

# NBC DC 12V 1B

## (DC/DC Battery Charger)



### 1 Introduction

NBCDC 12V 1B is the complete solution to use only one product for control and recharging a 12V 7,2 Ah acid lead battery, for the management of a maximum load of 3A.

The Control Unit uses a DC supply voltage ( $V_{in}$  12-32 Vdc) and is optimized for use in combination with photovoltaic panels.

### 2 Functionality

NBCDC 12V 1B is able to recharge a 12V battery with a maximum DC supply voltage load of 3A. The Battery Charger have a STEP-DOWN architecture and the charging voltage is compensated by temperature with an external NTC sensor (optional).

Inside the Control Unit there is also a control loop for the optimization of the charge of the battery depending of the solar irradiation (MPPT).

#### **Battery status monitoring during normal function (in presence of DC supply voltage):**

DC Supply Voltage LED indicator lights GREEN, DC Supply Voltage alarm NOT ACTIVE.

- Battery disconnected or short circuit (Battery LED lit with RED color, alarm output ACTIVATED)
- Battery connected and charged, voltage higher than 13V (Battery LED lit with GREEN color, alarm output NOT ACTIVATED)
- Battery connected and in charging, voltage in the range 11.5V - 13V 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 DC voltage power supply):**

DC Supply Voltage LED indicator lights RED, DC Supply Voltage alarm ACTIVE.

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

### 3 General Technical Data

DATI TECNICI GENERALI	
Input voltage	14-30 Vdc,
Battery charging voltage (no load)	14.5 V
Charging current	1 A Max
Battery type	12V - 7,2 Ah acid lead
Connection cables sections	Battery cables: min 0.75 mm <sup>2</sup> / Alarm cables: min 0,35 mm <sup>2</sup>
Housing dimensions	Box: IP 20, Thickness: 17 mm, Height: 90 mm, Width: 60 mm
Battery full charging time	24 h
Working temperature	0° ÷ 50°C
Storage temperature	-10° ÷ +70°C

### 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 DC supply voltage)				
Battery status	LED (Vin S)	LED (Bat S)	Battery output state alarm (Bat F)	Battery supply voltage alarm (Vin F)
Battery disconnected, short circuit or discharge	Green ON	Red ON	Active (CLOSED)	Not active (OPEN)
Battery connected and charged (voltage higher than 13V)	Green ON	Green ON	Not active (OPEN)	Not active (OPEN)
Battery connected in charge (battery voltage in the range 11.5V - 13V)	Green ON	Blinking RED / GREEN	Not active (OPEN)	Not active (OPEN)

Battery status during emergency condition (lack of DC supply voltage)				
Stato della batteria	LED (Vin S)	LED (Bat S)	Battery output state alarm (Bat F)	Battery supply voltage alarm (Vin F)
Battery worn out (voltage lower than 9.5V)	Red ON	Red ON	Active (CLOSED)	Active (CLOSED)
Battery connected and charged (voltage higher than 9.5V)	Red ON	Green ON	Not active (OPEN)	Active (CLOSED)

### 5 Connettori

**Inputs:**

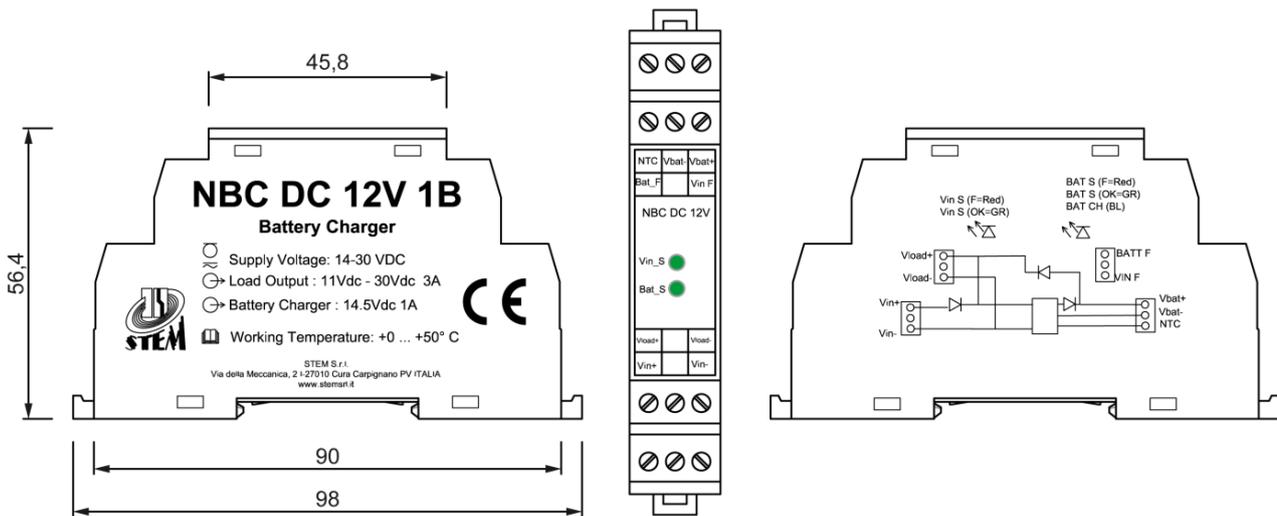
Name	Description	Range V	Max I
Vin+	Positive input voltage	0-30 Vac	3A
Vin-	Negative input voltage	0-30 Vac	3A

**Outputs:**

Nome	Descrizione	Range V	Max I
Vbat+	Battery voltage +	0-15 Vdc	1A
Vbat-	Battery voltage -	0-15 Vdc	1A
Bat_F	Battery output state alarm collector side (NPN)	0-30 Vdc	0.05A
Vin_F	Supply voltage alarm output (NPN)	0-30 Vdc	0.05A
Vload+	Charging voltage +	0-30 Vac	3A
Vload-	Charging voltage -	0-30 Vac	3A

### 6 Mechanical

The control unit is enclosed in a modular container represented below:



**ASSEMBLY**

Installation must be performed by authorized personnel only. The battery charger NBCDC 12V 1B 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.

**MANUTENZIONE E CONTROLLI**

The correct operation of the control unit NBCDC 12V 1B must be controlled by the operator periodically checking the follows:  
 - Simulate the battery is faulty, disconnected and short-circuited  
 - correct closing of the connections  
 In the event of damage or wear and tear, the damaged 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.