DC & AC power supply system WSZ-11

WSZ – multi-voltage power supply system

General description:

The WSZ-11 power supply system is intended for uninterruptible supply of 48Vdc and 230Vac loads. The construction of the system using cooperation of rectifiers type PDK, PDM, PDO or PDJ and FUL, FUH or FUO inverters and batteries under control of advanced PI1 controller.

The system is very flexible and may be configured with different DC distribution modules according to specified needs. There is also possibility to install large amount of load MCBs and fuses. Number of rectifier and inverter modules are assorted to customer needs.

Application:

+ telecommunications and teletransmission.

Features:

+ 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:

There is a possibility to install PDK 48/20-1000W, PDM 48/41-2000W, PDO 48/42-2000W, PDJ 48/73-3500W and FUL 230/0,75, FUO 230/1,5 or FUH 230/2,5 inverters in the system.

Constant power rectifiers have nominal output power 1000W (PDK), 2000W (PDM, PDO), 3500W (PDJ). The digital communication between rectifiers and control unit, gives operator the possibility of remote supervision on individual rectifiers of the system.
The 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.

Modular, single-phase inverters: FUL 230/0,75, FUO 230/1,5 or FUH 230/2,5 with a rated power output adequately 750VA, 1500VA or 2500VA 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 offers 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-11 system is supplied from three-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 depending on the configuration of the AC system WSZ-11 are supplied from:

+ single-phase for one group of AC load,
+ two phases for two groups of AC loads,
+ three phases for three groups of AC loads,
+ three phases for three-phase AC loads.

For the total (rectifiers and inverters) phase current <100A is a common three-phase connection of rectifiers and inverters. For the phase current > 100A, there is a separate AC power connection of rectifiers and inverters.

Design of the system:

In its standard version the power supply system is in form of stand-alone cabinet.
The standard version the power supply system consists:

+ DC distribution: 120A, 250A, 500A or 800A;
+ rectifier subracks for installation up to. 12pcs. of PDC/PDM or PDD/PDJ rectifiers;
+ microprocessor control unit PI1 with OLED display, control buttons and USB port for PC connection;
+ battery protections - 2 pcs.;
+ load protections: up to 26x MCB (critical and not-critical group including inverter protections) possibility of installation NH00 fuse holder in place of 2xMCB and NH2 (3xMCB). All above is valid for 800A DC distribution;
+ signaling actual state of loads and battery protections (fuses, MCBs);
+ contactors intended for protection of battery against deep discharge and selective cut off max two groups of loads:
  - K1 cuts off group of critical loads (LVD),
  - K2 cuts off first group of not critical loads,
  - K3 (option) cuts off second group of not critical loads;
+ control of AC mains presence (KZF) (option);
+ measurement of output voltage and current;
+ summary battery current measurement;
+ manual by-pass: 1x63A, 1x125A, 3x63A or 3x125A.

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.

DC & AC power supply system WSZ-11

TELZAS
ETC GROUP

Basic parameters of the system:

Input parameters:		
Input nominal voltage	Vac	3x230/400
Range of phase input voltage changes	Vac	185...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	%	±2
Maximum output current	Adc	800
Maximum output current	Aac	132
Maximum DC output power	W	38400
Maximum AC output power	VA	30000
Output voltage ripples (psophometric value)	mV	< 2
Range of power factor	-	0 ind. – 1 – 0 cap.
Crest factor	-	< 3,1
General data:		
Range of ambient temperature	°C	5-40
Cooling	-	forced
Efficiency (rectifier)	%	≥ 92 (PDK), ≥ 96 (PDM, PDO, PDJ)
Efficiency (inverter)	%	91 (on-line), 96(EPC)
Ingress protection		IP20
Electromagnetic compatibility	-	PN-EN 300-386
Safety requirements	-	EN 60 950
Dimensions of the power supply system (HxWxD)	mm	(1000, 1300, 1800, 2000 or, 2200) x600x600

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 – up to 11 relay outputs;
+ energy saving function by switching off rectifier modules unused at the moment;
+ temperature compensation of float voltage with temperature sensor;
+ battery asymmetry control (option);
+ control of the LVD battery contactor with adjustable voltage battery disconnect
+ management of groups of loads;
+ 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/ambient 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;
+ current limitation of battery charging,
+ automatic and maintenance-free battery test (STB) (option);
+ 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.