

# EMIX

## OPERATIONAL MANUAL

EMBC-8025

INTELLIGENT BATTERY CHARGER



Version 1.5

## **Product Overview**

**EMBC-8025** is an intelligent switching mode battery charger with float maintenance. It is designed to offer maximum life for battery. It represents the state-of-the-art of today's technology for battery charger. The EMBC-8025 is a 2-in-1 battery charger and switching power supply with overload and short circuit protection. The charging unit includes three stages, BULK, ABSORPTION and FLOAT intelligent battery charger with protection against terminals reversed and shorted.

At the front panel, there is a large LCD status display of battery voltage, charging voltage, charging current, battery connections and error message. The EMBC-8025 intelligent charger is also equipped with a battery low cut (BLC) feature that prevents the batteries from being over discharged. The build in smart cooling fan turns when charge current reaches 1000mA. This process cools the power MOSFET faster and much quieter on standby mode.

EMBC-8025 is suitable for charging batteries of up to 200Ah. Charging method is via PIC microcontroller controlled constant current with float maintenance. Multi level protections are incorporated to prevent premature batteries failure, such as battery low cut, battery over voltage charging, over current and polarity reversed charging.

## **Features**

- Intelligent PIC microcontroller controlled 24V battery charger
- Constant current charging with Float maintenance
- Battery over charge protection (exceed batteries limits)
- Battery charge terminals reversed protection (cause serious damage to batteries and equipment)
- Input over voltage protection (48V Batt. Connected to charger may damage internal circuitry)
- Input low voltage protection (12V Batt. Connected to charger cause serious over charging)
- Charge 24V batteries up to 10 to 200Ah (fully charge 24V/80Ah batteries within 24Hrs)
- Backup battery low auto disconnect and trigger buzzer sound alert
- 240VAC main power failed and resumed monitoring
- Liquid crystal display (LCD) voltage, Ampere, battery conditions and error message
- Voltage Output with 24VDC (4A) utility power supply unit
- Output short circuit and overload protections
- Real main switch and fused AC input socket to avoid accidentally switching off system

## Front View and Rear View

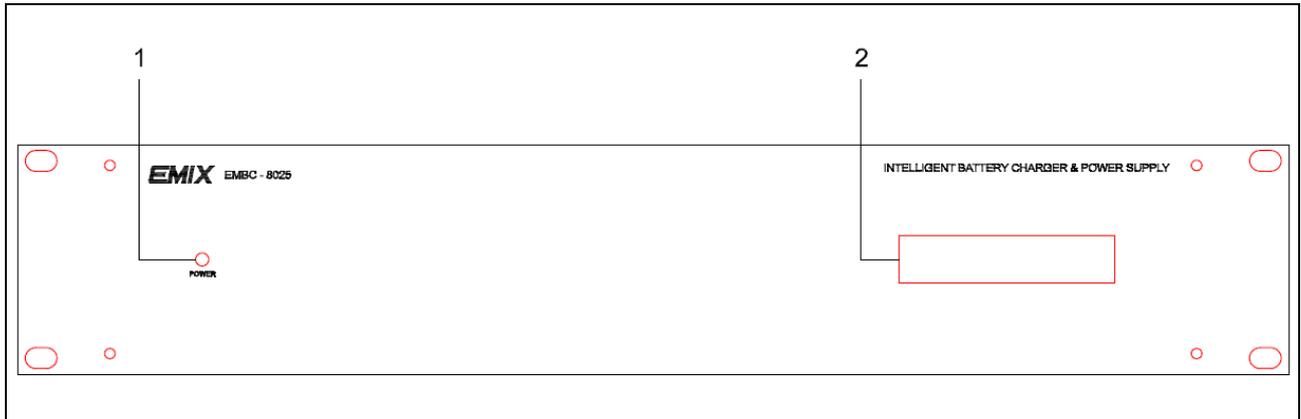


Figure 3.1 Front view of Battery Charger

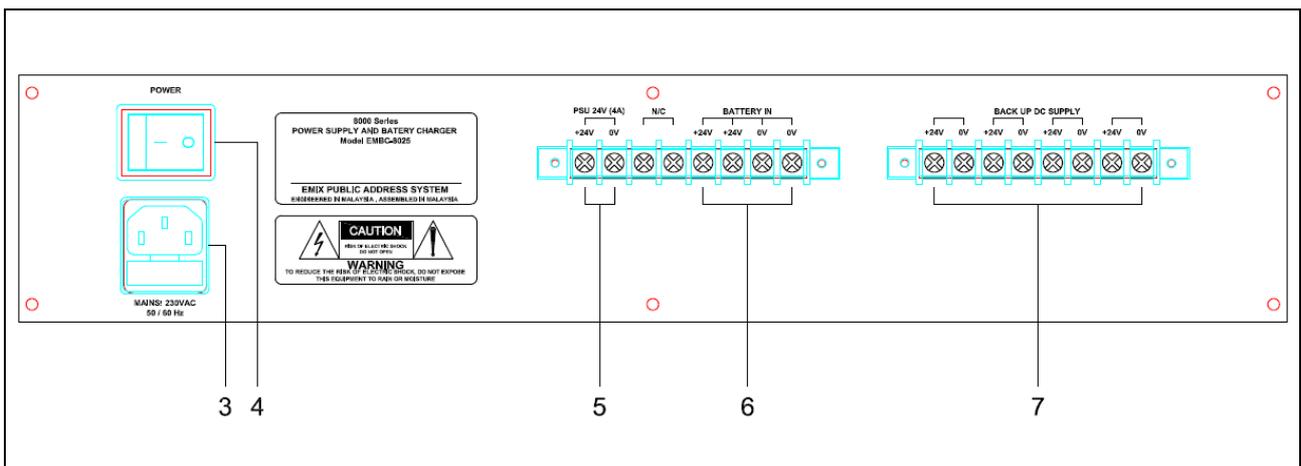


Figure 3.2: Rear view of the Battery Charger

## Front Panel and Rear Panel Indication

### EMBC-8025 Intelligent Battery Charger with Power Supply

#### 3.1.0 Front Panel Indicator

- 1 **Mains LED** – The power LED is red if the battery charger is connected to the main and switch on
- 2 **LCD Display** – Shows the battery voltage, charge current, charge voltage to the battery and error message.

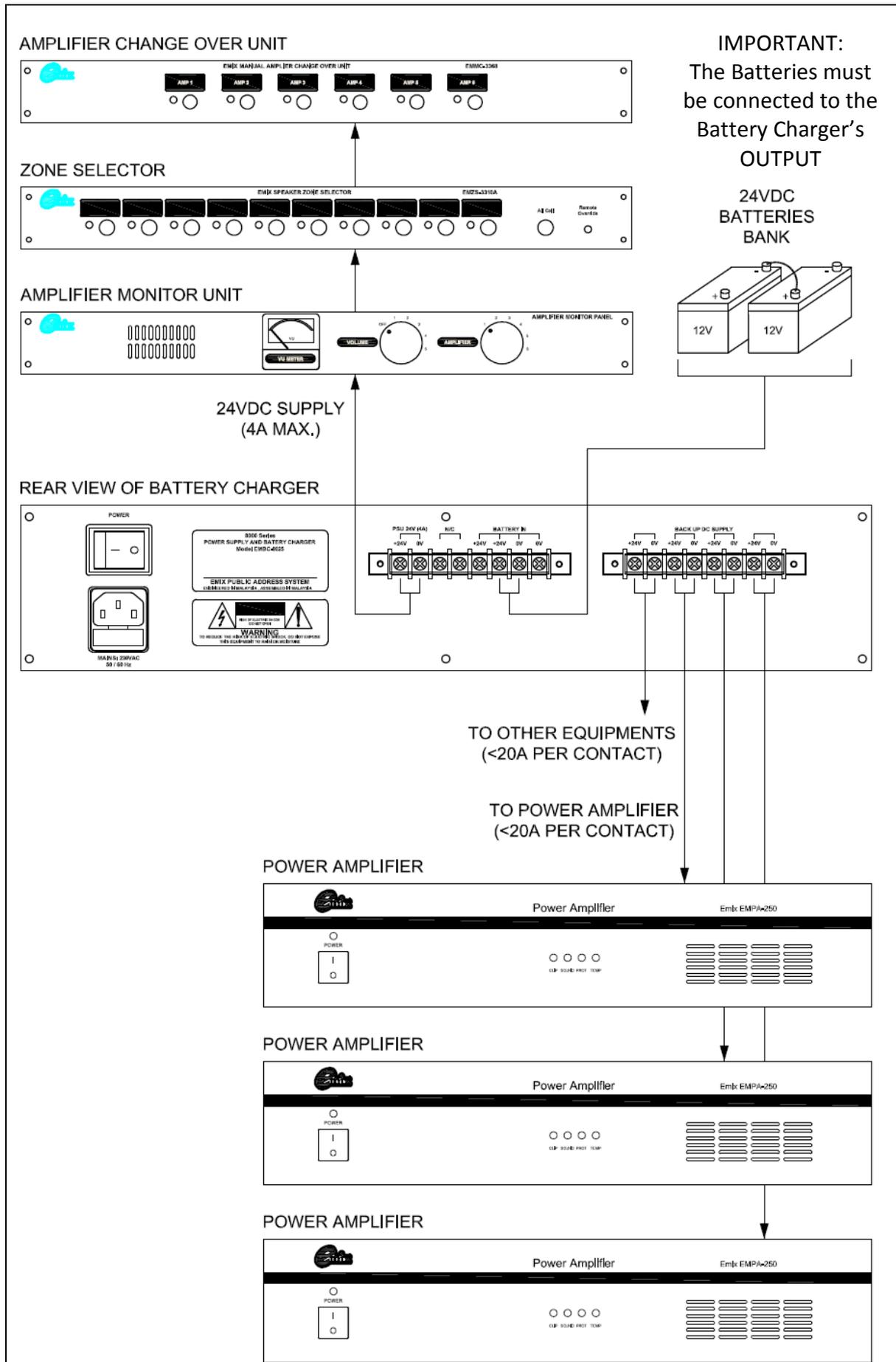
#### 3.2.0 Rear Panel connection

- 3 **Mains power Inlet** – A socket for connecting the battery charger to the mains power. Main voltage of 240V ± 10%
- 4 **ON/OFF Switch** – Connects and disconnects the main power supply.
- 5 **Power Supply Unit (24VDC)** – To equipments DC supply for total load maximum of 4A.
- 6 **Battery in** – Power Connector to the Batteries (Can be charged up to 200AH)
- 7 **Backup Power Supply (24VDC)** – Power out connector to the 24VDC (>20A) limit output back-up power on each contact for the EMIX rack systems products.

**\*\* NOTE:** It is very important to determine the size of cable for back up supplies. (*Ex: Size of the cable from Battery Charger to Battery and Battery Charger connect to others equipments*).

**\*\* NOTE:** Always Double Check on the positive (+) & Negative (-) priority before connecting to the unit

# Schematic Diagram / Connection diagram



## **Operation:-**

### **Bulk charge (Constant Current Charge)**

Primary constant current charging where approximately 80% of the charging happens. The charger delivers maximum voltage until the terminal voltage has risen to the preset level. After a number of hours, the charger goes on to the next phase of charging (absorption).

### **Absorption (Constant Voltage Charge)**

Final charging to almost 100%, voltage is kept at the preset level. During this case, the current is gradually reduced. When the preset length of time is reached and charging current drops to the preset level, the charger automatically switches to float charge mode.

### **Float charge**

The charging process range between 95% and 100%. The battery receives a pulse if the voltage falls. This stage will keep the battery in a good condition if it is not being used.

### **Equalization**

BATTERIES ARE DANGEROUS

The EMBC-8025 is design to charge 24V SLA (Sealed Lead-Acid) battery of 10A to 200A (over 4KW of DC power). It is of UTMOST importance that you follow the instructions each time you use the charger.

**\*\* NOTE:** Most of the battery would drained significantly over night

**\*\* NOTE:** EMBC-8025 must be connected to the batteries with minimum voltage of 16V for normal operation.

## Charge voltage and current:-

When the unit is connected to the battery (battery series), the charge current and charge voltage are as shown in figure 4.1 and figure 4.2 respectively.

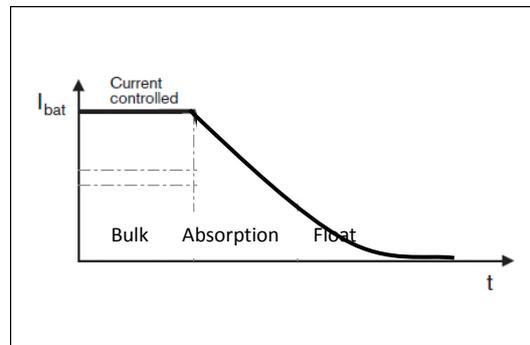


Figure 4.1: Charge current

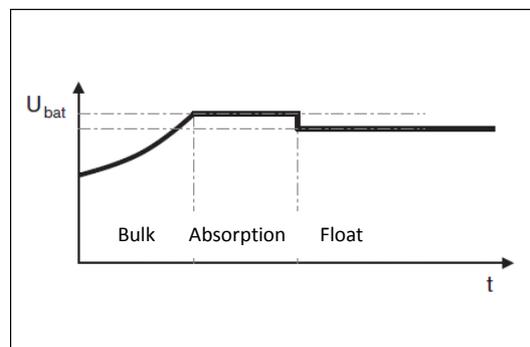


Figure 4.2: Charge voltage

When the main voltage is removed, the output voltage on the main 24V output is shown in figure 4.3

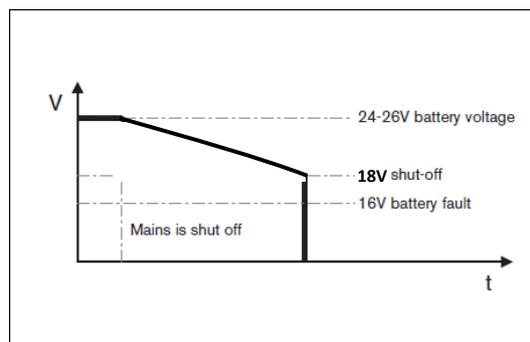


Figure 4.3: Output voltage (mains voltage removed)

## **Operation:-**

When switching from the mains to the backup power:

- The main system output will decrease in voltage from the charge voltage to the battery voltage (the system will not be affected by this).
- The auxiliary outputs can have a small dip in voltage, depending on the load (if the load is very high, the system may report this as a fault (blinking or blank-out) on the LCD Display).

A battery voltage below 18V will automatically disconnect the load from the battery (this is for deep discharge protection). When the mains voltage is restored, the unit will reset and start to charge the battery to be ready for the next power failure.

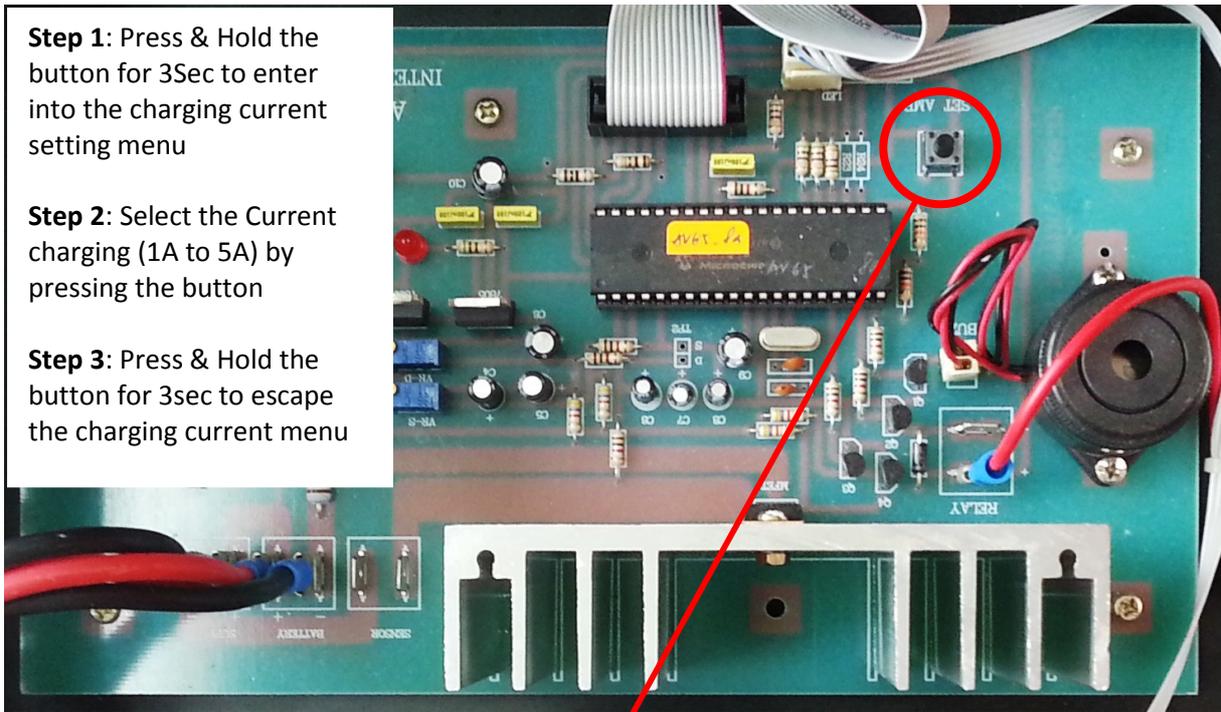
**\*\* NOTE:** If EMBC-8025 Battery charger couldn't detect any battery, kindly check the battery manually by using Multi-meter or contact us through our website. Battery's minimum voltage must be 16V.

## Setting on Current Charging:-

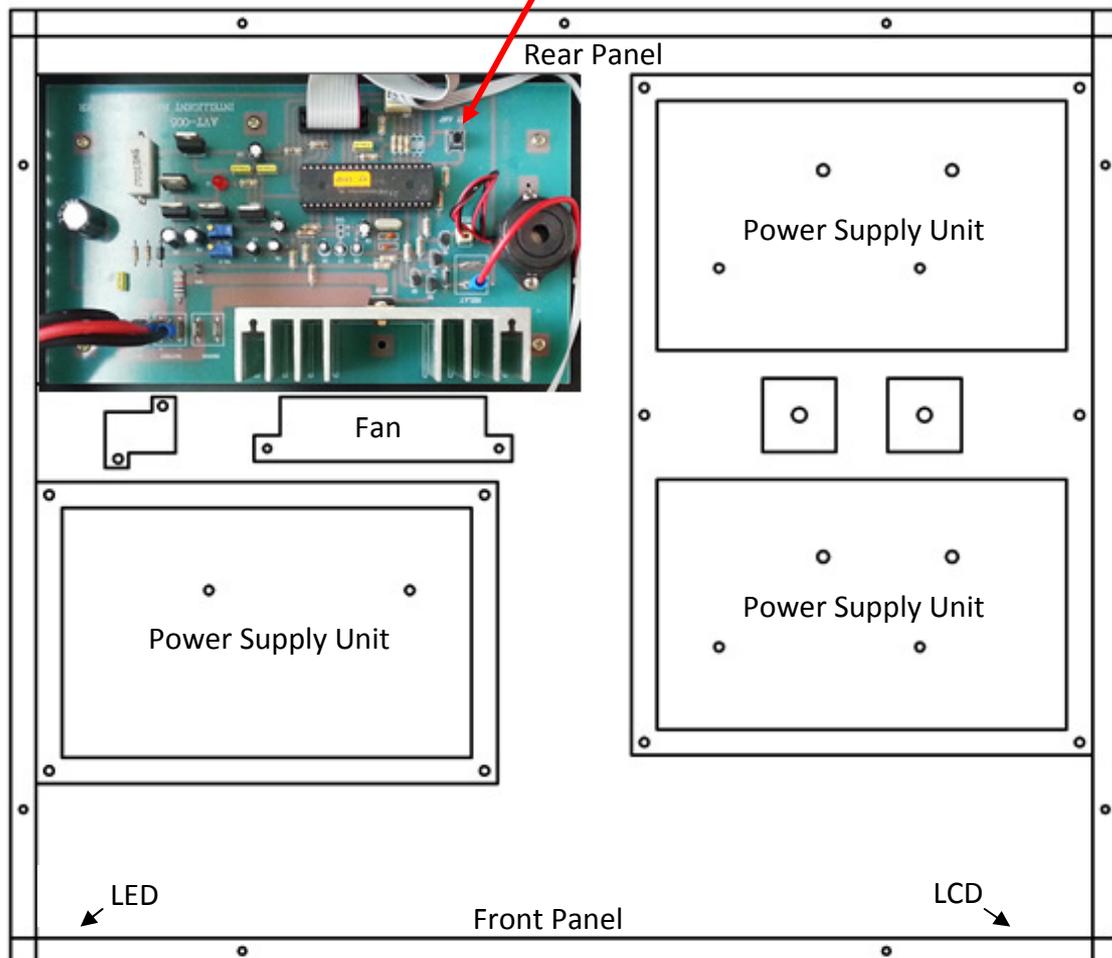
**Step 1:** Press & Hold the button for 3Sec to enter into the charging current setting menu

**Step 2:** Select the Current charging (1A to 5A) by pressing the button

**Step 3:** Press & Hold the button for 3sec to escape the charging current menu



Main Control Board

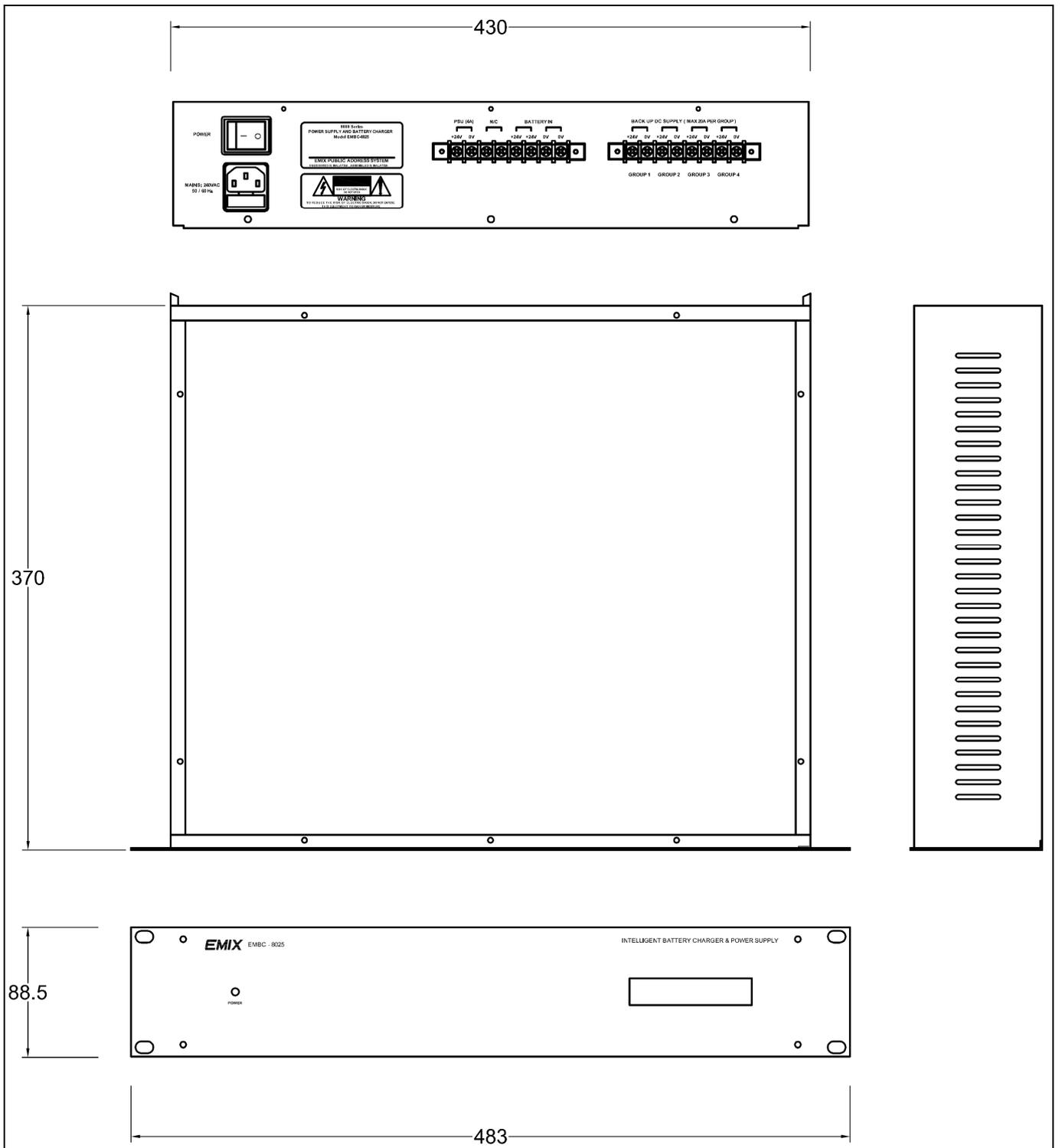


EMBC-8025 Internal Structure

## **Technical Specifications**

Input voltage	240V AC $\pm$ 10%
Charging voltage	27V to 29V DC
Minimum Charging Voltage	16V
Bulk	Constant current (PIC microcontroller controlled)
Absorption	29V DC (Preset limit)
Float	27V DC(Preset limit)
Charging current	1 to 5A (PIC microcontroller controlled); Default is 3A
Max Power consumption	200W
Protections	Over current, over voltage, over heating, short circuit, Low battery Indicator
LCD status displays	Battery volt, charge volt, charge current, battery conditions
Indicators LED	AC main failure, switching power supply status
Cooling	Smart FAN cooling system with charge, low cut at 18V
Terminals	Battery input, 24V (4A) output, battery backup/low cut outputs
Battery backup	Battery output 20A x 4 with low cut and fused protection (max. 80A)
Utility power supply	24V DC 4A switching power supply with changeover relay
AC Fuse	3A
DC Backup Fuse	30A x 4nos (At Every DC Backup output)
Battery Input 24VDC Fuse	Polarity Positive 20A; Polarity Negative 20A
Utility Power Supply Fuse	5A
Input Connection	Screw Terminal (Connect to battery)
Output Connection	Screw Terminal (Connect to System)
Dimension (W x H x D)	482 x 88 x 390mm
Gross Weight	9.3kg
Net Weight	7.3kg

**Dimension:-**



**Parts Included:-**

Quantity	Component
1	EMBC-8025 24VDC Battery Charger with Power Supply Unit
1	Operation Instruction Manual
1	Mains Plug

Only EMIX Technical Service Centers are allowed to make warranty repairs. Send the equipment directly to AV Electronics Marketing Sdn Bhd, or contact us for a list of Emix Technical Centers. This warranty is not valid if repairs are performed by unauthorized personnel or service centers.

This warranty covers only repairs and replacement of defective parts. Costs and risk of transportation as well as removal and installation of the product/equipment from the main system are to be borne by the purchaser. This warranty shall not extend to the replacement of the unit.

This warranty does not cover damages caused by misuse, neglect, accident of the products as well as using the product with power supply voltage other than shown on the product, or any other power supply source / adaptor not recommended by the manufacturer. This warranty does not cover damages caused by fire, earthquakes, floods, lightning and every cause not directly related to the unit.

This warranty does not include any indemnity in favor of the purchaser or the dealer for the period of use of the unit; moreover the warranty does not cover any damages which may be caused to people and things when using the products.

This warranty certificate is valid only for the described product, and is valid for a period of 12 months from the date of purchase or for a longer period in countries where this is stated by a national law. In this case, the extension is valid only in the country where the product is purchased.

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**NOTES:**

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