CHARGEGUARD®

automatic ON //// OFF timer switch

- **Fast, easy installation**
- **Rugged, durable construction**
- **Completely self-contained**
- **Saves on battery wear & tear**
- **Multiple Sensing Methods**
- **Made in USA**

U.S. Patent 4,950,913
U.S. Patent Pending
Canadian Patent 2,013,888
Canadian Patent Pending

Rev. 1/06

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FEATURES

- Easy, In-line Installation
- Microprocessor Based
- 30 Amp Load Current Rating
- Reverse Polarity Protection
- Hi & Lo Voltage Disconnect
- Selectable Timeout Delay
- Selectable Functions
- Shutdown Pre-warning
- Emergency Bypass
- Patented and Made in USA

BENEFITS

1. Extend battery life
2. Reduce maintenance problems
3. Warn of electrical system problems
4. Reduce equipment installation time
5. Equipment is always on when you want it on
6. Allow for the safe shut-down of computers before the CHARGEGUARD® removes power.

— SPECIFICATIONS —

OPERATING VOLTAGE (nominal)	13.8V
LOW VOLTAGE DISCONNECT	11V
STAND-BY CURRENT	15MA
OPERATING CURRENT	80MA
LOAD CURRENT RATING	30 Amps
MINIMUM TIME DELAY	5 sec. or 15 Min.
SELECTABLE TIME DELAY	1--16 Hrs. & Infinity

WHAT'S NEW

ENGINE SENSING: It is an alternative to the default "Normal" sensing method except that it is detected at the "ES" lug instead of the "BAT" lug. A small #18 gauge wire can be run directly to the battery from there. This allows for greater flexibility in locating the Chargeguard® unit and eliminates falsing caused by noisy power supplies and data sources. Placing the jumper on pins 2&3 of P6 enables this function.

DC ONLY SENSING: In some cases it is not necessary to detect the AC component from the vehicle so only the DC component is utilized. To select this option, connect the input lead to the "BAT" lug and set jumper P2 pins to position 3&4. This also has applications in fixed equipment where AC signals are not always present.

EMERGENCY OVERRIDE: Depressing the button for three seconds will shut down the Chargeguard® unit provided there is no active input signal. Also, the timeout is now the same as the selected delay time instead of only fifteen minutes.

WHAT'S NEW Continued

PRE-WARNING OUTPUT: This feature is specifically for computers and other devices that cannot withstand an abrupt removal of power. It provides a signal at the "PW" lug two minutes prior to the end of the time-out period to allow for an orderly shut-down.

DISABLE TIME SETTING: Provides a means to disable the users access to time delay programming. It is selected by removing the jumper from P3 pins 1 & 2. This function prevents the user or servicer from accidently changing the time delay setting.

HIGH/LOW: This is an entirely different method of triggering the Chargeguard® unit. Applying either a Low (<4vdc) or a High (>8vdc) to the "HL" lug will simulate an engine running condition. Removing the signal will cause the Chargeguard® to begin the time-out. A High voltage input is accepted with the jumper installed on pins 3&4 of P3. A Low voltage is accepted with the jumper removed or placed on pins 3&4 of P6. This can also be used as an ignition switch connection.

DESCRIPTION

The CHARGEGUARD® unit provides protection for the battery against excessive discharge, the convenience of turning your two-way radio or computer on and keeping it on after the engine is turned off.

With built in sensors, it automatically turns your mobile equipment on when you start the motor. Likewise, when you turn the motor off, the radio stays on from five seconds to infinity depending on the selected time delay setting. Additional features are built in including the protection of both the battery and connected equipment.

- The **First** feature is the ability to select various time delays before the unit will turn your radio off automatically. This delay begins the instant the motor is turned off or the "HL" input signal is removed. Selection is made via two push buttons in the time increments as indicated on page 12 of this manual.

DESCRIPTION Continued

- The SECOND feature is the flexibility to choose from several different trigger methods. Select the original "NORMAL" method that the Chargeguard® is famous for, which senses activity from the battery lead attached to the "BAT" lug for the easiest installation. However, in some cases where there is excessive continuous noise or special applications, one of the alternate trigger methods may be more appropriate. The noise problem can be resolved by running a separate #18 gauge lead from the "ES" terminal directly to the battery. The Chargeguard® can also be made to operate on "DC ONLY" which responds to a rise and fall of battery voltage only. Another choice is the "HL"input which accepts either a switched low or high voltage to simulate an engine running condition. A jumper change is all that is needed to make these selections. The appropriate jumper selections are shown on page 10.

DESCRIPTION Continued

- The **THIRD** feature provides a convenient means to turn your radio on long enough to get help when the motor won't start, or the alternator is inoperative. Simply push the Emergency Override button on the side of the unit, as indicated on page 13, to restore power to the radio for the preset time period. However, it will shut down if the vehicle battery stays below 11 volts for 15 continuous minutes. Holding the button in for 3 seconds will also turn the Chargeguard® off as long as there is no active input.

- The **FOURTH** is a new feature providing pre-warning output to alert computers that the Chargeguard® will turn off in two minutes, giving ample time for an orderly shutdown. The signal is available at the "PW" terminal.

- The **FIFTH** feature is the ability to easily alter parameters for unique situations due to the Microprocessor based design. However, this is only available as a factory option at this time.

DESCRIPTION Continued

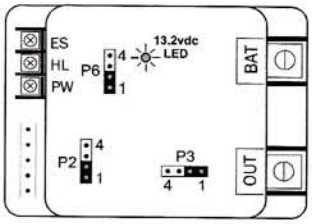
- The **SIXTH** feature is **complete voltage protection.**

  Low Voltage—An 11 volt detector takes priority over the delay time and turns the output off in 15 minutes. This protects a poorly charged battery from excessive discharge regardless of the remaining delay before normal dropout. Below 10 volts, the Chargeguard® unit turns itself off to further protect the battery. Both conditions are restored when the engine is started and the vehicle voltage returns to normal.

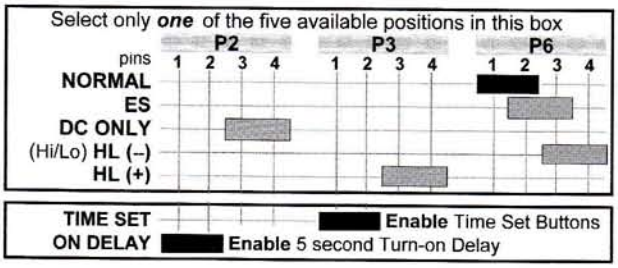
  High Voltage—An 18 volt detector helps protect the radio and computer equipment from an erratic voltage regulator or improper jump start. It's purpose is to protect against catastrophes. However, it *DOES NOT PROVIDE SURGE PROTECTION.*

  Reverse Polarity—The unit will not operate when the voltage is reversed. It helps protect both the radio equipment and the Chargeguard® unit from inadvertent damage resulting from an improper installation or jump-start.

JUMPER SETTINGS



The **Black** jumpers below are in the **default** positions from the factory. Move the **Normal** jumper to any one of the **Gray** jumper locations to select an alternate sensing method. ***See page 11 for details.***



JUMPER SETTINGS Continued

ES (Engine Sense) uses exactly the same detection method as "Normal" except it requires a separate small signal lead from the **"ES"** lug directly to the battery.
See page 4 for details.

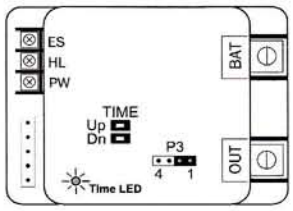
DC ONLY is installed and operates exactly the same as "Normal" but omits the detection of the AC component. Only a jumper change is required as shown on page 10.
See page 4 for details.

HL (High/Low) is a separate trigger input that simulates a motor running condition. A ground or positive DC voltage is required at terminal **"HL"** to trigger the unit.
See page 5 for details.

ON DELAY is intended for equipment that cannot withstand the voltage fluctuations that occur during the engine startup process after the Chargeguard has timed out. The default time of five seconds can be reduced to one second by removing the jumper at P2, pins 1&2. It is recommended however, that the five second delay is maintained when using the **"HL"** input.

TIME DELAY

This feature determines the length of time the connected equipment will remain on after the motor is turned off, or the signal is removed from the "HL" terminal.



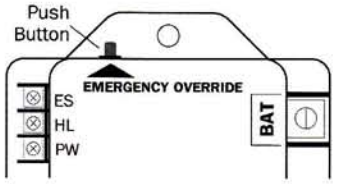
The time delay is set in the following manner:

1. Depress both the **TIME "Up"** and **"Dn"** buttons simultaneously to read the current time setting.
2. The delay time is indicated by a series of flashes of the green LED. **One normal flash** for each hour, **two rapid flashes** for 15 minutes or **three rapid flashes** for 5 seconds and **one long flash** for infinity.
3. Press the appropriate button to step the delay setting **Up** or **Down** one increment. **Default = 5 hrs.**
4. Removing the jumper on pins 1 & 2 of P3 will disable the ability to change the time settings.

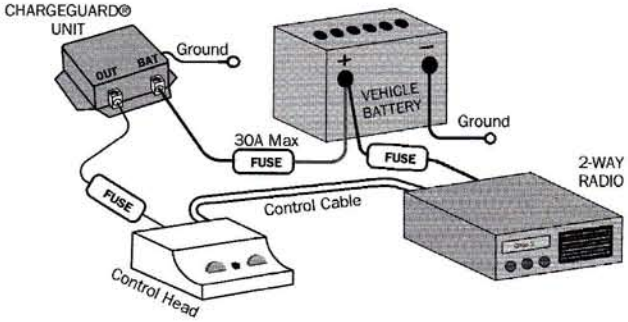
EMERGENCY OVERRIDE

Depressing the indicated push-button will provide a minimum of fifteen minutes power to your mobile radio and computer equipment when the motor will not start, or the electrical system is malfunctioning. After which, the unit will automatically reset to the stand-by mode. However, this function is disabled during a high voltage condition for as long as the vehicle's electrical system remains above 18 volts.

NOTE: Holding the push button in for 3 seconds will turn the Chargeguard® off unless the engine is still running or a signal is present at terminal "HL".



TRUNK MOUNT



Install a 30 Amp fused lead between the battery and the Chargeguard® "BAT" lug. Install another fused jumper between the "OUT" lug and the Control Head. Connect the power lead from the radio directly to the battery. Attach the ground lead using the supplied tooth lock washer between the terminal and the vehicle chassis.

INSTRUCTIONS Continued

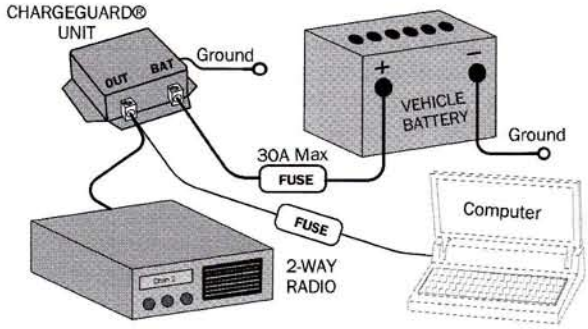
Wire Size: The minimum wire size between the "BAT" lug and the Battery should be #10 gauge regardless of the fuse size, and even larger for long runs over 15 feet.

Filters: When installing alternator and/or ignition filters, place them in the Chargeguard® output lead only when using the default sensing method. It is recommended that one of the optional sensing methods is used instead since they are immune to such filtering.

Caution: Only the Leads Attached to the Output Connector of the CHARGEGUARD® Are Protected by the Electrical Fault Detectors Contained Within.

Combining Components: Several different pieces of equipment may be operated through a Chargeguard® unit. Each component must be fused separately with the recommended value for that particular equipment. The sum of the fuses should not exceed the 30 AMP output current rating.

DASH MOUNT



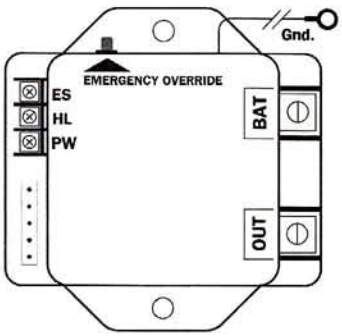
Locate the Chargeguard® unit between the vehicle battery and the Two-way Radio. Cut the power lead of the Radio leaving the fuse between the "BAT" lug and the battery. Insert the lead from the radio into the "OUT" lug and the lead from the battery into the "BAT" lug. Attach the ground lead using the supplied tooth lock washer between the terminal and the vehicle chassis.

INSTALLATION INSTRUCTIONS

Mounting the Unit: The Chargeguard® unit may be mounted anywhere inside the vehicle but must be wired directly to the battery. However, it is always better to install the unit in the operator's compartment where more moderate conditions exist. When the Chargeguard® is mounted under the hood, select a reasonably cool and dry location making sure that water cannot migrate down the leads. Be sure to avoid water hoses, engine components or the radiator framework. Secure the unit with the supplied screws as desired.
NOTE: Mounting the Chargeguard® unit under the hood is not recommended since there is a greater risk of heat and water damage.

Grounding: It is essential that the ground lead is firmly attached for proper operation of the unit. Fasten the terminal to the metal with a sheet metal screw, placing the tooth lock washer between the terminal and the metal.

EXTERNAL CONNECTIONS



BATT — Connect directly to the Battery
OUT — Wire leading to the Radio and/or Computer
GND — Connect to the Vehicle Chasis
ES — **Engine Sense** separated from **Batt** Lug
HL — **High/Low** switched DC input
PW — **Pre-warning** output signal for computers

LIMITED WARRANTY

CHARGEGUARD®, Inc. manufacturer of Chargeguard®, warrants this product against defects in material and workmanship under normal use and service for a period of one year from the date of purchase.

Chargeguard®, Inc., at its option, will at no charge, either repair, replace or refund the purchase price of this product during the warranty period as specified. This limited warranty is extended by Chargeguard®, Inc. to the original end user or purchaser only and is not assignable or transferable to any other party. Local and State laws may provide for other warranty benefits.

To receive warranty service, return the product to the dealer or send directly to Chargeguard®, Inc.

— SAFETY —

Warning: Do not expose to direct water or steam. Power is present in the unit at all times unless disconnected from the battery.

Do not connect directly to the battery without a fuse in series as shown on Page 12 of the installation section of the manual.

Do not use a metallic or conductive object to press the Time buttons due to the possibility of causing a short circuit and damaging the unit.

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