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Solid State Battery Separator Users Manual



The **Ultimate Power's BSD Series Solid State Battery Separator (Dual Direction)** is the latest in a product line designed to give the owner the ultimate in hassle-free dependability and control of electrical loads balanced between starter and auxiliary batteries.

As it sounds, it separates the power generated by the cold-cranking OEM battery meant to start the alternator and motor from the deep-cycle auxiliary batteries working to operate vehicle appliances. Its primary purpose is to ensure that the failure or low output of one battery does not rob or incapacitate the entire electrical system.

Made of anodized aluminum with copper and tin-plated connectors and stainless steel locking nuts, our separator avoids the issues connected with past solenoids and isolators by being solid state.

Unlike a solenoid, it has no moving parts. Unlike a diode isolator, it has no diodes to increase the resistance of the circuit and to gather heat. It can control the flow of current to one or multiple batteries.

It carries a two-year advance replacement warranty, and has a connector that can act as a switch in the event that the operator wishes to bypass the circuit to draw power to the weakened or dead chassis battery.

The Ultimate Power Battery Separator is available in various models.

Key Features:

- **Prevents excessive battery discharge by automatically disconnecting loads.**
- **Weather Resistant, Compact size and low profile.**
- **Little Voltage Drop**
- **100% solid state design - No moving parts to cause arcing and electrical noise.**
- **Automatic shutdown protection for over temperature, short-circuit, over-current and loss of ground.**

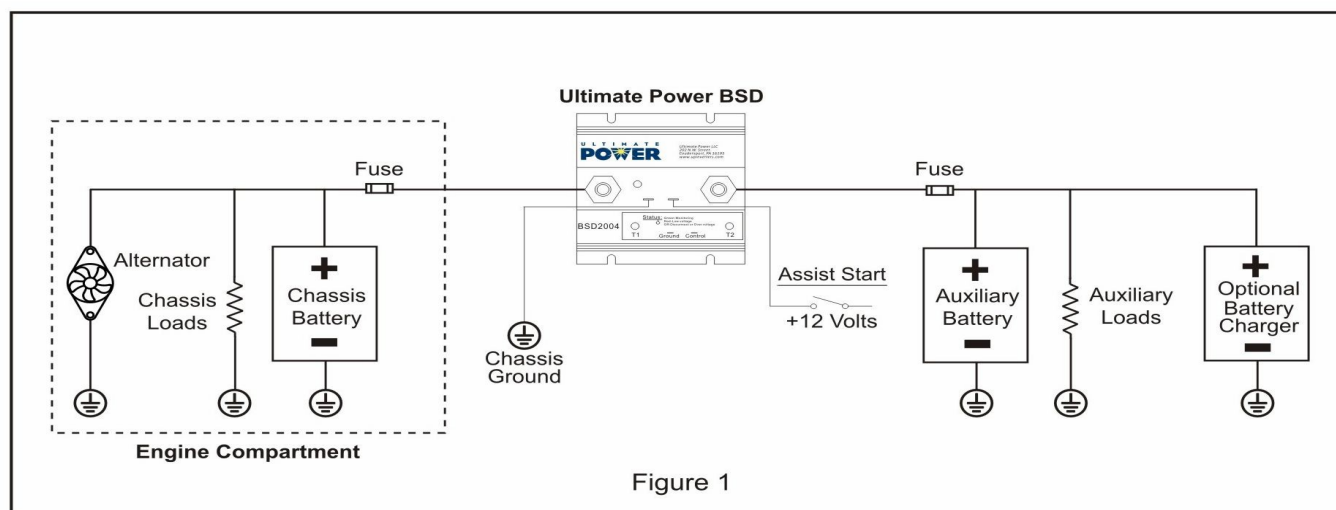
BSD Series Specification

Model NO	BSD125	BSD175	BSD200	BSD250
Rated Current@ Mount A*	125 Amps	175 Amps	200 Amps	250 Amps
Rated Current@ Mount B**	100 Amps	130 Amps	150 Amps	175 Amps
Max Voltage Drop @ Mount A*	0.33Vdc	0.34Vdc	0.24Vdc	0.24Vdc
Max Voltage Drop @ Mount B**	0.5Vdc	0.52Vdc	0.32Vdc	0.36Vdc
Logic Power Current Draw	5 milliamps			
Operating Voltage Range	+8 to +16 VDC			
Nominal Operating Temp	68°F / 20°C			
Over Current Trip	Over 110% for 500 milliseconds, resets every 20s			
LED Indicator Status	1 Solid Green: Connect 2 Solid Red: Low voltage cut off(both below 8V) 3 Flashing Red: Over voltage cut off(over 16V), freq 1Hz 4 Flashing Green: Over current or over temp cut off, freq 1Hz 5 Dim: Cut off			
High temperature protection	185°F / 85°C			
High temperature recover	140°F / 60°C			
Power Terminals	M10 copper stud with tin plating and stainless steel locking nuts			
Power Terminal Torque	10 to 15 Ft-Lbs			
Ground connection:	1/4 inch male faston blade terminal			
Dimensions	4 1/4" x 4 1/2" x 2 1/4" / 108x114x58 mm			5" x 4 1/2" x 2 1/4" 127x114x58 mm
Weight:	0.67Kg/1.48 lbs			0.8Kg/1.76 lbs

Mount A*: Mounting surface such as aluminum plate 1.5*4.5*25.5 inch or larger

Mount B**: Mounting surface such as woo, plastic or free air

System Diagram



Operation Chart

Separator Status	Voltage		LED Indicator	Operation
	Chassis Battery	Auxiliary Battery		
Connect	≥ 13.1 V	≥ 8.0 V	Solid Green	In the chassis battery and auxiliary battery, when the voltage of one rises above 13.1 volts for 20 seconds, and the other battery's voltage is above 8 volts, the BSD switch will connect the two batteries. If the BSD current is exceeded to 110% rated for 500 milliseconds, the BSD switch will turn off. It will automatically reset every 20 seconds.
	≥ 8.0 V	≥ 13.1 V		
Disconnect 1	< 13.1 and ≥ 8.0 V	≥ 8.0 V	Dim	Powered On
Disconnect 2	< 12.8 V	< 12.8 V	Dim	When the voltage of the combined batteries drops below 12.8 volts for 10 seconds the BSD switch opens, isolating the auxiliary battery from the chassis battery and alternator.
Disconnect 3	< 8.0 V	< 8.0 V	Solid Red	Low voltage
Disconnect 4	> 16 V	≥ 8.0 V	Flashing Red	Over voltage
	≥ 8.0 V	> 16 V		
Disconnect 5	≥ 13.1 V	≥ 8 V	Flashing green	Over current or over temp protection
	≥ 8 V	≥ 13.1 V		
Assist Start	≥ 8.0 V	≥ 8.0 V	Solid Green	The Assist Start function enables the BSD to connect the auxiliary battery to the over-discharged chassis battery to aid engine starting. It also enables an external battery charger to charge the auxiliary and chassis battery. When it is activated, the BSD offers a surge current of 150% rating for 2 seconds before it turns off. It will reset after removing the Assist Start control input and then reapplying it.

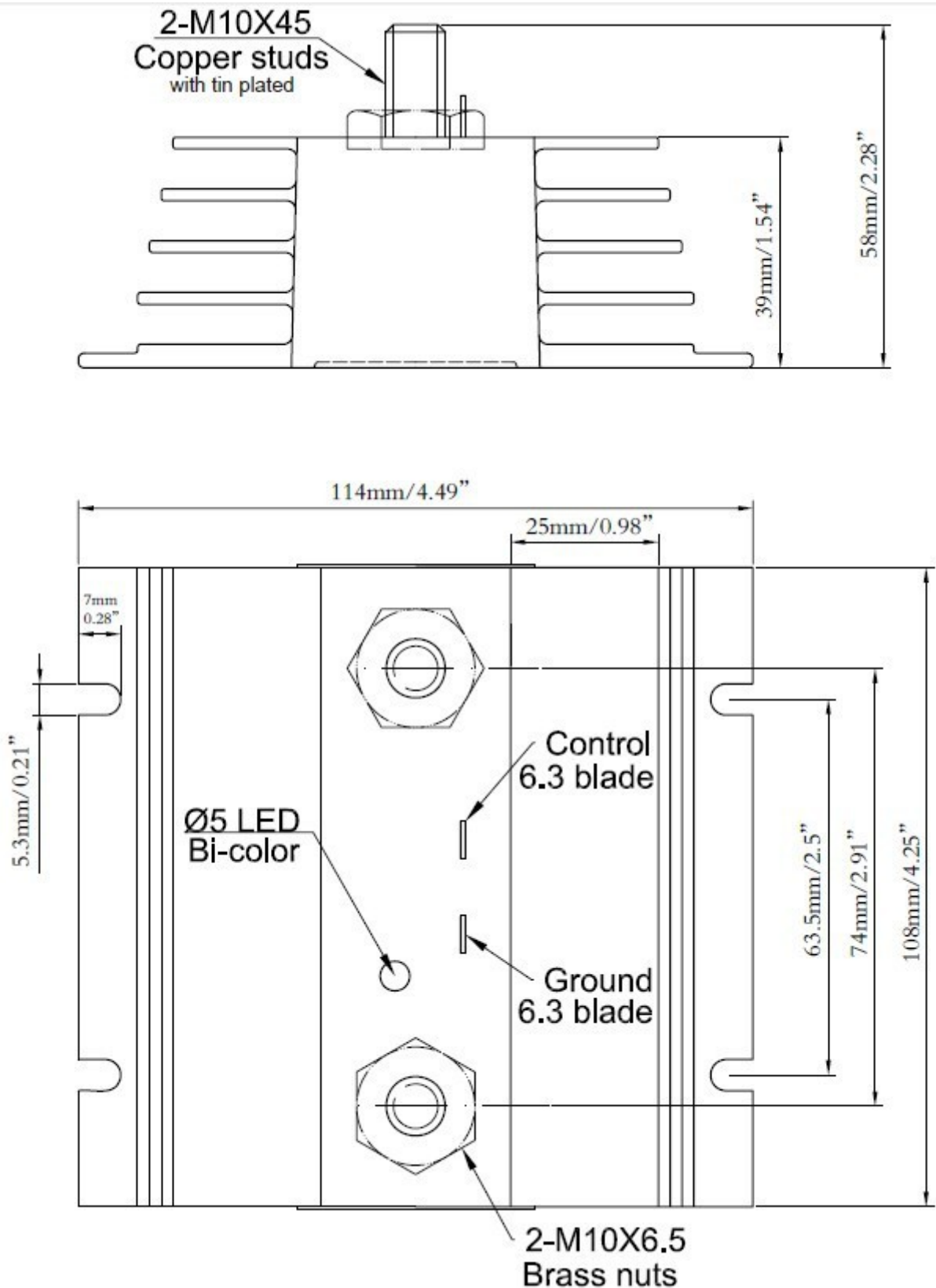
Installation:

DO NOT weld on the vehicle with the BSD installed as damage to the product may result. If electric welding is necessary, disconnect the cables attached to the T1 and T2 terminals. Damage due to electric welding while the unit is installed will VOID warranty.

Safety Precautions:

This product requires the installer to be trained for installation and work on vehicle electrical systems. We recommend that all wiring meet the SAE and applicable vehicle manufacturer's wiring specifications. Inspect the product and all other components for damage before starting the installation. Do not perform the installation if any problems exist.

Product Dimensions:



Mounting Location:

The BSD, although sealed, must be mounted in a protected and dry area. The BSD is not designed for exposure to saltwater spray, environmental debris or power washing. It must be mounted to a flat metal surface that maintains ambient temperature. The module must not be mounted in the engine compartment or any location near the engine's heat. Take into consideration the routing of the two battery cables. Connect only the battery cables to the BSD power terminals. Do not use these terminals for a junction post.

Grounding:

Proper operation of the BSD is dependent on a good quality ground system. Both the chassis battery and the auxiliary battery must be connected to a solid common ground. The BSD must be connected to this common ground. Connect a #16 AWG ground wire with a 0.25" blade socket to the common battery ground. Note that the best ground is at the chassis battery's negative terminal.

Battery Cable use:

A properly sized fuse must be installed in each cable connecting the BSD to the chassis and auxiliary batteries (Refer to Figure 1). Each fuse must be located within 16 inches of the respective battery.

Refer to Table A for the minimum fuse size for each BSD model.

Table A
Safety Fuse Size

BSD Mode	Minimum Fuse Size
BSD125	150 amps
BSD175	200 amps
BSD200	225amps
BSD250	275 amps

Connect the power cables:

Prepare the two cables to the batteries using a suitable size cable for the current required (recommended cable size: 2 AGW) and install a crimped lug terminal on the end. Install a fuse in each battery cable. The fuse rating must match the BSD rated current capacity. Terminal T1 is connected to the positive terminal of the chassis battery and terminal T2 is connected to the positive terminal of the auxiliary battery. Torque the nut to the torque of 10-15 Ft-Lbs.