DC power supply system SDCB 250

SDCB – Power & Battery cabinet in one device

General description:

The SDCB 250 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 PDC 48/41-2000W and batteries under control of advanced Pi1 controller.

Application:

+ telecommunications and teletransmission;
+ IT applications;
+ industrial automation systems.

Features:

+ high flexibility for extension of the system development;
+ 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 controller;
+ easy and full safe operation;
+ high efficiency;
+ immunity to short-circuits and overloads of output circuits;
+ immunity to electromagnetic interferences.

Rectifiers:

Constant power rectifier PDC 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 PDC 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 SDCB 250 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:

In its standard version the power supply system is in form of stand-alone cabinet with internal usable height 43U or 38U.

The standard version the power supply system consists:
+ distribution area AC/DC –10U height;
+ rectifier subrack 2U for installation up to. 6pcs. of PDC 48/41-2000W rectifiers;
+ free space depends on used battery type and capacity;
+ adjustable every 1U battery space depends on used battery type;
+ microprocessor control unit Pi1 with OLED color display (or with LED diodes), manipulator, RS232 or USB port for PC connection;
+ for power supply system without a display and manipulator there is a possibility to order a portable user interface with OLED display;
+ battery protections - NH00 fuse holder with 160A fuses– 2 pcs.;
+ load protections:
  - critical group – max. 10x MCB and 2x NH00,
  - not critical group – max. 12x MCB or:
  - not critical group 1 – max. 6x MCB,
  - not critical group 2 – max. 6x MCB;
+ signaling actual state of loads and battery protections (fuses, MCBs);
+ contactors intended for protection of battery against too deep discharge and selective cut off groups of loads:
  - K1 cuts off group of critical loads,
  - 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);
+ measurement of output voltage and current;
+ summary battery current measurement;
+ extended AC distribution with switch: AC mains - Gen-set, residual current device (option).

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.

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Basic parameters of the system:

Input parameters:		
Input nominal voltage	Vac	3x230 /400
Range of phase input voltage changes	Vac	184...253
Frequency	Hz	45...65
Configuration of AC mains	Aac	24
Max. phase current		1
Output parameters:		
Range of voltage	Vdc	48...58
Characteristic	-	UPI
Stabilization of output voltage	%	±1
Maximum output current	Adc	250
Maximum output power	W	12000
Output voltage ripples (psophometric value)	mV	< 2
General data:		
Range of ambient temperature	°C	5-40
Cooling	-	forced
Efficiency	%	≥ 91
Ingress protection		IP20
Electromagnetic compatibility	-	PN-EN 300-386
Safety requirements	-	EN 60 950
Dimensions of the power supply system (HxWxD)	mm	2000x600x600 or 1800x600x600
System weight without rectifier units	kg	~100
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:
  - blow out of batter=y 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 – 7 relay outputs;
+ temperature compensation of float voltage with temperature sensor;
+ battery asymmetry control;
+ 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 (in the case of the OLED screen equipment) 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;
+ current limitation of battery charging,
+ battery disposition test functionality;
+ operation mode with gen-set;
+ monitoring status of battery protections;
+ monitoring status of load protections;
+ storing the data structure of the selected parameters of the battery discharges
+ registration history other 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).

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