

| General description:

The SDMB 250Z power supply system is intended for uninterruptible supply of 48Vdc loads by direct current in direct full-float operating mode. The construction of the system using cooperation of rectifiers type PDM 48/41-2000W and batteries under control of advanced PI1 controller.

The power supply system was placed in an IP55 outdoor cabinet resistant to harsh climatic conditions. Cabinet provides protection devices installed in it from the negative influence of atmospheric factors for the European climate zone according to ETSI EN 300 019-1-4 class 4.1 standard.

| Application:

- + telecommunications and teletransmission;
- + IT applications.

| Features:

- + protection against unauthorized access;
- + free space 3U height for installation 19" devices;
- + battery space –16U max height;
- + zones of the different thermal requirements for the installed equipment;
- + thermodynamic functions of the cabinet:
 - heating during periods of low temperature or high humidity,
 - ventilation during periods of high temperatures;
- + modern, constant power rectifiers;
- + easy installation of rectifier (replacement or extension) during normal operation status (hot-swap);
- + continuous control of system's operation and fast reporting of alarm states by means of controller;
- + high efficiency – less energy consumption and heat dissipation;
- + immunity to short-circuits and overloads of output circuits;
- + immunity to electromagnetic interferences.

| Rectifiers:

Constant power rectifier PDM 48/41-2000 with nominal output power 2000W is equipped with microprocessor card controlling its work's parameters. The digital communication between rectifiers and control unit, gives operator the possibility of remote supervision on individual rectifiers of the system.

The PDK rectifier design is based on high-frequency energy conversion technology with DSP (Digital Signal Processor) function. This feature means less number of parts, optimized price & performance, better power distribution between rectifiers. In addition, the rectifier is equipped with a PFC provides sinusoidal current consumption from the mains.

| Power supply of the system:

The SDMB 250Z system is supplied from three-phase AC supply line. Failure of one or two phases of mains supply does not cause the whole power supply system to be switched off (individual rectifier units are supplied from different phases)

| Design of the system:

Cabinet has a double aluminum walls and is designed for mounting on a concrete foundation or metal rack adapted to the pedestal cabinet depending on version.

The standard version the power supply system consists:

- + microprocessor control unit PI1 with OLED display, control buttons and USB port for PC connection;
- + available space for installing up to 6pcs. of PDM 48/41-2000 rectifiers;
- + battery protections with status monitoring – NH00 fuse holders with 160A fuses – 4 pcs.;
- + load protections with status monitoring:
 - critical group – max. 6x MCB, 1x MCB 80A-125A,
 - not critical group – max. 6x MCB, 3x MCB 80A-125A;
- + contactors intended for protection of battery against deep discharge and selective cut off group of loads:
 - K1 (LVD) cuts off group of critical loads,
 - K2 cuts off group of not critical loads;
- + summary battery current measurement;
- + temperature compensation of float voltage with temperature sensor;
- + temperature measurement of loads area;
- + 3-point lock with Abloy insertion;
- + 2x500W heaters in load section;
- + 2x500W heaters in battery section;
- + two fans controlled by system control unit;
- + hygrostat - runs the ventilation and heater after exceeding the declared value of relative humidity (80%);
- + additional equipment: door opening sensor, service socket 230VAC;
- + 7 alarm outputs - potential-free relay contact.

| Safety and Environmental aspects:

During the system design process following aspects related to environmental protection have been taken into consideration:

- + compliance with the European Union's directive RoHS - restrict the use of certain hazardous substances,
- + compliance with the European Union's directive WEE regarding waste of electrical and electronic equipment,
- + compliance with the European Union's directives LVD and EMC - electrical safety and electromagnetic compatibility,
- + reduce of used electrical energy as the result of high efficiency,
- + reduce the amounts of used materials and wastes as a consequence of system dimensions minimization and high reliability.



Basic parameters of the system:

Input parameters:

Nominal voltage	Vac	3x230 /400
Range of phase input voltage changes	Vac	184 ÷ 253
Frequency	Hz	45 ÷ 65
Max. phase current	Aac	18
Power factor λ		~1

Output parameters:

Range of voltage regulation	Vdc	48 ÷ 58
Characteristic	-	UPI
Stabilization of output voltage	%	±1
Maximum output current	A _{dc}	250
Maximum output power	W	12000
Output voltage ripples (psophometric value)	mV	< 2

General data:

Cooling	-	forced
Rectifier module efficiency	%	96,5 (peak)
Ingress protection		IP55
Electromagnetic compatibility	-	in accordance with PN-EN 300-386
Safety requirements	-	in accordance with EN 60 950
External dimensions of the cabinet (HxWxD)	mm	1950x756x794
System weight without rectifier units	kg	150
Dimensions of the rectifier unit (HxWxD)	mm	86 x 84,5 x 272
Weight of the rectifier	kg	2,4

Basic functions of the control unit:

- + Measurements:
 - output voltage,,
 - summary battery current,
 - battery temperature;
- + Alarms:
 - load or battery fuse blow out,
 - LOW or HIGH output voltage,
 - LOW or HIGH temperature,
 - open door,
 - many other alarms,
 - mapping and sending alarm in form of potential-free relay contacts – 3 relay outputs;
- + temperature compensation of float voltage;
- + battery asymmetry control;
- + control of the LVD battery contactor with adjustable voltage battery disconnect;
- + management of groups of loads (ZGO);
- + visualization of alarm states;
- + sending alarm status as potential-free relay contact;
- + automatic reporting of alarm states to WinCN supervisory system;
- + control & display values of:
 - loads voltage,
 - rectifiers, loads and battery current,
 - first battery temperature,
 - second battery temperature (option);
- + output voltage control (LOW and HIGH voltage alarm, rectifiers blocking alarm);
- + automatic and equalizing battery charging mode with possibility to set initial and final parameters of process;
- + limitation of battery charging current;
- + battery disposition test function;
- + signaling of battery protections blow-out;
- + signaling of load protections blow-out;
- + storing the data structure of the selected parameters of the battery discharges;
- + register of other event history.

Extended functions of the control unit:

- + remote computer monitoring of the system by selected Communications medium:
 - Ethernet,
 - Analog modem (PSTN),
 - mobile network (GSM/GPRS),
 - SNMP protocol.