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Read carefully for proper installation and operation.

INSTALLATION INSTRUCTIONS

BATTERY CHARGER BCU MODEL

BEFORE YOU INSTALL

HOTSTART's BCU battery charging unit provides float charging to batteries, allowing them to maintain their available voltage. The BCU is designed for use in locomotives, heavy equipment, mobile applications and other battery installations.

⚠ DANGER

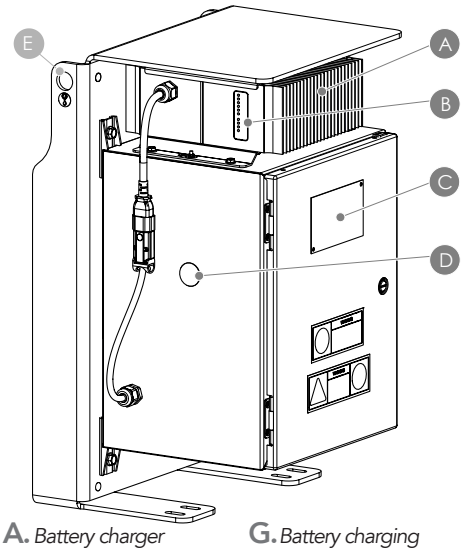
Hazardous voltage: Before wiring or servicing the charging system, turn off the power and follow your organization's lockout and tagout procedure. Failure to do so could allow others to turn on the power unexpectedly, resulting in harmful or fatal electrical shock.

⚠ CAUTION

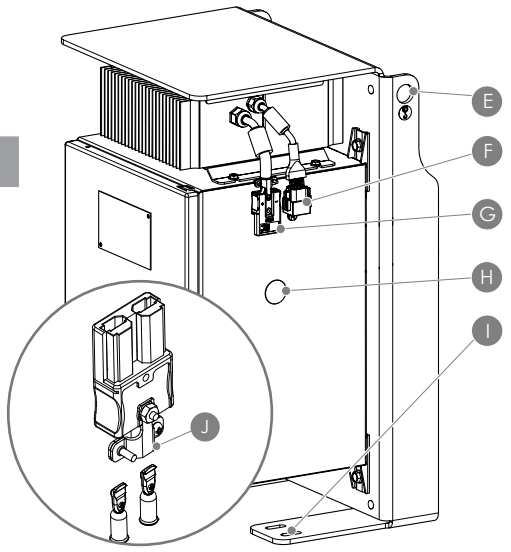
Electrical hazard: Power source must be properly grounded and in accordance with national and local electrical codes.

NOTICE

Read instructions carefully: The HOTSTART warranty does not cover any damage that a charging system may sustain from improper installation, improper operation, improper specification or corrosion. Before installing, be sure you have the right charging system for your application. Carefully read all instructions before installing and energizing your system. The safety of any system incorporating this charging unit is the responsibility of the assembler. The safe and proper use of this charging unit is dependent upon the installer following sound engineering practices. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. All applicable electrical safety standards defined by local jurisdictions must be followed. (Reference EU directive 2006/95/EC in EU countries.)



A. *Battery charger*
B. *Battery charger interface*
C. *Identification plate*
D. *Power in wiring entrance*
E. *Lift points × 2*
F. *Program connector (factory use only)*
G. *Battery charging connector*
H. *Power in wiring entrance*
I. *Mounting slots × 8 (0.41 × 0.75")*
J. *Battery charging connector for battery wire (shipped loose)*



INSTALLING THE CHARGER

INSTALL CHARGER

⚠ CAUTION

Proper lifting: Use proper lifting equipment and rigging to move this equipment. Create a plan before attempting to move. Proper lifting locations are identified with labels on each system; use these locations when lifting and mounting the system.

Improper mounting hazard: Reference charging system component drawings before mounting the system. Unless mounted properly, the charging system will be unstable.

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1. Mount the unit in a vertical orientation with charger directly above control box. Reference drawings for mounting position. When installing the charging system, HOTSTART recommends a minimum total front-to-back clearance of 26.5 inches (67.2 cm) to account for door swing.

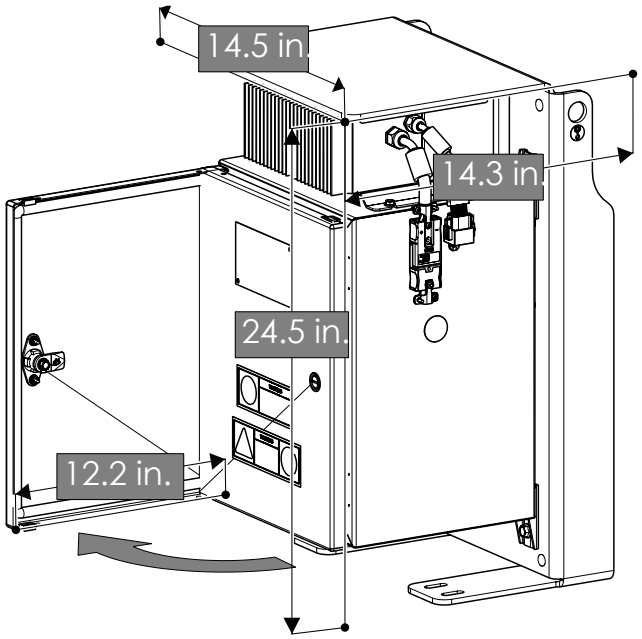


Figure 1. BCU dimensions. HOTSTART recommends a minimum front-to-back clearance of 26.5 inches (67.2 cm) to account for door swing.

2. Fasten charger in place using foot mounting slots (0.41 × 0.75").

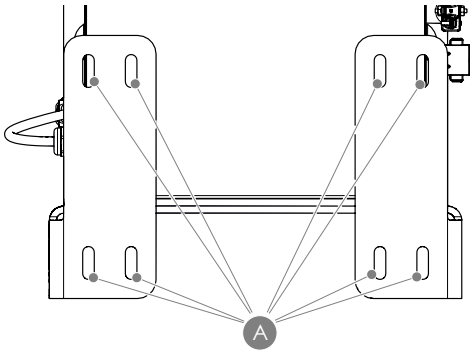


Figure 2. BCU underside, showing foot mounting slots **(A)**.

CONNECT BATTERY

1. Ensure BCU is not connected to battery or power source.
2. Locate supplied battery charging connector in control box.

   NOTE: Battery charging connector will accept wire sizes of 16 – 6 AWG

3. Strip battery positive and negative wires to 0.56" (14 mm). Slide positive and negative wires into connectors. **NOTICE!** Ensure correct position and orientation of connectors to avoid wire twisting.
4. Using appropriate crimping tool, crimp positive wire connector and negative wire connector.

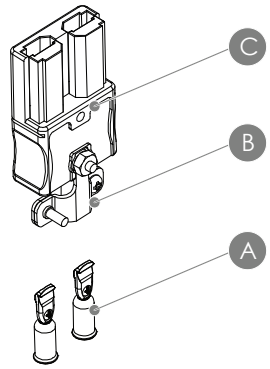


Figure 3. Battery connector, showing connectors **(A)**, *strain relief* **(B)**, *and housing* **(C)**.

5. Noting correct polarity, insert connectors into housing until connector snaps over spring.
6. Tighten cable strain relief.
7. Connect other end of cable to battery. Connect battery connector to BCU connector.

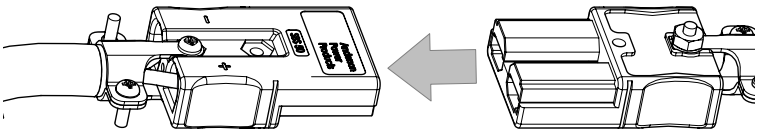


Figure 4. Connecting battery connector to battery charging connector.

CONNECT POWER SOURCE

1. Ensure power is disconnected.
2. Route power source wiring through either wiring entrance (0.875").

   NOTE: Power in wiring entrance may be knocked out to a larger diameter size if necessary.

3. Secure power source wiring using appropriate cable grip or cable strain relief (not supplied).
4. Connect power to the BCU circuit breaker CB1 terminals CB1:L1 **(A)** and CB1:L2 **(B)**. Connect main power ground wire to the ground block terminal **(C)**.

   NOTE: Do not connect to terminal L3. If connecting a three-phase power supply, connect two legs only.

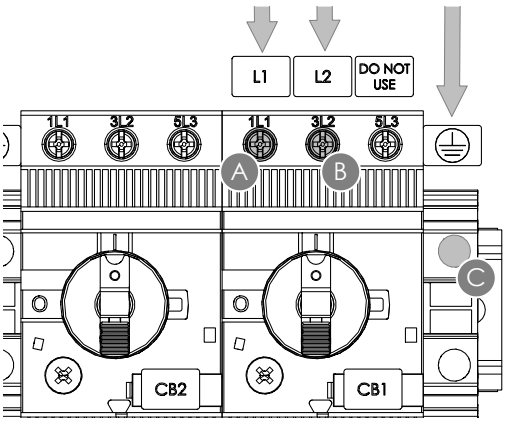


Figure 5. Connecting power source wiring to circuit breaker CB1:L1 **(A)**, *CB1:L2* **(B)** *and ground terminal* **(C)**.

CHARGING OPERATION

1. Connect battery charger to battery. Energize battery charger. For charging status, refer to BCU interface.

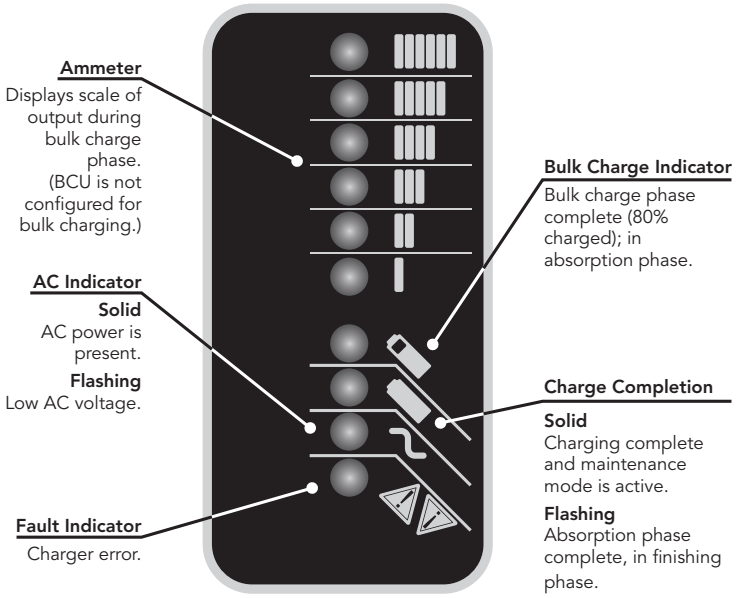


Figure 6. BCU charger interface.

- **Ammeter**
  The BCU is not configured for output scaling during bulk charging phase. Ammeter lights may not apply to BCU charging operation.
- **Bulk Charge Indicator**
  Displays solid when batteries have reached 80% charged status.
- **AC Indicator**
  Displays when AC power is present. If flashing, low AC voltage is present.
- **Charge Completion**
  Batteries have reached 100% charge status. BCU will now apply charging as needed.
- **Fault Indicator**
  A charger error is present. Battery charging may not occur normally.

TROUBLESHOOTING

AC Indicator Off	Problem	No AC power connected
	Possible Cause	➤ Missing/loose connection ➤ Tripped circuit breaker
AC Indicator Flashing	Problem	Low AC voltage present
	Possible Cause	➤ Low AC voltage power source ➤ Incorrectly configured for source voltage
Fault Indicator	Problem	Charger error
	Possible Cause	➤ Incorrectly connected battery ➤ Incorrectly connected power source ➤ Internal short circuit

Disconnect power source prior to opening control box or performing further troubleshooting/repairs. Ensure all electrical connections are secure. Check connections for correct polarity. Verify circuit breakers are not tripped. Verify power source voltage is correct and matches BCU transformer (if applicable) and circuit breaker settings. Reconnect power and check for AC Indicator and Fault Indicator lights for proper BCU operation.

CHARGER SOURCE VOLTAGE

⚠ WARNING

Electrical hazard: All electrical work must be done by qualified personnel in accordance with national, state and local codes.

System labeling: HOTSTART recommends relabeling BCU if modified from original factory shipped labeling to prevent connecting to incorrect power source voltage.

1. Ensure your BCU model can accept the power source. BCU models without transformers may accept 120, 208 or 240 volt power sources. Models with transformers may accept 460, 480, 575 or 600 volt power sources. **CAUTION!** Do not attempt to configure BCU for a voltage source that is not listed as an available power source for your model. Contact HOTSTART for additional voltage configuration options, as conversion may require additional or replacement parts.

BCU MODELS WITHOUT TRANSFORMERS

BCU Model Primary Voltage	Available Voltages (w/o parts)
120 V	208 V, 240 V
208 V	120 V, 240 V
240 V	120 V, 208 V

BCU MODELS WITH TRANSFORMERS

BCU Model Primary Voltage	Available Voltages (w/o parts)
480 V	460 V, 575 V, 600 V
575 V	460 V, 480 V, 600 V

2. Disconnect BCU from power source. Open control box lid. Locate circuit breaker CB1. Adjust CB1 setting to amperage setting listed on following page. **CAUTION!** Do not adjust CB2 amperage setting (if applicable).
3. Locate transformer T1 (if applicable). Disconnect and reconnect transformer jumpers to terminals positions listed on following page. Reference part drawings for specific model information.

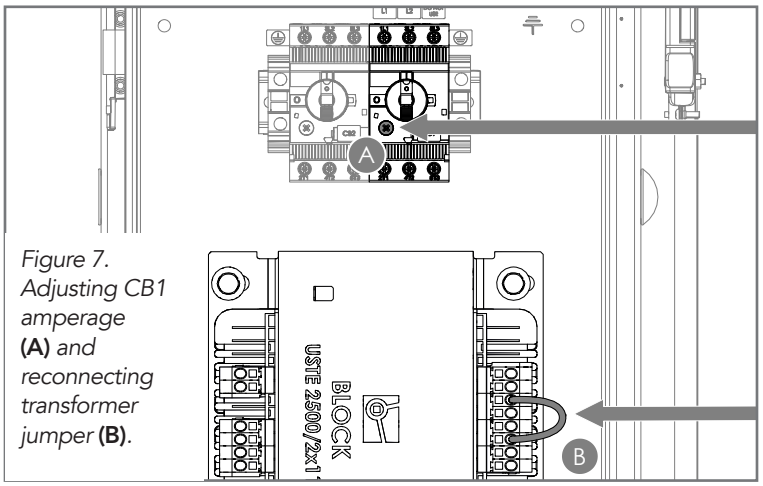


Figure 7. Adjusting CB1 amperage **(A)** *and reconnecting transformer jumper* **(B)**.

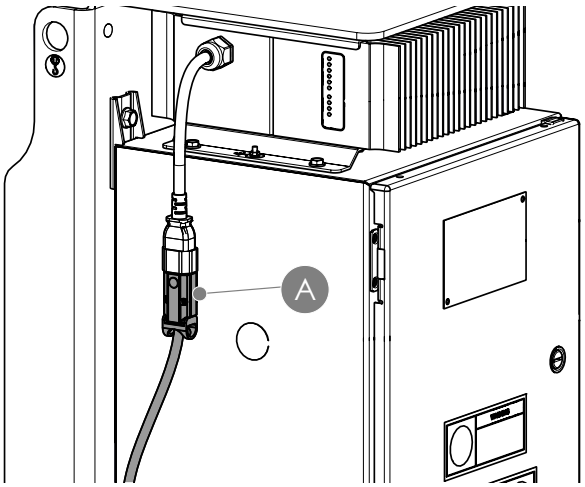


Figure 8. Testing BCU charger input cable for voltage **(A)**.

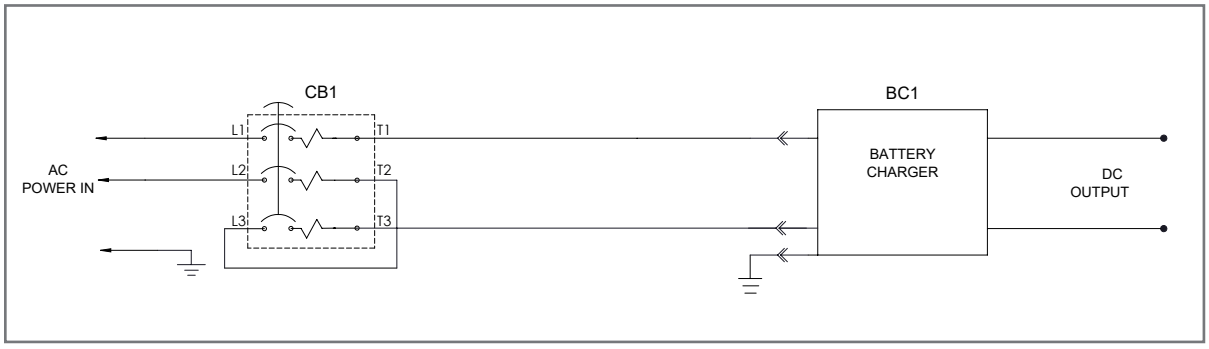
BCU Voltage	CB1 Setting (72 V)	Jumper Configuration
120	12 A	–
208	10 A	–
240	9 A	–
460	5.6 A	32-36
480	5.4 A	33-36
575	4.5 A	33-35
600	4.4 A	34-35

Table 1. BCU circuit breaker amperage settings and transformer jumper configurations.

4. Close control box lid.
5. Unplug charger input cable. Reconnect power source. Using an appropriately rated multimeter, test charger input cable for transformer output voltage (if applicable).

   NOTE: Charger will accept voltages between 108 V and 265 V. All transformer-equipped BCU models must have a transformer output voltage of 230 V ± 10 volts.

6. Reconnect charger input cable. Ensure BCU is connected to power source to resume battery charging. **WARNING**! HOTSTART recommends relabeling BCU for new power source configuration to prevent connecting to incorrect power source voltage.



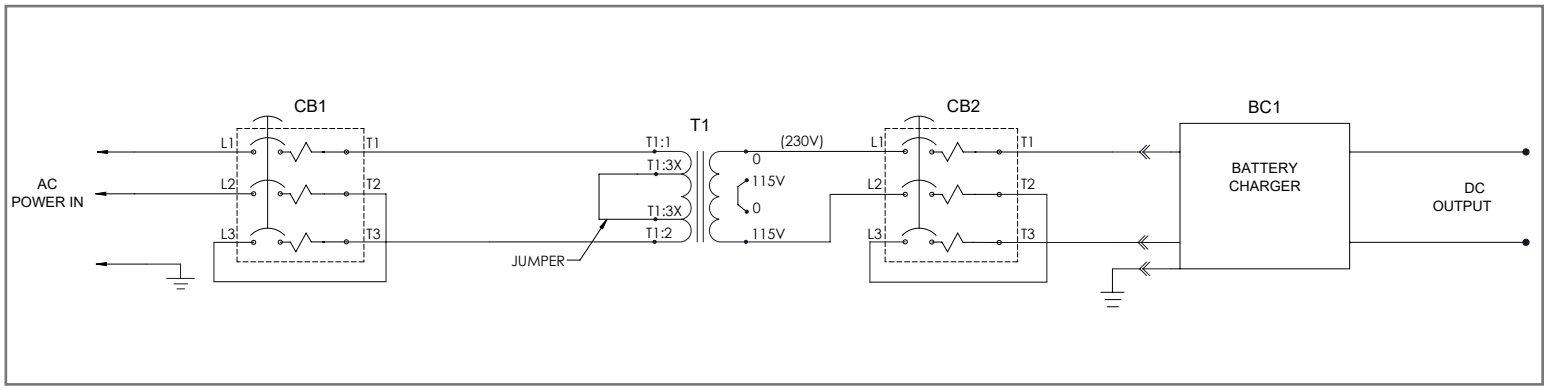


Figure 9. Example BCU wiring schematic for models without transformer (left) and wiring schematic for models with transformer (below). Reference electrical schematic drawing for proper wiring locations; illustrations are typical wiring schematics.