



BENTON

Battery Charger

BX-2M / BX-2D

User's Manual

For Lead Acid / Lithium / Calcium Batteries

12V/24V

Battery Charger

BX-2M / BX-2D

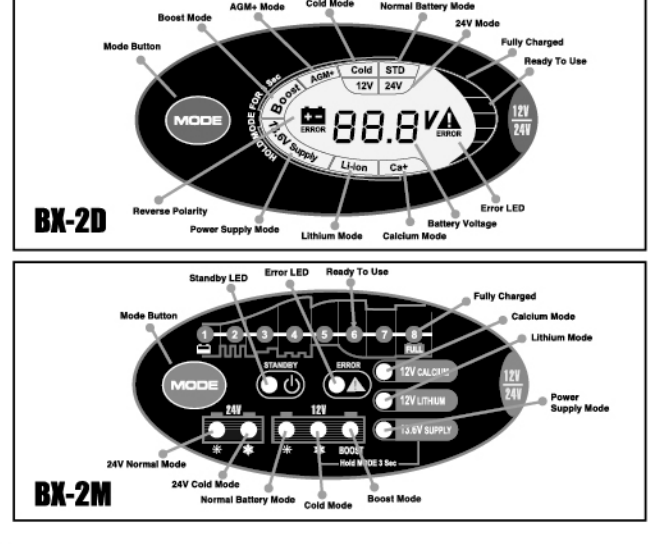
Charging Current
7.5A / 3.75A

Battery Capacity
10-240Ah

8 Step Charging

105mm

User's Manual And Guide To Professional Battery Charging



For Your Safety

This manual contains important safety and operating instructions. Read this manual carefully before using the charger for the first time and keep the manual in a safe place for future reference.

Safety Information

- BENTON® BX-2M / BX-2D** charger is designed for charging 12V/24V 10-240Ah Lead-Acid rechargeable batteries and 10-80Ah Lithium batteries.
- ⚠ WARNING! DO NOT ATTEMPT TO CHARGE A NON-RECHARGEABLE BATTERY (PRIMARY CELLS)**
- Before charging make sure the input power is as per rated specifications, otherwise the charging performance may be seriously affected.
 - Do not use the charger with a damaged cable. It must be replaced by the manufacturer, its service agent or similarly qualified technician in order to ensure safety.
 - Never charge a damaged battery.
 - Never charge a frozen battery.
 - Never place charger above battery being charged, gases from battery will corrode and damage charger.
 - Do not cover the charger while charging.
 - During charging the battery must be placed in a well ventilated area.
 - While charging always use safety glasses, gloves, protective clothing and keep your face away from the battery.
 - **Explosion hazard!** A battery being charged could emit explosive gasses. Avoid smoking or open sparks or flames in the vicinity of the battery. Explosive and flammable substances such as fuel or solvents should not be kept in the vicinity of the charger or the battery.
 - **Danger of chemical burns!** Battery acid is highly

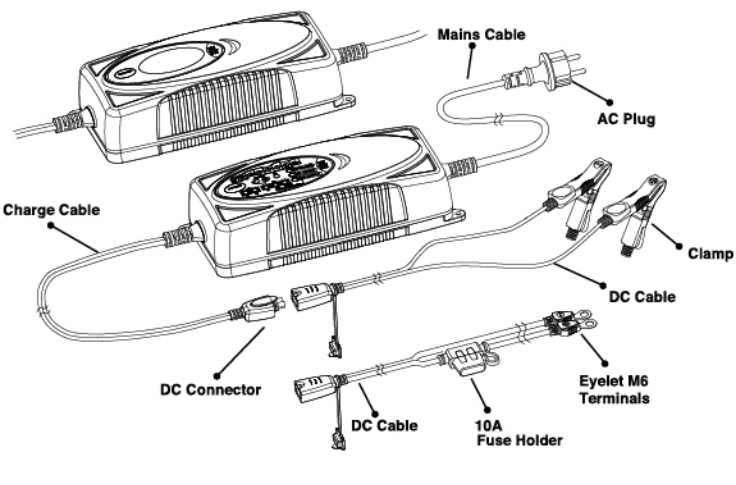
corrosive. If your skin or eyes come into contact with acid, immediately rinse the affected part of the body with excessive water and seek medical advice.

- All batteries eventually fail. If that happens during charging, charger's advance control system will detect it, but there may some rare errors still exist in the battery, so do not leave charging unattended for a long period of time.
- Normally, a battery is grounded either, on negative or positive terminal to the vehicle's chassis. The charger's DC Clips are to be connected to the battery terminal not connected to the chassis first. The other connection is to be made to the terminal connected to the chassis, far from the battery and fuel line. The battery charger is then to be connected to the power supply.
- After charging, disconnect the battery charger from supply mains. Remove the chassis connection and the battery connection, respectively. This will reduce back drain current.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with appliance. Cleaning and user maintenance shall not be made by children without supervision.



Contents

- 1) BENTON® BX-2M / BX-2D Charger
- 2) Quick contact battery leads with clamps
- 3) Quick contact battery leads with eyelet terminals (Ø 6.3mm) with in-line battery protection fuse (10A) for permanent attachment to the battery posts to allow quick connection/disconnection through snap-connector.
- 4) User Manual

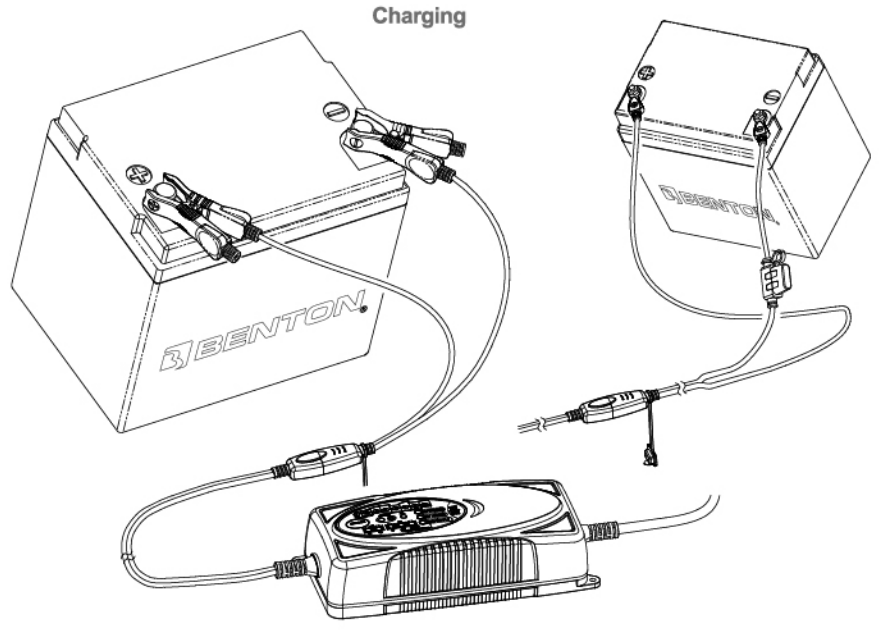


Charging Modes

| Symbol | Description |
|--------------|--|
| 12V STD | Mode 12V/7.5A This mode is normally used for WET, MF, VRLA, and GEL batteries. |
| 12V Cold | Mode 12V/7.5A This mode is recommended for AGM batteries. This mode is also suitable for charging batteries in sub-zero temperatures |
| 12V AGM+ | Mode 12V/7.5A This mode is recommended for AGM+ batteries. |
| 12V Boost | Mode 12V/7.5A + BOOST This mode is suitable to recover severely discharged batteries. Recommended to boost at least once a year. |
| 12V CA+ | Mode 12V/7.5A This mode is normally used for Calcium batteries. |
| 12V Li-Ion | Mode 12V/7.5A This mode is normally used for Lithium batteries |
| 13.6V Supply | Mode 13.6V/5A Power Supply special Mode |
| 24V STD | Mode 24V/3.75A This mode is normally used for WET, MF, VRLA, and GEL batteries. |
| 24V Cold | Mode 24V/3.75A This mode is recommended for AGM batteries. This mode is also suitable for charging batteries in sub-zero temperatures. |
| 24V AGM+ | Mode 24V/3.75A This mode is recommended for AGM+ batteries. |



Operation



- 1) Charging of a permanently installed battery in a vehicle
 - a) Before connecting or disconnecting the battery leads, the power cord should be removed from the mains.
 - b) Check polarity of battery post. A positive (+) battery post usually has a larger diameter than a negative (-) post.
 - c) Identify the pole of battery which is connected to the chassis (earth). Normally the negative terminal is connected to the chassis.
 - d) Charging of negative earthed battery:
 - Make sure the black clamp or eyelet terminal (-) (pole connection) has not contact with the fuel line or the battery.
 - Connect the red clamp or eyelet terminal (+) to the positive (+) pole of the battery and the black clamp or eyelet terminal (-) to the vehicle chassis.
 - e) Charging of positive earthed battery:
 - Make sure the red clamp or terminal (+) pole connection) has not contact with the fuel line or the battery.
 - Connect the black clamp or eyelet terminal (-) to the negative (-) pole of the battery and the red clamp or eyelet terminal (+) to the vehicle chassis.
 - 2) Charging of a battery not connected to a vehicle
 - a) Before connecting or disconnecting the battery leads, the power cord should be removed from the mains.
 - b) Connect the red clamp or eyelet terminal (+) to the positive (+) pole of the battery and the black clamp or eyelet terminal (-) to the negative (-) pole.
 - 3) Connect charger to the mains.
 - 4) Select charging mode
Charger automatically detects 12V or 24V batteries.
 - For 24V batteries**
By pressing **MODE** button once, Standard or Cold charge and **AGM+** charge options could be selected.
 - For 12V batteries**
By pressing **MODE** button once, Standard or Cold charge or **BOOST** and **AGM+** charge options could be selected.
- Press **MODE** button for 3 second to change to special modes.
By pressing **MODE** button once, 13.6V Power Supply or 12V Calcium or Lithium charge options could be selected.
- Press **MODE** button for 3 second to change from special modes to Standby.
- 5) At step 6 battery is ready to use and step 8 it is fully charged.



Bulk Charging Time

| Battery Size (Ah) | Mode | For about 80% Charge (hours) |
|-------------------|------|------------------------------|
| 10 | 24V | 3 |
| 40 | | 11 |
| 80 | | 22 |
| 120 | | 32 |
| 20 | 12V | 3 |
| 80 | | 11 |
| 160 | | 22 |
| 240 | | 32 |

Technical Data

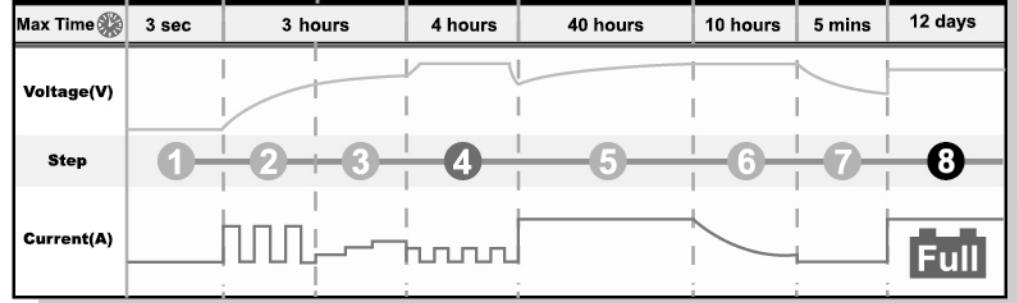
| Model | BX-2M / BX-2D |
|-------------------------|---|
| Input Voltage AC | 220-240VAC, 50Hz |
| Output Voltage | Nominal: 12V / 24V |
| Input Current | 1.33A RMS max |
| Minimum Battery Voltage | >2.0V |
| Output Power | 110W |
| Efficiency | >80% |
| Charging Current | 7.5A for 12V battery 3.75A for 24V battery 5.0A for 13.6V Power Supply |
| Back Current Drain* | <10 mA |
| Standby Power | < 1W |
| Operating Temperature | -20°C to 50°C |
| Type of Charger | Eight step, fully automatic, switch mode charging |
| Type of Batteries | 12V / 24V Lead-acid rechargeable batteries (WET, MF, VRLA, AGM and GEL); 12V Calcium batteries; Lithium: 12.8V; 4-cells LiFePO4 |
| Battery Capacity | Lead-acid: 12V: 18Ah-240Ah 24V: 10Ah-120Ah Lithium: 10-80Ah |
| Dimensions (LxWxH) | 219.3x90.8x60.8mm |
| Housing Protection | IP65 (Dust and Splash proof) |
| Weight | 0.95kg |
| 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-2M / BX-2D has extremely low back current drain.



Charging Phases

BENTON® BX-2M / BX-2D charger performs 8-step fully automatic charging cycle.



- 1) **Diagnosis** : The unique diagnostic function checks status of battery and ascertains if battery can accept charging.
- 2) **Recovery** and 3) **Softstart** : A deeply discharged battery of over 2.0V can be recovered and charged with pulse charging of small current.
- 4) **Boost** : Recovers severely discharged batteries under high voltage charge. Recommended to apply it at least once a year.
- 5) **Bulk** : 80% of energy is returned in this phase with maximum charging current.
- 6) **Absorption** : With use of declining current charging up to almost 100% is achieved.
- 7) **Analysis** : Checks status of charge. If battery does not retain energy, it must be replaced.
- 8) **Float** : Battery is fully charged and ready to use. The battery is maintained at maximum level by applying low current charge.

Trouble Shooting

| Problem | Indication | Possible Cause | Solution |
|--------------------------|-----------------------------|---|---|
| Charger does not work | Indicator lights are not on | a) Charger is not plugged in b) Poor electrical connection c) AC outlet is dead | a) plug in b) Check AC connections and make sure mains is switched on c) Check receptacle |
| Charger has no DC output | Flashing Red | a) Charging is interrupted in Phase 4 b) Charging is interrupted in Phase 7 | a) Battery is extremely sulphated, it must be replaced b) Battery cannot retain charge, it must be replaced |
| Charger has no DC output | Red ON | a) Battery is connected with reverse polarity poles | a) Check DC connection between charger and battery and make sure they are not short circuited |
| Charger has no DC output | Flashing Green | a) Charging is interrupted in Phase 2 | a) Battery cannot accept charge, it must be replaced |
| Charger has no DC output | Green ON | a) Lithium Battery may be defective / excessive current draw b) Lithium Battery may be severely sulfated | a) Dead battery, it should be replaced b) If battery cannot be de-sulfated, it must be replaced |
| Charger has no DC output | Flashing Yellow | a) Battery may be defective/excessive current draw b) Battery may be severely sulfated | a) Dead battery, it should be replaced b) If battery cannot be de-sulfated, it must be replaced |
| Charger has no DC output | Yellow ON | a) Battery is over voltage. | a) Damaged battery, it should be replaced |
| No charging Phases | Power Off | a) Poor contact from charger to battery b) Charger is not connected to battery over 2 mins | a) Check if connectors are not greasy or corroded and making a clean connection and there are no loose or damaged connection b) Charger is in energy save mode |



Declaration of Compliance

Tested and approved by and conforms to
 EN 60335-1
 EN 60335-2-29
 EN 62233:2008
 EN 55014-1
 EN 55014-2
 EN 61000-3-2
 EN 61000-3-3

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