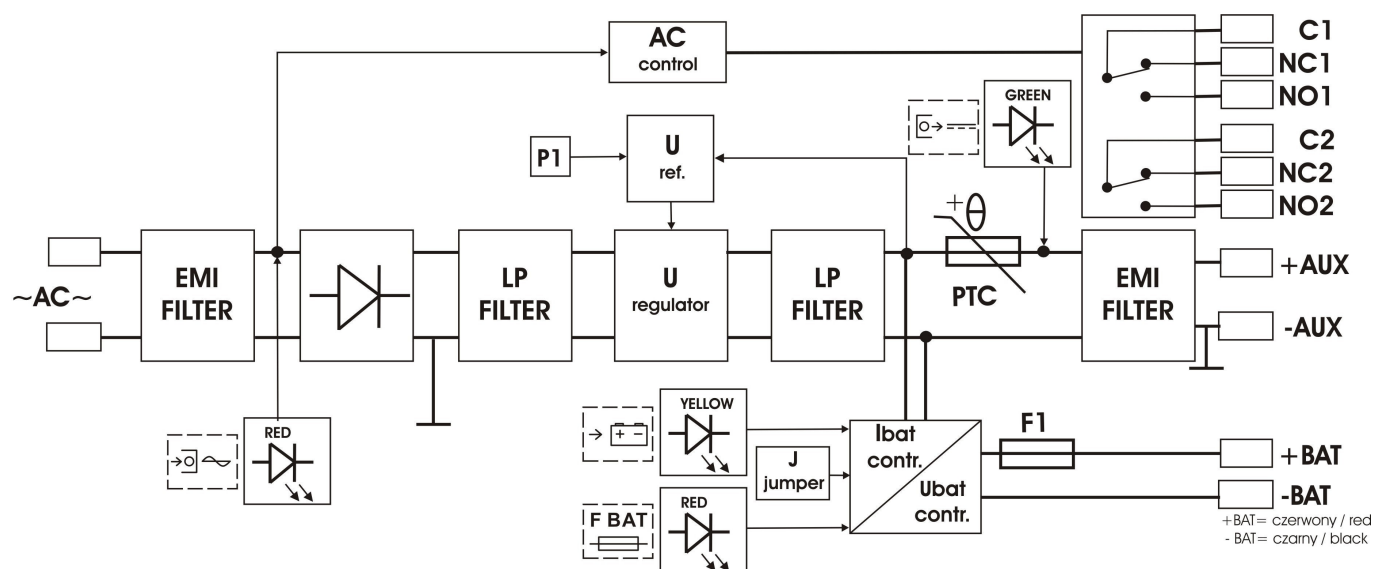


Fig.1. Block diagram of the PSU module.

1.3. Description of elements and connection links of the PSU module (tab.1, tab.2, fig.2).

Table 1.

Element no. [fig.2]	Element description
[1]	AC, AUX, IB, Fbat optical indication of the power-supply module operation
[2]	TECHNICAL OUTPUT connector (Tab.2)
[3]*	J, jumper - the limitation of the battery charging current J : Ibat=200mA max. J : Ibat=500mA max. Legend: jumper installed, jumper removed
[4]	P potentiometer, voltage adjustment
[5]	INPUTS/OUTPUTS connector (Tab.2)
[6]	START pushbutton (power activation with battery)
[7]	STOP pushbutton (power deactivation with battery)
[8]	F switch in the battery circuit
*= Version v.2.0 or higher	

Table 2.

[2,5]	Description of power-supply module outputs
~AC~	AC supply input (16V-22V AC)
+BAT -BAT	DC supply output of the battery (+BAT= red, -BAT=black)
+AUX -AUX	DC supply output (+AUX= +U, -AUX=GND)
C1 NC1 NO1 C2 NC2 NO2	Technical output of AC absence – relay assisted Cx= common contact NCx= normally closed contact (without AC supply) NOx= normally opened contact (without AC supply)

Tab.2. Output terminals of the power-supply module.

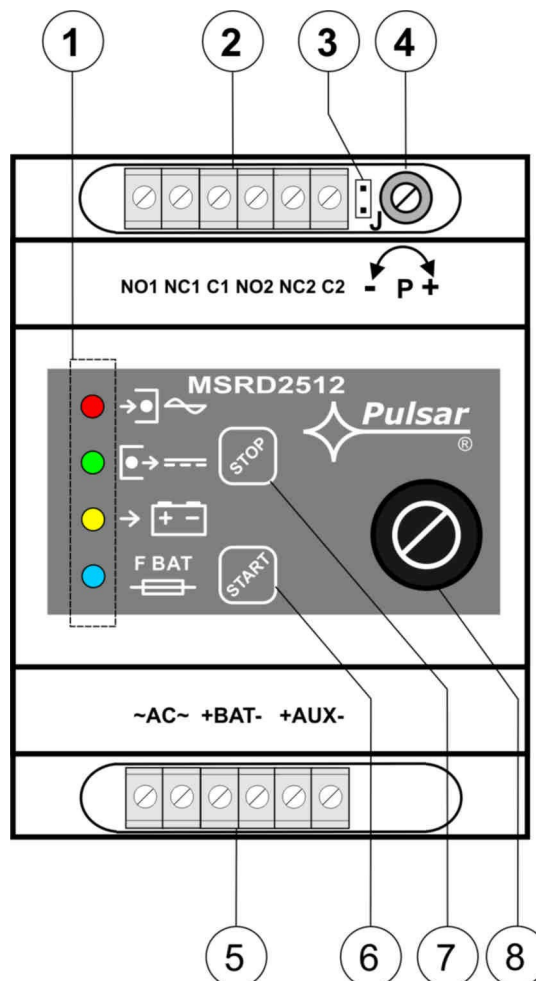


Fig.2. The view of the power-supply module.

- 1.4. Technical parameters:
- electrical parameters (tab.3)
 - mechanical parameters (tab.4)

Table 3.

Supply voltage	16V÷22V/AC (min. 50VA)
Supply frequency	50Hz (47÷53HZ)
PSU module power P	35W max.
Current consumption	3.3 A max.
Output voltage	11,0V÷13,8Vdc – buffer operation 10,0V÷13,8Vdc – battery assisted operation
Output voltage setting, escalation and keeping time	20ms/40ms/12ms @ Inom., Uac=min.
Voltage setting range	11,5 V÷14,0 V
Voltage adjustment range	± 1%
Ripple voltage	25mV p-p max.
Output current	2,0 A max.
Current consumption by PSU module systems	25 mA max.
Battery charging current	500 mA max (@7Ah, U bat.=10,0V) or * 200 mA max (@1,2Ah, U bat.=10,0V) (± 5%) (* 1 dip switch function, version v.2.0 or higher)
SCP short-circuit protection	200% ÷ 250% of supply power – limitation of current and/or fuse failure in the battery circuit (fuse-element replacement required)
OLP overload protection	110% ÷ 150% (@25°C÷55°C) of power supply – current limitation with the PTC automatic fuse, manual restart (the fault requires the disconnection of the DC output circuit)

SCP short-circuit protection in the battery circuit and reverse polarity protection	3,15A- current limitation, fuse F3,15A (failure requires replacement of the fuse-element)
Excessive discharge protection UVP	$U < 10,0 \text{ V } (\pm 5\%)$ – disconnection of (-BAT) battery
Technical outputs: -Cx, Nx, Nx output indicating the fault to the AC supply $x=\{1,2\}$	- R-relay type, 1A@ 30Vdc/50Vac max. Time lag about 5s (+/-1%) Normal status: activated Cx-NOx, Failure status: activated Cx-NCx
Optical indication: - AC diode indicating the AC supply status - AUX diode indicating DC supply status at the power-supply output - LB diode indicating the battery charging process - Fbat diode indication the battery fuse	- red, normal status, permanently illuminated, - green, normal status, permanently illuminated, - yellow, illuminated with light with intensity depending on battery charging current - blue, normal status no illumination, fuse failure permanently illuminated
F fuse	F 3,15A
Operation conditions	II environmental class, $-10^{\circ}\text{C} \div +40^{\circ}\text{C}$, convectional air flow around the power supply for the convectional cooling shall be provided

Table 4.

Casing dimensions	70 x 69 x 89 (WxHxD)
Fixation	on the DIN rail TH35
Connectors	$\Phi 0,41 \div 1,63$ (AWG 26-14)
BAT battery outputs	Connectors 6,3F-2,5, 30cm
Net/gross weight	0,19kg/0,25kg

2. Installation.

2.1 Requirements.

The buffer PSU module is dedicated for installation by the qualified electrician, holding relevant permits and licenses (applicable and required for the specific country) for connecting (interference with) the 230V/AC and low-voltage systems. The unit should be mounted in the non-open premises, in accordance with the II-nd environmental class, with the normal relative humidity (RH=90% maximum, without condensing) and temperature within the range -10°C to $+40^{\circ}\text{C}$. The PSU module should be operated in the position ensuring that the air may freely flow through ventilation openings in a convectional way.

Prior to entering for the installation, the balance of load should be drawn up. Pending the normal operation, the sum of currents consumed by the consumers may not exceed $I=2,5\text{A}$ with the inclusion of the battery charging current I_{bat} .

As the PSU module is designed for constant operation, it is not equipped with supply isolator, the proper overload protection in the supply circuit should be ensured. Also the user should be advised of the methods of disconnecting the PSU module from the supply voltage (most frequently through the separation and indication of the relevant fuse in the fuse box). The wiring system should be completed in accordance with the applicable standards and regulations.

The unit should be installed in the metallic enclosure (cabinet, equipment) equipped with the DIN TH35 rail (width 35 mm) and, in order to meet the requirements of EU, the following rules should be observed: supply, development, shielding - accordingly to the application.

The module requires for proper operation Voltage in range 16-22V AC with galvanic separation (transformer). It is needed to compare power of the transformer with the Diagram.1. ($S=f(I)$).

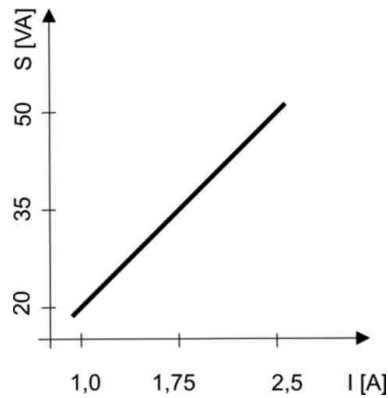


Diagram.1. Relation between the required transformer capacity S and the output current I of the PSU module.

2.2 Installation procedure.

1. Install the enclosure or cabinet and insert the cabling through the cable passes.
2. Install the PSU on DIN rail: mount the enclosure on DIN rail, lock by the fastener (Fig.3).
3. Deliver the output voltage from the AC transformer to the $\sim AC \sim$ terminals.
4. Connect the conductors of consumers to the +AUX, -AUX terminals of the terminal box on the PSU module
5. If necessary, connect the conductors from the equipment to the technical output Cx-NCx-NOx (alarm panel, controller, signaling unit, LED diode, etc.).
6. Activate the $\sim 230V/AC$ supply (the AC red diode should be permanently illuminated, and AUX diode should be permanently illuminated).
7. Check the output voltage (the PSU module voltage without load should be anywhere between 13,6V-13,9V, and during battery charging 11V-13,8V). If the value of the voltage requires adjustment, the setting should be made by means of the potentiometer P, monitoring the voltage at the AUX output of the PSU module.
8. 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).
9. Once the tests and control operation have been completed, lock the enclosure, cabinet, etc.

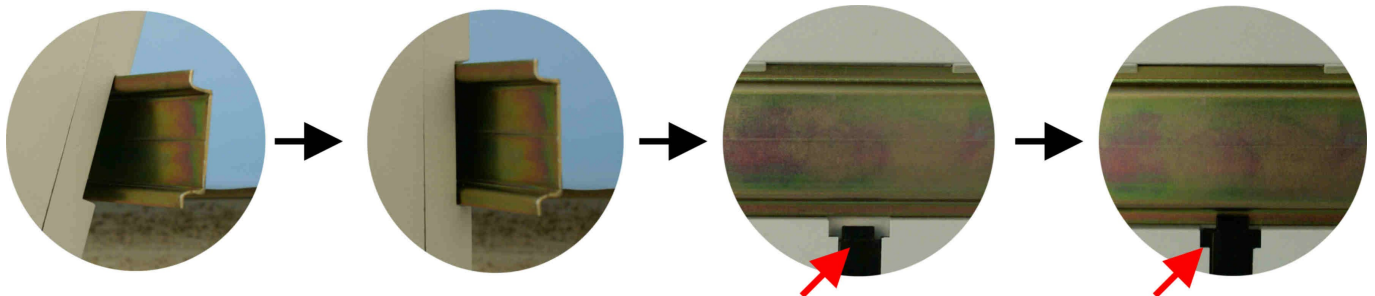


Fig.3. Installation procedure on the DIN rail.

3. PSU module operation indication.

3.1 Optical indication.

The PSU module is equipped with four diodes indicating operation status: AC, LB, AUX, Fbat.

- 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.
- AUX- green diode: indicates the DC supply status at the output of the PSU module. Under normal status, the diode is permanently illuminated and in the case of short-circuit or overload, the diode goes off.
- LB - yellow diode: indicates the battery charging process; the intensity of illumination is dependent on the charging current: 0,5A=100%.....0A=0%.
- Fbat – blue diode: under normal status the diode does not illuminate. Fuse failure (fuse blown) is indicated with illumination of the above mentioned LED diode.

3.2 Technical output.

The PSU module is equipped with indication outputs allowing transmitting the information of the absence of AC supply.

- Cx-NCx-NOx: AC supply absence output: -relay output indicates the absence of AC supply.

Under normal status, with the AC supply on, the C1-NO1 and C2-NO2 contacts are closed and in the case of AC supply loss, the PSU module will switch over C1-NC1 and C2-NC2 contacts.

4. Handling and operation.

4.1 Overload or short-circuits to the PSU module output.

The AUX output of the PSU module is equipped with the PTC polymer fuse assisted protection. If the load of the PSU module exceeds 2,5A (load 110% ÷ 150% @25°C of the PSU module 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% ÷ 250% of the PSU module power) or incorrect connection of the battery, the fuse F 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 START button during [5s]. Turning off the power supply module – pressing STOP button on the module panel

The PSU is equipped with the discharged battery disconnection system (UVP).

4.3 Maintenance.

Any and all maintenance operations may be performed following the disconnection of the PSU module from the power supply network. The PSU module 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 electrical and electronic equipment, do not mix with general household waste. There are separate collection systems for waste electrical and electronic equipment in accordance with legislation under the WEEE Directive and is effective only with EU.

The power supply module cooperates with the sealed lead-acid battery (SLA). After the operating period ends, the power supply shall not be discarded but recycled according to valid regulations.
