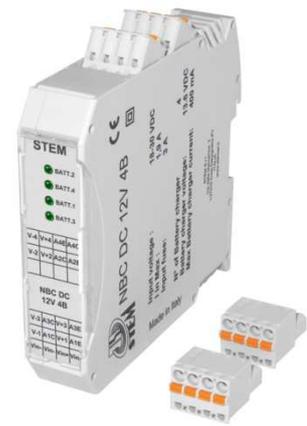


NBC DC 12V 4B

(DC/DC Battery Charger)



1 Introduction

The battery charger NBCDC 12V 4B is a complete solution to use only one product to control and charge FOUR independent batteries 12V 7.2Ah acid lead. The batteries can be recharged and monitored independently even when they are connected in series between them. This product uses a DC supply voltage (V_{in} 12-32 Vdc).

2 Functionality

NBCDC 12V 4B monitor the charging current ($I_{max}=300mA$) and the charging voltage in safety and efficient way, maximizing the capacity of the batteries and its duration in time and can remain always connected to the batteries without any risk and without need to disconnect the batteries from the equipment, maintaining the charge level constant also through long (up to months) idle period, providing also informations about the state of the batteries.

The battery charger is provided of FOUR independents and isolated stage, ideals for charging and monitoring of individual batteries even when they are connected in series between them.

The device provides a maximum current up to 0.3A each stage; the system manage the current of each battery and control the current depending of the charge level of the battery.

This product is suitable for standard batteries (acid lead) which normal charge could be evaluated at 0.057A per each Ah of capacity.

Each stage is equipped with its own microprocessor to allow analysis on the battery behavior.

Battery status monitoring during normal function (in presence of main voltage):

- Battery disconnected or short circuit (Battery LED LIT with RED color, alarm output ACTIVATED).
- Battery connected and charged, voltage higher than 12.8V (Battery LED LIT with GREEN color, alarm output NOT ACTIVATED).
- Battery connected and in charging, voltage in the range 11.5V - 12.8V and charging current higher than 50 mA, battery is charging (Battery LED blinking RED and GREEN, alarm output NOT ACTIVATED).
- Battery connected with voltage lower than 11.5V, battery is considered not compliant with the required specifications "battery damaged" (Battery LED LIT with RED color, alarm output ACTIVATED).

Battery status monitoring during emergency condition (lack of main voltage power supply):

In an emergency status, so when the battery starts running, the device allows you to track the battery voltage. When the battery voltage drops below 9.5V the device will give a flashing light (RED LED ON and alarm output ENABLED).

3 General Technical Data

GENERAL TECHNICAL DATA	
Input voltage	12-32 Vdc
Battery charger voltage (no load)	13,6 V
Charging current (for each battery stage)	0.300 A Max
Battery type	12V – 7,2Ah acid lead
Connection cables sections	Battery cables: min 0.75 mm ² / Alarm cables: min 0,35 mm ²
Protections	Short circuit, over current, over temperature. Automatic restart after fault removal.
Housing dimensions	Box IP 20, Thickness 22.5mm Height 114mm; Width 105mm
Battery Full Charging Time	24 h
Working Temperature	0° ÷ 50°C
Storage Temperature	-5° ÷ +70°C
EMC	EN12015:2005 – EN12016:2005 EN61000-6-3, EN61000-6-2

4 Battery status

The control unit is able to detect certain conditions that allow an analysis of the status of the battery:

Battery status during normal function (in presence of main voltage)			
Battery status	(Led Batt.)	Output Alarm	Description
Battery disconnected, short circuit or discharge	ON Red	Alarm On (Closed)	Voltage lower than 11.5V
Battery connected and charged	On Green	Alarm Off (Open)	Voltage higher than 12.8V
Battery connected in charge	Blink Red / Green	Alarm Off (Open)	Voltage in the range 11.5V - 12.8V

Battery status during emergency condition (lack of main voltage)			
Battery status	(Led Batt.)	Output Alarm	Description
Battery worn out	ON Red	Alarm On (Closed)	Voltage lower than 9.5V
Battery connected and charged	On Green	Alarm Off (Open)	Voltage higher than 9.5V

5 Connectors

Inputs:

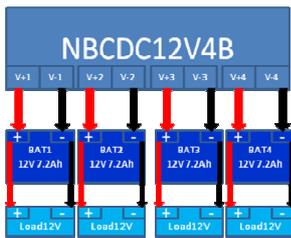
Name	Description	Range V	Max I
Vin-	Negative input voltage	12-32 Vdc	2.6 A
Vin-	Negative input voltage	12-32 Vdc	2.6 A
Vin+	Positive input voltage	12-32 Vdc	2.6 A
Vin+	Positive input voltage	12-32 Vdc	2.6 A

Outputs:

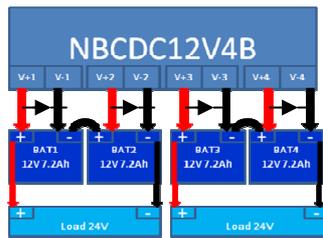
Name	Description	Range V	Max I
V+1	Battery voltage + (1 channel)	5-15 Vdc	0.300 A
V-1	Battery voltage - (1 channel)	5-15 Vdc	0.300 A
A11	Optoisolated NPN type Alarm 1 (Collector)	0-30 Vdc	0.05 A
A12	Optoisolated NPN type Alarm1 (Emitter)	0-30 Vdc	0.05 A
V+2	Battery voltage + (2 channel)	5-15 Vdc	0.300 A
V-2	Battery voltage - (2 channel)	5-15 Vdc	0.300 A
A21	Optoisolated NPN type Alarm 2 (Collector)	0-30 Vdc	0.05 A
A22	Optoisolated NPN type Alarm2 (Emitter)	0-30 Vdc	0.05 A
V+3	Battery voltage + (3 channel)	5-15 Vdc	0.300 A
V-3	Battery voltage - (3 channel)	5-15 Vdc	0.300 A
A31	Optoisolated NPN type Alarm 3 (Collector)	0-30 Vdc	0.05 A
A32	Optoisolated NPN type Alarm3 (Emitter)	0-30 Vdc	0.05 A
V+4	Battery voltage + (4 channel)	5-15 Vdc	0.300 A
V-4	Battery voltage - (4 channel)	5-15 Vdc	0.300 A
A41	Optoisolated NPN type Alarm 4 (Collector)	0-30 Vdc	0.05 A
A42	Optoisolated NPN type Alarm 4 (Emitter)	0-30 Vdc	0.05 A

6 Connection diagram

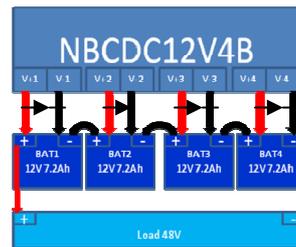
Independent batteries (Load 4x12V)



Batteries in series (Load 2x24V)

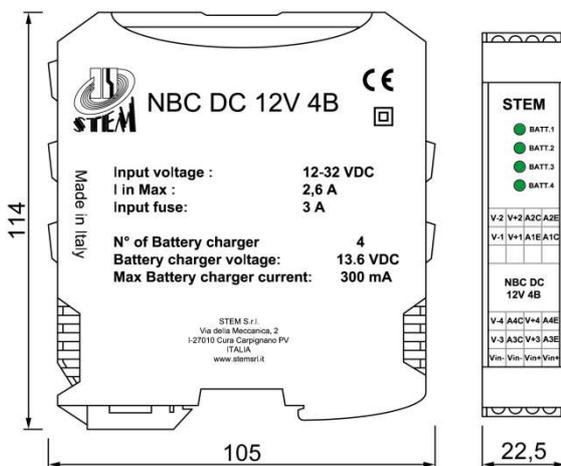


Batteries in series (Load 1x48V)



*In case of connecting in series batteries, it is necessary to insert a bypass diode which protects the battery charger if the battery has an open element, preventing any current passing through the device. The model and sizing of the diodes must be evaluated based on the electrical characteristics of the load.

7 Mechanical



Assembly:

Installation must be performed by authorized personnel only. The NBCDC 12V 4B unit must be assembled in a suitable operating area (switch cabinet, protective housing, at least IP 54). The unit is installed by clipping it to a standard 35 mm top-hat rail in accordance with EN 50022. All outputs must be isolated from the main supply.

Service and Inspection:

No servicing is required. In order to ensure lasting, trouble-free operation, regular inspection of the following is required:

- correct LED status
- closed connections

In the event of damage or wear and tear, the damaged system component must be replaced.

Liability coverage is void under the following circumstances:

- if instructions are not followed
- non-compliance with safety regulations
- installation and electrical connection not performed by authorized personnel
- non-implementation of functional checks

Setup:

If the control unit does not appear to function when operating voltage is applied (Green power in LED does not light up), the unit must be returned unopened to the manufacturer.