



MERAWEX Sp. z o.o.
Toruńska 8
44-122 Gliwice, Poland
tel. +48 32 23 99 400
fax +48 32 23 99 409
e-mail: merawex@merawex.com.pl
<http://www.merawex.com.pl>

USER MANUAL

for power supply units

ZKDN-12V3A, ZKDN-12V6A, ZKDN-24V1.5A and ZKDN-24V3A

23.06.2023 r.

Warnings

All the following advices and rules have to be read. Mistakes in their observation can bring about damage of the device, electric shock, fire or severe body injuries.

- **Carrying and transport of the device with mounted and switched accumulators is forbidden.** This may bring about severe damages up to losing the safety of operation.
- **Assembly and connections can be realized only when the accumulators are removed.**
- **When connecting the accumulators battery, hazardous due to the high energy level, an ultimate attention should be paid to accordance of their polarity with the description shown on the connectors.**
- **Avoid blanking off the ventilation openings.** Free space surrounding device side walls should be kept for enabling its proper ventilation. In other case, the device can be damaged or the accumulators battery can be prematurely used up.
- **The device should be mounted in a place where it is not subject to direct influence of the sunlight.**
- **The device has to be powered from a power network equipped with the protective grounding terminal.**
- **Before the device is switched on for the functioning, all the performed connections have to be inspected.**
- **The device may cause interference with sensitive radio and television sets existent in nearby.**
- **Servicing of the device is allowed to be done only by the producer representatives or by specialized units authorized by the producer.**

Contents

1. Technical description of the power supply unit	2
1.1. Perspective view of the supplies and listing of the parameters.....	2
1.2. The main and mounting dimensions of the power supply units	3
1.3. Location of the ZBM supply module basic elements	4
1.4. Functional description of the ZBM supply module signalling	5
1.5. List of the signalling states	5
2. Installation, connection, actuation.....	5
3. Handling of the package and waste	6

1. Technical description of the power supply unit

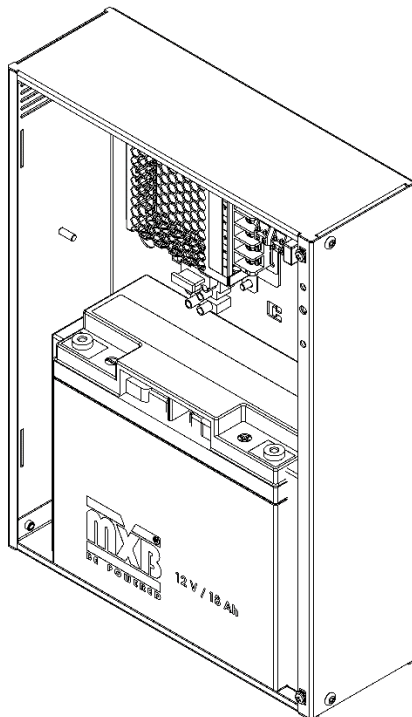
Power supply units are designated for breakless powering of devices adapted for working under the voltage 12V (24V). As a reserve load source, one (two) 12V VRLA-type lead-acid accumulator is used. The supplies are constructed in a box form, designed for hanging on a wall, wherein an appropriate supply module ZBM is mounted and a space is provided for one 12V 22Ah accumulator or two 12V 9Ah accumulators in case of 24V version. The module provides full maintenance for the accumulators battery, protection for the outlets, signalling etc.

The connection of the accumulators battery is realized with two stably mounted wires ended with 6.3mm connectors. The connection with 22Ah accumulator, equipped with screw terminals, is realized by using a transition element – a 6.3mm male connector with Ø6mm port.

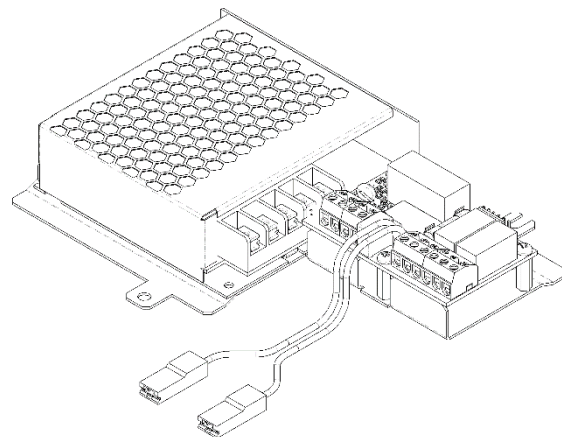
The current outlets of the power supply unit and its signal relay outlets are connected by using connectors with screw terminals. The connection can be done both in case when the connection attachments are already fixed in the power supply unit as well as after being previously replaced.

1.1. Perspective view of the supplies and listing of the parameters

Perspective view of the ZKDN-12V6A supply



ZBM-12V6A supply module



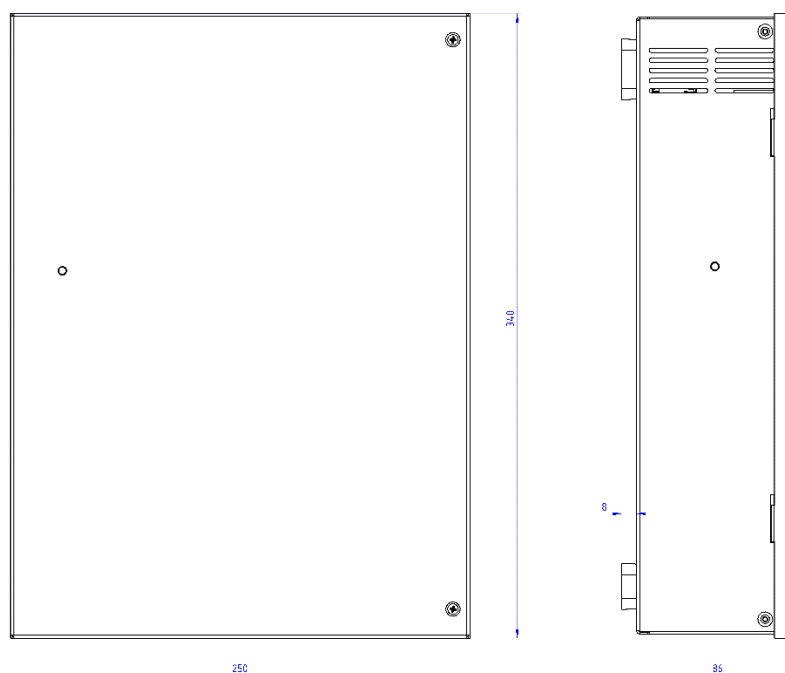
Parameters list

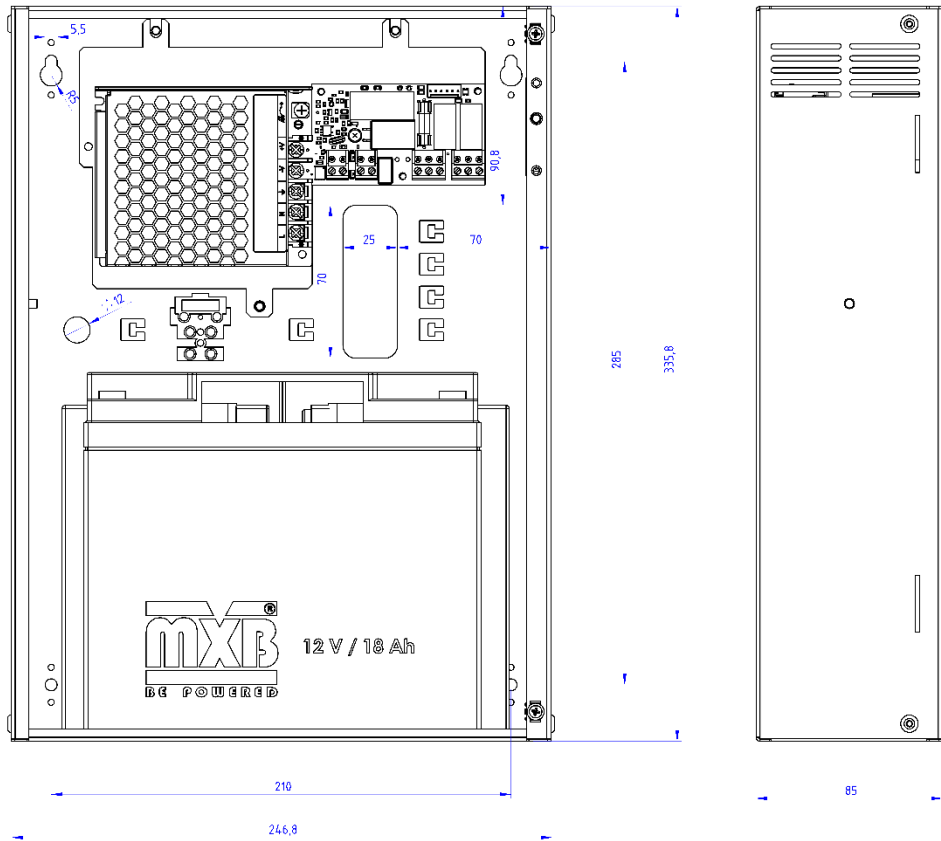
	ZKDN-12V3A	ZKDN-12V6A	ZKDN-24V1.5A	ZKDN-24V3A
ELECTRIC PARAMETERS				
Input				
Input voltage	110...240Vac 50Hz			
Input current	0.76A	1.52A	0.76A	1.52A
Power factor	0.58			
Leakage current in protection wire	≤ 0.75mA /240Vac			
Efficiency under nominal conditions	85%	88%	87%	89%
Starting current (cold start)	45A /230Vac	65A /230Vac	45A /230Vac	65A /230Vac
Output				
Outputs count	2			
Outputs protection:	Polymer fuse			
- output OUT 1	1.1A	4A	0.75A	1.1A
- output OUT 2	0.5A	1.1A	0.3A	0.5A
Output voltage	13.5...13.6...13.7V		27.0...27.2...27.4V	
Maximum output current	1.5A	5A	1A	1.5A

Total, from both outputs, at ambient temp. 25°C				
Outputs connection method	2 connectors with screw terminals of ARK 130-2 type			
Servicing of the accumulators battery				
Output protection (5x20mm)	5AF	8AF	3.15AF	5AF
Capacities of the batteries used	7...22Ah		2x 7...9Ah	
Battery charging current limitation	~1A			
Floating mode voltage	13.5...13.6...13.7V		27.0...27.2...27.4V	
Low battery voltage signalization	11.2...11.4...11.6V		22.4...22.8...23.2V	
Automatic disconnection of the discharged battery	10.5...10.8...11.0V		21.0...21.6...22.0V	
Quiescent current				
- battery switched on	< 65mA		< 35mA	
- battery switched off	< 0.2mA		< 0.2mA	
Battery connection method:				
- permanently connected wires	1.5mm ² /250mm ended with 6.3mm connectors			
- transition element (6.3/ Ø6mm)	2 units			
Relay signal outputs				
Outputs characteristics				
- quantity of relays, load capacity of contacts	2, 30Vdc/1A			
- type of mounted contacts	3 switching contacts (NO and NC)			
- signal active condition	inactivated relay			
Connection method	2 connectors with screw terminals of ARK 130-3 type			
MECHANICAL PARAMETERS				
Dimensions	340 × 250 × 86 mm			
OPERATING CONDITIONS				
Ambient temperature during operation	-25...+55°C			
Limits of storage temperature	-30...+85°C			
Relative humidity (without condensation)	30...80%			
CONFORMITY WITH STANDARDS				
Electromagnetic compatibility	EN 50130-4 EN 61000-6-3			
Electric safety	class I according to EN 62368-1			

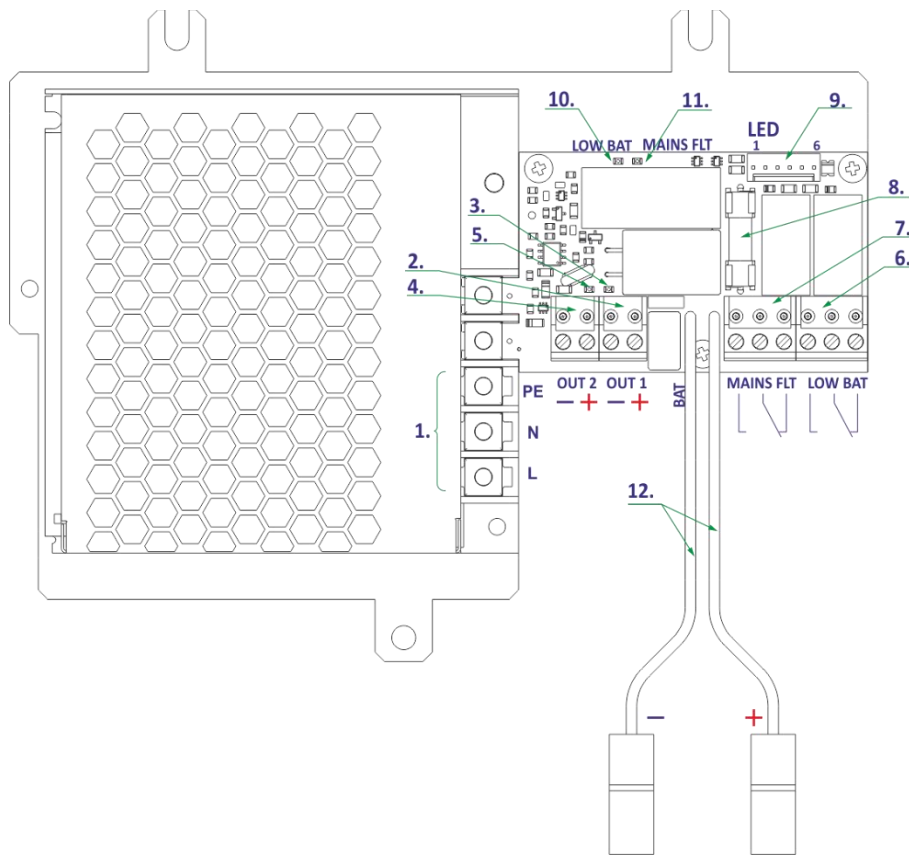
1.2. The main and mounting dimensions of the power supply units

The power supply unit is prepared for mounting on wall. Views of the closed power supply unit, with main dimensions and dislocation of the mounting openings, are shown in the following drawings.





1.3. Location of the ZBM supply module basic elements



No	Description	Designation
1.	230V mains connection terminals	L, N, PE
2.	+ and – terminals of the first output	OUT 1
3.	LED diode of voltage active signal for the OUT 1 output	
4.	+ and – terminals of the second output	OUT 2
5.	LED diode of voltage active signal for the OUT 2 output	
6.	Relay low battery voltage signal output	LOW BAT
7.	Relay mains fault signal output	MAIN FLT
8.	Accumulators battery fuse	
9.	Optional connection for external LED signalling	LED
10.	Low battery voltage signal LED diode (yellow)	LOW BAT
11.	Mains fault signal LED diode (green)	MAIN FLT
12.	Accumulators battery connection cables	BAT

Warnings

- The mains are connected directly to the mains converter terminals. Apart from connection of the mains terminals L and N, the protection wire PE connection is required.
- 3 relay contacts are available for each output of the relay signalling. Description of relay connections is shown on the drawing with the contacts pattern indicating lack of supply (inactivated relay).
- Outlets 1, 3 and 5 of the external LED signalling terminal are short-circuited and connected by a polymer fuse with positive supply bus line. The system is resistant to both short-circuiting of the LED diodes and to short-circuiting of connections of that terminal to the negative supply bus line.
- The accumulators battery fuse is the sole element that can be replaced by the user. Its parameters have to be compatible with the data given in table **Parameters list**, section **Servicing of the accumulators battery**.

1.4. Functional description of the ZBM supply module signalling

The power supply unit is equipped with two relay outputs and with four LED diodes, placed directly on its printed circuit board. It is also possible to connect an external LED signalling, that repeats signalling of the printed circuit board.

1.5. List of the signalling states

Designation	State	Description
Relay outputs		
MAINS FLT	inactivated	- lack of the mains supply or the power supply unit failure
	activated	- the mains supply active, the power supply unit efficient
LOW BAT	inactivated	- low battery voltage
	activated	- normal battery voltage
LED diodes on PCB		
OUT 1 (G)	switched-off	- lack of voltage on the OUT 1 output
	switched-on	- voltage present on the OUT 1 output
OUT 2 (G)	switched-off	- lack of voltage on the OUT 2 output
	switched-on	- voltage present on the OUT 2 output
LOW BAT (Y)	switched-off	- low battery voltage
	switched-on	- normal battery voltage
230Vac (G)	switched-off	- lack of the mains supply or the power supply unit failure
	switched-on	- the mains supply active, the power supply unit efficient

2. Installation, connection, actuation.

The power supply units are designed for installation as an element of the permanent network by qualified personnel. When the installation work is performed, the power supply unit should not be equipped with accumulator(s). Removal of the power supply module itself is not required. The enclosure

of the unit is designed so that the input and output installation cables are routed through the rear enclosure wall. The openings used for that purpose are shown in the figure given in sec. 1.2.

Before mounting (for example, on wall by using screw anchors), 4 holes should be drilled on the chosen base in 285 × 210mm dislocation. Appropriate bolts should be screwed in two upper holes (maximum head diameter: 8 mm), on which the power supply unit cabinet should be mounted. After screwing in the two bottom screws the cabinet is fixed. Then it is possible to turn tight all the screws.

The power supply unit has to be connected to the permanent installation by using a protective wire according to the designations **L**, **N** and **PE**. Equipment of the installation with the overvoltage protection system is recommended. The power supply circuits, outside the power supply unit, should be equipped with an installation switch characterized by minimum 3A nominal current. This switch serves only as a short-circuit protection for the mains supply and can be used for servicing and testing purposes – inspection of the output voltage maintenance under the mains power decay.

The power supply unit converter is equipped with its own fuse located in the mains supply circuit. This fuse is not subject to replacement as its break off means the converter is severely damaged.

The power supply unit is designed for working with the so-called maintenance-free accumulators, which should be placed in the cabinet after the mechanical and electrical installation is already finished. Special attention should be paid to the polarity of power supply module and accumulators battery interconnection. **When faulty interconnection is made, the accumulator circuit fuse will break off.**

When all the necessary connections are made (mains supply, accumulators battery and optional receivers – their connection is not necessary for examining the power supply unit function), the ability of the output voltage maintenance can be inspected. For that purpose, the mains supply switch, located on the power supply line outside the power supply unit, should be switched-off, and voltage should be checked if active on the unit outputs, signaled by the LED diodes located on its circuit board. It is also possible to check the state of the **MAIN FLT** relay by using an ohmmeter. The signalling states are listed below in the table.

	Mains supply switched-on	Mains supply switched-off
LED diode MAIN FLT	switched-on	switched-off
OUT 1 diode	switched-on	switched-on
OUT 2 diode	switched-on	switched-on
MAIN FLT relay	activated *)	inactivated

*) *The relay is activated if it changed its state compared to what is shown in the figure describing this output (the figure shows pattern of contacts in the inactivated relay state).*

3. Handling of the package and waste



The product packaging is made of materials which may be subject to recycling (wood, paper, paperboard, plastics). Unused packagings should be segregated and returned to a waste receiver. This mark, when present on a product, indicates that the product after its working life should not be disposed of together with communal waste, but should be transferred to the used electronic equipment reception point. **The used accumulators are qualified dangerous waste and have to be subject to utilization.** Thus we contribute to avoiding a harmful influence on human health and on the natural environment.