

## SmartGuard Owners/Installation manual – Battery protection model

### READ THE ENTIRE MANUAL BEFORE INSTALLATION

SmartGuard ensures your batteries do not become damaged as a result of excessively deep discharges by shutting off the entire electrical system in the event that the battery voltage falls below a level deemed to be that which can severely shorten the life of wet and/or gel cell batteries. This level is dependent upon the time during which the voltage is low and the ambient temperature.

The reset switch incorporates an integral LED. In normal mode (“standby”) this LED will be unlit. When the LED starts to blink this indicates the unit has entered the “shutdown imminent” mode and the system will be disconnected 4 minutes later if the battery voltage does not return to normal. Once SmartGuard has disconnected the system, the LED will be on solid (“shutdown”).

Once shut down, the only way to reconnect the system is by pressing the SmartGuard Reset switch.

SmartGuard incorporates an inhibit input (marked “ALT” on the PCB). This input will prevent the unit shutting the electrical system down if a 12 volt feed is provided to it. This could be used to ensure the system remains active under the control of another system. This input is optional. If it is ignored (ie no connection is made to it) SmartGuard will operate as normal.

**WARNING** Under no circumstances must this input be provided with a permanent 12 volt feed.

Certain loads require a permanent power feed in order to function and therefore SmartGuard incorporates a “bypass” output which remains connected to the battery even after shutdown. This output would typically be used for such items as radio memory backups or tracker equipment. The bypass output is rated to provide 35 amps but it is not recommended to use such high current for several reasons.

Firstly the whole purpose of SmartGuard is to prevent excessively deep battery discharges. All equipment connected to the bypass output will continue to drain the battery. For this reason only connect equipment that **MUST** have a permanent feed.

Secondly (and perhaps more importantly) higher current draw from this terminal would require heavier gauge wire to be used in the installation of SmartGuard in order to ensure correct and reliable operation.

SmartGuard should be installed by reference to the wiring diagram in conjunction with the following notes.

1. 1.5mm<sup>2</sup> cable should be used for all interconnections between the SmartGuard control unit, the reset switch and the relay.
2. The fuse in the power feed to SmartGuard should be a 5 amp fuse fitted as close to the battery as possible.

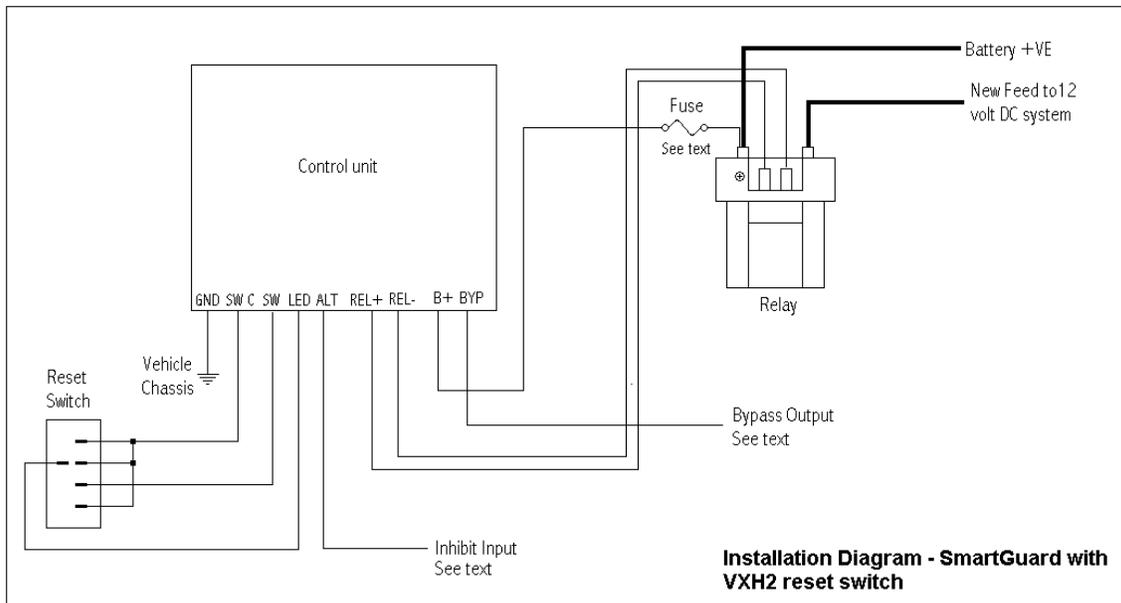
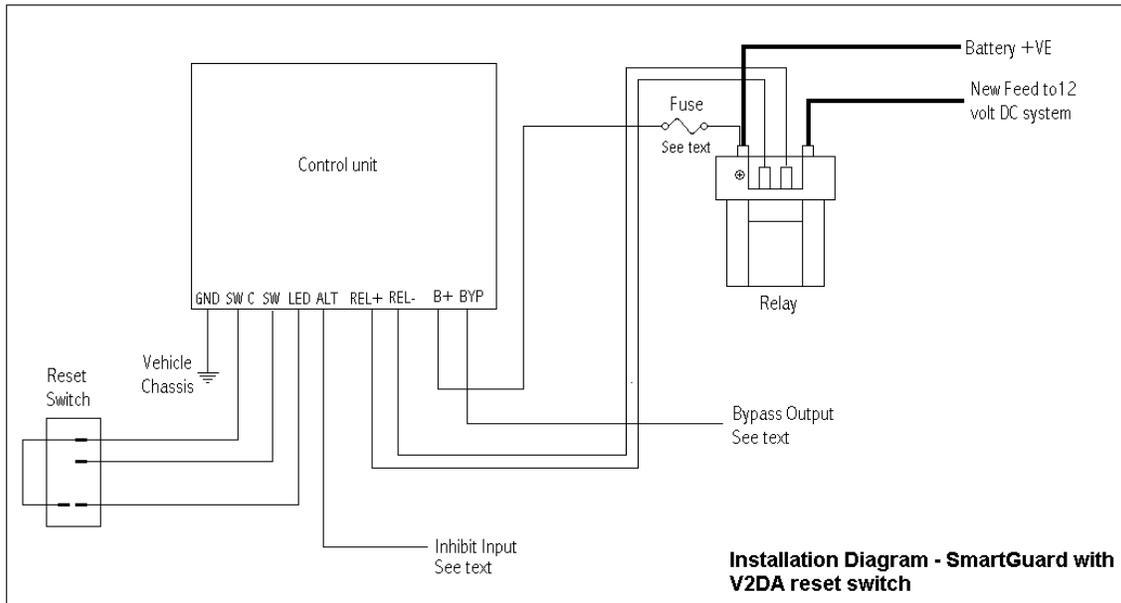
**WARNING** All connections must be soundly and solidly made using the correct crimping tool for the spade connectors (or soldered joints). Any form of bad or loose connection could conceivably result in the system shutting down when the batteries are not deeply discharged.

3. The reset switch should be fitted in a prominent position that is easily visible in order to warn the operator that the system has been shut down
4. Ensure the connections to the relay coil are the correct way round ! Failure to ensure this will result in the relay having exactly the opposite action to that required. The terminal marked “REL –“ on the PCB should be connected to the unmarked coil contact on the relay. The terminal marked “REL+” on the PCB should be connected to the coil contact marked with a “+” on the relay.

**WARNING** Incorrect connections to any of the terminals may cause permanent damage to the unit which will not be covered under warranty.

### **Installation and usage notes**

SmartGuard will not allow the reset button to attempt to *close* the relay unless it was actually SmartGuard that *opened* it in the first place. For this reason it may be found that, following installation or trouble shooting (for instance if the relay was installed or supplied in the latched open position) the relay is latched in the open position and therefore the entire electrical system is shut down. It would seem that there is no way out of this situation without disconnecting the relay and manually connecting it to the batteries temporarily to reset it. This is not the case. Simply press the reset switch and HOLD it pressed. After approximately 6 seconds the LED in the switch will start to blink. Releasing the switch whilst the LED is blinking will force the relay into the latched closed position.



**Specifications.**

**Current consumption:-**

|                                |                   |
|--------------------------------|-------------------|
| Standby                        | < 0.2mA (< 200uA) |
| Relay actuation                | < 3 Amps          |
| Shutdown                       | < 12mA            |
| Normal voltage operation range | 10 to 16 volts    |

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