

# **Product Features**





7.5V (for 12V batteries)

Standby feature-Monitors current drawn by battery









Fully protected against short circuit & wrong connections

# All major starter battery manufacturers recommend to keep your battery fully charged during idle period.

BENTON® BX-3 is a 5-Step fully automatic switch mode battery charger and maintainer, designed for charging a variety of Lead-Acid rechargeable batteries, widely used in motorbikes and several other vehicles. The batteries may be of various types i.e. WET/Flooded (Liquid Electrolyte), GEL (Gelatin type Electrolyte, absorbed into the plates), AGM (Absorbed Glass Mat), MF, VRLA (Valve Regulated Lead Acid) batteries. Their capacity range from 6V/1.2Ah to 6V/12Ah and 12V/7.2Ah to 12V/60Ah. Using state-of-the art technology, the charger enables the recharging of the batteries to almost 100% of their original capacity. It recovers slightly sulphated batteries. It diagnoses and rescues drained battery. It provides trickle charge and maintenance charging which increases battery life and gives superb performance. It is also ideal for maintaining batteries of non-regularly used vehicles of all types. It also features low back current drain and low ripple.

**Memory Function:** It has memory function. The charger returns to last selected mode automatically when power is switched on. For repetitive charging process, this is a very useful feature. However charging mode could be selected by pressing the "MODE" button.

#### **Product Safety Feature**

Electronically safe against user errors. The charger will not damage vehicle electronics. It is totally safe for months-long connections and maintenance of irregularly or seasonally used batteries even while the charger is still connected to the vehicle. It provides optimal condition without damage. No risk of

#### over-charging!

- Full protection against wrong connection and against short circuit ensures safe charging operation.
   Provided with Spark protection mechanism. The charger will not begin operation upon connection to the battery unless charging mode has been selected. This embedded feature eliminates the possibility
- of a spark that often appears during connections.
- Fully controlled by internal MCU (Micro-Computer-Unit), which makes it faster, powerful, reliable and
- smarter. It detects the state of charge of the battery plugged into it and initiates charging.
- Dust and splash proof (IP65) approval. Approved for indoor use.
   Double insulated.

#### **Battery Type & Settings**

The following recommendations should only be referred to as guidelines. For precise details, you must refer to battery manufacturer for instructions.

SYMBOL	MODE	SETTINGS	DETAILS	
BV	1	7.2V/1.0A	This mode is normally suitable for 6V (1.2Ah to 12Ah) WET/Flooded, GEL, AGM, MF, VRLA type Lead-Acid Rechargeable Batteries	
120	2	14.4V/1.0A	This mode is normally suitable for 12V (7.2Ah to 60Ah) WET/Flooded, GEL, AGM, MF, VRLA type Lead-Acid Rechargeable Batteries	

#### **Rescuing Drained Battery**

When charger is connected to a battery, before the start of charging process, the charger automatically detects the voltage of the battery. It initiates recovery charging mode by applying a high voltage charging if the battery voltage is in the range of 1.0V-5.25V (for 6V battery) or 8.0V-10.5V(for 12V battery)

#### **Abnormality Protection**

In case of short-circuit, open circuit, reversed polarity connection or battery voltage below 1.0V (for 6V battery) or below 8V (for 12V battery), the charger will turn-off the electronic system and will immediately reset the system back to basic position to avoid damage to battery and charger.

#### **Overheating Protection**

BENTON® BX-3 charger is protected by NTC control. During the charging process, if the charger becomes too hot, the power output is automatically reduced to protect itself from damage. The charger continues to work trickle charge. Charger increases power automatically when the ambient temperature drops.

### -Bulk Charging Time

Time required for the BENTON® BX-3 to complete a charge on a normally discharged battery is roughly equal to the battery's Ah rating. Deep-discharged battery might take longer time to charge.

Battery Size (Ah)	For about 80 6V	0% Charge (hours) 12V
1.2	3	
2	4.5	
7.2	15	15
10	20	20
12	25	25
20		40
30		60
40		80
50		100
60		120



Note: Above table for reference only. Actual data may differ due to battery condition.

## \-\-**Technical D**ata

MODEL	BX-3	
Input Voltage AC	220-240VAC, 50/60Hz	
Input Poerational Voltage AC	170-260VAC, 50/60Hz (Reduced efficiency)	
Output Voltage	6V & 12V (Manual-Select)	
Input Current	0.4A RMS max	
Efficiency	>75%	
Charging Voltage Normal Temperature Mode Maintenance Charging Mode Recovery Mode	7.2V (for 6V Battery), 14.4V (for 12V Battery) 6.8V (for 6V Battery), 13.6V (for 12V Battery) 8V (for 6V Battery), 16V (for 12V Battery)	
Charging Current	1.0A or 0.6A or 0.2A or 0.2A ON 30 min and OFF 30 min, 0.1A	
Back Current Drain*	<5mA	
Ripple**	Max 150mV, 0.3A	
Ambient Temperature	-20°C to +50°C/-4°F to +122°F Reduced output power at higher temperature	
Type of Charger	Five step, switch mode with Recovering, fully automatic, battery capacitance verification stage with maintenance charging	
Type of Batteries	6V & 12V Lead-acid rechargeable batteries (WET, MF, AGM and GEL)	
Battery Capacity	1.2-12Ah (for 6V battery) and 7.2-60Ah (for 12V battery)	
Dimensions (LxWxH)	140x60x34.5mm	
Housing Protection	IP65 (Dust and Splash proof) Indoor use	
Weight	0.38kg	
Noise Level	<50 dB (Tested from a distance of 50cm)	

- \* = Back current drain is the amount of current drawn by the charger from battery, when the charger is connected to the battery, without power cord connected. BENTON® BX-3 has extremely low back current drain which corresponds to 0.7 Ah per month (1mA/hr)
- \*\* = Ripple refers to interference of current and voltage. A high current ripple heats up battery and reduces life of battery. Against a linear charger, BENTON® BX-3 charger's ripple voltage is below 2.5% (0.15/6V or 0.3/12V battery voltage), which is much lower than the max 5% for a lead-acid rechargeable battery. Equipments connected to the battery could be damaged by high voltage ripple.

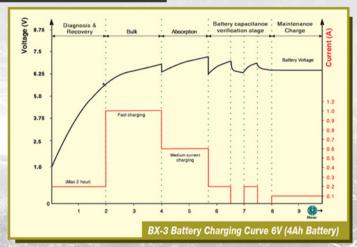
# -{-**\--\-Charging Phases** ;

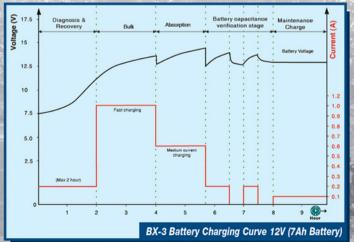
BENTON® BX-3 charger performs 5-step fully automatic charging cycle.

MODE	SETTINGS	SYMBOL
1	7.2 V/1.0A	i i
2	14.4 V/1.0A	121









#### – 11 Diagnosis & Recovery :

Initializes the recovery process for drained batteries by high voltage charging in order to restoring the battery capacity.

#### - 21 Bulk :

80% of energy is returned in this phase of charging.

#### - 31 Absorption :

In this phase complete charging up to almost 100% is achieved. Charger would initiate verification stage.

#### -4) Battery Capacitance verification stage :

The battery will signal to the charger and will only take enough current to sustain small loads such as alarms etc or current leaks in the vehicle wiring circuit. The charger will be charging with 30 minutes on and 30 minutes off and use a constant voltage and constant current to confirm the battery voltage. When the battery voltage reaches to 7.2V (for 6V battery) or 14.4V (for 12V battery), battery is fully charged and ready to use. The charger switches to maintenance phase.

#### - 51 Maintenance Charge :

Charger begins maintenance charging pulse at constant 100mA to support any connected accessories or losses due to deteriorating vehicle wiring until voltage reaches 6.8V (for 6V battery) or 13.6V (for 12V battery).

# Standby feature

When battery remains connected with vehicle's wiring system, during the trickle mode, circuits continuously monitor the current drawn by the battery.

# **33.53 (U) BK-3 is** fully interactive

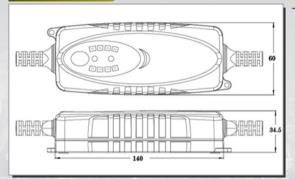
charger which adjusts itself to changing current requirement to charge and maintain the battery.

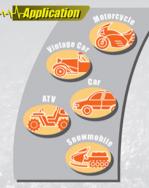
# Mounting & Product dimensions

The charger is easy to fix using four screws.

(Please refer to product drawing.)

#### **\-\-Product Dimensions** .





## -1-1\-\-\-Equipment

**BENTON® BX-3** charger is supplied with two detachable and interchangeable colour coded lead sets- one with clamps for bench charging and other with eyelet terminals with in-line battery protection fuse 2.0A for permanent attachment to the battery posts to allow quick connection/disconnection through snap-connector.





Packing Illustration



## **--Declaration of Compliance**

Tested and approved by and SGS, and conforms to EN 60335-2-29, EN 60335-1, EN 62233, EN 55014-1, EN 55014-2, EN 61000-3-2, EN 61000-3-3, AS/NZS CISPR 14.1:2003, AS/NZS 60335.2.29:2004 Inc. A1



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