

**MLR-13,8V/1A
MLR 1012**

v.1.2

**Buffer, linear power supply module,
with the AC supply absence indication output.**

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= 12,0V÷13,8 V DC** of total current efficiency equal to **1A**. 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) and overvoltage (OVP). 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. It is equipped with the optical signaling indicating the operation mode (AC power-supply, DC output). In addition, the PSU module offers the technical output (COM, NC, NO) used for controlling the AC supply status.

Information about types:

Model	Description
ML-13,8V/1A ML 1012	12V DC buffer (linear) power-supply module, with the total current capacity 1A and output voltage 12,0V-13,8V.
MLR-13,8V/1A MLR 1012	12V DC buffer (linear) power-supply module, with the total current capacity 1A and output voltage 12,0V-13,8V. Equipped with the AC supply absence indication system (battery assisted operation).
MLRK-13,8V/1A MLRK 1012	12V DC buffer (linear) power-supply module, with the total current capacity 1A and output voltage 12,0V-13,8V. Equipped with the AC supply absence indication system with regulated time lag (battery assisted operation) and battery protection against excessive discharging.

1.2. Block diagram (fig.1).

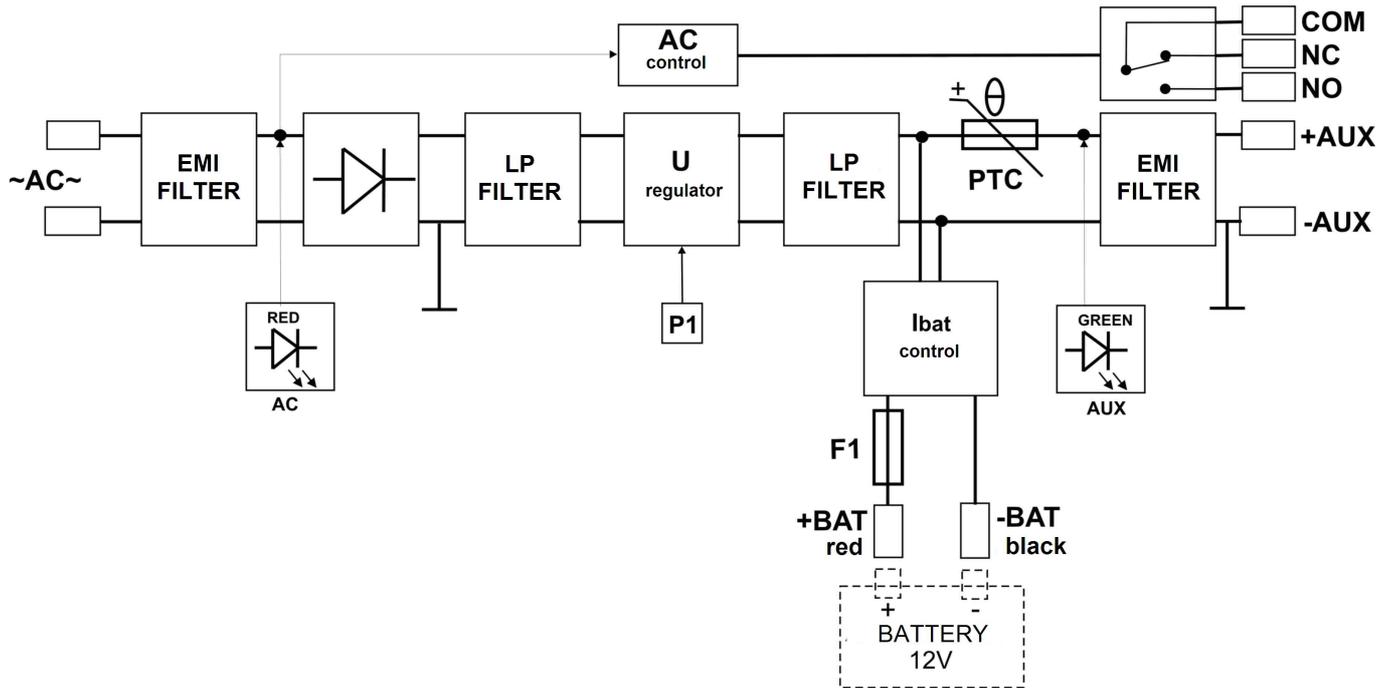


Fig.1. Block diagram of the power-supply module.

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

Table 1.

Element no. [Fig. 2]	Element description
[1]	P1 DC output voltage regulation
[2]	AC, AUX optical indication of the power-supply module operation
[3]	Connector: AC, AUX (Tab.2)
[4]	Connector: BS technical output (Tab.2)
[5]	Connector: BAT (Tab.2)
[6]	F1 fuse in the battery circuit

Table 2.

[4], [5], [6]	Description of power-supply unit module outputs
~AC~	AC supply input (go to transformer selection)
+BAT -BAT	DC battery supply output (+BAT= red, -BAT= black)
+AUX -AUX	DC supply output (+AUX= +U, -AUX=GND)
COM NC NO	Technical output of AC absence – relay assisted COM= common contact NC= normally closed contact (without AC supply) NO= normally opened contact (without AC supply)

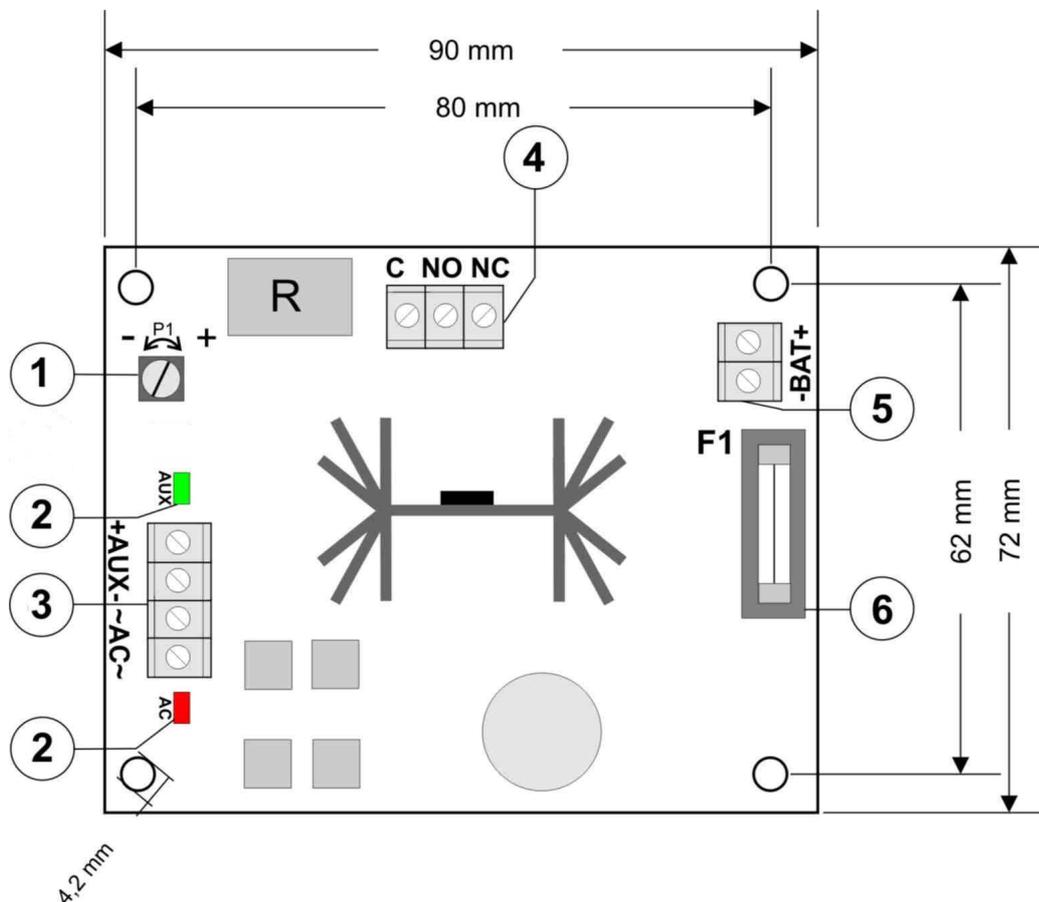


Fig.2. The view of the power-supply module.

1.4. Technical parameters:

- electrical parameters (tab.3)
- mechanical parameters (tab.4)

Table 3.

Supply voltage	16V±17V/AC (min. 30VA)
Supply frequency	50Hz (47÷53Hz)
PSU module power P	14W max.
Current consumption	1.9A max.
Output voltage	12,0V÷13,8Vdc – buffer operation < 13,8Vdc – battery assisted operation
Output voltage setting, escalation and keeping time	70ms/70ms/16ms
Voltage setting range	11,5 V±14,0 V
Voltage adjustment range	± 1%
Ripple voltage	5mV p-p max.
Output current	1A max.
Current consumption by PSU module systems	60 mA max.
Battery charging current	300 mA max (@7Ah, U bat.=10,0V)
Short-circuit protection SCP	200% ÷ 250% - of module 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 module power - limitation with the PTC automatic fuse, manual restart (the fault requires the disconnection of the DC output circuit)
Protection of the battery circuit SCP	2A- current limitation, F1 fuse (failure requires replace of the fuse-element)
Excessive discharge protection UVP	No protection
Technical outputs: - COM, NC, NO output indicating the fault to the AC supply	- R-relay type, 1A@ 30Vdc/50Vac max. Normal status: activated COM-NO, Failure status: activated COM-NC

Optical indication: - AC diode indicating the AC supply status - AUX diode indicating DC supply status at the power supply module output	- red, normal status, permanently illuminated - green, normal status, permanently illuminated
F1 fuse	F 2A/250V
Operation conditions	II environment class, -10°C ÷40°C, convectional air flow around power supply unit for convection cooling should be guaranteed

Table 4.

Dimensions	90 x 55 x 72 (WxHxD)
Fixation	Assembly bolts x 4 (PCB fi=4,2 mm)
Connectors	Φ0,41÷1,63 (AWG 26-14)
BAT battery output	Connectors 6,3F-2,5
Net/gross weight	0,13kg/0,17kg

2. Installation.

2.1. Requirements.

The buffer power-supply module 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 convectional air flow through ventilating holes of the casing is guaranteed.

Before installation is started, the balance of the power-supply module load shall be performed. During the normal operation, the sum of currents collected by receivers shall not exceed **I=1A** considering that the maximum battery charging current **I_{bat max}**.

As the power-supply module 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 module 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.

The unit should be installed in the metallic enclosure (cabinet) in order to meet the requirements of EU, the following rules should be observed: supply, development, shielding - accordingly to the application.

The module requires 16-17V AC power supply with galvanic separation (transformer insulation). Transformer power shall be selected according to the diagram $S=f(I)$ (diagram 1).

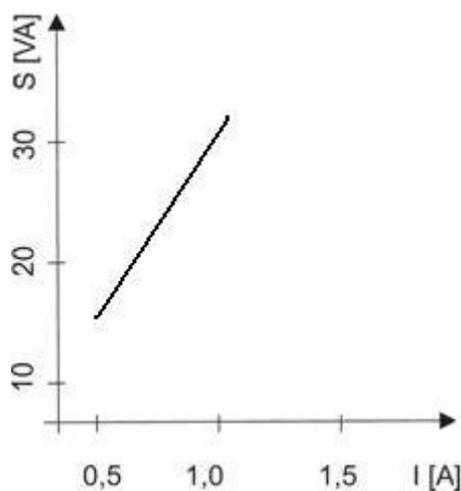


Diagram.1. Relation between the required transformer capacity S and the output current I of the PSU module.

2.2. Installation procedure.

1. Install the enclosure or cabinet and insert the cabling.
2. Install the PSU module voltage reducer on the assembly bolts (the bolts should be installed prior to the operation of enclosure or cabinet assembling).

3. Deliver the output voltage from the AC transformer to the ~AC~ 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 technical outputs COM-NC-NO (alarm panel, controller, signaling unit, LED diode, etc.).
6. Activate the ~230V/AC supply (the AC red diode should be permanently illuminated, and AUX green 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 12V-13,8V). If the value of the voltage requires adjustment, the setting should be made by means of the potentiometer P1, 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'.
9. Once the tests and control operation have been completed, lock the enclosure, cabinet, etc.

3. The power supply module operation indication.

3.1. Optical indication.

The PSU module is equipped with two diodes indicating operation status: AC, AUX.

- **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.

3.2. Technical output.

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

- **COM-NC-NO: AC supply absence output:** -relay output indicates the absence of AC supply.

Under normal status, with the AC supply on, the COM-NO contacts are closed and in the case of AC supply loss, the PSU module will switch over the COM-NC contacts closed

4. Service and operation.

4.1. Overloads or short circuits to the PSU module.

The AUX output of the PSU module is equipped with the PTC polymer fuse assisted protection. If the load of the PSU module exceeds 1,5A (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 F1 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 module 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.

The PSU module is not equipped with the discharged battery disconnection system.

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 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.

GENERAL WARRANTY CONDITIONS

1. Pulsar K. Bogusz Sp.j. (manufacturer) grants a two-year quality warranty for the equipment, starting from the date of purchase placed on the purchase order.
2. Should such purchase order be missing when the claim is submitted, the three-year guarantee period is counted from the date of the manufacturing of the device.
3. The warranty includes free-of-charge repairing or replacing with a functional equivalent (the selection is made by the manufacturer) of the malfunctioning device, due to reasons attributable to the manufacturer, including manufacturing and material defects, unless such defects have been reported beyond the warranty period (item 1 and 2).
4. The equipment subject to warranty is to be brought to the place where it was purchased, or directly to the main office of the manufacturer.
5. The warranty applies to complete equipment, including the type of defect specified in writing, using a properly filled warranty claim.
6. Should the claim be accepted, the manufacturer is obliged to render warranty repairs, as soon as possible, however not later than within 14 days from the delivering of the equipment to the service centre of the manufacturer.
7. The repair period mentioned in item 5 may be prolonged, if there is no technical capability to carry out the repairs, and in the case that the equipment has been accepted conditionally, due to the failing of the warranty terms by the claimant.
8. All the services rendered by force of the warranty are carried out at the service centre of the manufacturer, exclusively.
9. The warranty does not cover the defects of the equipment, resulting from:
 - reasons beyond the manufacturer's control,
 - mechanical damage,
 - improper storage and transport,
 - use that violates the operation manual or equipment application,
 - random events, including lightning discharges, failures of power networks, fire, flooding, high temperatures and chemical agents,
 - improper installation and configuration (at variance with the rules set forth in the manual),
10. Each confirmation of structural modifications or repairs, carried out beyond the service centre of the manufacturer, or any modification of serial numbers or warranty labels, results in the loss of the rights resulting from the warranty.
11. The liability of the manufacturer towards the buyer is limited to the value of the equipment, determined according to the wholesale prices suggested by the manufacturer on the day of purchase.
12. The manufacturer shall not be responsible for the defects that resulted from the damaging, malfunctioning or inability to operate the equipment, particularly, if such defects are the result of failing to abide by the recommendations and requirements contained in the manual, or the use of the equipment.

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