

| General description:

The WSZ-21 power supply system is intended for uninterruptible supply of 48Vdc and 230Vac loads. The construction of the system using cooperation of PDK 48/20-1000W rectifiers and FUL 230/0,75 inverters and batteries under control of advanced PI1 controller.

| Application:

- + telecommunications and teletransmission.

| Features:

- + uninterruptible power supply of 48Vdc and 230Vac loads in one device;
- + high flexibility for extension of the system development;
- + modern rectifiers and inverter modules;
- + easy installation of rectifier during normal operation status (hot-swap);
- + continuous control of system's operation and fast reporting of alarm states by controller;
- + easy and full safe operation;
- + high efficiency;
- + immunity to short-circuits and overloads;
- + immunity to electromagnetic interferences.

| Rectifiers and inverters:

Constant power rectifier **PDK 48/20-1000W** with nominal output power 1000W 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.

Modular, single-phase inverters **FUL 230/0,75**, with a rated output power 750VA are intended for convert direct current to alternating current in the parallel mode. Inverters are built based on innovative design solutions allowed to achieve very high efficiency at small size.

The inverter uses EPC mode, where energy from the AC mains is buffered and then converted to alternating voltage output. This mode offers high efficiency and zero switching time.

| Power supply of the system:

The WSZ-21 system is supplied from three-phase or single-phase AC supply line. Failure of one or two phases of mains supply does not cause the whole DC part of power supply system to be switched off (individual rectifier modules are supplied from different phases).

Inverters are supplied from one phase.

| Design of the system:

In standard version the enclosure of the system is intended to installing in standard 19-inch cabinets (racks).

The standard version the power supply system consists:

- + AC and DC distribution;
- + space for installation up to. 2pcs. of PDK 48/20 1000W rectifier modules;
- + space for installation up to. 4pcs. of FUL 230/0,75 inverter modules;
- + microprocessor control unit PI1 with OLED display, control buttons and USB port for PC connection;
- + battery protection – MCB 63A - 1 pc.;
- + inverters DC input protection – MCB 63A - 1 pc.;
- + load protections: AC output, IEC type, protected by MCB 15A - 2 pcs;
- + signaling actual state of loads and battery protections (fuses, MCBs);
- + LVD contactor intended for protection of battery against deep discharge;
- + control of AC mains presence / all phases;
- + measurement of output voltage and current;
- + summary battery current measurement;
- + manual by-pass.

| 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,
- + 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:

Input nominal voltage	Vac	200 ÷ 240
Range of phase input voltage changes (full power)	Vac	184 ÷ 265
Frequency	Hz	45 ÷ 65

Output parameters:

Range of voltage	Vdc	48 ÷ 58
Range of voltage	Vac	200 ÷ 240
Characteristic (rectifiers)	-	UPI
Stabilization of DC output voltage	%	±1
Stabilization of AC output voltage	%	±1
Maximum output current	A _{dc}	42
Maximum output current	A _{ac}	13
Maximum DC output power	W	2000
Maximum AC output power	VA	3000
Output voltage ripples (psophometric value)	mV	< 2
Range of power factor	-	0 ind. – 1 – 0 cap.

General data:

Range of ambient temperature	°C	-20 ÷ 50
Cooling	-	forced
Efficiency (rectifier)	%	92 (peak)
Efficiency (inverter)	%	94% (EPC) 89% (on-line)
Ingress protection		IP20
Electromagnetic compatibility	-	PN-EN 300-386
Safety requirements	-	EN 60 950
Dimensions of the power supply system (HxWxD)	mm	177,5(4U)x483x384

Basic functions of the control unit:

- + Measurements:
 - output and battery voltage,
 - summary battery current,
 - battery temperature;
- + Alarms:
 - blow out of battery or load protection,
 - LOW or HIGH output current,
 - LOW or HIGH temperature,
 - many other alarms,
 - mapping and sending alarm in form of potential-free relay contacts – 3 alarm outputs;
- + temperature compensation of float voltage with temperature sensor;
- + battery asymmetry control (option);
- + control of the LVD battery contactor with adjustable voltage battery disconnect
- + 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:
 - AC and DC voltages,
 - rectifiers, loads and battery current,
 - battery temperature;
- + 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;
- + current limitation of battery charging,
- + monitoring status of battery protections;
- + monitoring status of load protections;
- + registration history of events occurring.

Extended functions of the control unit:

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