

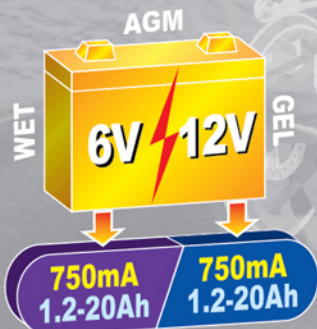
BENTON

CAR ACCESSORIES

3 STEP

- A Unique Battery Charger
- Fully Automatic
- Electronically safe against user errors!
- Smart Option for computerized battery charging and management!

SWITCH MODE BATTERY CHARGER



Charges 6V & 12V Batteries

MCU controlled, fully INTERACTIVE

Select for 6V or 12V Battery, rest is 100% automatic from Charge to Maintenance!!

Charges WET/Flooded, GEL, AGM type Lead-Acid Rechargeable Batteries

Automatically Diagnoses, Recovers, Charges & Maintains batteries for months...

**BX-4**

Product Features



**Standby feature-
Monitors current drawn
by battery**

FULL

**No risk of
over-charging**



**Electronically safe
against user errors**



Spark-proof



Overheat protection



**Fully protected against
short circuit & wrong
connections**

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



BENTON® BX-4 is a 3-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/20Ah and 12V/1.2Ah to 12V/20Ah. 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 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.

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 proof (IP60) 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
	1	7.2V/750mA	This mode is normally suitable for 6V (1.2Ah to 20Ah) WET/Flooded, GEL, AGM, MF, VRLA type Lead-Acid Rechargeable Batteries
	2	14.4V/750mA	This mode is normally suitable for 12V (1.2Ah to 20Ah) WET/Flooded, GEL, AGM, MF, VRLA type Lead-Acid Rechargeable Batteries

Abnormality Protection

In case of short-circuit, open circuit, reversed polarity connection or battery voltage below 3.75V (for 6V battery) or below 7.5V (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-4 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-4** to complete a charge on a normally discharged battery is shown as under. Deep-discharged battery might take longer time to charge.

Battery Size (Ah)	For about 80% Charge (hours)	
	6V	12V
1.2	4	4
2	7	7
10	30	30
12	37	37
20	60	60

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



Technical Data

MODEL	BX-4
Input Voltage AC	220-240VAC, 50/60Hz
Output Voltage	6V & 12V (Manual-Select)
Input Current	130mA RMS max
Efficiency	>75%
Charging Voltage	
Bulk Charging Mode	3.75V (for 6V Battery), 7.5V (for 12V Battery)
Trickle Charging Mode	6.5V (for 6V Battery), 13.0V (for 12V Battery)
Maintenance Charging Mode	7.2V (for 6V Battery), 14.4V (for 12V Battery)
Charging Current	750mA, 750mA ON 100mS OFF 900mS (average current 100mA)
Back Current Drain *	<35mA
Ripple**	Max 150mV, 0.2A
Ambient Temperature	-20°C to +50°C/-4°F to +122°F Reduced output power at higher temperature
Type of Charger	Three step, fully automatic, switch mode with maintenance charging
Type of Batteries	6V & 12V Lead-acid rechargeable batteries (WET, MF, AGM and GEL)
Battery Capacity	1.2-20Ah (for 6V and 12V batteries)
Dimensions (LxWxH)	100x65x38mm
Housing Protection	IP60 (Dust proof) Indoor use
Weight	0.190kg
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-4** has extremely low back current drain which corresponds to 0.7 Ah per month (1mA/hr)

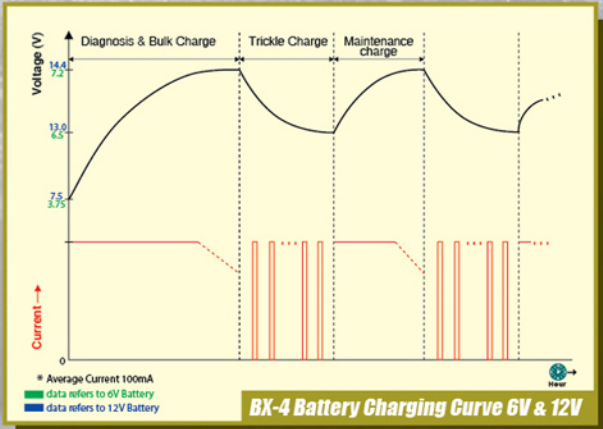
** = Ripple refers to interference of current and voltage. A high current ripple heats up battery and reduces life of battery. Against a linear charger, **BENTON® BX-4** charger's ripple voltage is below 2.5% (0.15/6V or 0.3/12V battery voltage), which is much lower than the max 5% for a lead-acid rechargeable battery. Equipments connected to the battery could be damaged by high voltage ripple.

Charging Phases

BENTON® BX-4 charger performs 3-step fully automatic charging cycle.

MODE	SETTINGS	SYMBOL
1	7.2V/750mA	
2	14.4V/750mA	

Control Panel



1) Diagnosis & Bulk Charge :

As soon charging instruction is given to the charger, the unique diagnostic function automatically checks status of battery (detects voltage). If a battery's voltage is over 3.75V (for 6V battery) or 7.5V (for 12V battery), charger begins bulk charging mode by applying a constant current 750mA for both 6V or 12V battery, which terminates when voltage reaches 7.2V (for 6V battery) or 14.4V (for 12V battery).

2) Trickle Charge :

Battery is fully charged and ready to use. Use of a constant high current for extended periods of time risks gassing the battery.. 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. Low current in frequency of 750mA ON for 100mS, OFF for 900mS is given to the battery. Since current is not delivered constantly, **BENTON® BX-4** charger would minimize the heating up of the battery, and hence it will eliminate the build up of gases. This ensures more efficient and safer performance. When voltage drops below 6.5V (for 6V battery) or 13.0V (for 12V battery), monitoring circuit senses that battery needs more current to maintain its charge than available in trickle charge phase. The Charger switches to Maintenance Charge phase.

3) Maintenance Charge :

As charger continuously monitors the terminal voltage in order to determine if a maintenance charging should be initiated. If the battery is loaded and/or terminal voltage falls below 13.0V (for 12V battery) or 6.5V (for 6V battery), the charger starts a maintenance cycle until voltage reaches to 14.4V (for 12V battery) or 7.2V (for 6V battery). The maintenance charging is discontinued. Cycle of trickle charging and maintenance charging is repeated indefinitely to keep battery in good condition when it is not in use and enables charger to be let connected indefinitely.

Standby feature

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

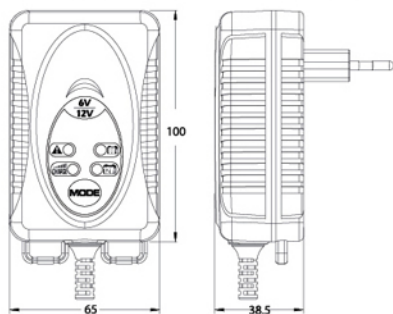
BENTON® BX-4 is fully interactive

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

Mounting & Product dimensions

The charger is direct plug-in type. (Please refer to product drawing.)

Product Dimensions



Packing Illustration


Application



Equipment

BENTON® BX-4 charger is supplied with two kind of colour coded battery leads, one with clamps and one with eyelet terminals, which are available in Ø6.3mm.

Declaration of Compliance

Tested and approved by  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 14.1:2005, AS/NZS 60335.2.29:2004 Inc. A1

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CAR ACCESSORIES

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