EXPSU120
battery charger- datasheet

Features

- Charger for 24V lead-acid batteries (flooded, Gel and AGM).
- Three stage charging.
- Current leakage measurements.
- Protection: short circuit / over voltage and over temperature.
- Graphic display to monitor system status.
- ModBus RTU interface (RS485/RS232).
- CANBUS interface
- Six status relays (fixed or programmable).

Key specification

- Could manage 50Ah to 600Ah Lead-Acid batteries, with selectable charging currents up to 60 A.
- Fully compatible with TDK HFE1600-24 and TDK FPS1000-24 power supplies. In these configurations the system is capable to manage loads up to 90A.
- Power supply EN54-4 compliant

Description

EXPSU120 is capable to provide high-current charging, significantly reducing charging time. It features automatic current regulation and protection against overload, leakages and short circuits. Additionally, a built-in graphic display is present to monitor battery status and other operational metrics.

The battery charger manages lead-acid batteries (flooded, Gel and AGM) with a capacitance ranging from 50Ah to 600Ah, ensuring the full battery charge within 24 hours. In case of missing AC voltage, the battery charger guarantees the power continuity to loads by means of discharging batteries. Once AC presence is restored, battery recharging is automatically enabled, without any user intervention.

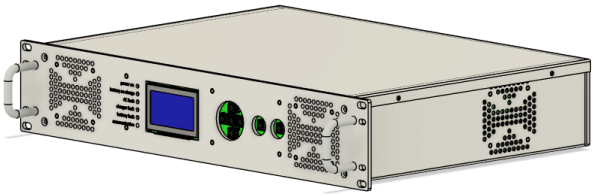


Figure 1: EXPSU120 Battery Charger

Battery Charger general Information		
	Product ID	EXPSU120-24
	Product configuration	EXPSU120-24-HFE / EXPSU120-24-FPS
	Long description	EN54-4 Battery Charger
	EN54-4 Certificated	Yes

1.1 Product overview

The EXPSU120-24 battery charger is designed for 24V applications, whereas a large amount of power must be provided to the batteries and loads. Through an external AC-DC power supply, the battery charger provides power both to batteries and loads. The loads power continuity is guaranteed in case of AC faults, thanks to backup batteries. This solution is fully modular, so that each part can be replaced individually.

The battery charger is compatible with TDK FPS1000-24 and HFE1600-24 industrial power supplies that can operate in a hot-swap redundant configuration. FPS1000-24 guarantees up to three power supplies can be fitted in a variety of 19" 1U high racks, with a maximum power of 3000W. HFE1600 instead guarantees up to five power supplies, with a maximum power of 8000W.

Charger is available in two different configurations upon field power requirements:

- EXPSU120-24-**HFE**: Compatible with TDK HFE1600-24.
- EXPSU120-24-**FPS**: Compatible with TDK FPS1000-24.

1.2 Technical Specifications

1.2.1 Electrical specifications

Nominal battery voltage	2 x 12V
Nominal output voltage	27.2 V
Output voltage ripple	150mV
Maximum loads output current	$90\ A$
Total minimum load current	$0.5\ A$
Battery max. charging current	$60\ A$
Battery max. discharging current	$90\ A$
Battery fuse rating	$150\ A$
Battery max. internal resistance	$50\ m\Omega$
Battery Low Voltage Detect (LVD) threshold	$19\ V - \ 23\ V$
Battery charger current absorption	$0.5\ A$
Battery capacitance (2 x 12V)	$50\ Ah - 600\ Ah$
Short circuit protection threshold	130A
Overcurrent protection threshold	115 A
Earth current leakage threshold	$\pm\ 100mA$
Article Number	EXPSU120

1.2.2 Mechanical construction

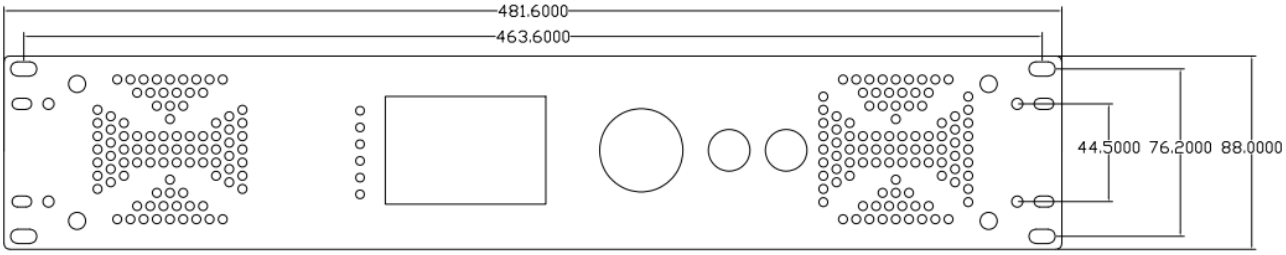
Physical Specification	
Chassis material	Aluminum
Rack mounting	19'', 2U
Height	88mm / 3.46 inches
Width	320mm / 12.6 inches
Depth	430mm / 16.9 inches
Weight	4500 g
Temperature range	$-5\ °C\ /\ 40°C$

1.3 General description

The battery charger is designed to deliver a range of charging currents to accommodate different battery types and capacities, ensuring efficient and safe charging. Here is a detailed description of the battery charger's current capabilities:

- **Graphic Interface**: User interaction is simplified thanks to the user graphic interface (GUI).
- **Adjustable current settings**: the chargers allow users to select the appropriate charging current based on the battery's specifications. This ensures compatibility with a wide range of batteries, from small capacity cells to large, high-capacity cells packs. This can be achieved from the graphic user interface.
- **Soft start**: gradually increases the current at the beginning of the charging process to reduce stress on the battery and extend its lifespan.
- **Overcurrent protection**: built-in safeguards prevent the charger from delivering excessive current, protecting both the charger and the battery from damage.
- **Short circuit protection**: in case of a battery short circuit the charger is switched off, leaving the battery floating without affecting the outputs. Charger restoration could only be executed from the user interface.
- **Battery Internal resistance**: a periodic battery resistance test is executed assessing the health and performance of batteries.
- **Thermal management**: The charger monitors its temperature and the battery's temperature, adjusting the current and voltage to prevent overheating and ensure safe operation.
- **Leakage Currents**: Built-in monitor detects and measures any leakages of current to the earth, with a full scale of ±100mA.

1.4 Mechanical dimensions



1.5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
03/06/2023	REV 0.0	First issue
25/06/2024	REV 0.1	Removed battery charger on boards outputs.