

Electric Vehicle DC-DC Installation and Wiring Guide

Belktronix

Initial Release 111206

Revised 053007

Rev 1.4

Document Revision History

- 1.0 Initial release
- 1.1 Revised 4” fan to 80mm fan, changed text to match labels, fan info & wiring text
- 1.2 Added detailed mounting information and instructions for the DC-DC
- 1.3 Added more clarity for wiring sizes and precharge schematic.
- 1.4 Added pictorial view of DC-DC mounting bracket and restructured detailed install

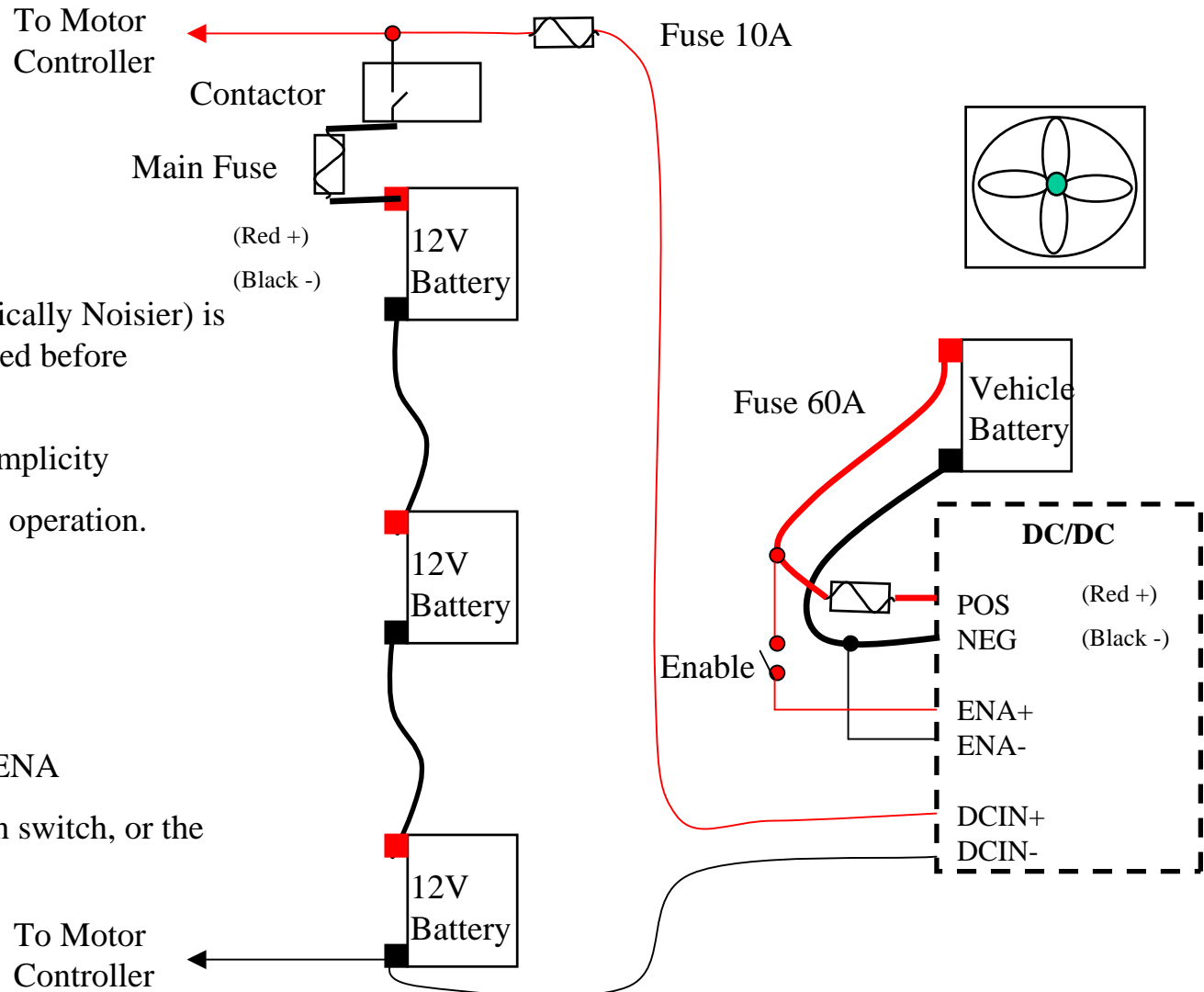
System Wiring

DANGER: Working with HIGH VOLTAGE Systems can be FATAL.

Follow Guidelines. Maximize Caution. Avoid Distractions.

- The following slides will show 2 possible system hookups to provide an overall final system installation view.
- Each wiring task is illustrated to make it easy to follow, point to point.
- Route low signal wiring away from high current wires.
- A 3 Traction Battery string is illustrated in the diagrams, your system will have more. Limit series connected batteries to 17. With $>1A$ load on the DC-DC Converter, limit series connected batteries to 20.
- Quickly make the final positive connections after pre-charging for 10 seconds.
- The external 80mm cooling fan is supplied by the user. Use fan to match battery voltage, supply on/off control. Avoid low CFM fans (super quiet type).
- Converter should be enabled after DCIN is powered.
- For main wiring that has a circuit breaker for battery maintenance, use a parallel switch and 10K resistor to re-establish charge prior to closing breaker.

DC-DC Power & signal wiring



Post Contactor Connection (Electrically Noisier) is completely isolated. Soft start required before enabling main contactor.

Traction Pack String, 3 shown for simplicity

Vehicle Battery required for DC/DC operation.

DC Input wire size 18 AWG

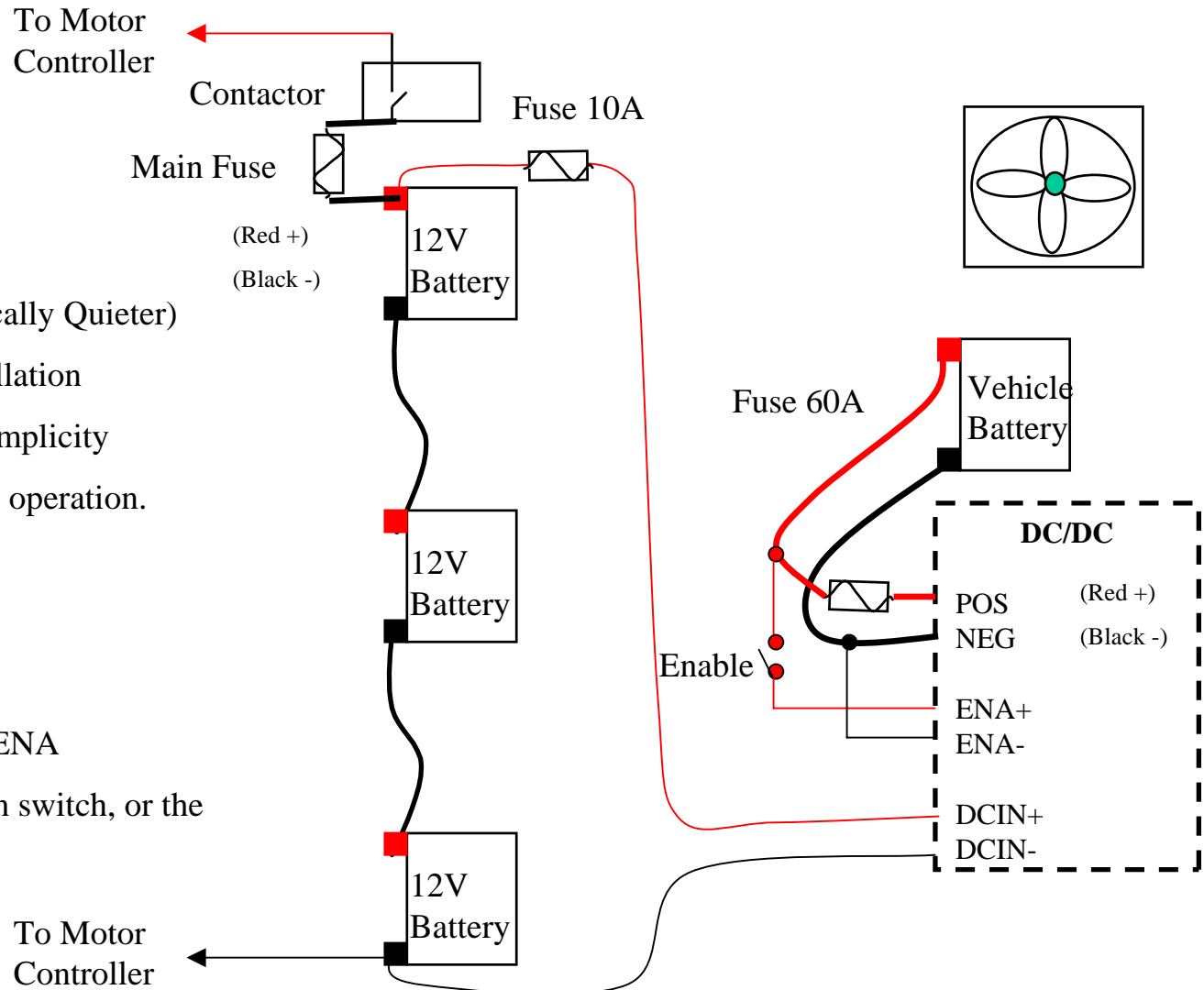
DC Output wire size 10 AWG

22 AWG Wiring for low signal

External fan can be in parallel with ENA

Enable can be a SPST normally open switch, or the Vehicle Ignition Run connection.

DC-DC Power & signal wiring



Pre-Contactor connection (Electrically Quieter)

Pre-charge only needed during installation

Traction Pack String, 3 shown for simplicity

Vehicle Battery required for DC/DC operation.

DC Input wire size 18 AWG

DC Output wire size 10 AWG

22 AWG Wiring for low signal

External fan can be in parallel with ENA

Enable can be a SPST normally open switch, or the Vehicle Ignition Run connection.

Mechanical Information

DANGER – USE CAUTION WORKING WITH HIGH VOLTAGE AND CURRENT!

Extra hands may be needed for this installation, if mounting holes are out of reach.

Use safe wiring practices and recommended fuse ratings.

Items included with DC-DC:

- (2) Threaded ¼-20 rods
- (4) ¼-20 Serrated shoulder nuts
- (2) ¼ Ring Lugs, 12-10Ga.
- (4) 0.250 Female insulated Fast-on terminals

Items Required:

10Ga Wire

18Ga Wire

Fuse Holders

Fuses (1) 10A 250V. (1) 60A Automotive (can use 2x 30A in parallel if 60A is not available)

Proper crimping tool required for Crimp lugs and Fast-on Terminals. Available at automotive stores.

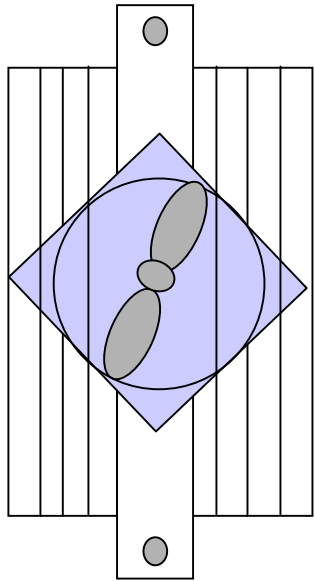
Detailed Mechanical Installation

- The 8.7" rectangular aluminum mounting bracket slides over the centermost fin of the DC-DC with the 2 fan mounting holes facing up. The ends are ¼ through holes for mounting the threaded rods to the mounting surface.
- Locate a flat area in engine compartment which is away from direct exposure to outside elements (i.e. front grill).
- Use aluminum mounting bracket as a template and mark holes to be drilled on vehicle chassis.
- Align DC-DC with fins facing you vertically if no external fan is used. Horizontal OK with fan.
- Drill through with ¼ drill (blind holes require proper drill/tap to use with ¼-20 thread).
- Run rods through mounting holes and secure on backside with serrated shoulder nuts. For blind holes, insert and turn threaded rods clockwise into threaded holes.
- Secure rubber mat to mounting surface with tape, place DC-DC onto rubber mat and hold in place.
- Insert topside bracket (bracket slot facing heatsink) onto centermost heatsink fin, sliding over threaded rods.
- Tighten topside serrated shoulder nuts onto bracket. Be sure DC-DC is secure. Install fan if needed.
- Wire up battery ground paths to DC-DC first. Hold ring lugs securely while tightening to DC-DC high current posts.
- Ready up positive wires to DC-DC but do not install yet. Cover exposed terminals.
- Choose method of wiring Pre or Post contactor for DCINwiring.
- For DCIN (+), Pre-charge with resistor lead for 10 seconds, then insert pre-crimped fast on to DCIN positive (red) chassis receptacle.
- For POS post, Pre-charge with resistor lead for 10 seconds, then connect ring terminal and secure tight.
- Wire up remote enable to switched 12V. You can use this to power the fan as well.
- Unit is ready to run when power is at DCIN terminals on the DC-DC and remote switch is enabled.

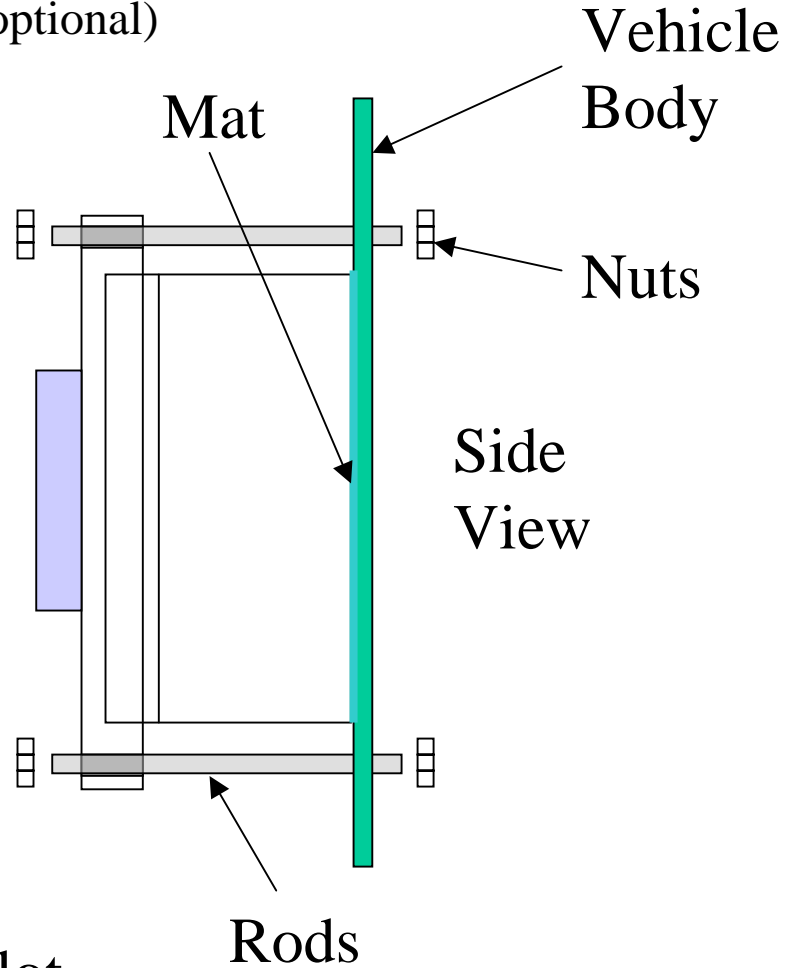
Mounting Diagrams

(Fan shown optional)

Top View



Side View



Bottom side bracket view

