

| General description:

The SAL 4,5 power supply system is intended for uninterruptible supply of 230Vac loads by alternating current. The construction of the system using cooperation of FUL 230/0,75 inverters and batteries.

| General description:

- + telecommunication and teletransmission;
- + IT systems;
- + industrial automation systems.

| Features:

- + modular - parallel operation of inverters allows easy extension of the system;
- + modern inverters generate noise-free sinusoidal voltage;
- + manual bypass system allows to choose emergency or service operation mode, disconnecting the loads from the inverters and disconnect the inverters from the AC mains;
- + inverter has built-in calable system to ensure zero time of switching the output voltage between the AC mains supply voltage and DC voltage;
- + easy installation of inverter (replacement or extension) during normal operation status (hot-swap);
- + easy and full safe operation;
- + high efficiency (94% in EPC mode and 89% on-line mode);
- + wide range of power factor of loads;
- + sinusoidal current consumption from the AC mains regardless of the type of load;
- + continuous control of system's operation and fast reporting of alarm states;
- + immunity to short-circuits and overloads of output circuits;
- + immunity to electromagnetic interferences.

| Inverters:

Modular, single-phase FUL 230/0,75 inverters with a rated power output of 2500VA are intended for convert direct current to alternating current in the parallel mode. FUL Inverter is 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 is characterized by very high efficiency and zero switching time.

EPC mode offers additional saving - lower required output power of DC power supply system. DC power supply system serves only to recharge the battery with a capacity necessary to provide required back-up time. When AC mains is available AC loads are supplied from energy coming from AC mains not from DC system or battery.

The AC-to-AC conversion isolates the AC output from the AC input and features a double filtering function. The voltage supplied to the critical load is a pure sine despite all the disturbances (harmonics, surges, glitches) usually arising from AC mains.

| Power supply of the system:

SAL system is powered from two sources: 48VDC and 230VAC AC.

| Design of the system:

In its standard version the power supply system is designed as stand-alone cabinet.

The standard version the power supply system consists:

- + AC panel with optional PI1 controller (1U) - designed to connect the AC load through 7pcs (4pcs when equipped with a display) IEC sockets;
- + AC distribution with optional PI1 controller (3U); with manual service bypass 32A;
- + cassette 19" for installation of 1-6pcs FUL inverters (1U/2U);
- + DC input protections;
- + AC load protections – max 18pcs of MCBs;
- + 2 battery protections 125A;
- + Alarm contacts indicating an emergency state of the inverters;
- + LEDs signaling current operation status of inverter module;
- + PI1 control unit (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.



Basic functions of the system:

- + controlling values of:
 - input voltage,
 - output power and current,
 - output voltage frequency;
- + LED signalization of inverters working status and their current load;
- + automatic reporting of alarm states and sending alarm status as potential-free relay contact.

Basic parameters of the system:

Input parameters DC:

Input nominal voltage	Vdc	48
Range of phase input voltage changes	Vdc	40 ÷ 60
Psophometric noise level	mV	<2

Input parameters AC:

Input nominal voltage	Vac	230
Range of phase input voltage changes	Vac	185 ÷ 265
Frequency	Hz	50/60
Power factor	-	1

Output parameters:

Nominal voltage	Vac	230 or 3x230/400
Range of voltage regulation	Vac	200 ÷ 240
Stabilization of output voltage	%	± 2
Maximum output current	Aac	19,8 (6 x 3,3)
Maximum output power	kVA	4,5
Frequency	Hz	50/60
Overload capacity	%	135 (15s)
Range of power factor	-	0 ind. – 1 – 0 cap.
Crest factor	-	< 3,1

General data:

Range of operating temperature	°C	-20 ÷ +50
Cooling	-	forced
Efficiency – online mode	%	89
Efficiency – EPC mode	%	94
Ingress protection		IP20
Electromagnetic compatibility	-	in accordance with PN-EN 300-386
System dimensions (WxSxG)	mm	282x483x300
Inverter dimensions FUL 230/0,75 (WxSxG)	mm	44(1U) x 106 x 325
System weight 7,5kVA 6xFUL	kg	33

Extended functions of the system:

Optional SAL system is equipped with a PI1 control unit which gives following possibilities:

- + Supervision of the system, readout and setting of parameters on the OLED screen
 - power, output AC voltage and current,
 - input AC voltage and current,
 - input DC voltage and current,
 - actual operation mode (on-line, EPC),
- + readout alarm states of the inverters:
 - LOW input voltage,
 - HIGH input voltage,
 - LOW output voltage,
 - HIGH output voltage,
 - HIGH output current,
 - HIGH internal temperature;
- + optional remote computer monitoring of the system by WinCN software and selected Communications medium:
 - Ethernet,
 - fixed network (telecom modem),
 - mobile network (GSM/GPRS).