

## **SmartGuard, PowerGuard Owners/Installation manual – Engine start model**

### **READ THE ENTIRE MANUAL BEFORE INSTALLATION**

Throughout this manual the equipment is referred to as PowerGuard. SmartGuard has identical features and functions.

PowerGuard ensures your vehicle engine will always start by shutting off non essential items of electrical equipment in the event that the battery voltage falls below a level deemed to be that which will prevent reliable starting. This level is dependent upon the time during which the voltage is low and the ambient temperature.

### **IMPORTANT NOTE FOR ROAD VEHICLES**

Please note that in the case of road vehicles, and for two entirely separate reasons, there are limits to what can and cannot be isolated from the engine start battery.

Firstly, due to European legislation, any equipment that affects the control or safety of the vehicle must not be isolated from the battery. Such equipment includes, obviously, the engine management system, all external factory fitted driving lights, hazard warning lights, anti lock braking systems, traction control systems etc. The list contained here is by no means exhaustive and to isolate such equipment would contravene the European Automotive Directive.

Secondly, most modern vehicles incorporate quite complex electronic control units (ECUs) supervising the engine management system and monitoring safety equipment such as external driving lights, anti lock braking systems, traction control systems etc. To disconnect any of these from the battery often causes the ECU to generate an error. In worst case scenarios it can force the engine management system into “limp home” mode necessitating a trip to the main dealer to have the system reset.

Such equipment should continue to be connected as per the original factory installation and only the non essential equipment should be rewired via the PowerGuard/SmartGuard latching relay.

If in any doubt about what equipment can or cannot be isolated please refer to your dealer or a qualified auto electrician.

This restriction does not apply to marine installations.

### **END OF NOTE FOR ROAD VEHICLES**

The reset switch incorporates an integral green 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 PowerGuard has disconnected the system, the LED will be on solid (“shutdown”).

### **IMPORTANT NOTE FOR ROAD VEHICLES**

The reset switch and LED must not be placed in view of the driver as this may cause a dangerous distraction and/or confusion.

### **END OF NOTE FOR ROAD VEHICLES**

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

Certain loads require a permanent power feed in order to function and therefore PowerGuard 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 PowerGuard is to retain sufficient power in the battery for engine starting. 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. A list of “**MUST**” have equipment would typically be the radio memory backup, clock and alarm/immobiliser.

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

PowerGuard 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 PowerGuard control unit, the reset switch and the relay.
2. The fuse in the power feed to PowerGuard should be a 5 amp fuse fitted as close to the battery as possible.

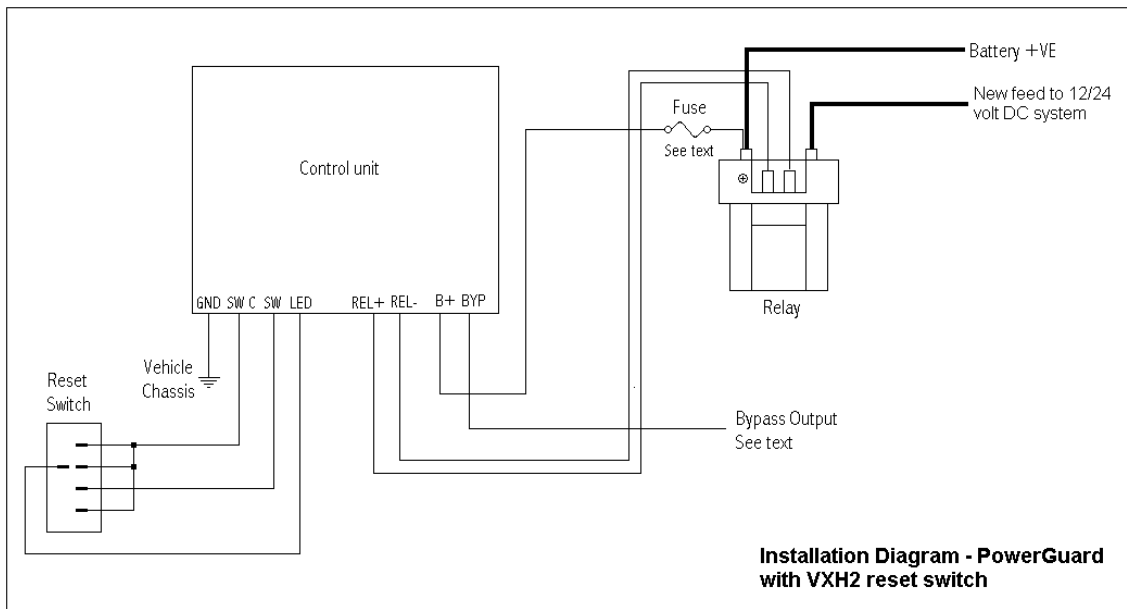
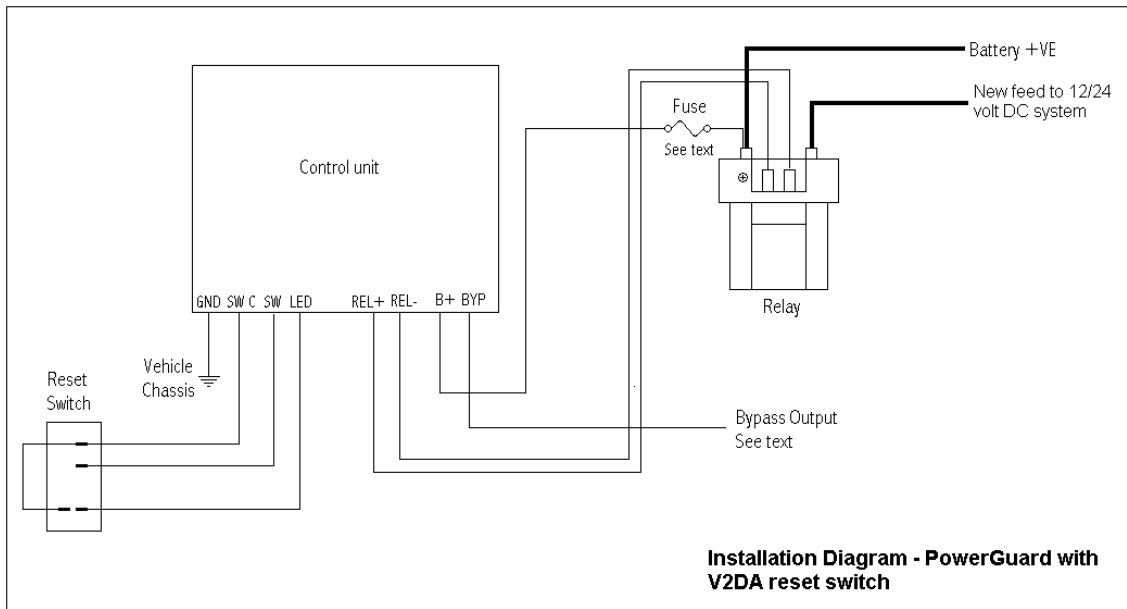
**WARNING** All connections must be soundly and solidly made using the correct crimping tool for the spade connectors (or soldered joints). Any form of bad or loose connection could conceivably result in the engine shutting down whilst driving or other malfunctions

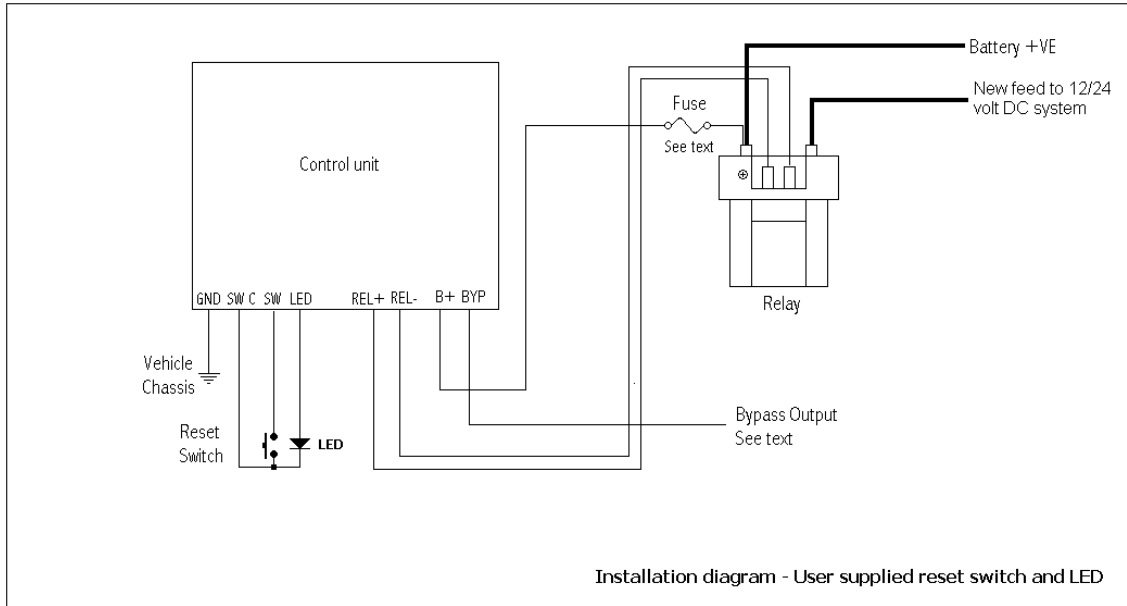
3. In the UK a legal requirement is that the hazard warning lights must have power available at all times. For this reason they should be powered directly from the battery side of the disconnect relay via their own fuse. The fuse should be of the same rating that the vehicle currently uses in the fuse box and the cable must be of at least the same gauge as that in the wiring harness. For installation in vehicles in other countries the installer should check the relevant legislation. If in doubt, err on the side of caution and ensure a permanent feed is available to the hazard warning lights.
4. The reset switch should be fitted in a prominent position within the vehicle cabin where the LED can clearly be seen from the driving position.
5. 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**

PowerGuard will not allow the reset button to attempt to close the relay unless it was actually PowerGuard 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 supplied or installed in the latched open position) the relay is latched open 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 the coil to the batteries temporarily to reset the relay. This is not the case. Simply press the reset switch and HOLD it pressed. After approximately 6 seconds the LED will start to blink. Releasing the switch whilst the LED is flashing will cause the relay to reset to the closed position.





Specifications.

Current consumption:-

Standby	< 0.2mA (< 200uA)
Relay actuation	< 3 Amps
Shutdown	< 12mA
Normal voltage operation range	10 to 16 volts (20 to 32 volts for 24 volt systems)

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[www.smartgauge.co.uk](http://www.smartgauge.co.uk)