User Manual
Mobile Power System

Version 1.0

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1 Introduction

The Mobile Power System is a system that provides 230VAC power from a battery pack. This system is designed for mobile medical electrical equipement. In certain situations this system can be used as an UPS.

Before the Mobile Power System can be used for the first time, it has to be charged for at least 16 hours. See also Chapter 3.

1.1 Bookmark

Important! Read these directions for use in their entirety before you use this system. Take the directions for safety (chapter 2) especially into consideration. Do not work on the system if you do not possess the necessary knowledge, or if you are not authorised to do so.

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2 General safety rules

General

The system is for INDOOR use only and is designed to be mounted on a medical cart.

Switch off the central power switch and unplug the mains socket before moving. Make sure the mains cable is secured on the cart while moving the system.

The unit is equipped with ventilation slots. NEVER COVER THESE SLOTS AND AVOID LIQUIDS OR (METAL) OBJECTS FROM GETTING IN.

If fuses fail, switch off the system and remove the power plug before replacing them. Replace only by fuses of the same type and current.

Make sure the batteries are in optimum condition at all times by means of charging them when the system is not in use.

Do not connect more than 4 medical devices to the system in order to keep the earth leakage current on the output below 5mA.

The supplied 5 meter long power cord is rated for medical use. Always connect power plug to a medical grade outlet to ensure grounding protection, and always connect the equipotentiality plug to a valid equipotentiality terminal before use.

Inspect the power cord before each use. DO NOT USE CORD IF DAMAGED.

DO NOT plug more than the specified number of watts into socket strip.

Fully insert power cord plug into outlet. DO NOT unplug by pulling on cord.

DO NOT remove, bend or modify any metal prongs or pins of power cord or electrical terminal on the system.

DO NOT use excessive force to make connections.

Keep the system and all connected cables away from water. DO NOT PLUG CORD INTO OUTLET IF WET.

DO NOT OPERATE POWER SYSTEM IF WET.

DO NOT ALLOW THE SYSTEM OR POWER CORD TO OVERHEAT.

DO NOT drive, drag or place objects over the power cord. Do not stand or walk on the power cord.

EQUIPMENT not suitable for use in the presence of a FLAMMABLE ANESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE.

Cleaning

Before cleaning, always switch off the system and remove the power plug of the mains cable from the mains outlet. This prevents you getting an electric shock.

The system may only be cleaned with a slightly damp cloth with a non-aggressive (household) cleaning agent.

Never use aggressive solvents such as alcohol, thinner or salt to clean the system.

Maintenance

Regularly check that the system is working properly. If you notice irregularities, have them checked by a qualified person.

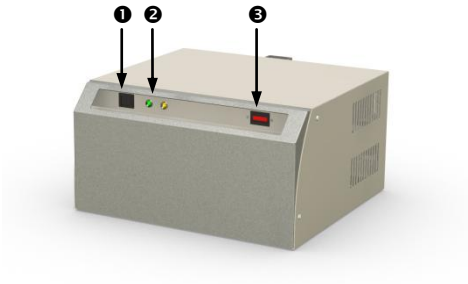
Technical maintenance must always be carried out by qualified personnel.

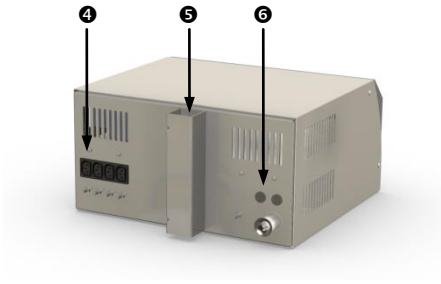
The cart must be checked at least once a year by technical personnel. Important points are: check for wear and tear, check screws, welding and battery condition. Also check if the system works properly and check the earth leakage current of both input and output.

3 Instructions for use

The Mobile Power System is designed to provide 230VAC voltage to a mobile system set-up, while the power-plug is unplugged. The 230VAC is delivered from a battery pack.

Once the plug of the Mobile Power System is connected to a mains socket, the output of the system is switched to the incoming voltage and at the same time the battery is charged.





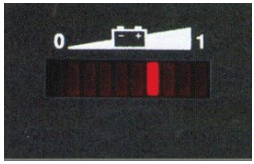
❶ Main on/off switch
❷ Status indication LEDs:
    Green= 230VAC input voltage passed through to outputs
    Yellow= 230VAC output voltage is derived from the battery
❸ Battery condition indicator
❹ Output: 4x IEC320, each equipped with a equipotentiality connection
❺ Mounting system for Crozz one cart
❻ Fuses: 2x 5AT (6,3x32mm)

Using the On/Off switch, the 230VAC to the output can be switched on and off. The output voltage is provided by either the internal inverter or via the power cord (when connected to a mains power socked). The battery is charged as soon as the system is connected to a mains socket, regardless the state of the power switch.

If the system is turned on, the status LEDs indicate whether the power comes from batteries (orange LED lights up) or whether it comes from the mains

network (green LED). If neither LED is lit, the system provides no voltage on the output.

The battery condition indicator on the front features a 10-digit red LED display. With a fully charged battery the right most LED lights up. As the battery is discharged, the left lying LEDs will light up one by one.



If the battery is discharged for 70%, the second LED from the left will flash. With a 80% discharge (or more), the first two LEDs from the left will flash. This indicates that the batteries are almost empty and the system will switch of within a short period of time. In this situation it is recommend to connect the system to the mains power, so that the batteries are charged and the output will not be switched off. The reading on the battery condition indicator will remain unchanged during the entire charging process. Only when the battery is completely full, the rightmost LED lights up again.

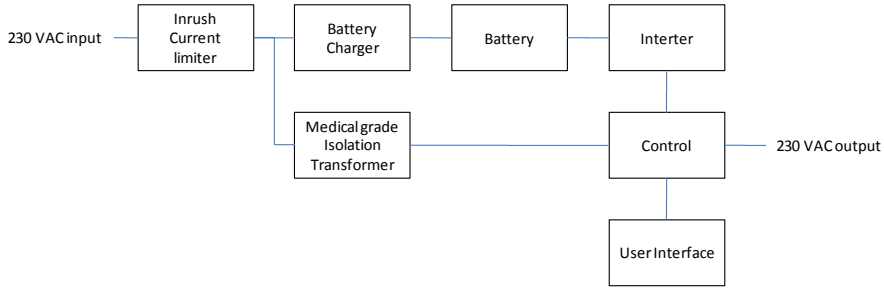
On the rear side of the system 4 outputs of the type IEC320 are located. Each output features a equipotentiality connector, so that medical devices can be individually connected (according to the NEN/EN/IEC60601-1).

Before the system is put to use, the battery must first be fully charged. Through this initial charge cycle the battery is fully charged and the battery condition indicator is initialized.

4 System set-up and specifications

This chapter gives a brief overview of the basic elements in the system and provides the most important specifications.

4.1 Block diagram

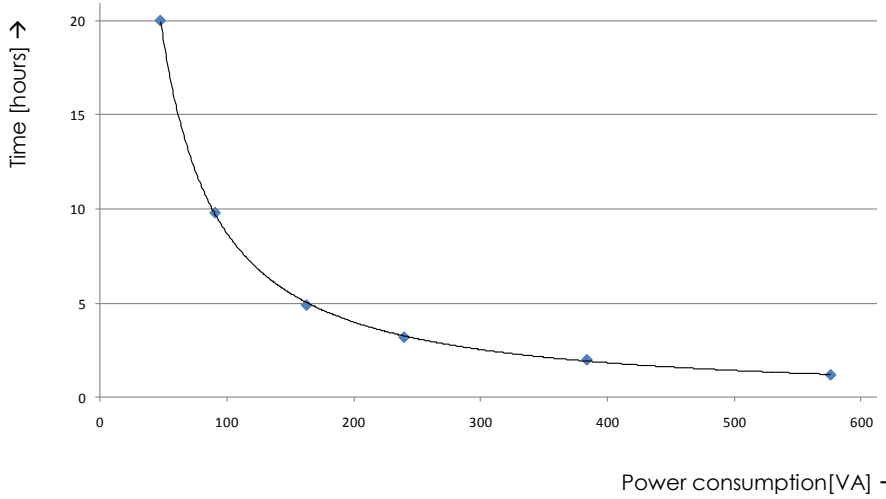


The medical grade battery charger complies with the NEN/EN/IEC60601-1 standard for medical electrical systems. Because the isolation transformer has an very low earth leakage current, the total leakage current at the input remains less than 500µA.

The output of the system features 4 outputs for the connection to medical grade equipment. The maximum earth leakage current for each of the connected electrical systems, must be less than 500µA. Because the internal earth leakage current of the internal inverter is less tan 3mA, the total leakage current on the output remains less than 5mA (compliant with NEN1010-7-710).

4.2 Battery time

The graph below gives an indication of the battery time [h] as a function of power demand in [VA].



Recharging the batteries is provided by an internal battery charger. The charging time for an empty battery pack lasts up to 16 hours.

4.3 Specificaties

General	
Dimensions	B=430mm; H=230mm; D=442mm
Weight	65kg
Electrical output	
Voltage	230 VAC / 50Hz
Maximum load	600 VA
Earth leakage current	<3 mA*
Switch-time inverter/mains	<500 ms
Electrical inpuy	
Voltage	230 VAC / 50Hz
Earth leakage current	<500 µA
Battery package	
Type	Valve Regulated Lead-Acid
Voltage	24 V (2x12V battery)
Capacity	50 Ah
Inverter	
Output voltage	230VAC ± 2%
Alternating current	True sine-wave (THD <5% @ 600VA)
Maximum load	600 VA
Output frequency	50 Hz ± 0.05%
Max. efficiency	93 %
Permitted cos φ	0,2 … 1
Battery Charger	
Type	3-stage charger
Charging currunt	5 A (10% van de battery capacity)
Max. charging time	16 h

5 Inspection and maintenance

The Mobile Power System is a low maintenance system. Maintenance is therefore limited to inspecting and/or measuring of following points:

1. Check on possible damage of the housing, check weldings and screws. Check if possible damage of the housing can course internal (electrical) hazards.
2. Visual inspection of wiring and electrical components.
3. Checking for wear and tear of mechanical parts (including the fan and switch). Replace when necessary.
4. Check the condition of the battery. If the battery time is too short for the application, they should be replaced. Always replace batteries by the same type.
5. Verification of correct operation:
    a. Check for correct switching between mains voltage and voltage generated by the inverter.
    b. Check the output voltage.
    c. Checking the LED indicators and the battery discharge indicator.
6. Measure the earth leakage current on both primary and secondary side.
7. Measure the earth resistance of grounding and equipotential earth.

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Jansen Medicars' modulaire cart concept
The optimal solution for every application

Typical product application

Wireless Monitor Cart