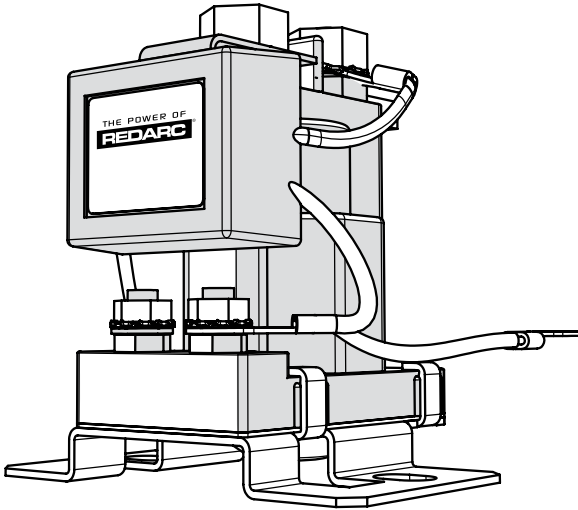


THE POWER OF

REDARC®

BMS Load Disconnect Isolator

SBI12-BLD



WARNING & SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains **IMPORTANT SAFETY INSTRUCTIONS** for the SBI12-BLD battery isolator.

DO NOT OPERATE THE ISOLATOR UNLESS YOU HAVE READ AND UNDERSTOOD THIS MANUAL AND the ISOLATOR is installed as per these installation instructions.

⚠ WARNING

RISK OF EXPLOSIVE GASES: Working in vicinity of a Lead-Acid battery is dangerous. Batteries generate explosive gases during normal operation. For this reason, it is of utmost importance that you follow the instructions each time you use the charger.

⚠ CAUTION

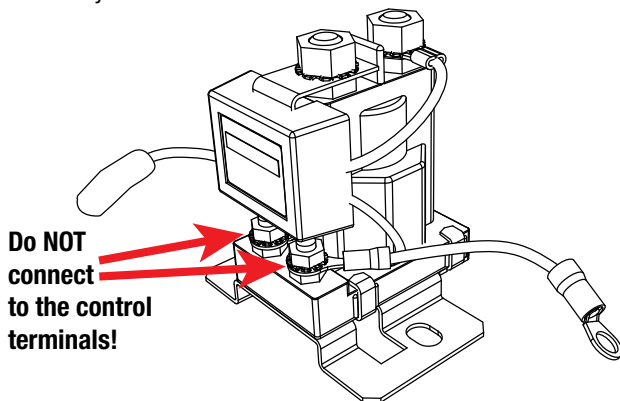
1. NEVER smoke or allow a spark or flame in vicinity of battery or engine. This may cause the battery to explode.
2. Be extra cautious so as to reduce the risk of dropping a metal tool onto a vehicle battery. Doing so might cause the battery to spark or might short-circuit the battery or other electrical parts that may cause an explosion.
3. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
4. A spark near a battery may cause the battery to explode. To reduce the risk of a spark near a battery when connecting the battery installed in a vehicle to the isolator, always do the following:
 - a) Position DC cords to reduce the risk of damage by the vehicle hood, door, or moving engine part.
 - b) Stay clear of fan blades, belts, pulleys and other parts that can cause injury to persons.
 - c) Determine which post of the battery is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see (e). If the positive the post is grounded to the chassis see (f).
 - d) For use in negative-grounded vehicles only. Connect the POSITIVE (RED) terminals from the Battery Isolator to the POSITIVE (POS, P, +) of the auxiliary battery. Connect the NEGATIVE (BLACK) lead to a metal part of the frame or the vehicle chassis, away from the battery. Do not connect the connect to the carburettor or fuel lines.
5. Personal safety precautions to assist with safely working with Batteries:
 - a) Consider having someone close by to come to your aid when you are working with the Battery.
 - b) Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
 - c) Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
 - d) If battery acid contacts your skin or clothing, remove the affected clothing and wash the affected area of your skin immediately with soap and water. If battery acid enters your eye, immediately flood the eye with running cold water for at least 10 minutes and seek medical assistance immediately.

NOTICE

1. Over discharge risk. Ensure that the Turn OFF voltage is suitable for the specifications provided by the battery manufacturer.
2. The SBI12-BLD is designed for controlling loads from an Auxiliary battery. Using the SBI12-BLD to isolate from a start battery will result in a state of charge too low to start the vehicle.

WARNING & SAFETY INSTRUCTIONS

3. The SBI12-BLD will achieve best results when proper battery maintenance is regularly performed. This includes but is not limited to checking water and specific gravity levels of the battery. Refer to the battery manufacturers manual for more details.
4. Fuses or Circuit breakers of appropriate rating must be installed to protect the vehicle system.
5. Fuses must be installed as close as possible to the battery.
6. **IMPORTANT!** Do NOT make any connections to the control terminals found on the front of the unit. Ensure that connections are not accidentally bridged between terminals whilst tightening. Connecting to the control terminals on the front of the SBI may cause damage to the unit and/or equipment connected to it. Connecting to the control terminals will void the warranty of the unit.



SPECIFICATIONS

System Voltage	12V Nominal
Turn ON Voltage	10.2V
Turn OFF Voltage	10.0V
Turn ON Delay	5 sec
Turn OFF Delay	10 sec
Instant OFF Voltage	9.0V
Max. Cont. Current	100 Amps
Max. Inrush Current	400 Amps
Standby Current	< 5mA
Operating Current	<0.1A
Dimensions	75 x 70 x 80mm
Weight	200g
Warranty	2 years
Standards	CE, C-Tick, AS/NZS CISPR11:2004
Main Stud Torque	5-6.2 Nm

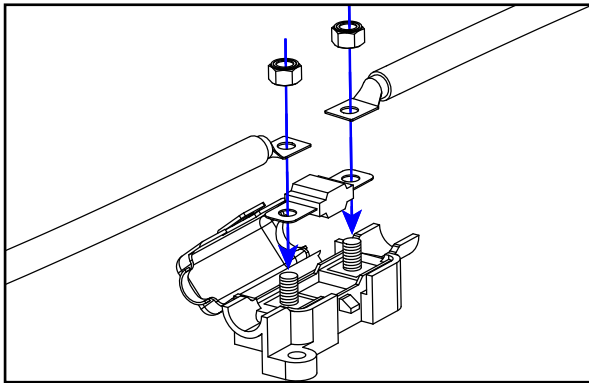
RECOMMENDED FUSES & CABLING

The SBI12-BLD is used in conjunction with a Redarc *Manager15* or *Manager30* battery management system in a 12V negative ground automotive system to protect the auxiliary battery from excessive discharge. Specifically designed for use as the load disconnect solenoid controlled by the BMS, the black (earth wire) should be connected to the load pin of the BMS. The BMS sets the turn on and turn off points through its settings and switches this black wire (earth when loads should be on, no earth when loads should be off), and there is additional voltage thresholds monitored by the SBI12-BLD to ensure reliable solenoid engagement. The Isolator monitors the auxiliary battery and when this drops below the Turn OFF voltage, the solenoid will open, disconnecting the load. The solenoid will close again when the auxiliary battery voltage reaches the Turn ON Voltage. A Delay Time is built into the unit for each transition to reduce the chance of chattering.

The voltage must remain at or above the Turn ON Voltage for a Delay Time ON period before the solenoid closes. Similarly the voltage must remain at or below the Turn OFF Voltage for a Delay Time OFF period before the solenoid opens.

RECOMMENDED FUSES & CABLING

Suitably sized Wire and fuses for the connected loads should be used. REDARC recommend using MIDI fuses along with a quality fuse holder to match. The diagram below shows the construction of a MIDI fuse installation (cables not included).



REDARC offer MIDI fuse kits containing the required fuses, fuse holders, crimps and nuts:

Part Numbers	
FK40	40A Fuse Kit
FK60	60A Fuse Kit
FK100	100A Fuse Kit

INSTALLATION INSTRUCTIONS

1. Mount the SBI12-BLD securely in a convenient location near the auxiliary battery bank. Do not mount in direct engine heat.
2. Install in the order described below:
 - Ground Connection. Connect the SBI12-BLD ground terminal to the BMS Load Disconnect terminal. Note: A good connection will ensure correct switching voltage.
 - Select correct Circuit Breaker/Fuse sizes and install at battery end of the positive cable
 - **LED Connections (optional)**. Connect a wire from the Blue wire of the SBI12-BLD to the positive end of an indicator LED (15mA limited current draw) or LED/resistor combination.
 - **Install and operate in conjunction with the BMS User manual.**

⚠ CAUTION

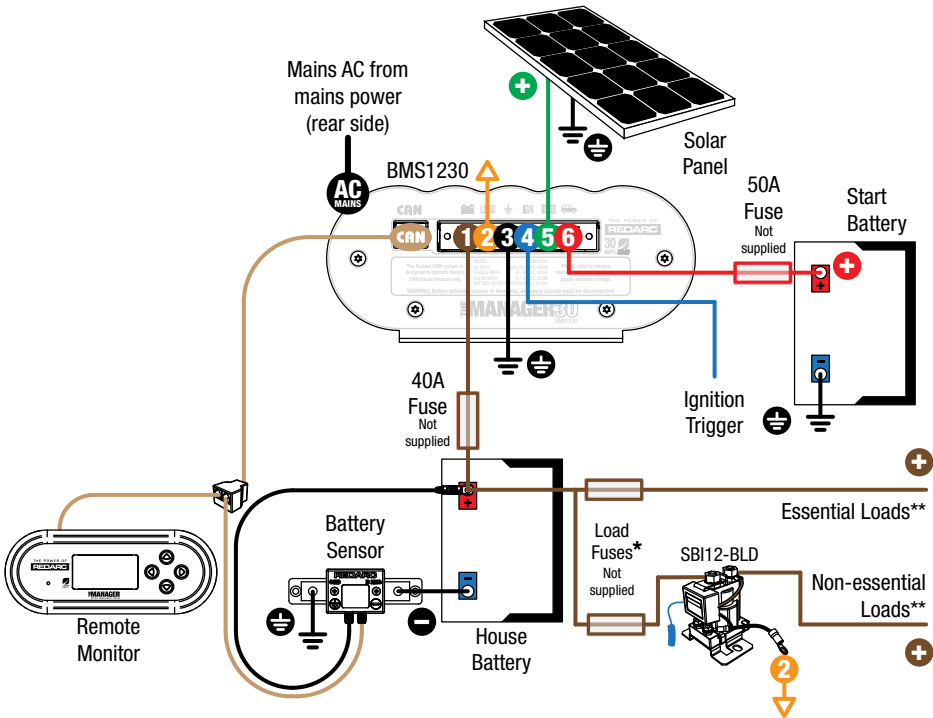
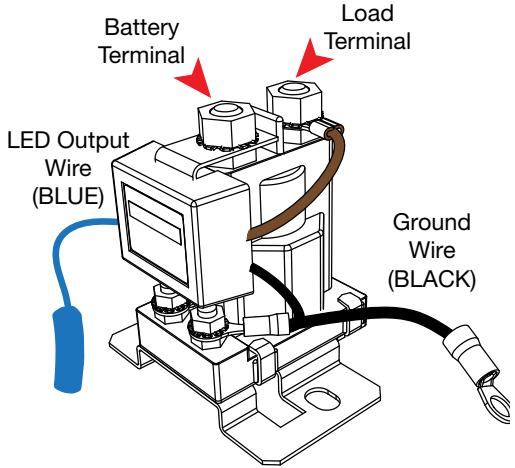
Over discharge risk. Ensure that the Turn OFF levels set on the BMS are suitable for the specifications provided by the battery manufacturer.

NOTICE

As per above, it is normal for the LED to stay ON whenever the auxiliary battery is in a condition suitable for running loads.

STANDARD WIRING DIAGRAMS

- Ensure adequately sized cable is used.
- Ensure the loads are properly grounded to a common chassis earth point.
- Ensure the SBI12-BLD ground wire is wired to the load Disconnect terminal of the BMS.
- When using fuses make sure that the fuse makes a good low resistance connection.
- Fuse/Circuit Breaker ratings are dependent on the type of installation and the size of the loads.



* The size of this fuse relates to the total current draw of all the loads connected to the House Battery, and should be rated slightly higher than this.

** Essential loads are loads which must be left on at all times, until the battery is flat. Non-essential loads are those switched off when the battery reaches a particular low-charge level, which can be set in the *'Advanced Settings' menu*.

FAULT INDICATION

NOTE: The LED will be on when the SBI12-BLD is active (on).

Should a fault occur, the SBI12-BLD is set to notify the operator of the fault. The LED will flash repeatedly with the following sequences:

CODE 1	2 Flashes	Over-Voltage
CODE 2	3 Flashes	Voltage Drop or Excessive Current Draw Fault

FAULT CODE 1: 2 Flashes (Over-Voltage Detection)

If the battery connected to the SBI12-BLD should rise above 16.5 Volts the Smart Start® will:

- Disconnect, to prevent the source of over-voltage reaching the load
- Flash the LED 2 times for 20 seconds, then reassess the fault condition, continuing until the fault is cleared.

FAULT CODE 2: 3 Flashes (Voltage Drop / Excessive Current Draw)

If the SBI12-BLD detects a voltage drop across its contacts of greater than 1 Volt for more than ½ second then the unit will:

- Immediately protect itself and the load by disconnecting the load; and
- Flash the LED 3 times for 20 seconds, then reassess the presence of a fault, continuing until the fault is cleared.

FREQUENTLY ASKED QUESTIONS

Question: Is the unit protected against voltage spikes?

Answer: Yes, the SBI12-BLD incorporates a number of spike protection components specifically designed to reduce the risk of damaging the unit. The SBI12-BLD is also designed to prevent any spikes generated by the solenoid coil from affecting any vehicle equipment.

Question: What does the red LED indicate?

Answer: The red LED indicates the solenoid is activated and therefore the battery is supplying power to the load. A flashing red LED during operation indicates a fault. See *Fault Indication* on page 6.

Question: Can the voltage limits and time delay settings be changed?

Answer: Yes! Both upper and lower voltage limits & on and off times can be changed. However, this needs to be done at the time of manufacture and will incur a cost.

Question: We are experiencing repetitive switching of our SBI12-BLD. What could be causing this?

Answer: This can occur for one of two reasons. Firstly, switching an excessively large load which would drop the battery to below its lower voltage limit and causing the SBI12-BLD to turn off. After turning off the load, the battery would recover in voltage; if the battery voltage climbs higher than the turn on threshold, the SBI12-BLD would turn the loads back on.

Secondly, voltage drop due to cable length (ie the SBI12-BLD being mounted too far from Auxiliary battery) can cause the voltage at the battery terminal on the SBI12-BLD to be lower than at the auxiliary battery, which can also cause the unit to switch off. Voltage seen by the SBI12-BLD will now rise again until the SBI12-BLD switches back on. This switching will continue until the cause of voltage drop is removed. On and Off Time delays are built into the product to avoid the solenoid contacts chattering in this scenario.

Question: Can I use the SBI12-BLD on a positive chassis vehicle?

Answer: Yes. Please contact REDARC for further information.

WARRANTY

LIMITED WARRANTY

For full warranty terms and conditions, visit the Warranty page of the REDARC website. Refer to the web address and contact details applicable to your region.

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www.redarc.com.au/warranty

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