

## DC to DC VOLTAGE and POLARITY CONVERTER

This device accepts any voltage input from 4.5 to 36 volts DC, and converts that to a fixed output voltage of 12.4 volts DC (+2%) If the input voltage is below 12.4v, eg 6.5v, it takes and converts extra current from the battery into the required higher voltage (12.4v). Conversely, if the input voltage is higher than 12.4v, eg 24v, it converts this extra voltage into available current at the 12.4v output voltage. This means that if the input is 6.2v, the regulator must draw more current from the battery than the radio connected to it actually draws. For example, 6.2v to 12.4v is a gain of x2. If the radio is drawing 4 amps at 12.4v, the regulator will at least need  $4 \times 2 = 8.8$  amps at 6.2v. But actually it will need more, because in physics nothing is 100% efficient. At 80% efficiency we must add another 20% to our 8.8 amps. These figures illustrate the importance of using correct cable sizes, low resistance connections, and good quality switches and fuse-holders. Use of the supplied relay means the switch can be of a much lower rating, and the main heavy battery cable can be short and direct.

## INSTALLATION

**\*\* THIS UNIT CAN BECOME VERY WARM WITH NORMAL OPERATION \*\* THIS UNIT IS NOT WATERPROOF \*\***

Secure to a rigid surface, preferably metal, where it is protected from water and contaminants, and with some natural airflow for cooling. The input and output wires are internally completely isolated, and also isolated from the frame of the regulator, enabling the unit to be installed in a positive or negative chassis vehicle without modification, or the need to try and isolate it or the radio from the vehicle chassis.

**CABLE SIZE: The length below is the total of the distances from Regulator to battery positive, and the Regulator to battery negative**

Total cable run length up to .5 meter (1 1/2 foot) use 1.5mm<sup>2</sup> (16 AWG) Cable

Total cable run length .5 to 1 meter (1 1/2 to 3 foot) use 2.0mm<sup>2</sup> (14 AWG) Cable

Total cable run length 1 to 4 meters (3 to 13 foot) use 5 mm<sup>2</sup> (10 AWG) Cable

*REMEMBER - YOU CAN USE LARGER SIZE CABLES THAN THOSE SUGGESTED ABOVE - THE BIGGER THE BETTER*

## INPUT CONNECTIONS

Connect your INPUT voltage to the Yellow and Black wires exiting the unit via the grommet marked DC INPUT 4.5 to 36v.

**THE YELLOW INPUT WIRE MUST ALWAYS BE CONNECTED TO VEHICLE BATTERY POSITIVE.**

**It does not matter if the battery positive is also connected to the car chassis (as with a positive chassis vehicle).**

This Yellow positive wire already has a fuse installed, rated at 20 amps.

**THE BLACK INPUT WIRE MUST ALWAYS BE CONNECTED TO VEHICLE BATTERY NEGATIVE**

**It does not matter if the battery negative is also connected to the car chassis (as with a negative chassis vehicle).**

The Regulator draws a small amount of power even when your radio is turned off, so it is recommended to install an on-off switch on the input wiring side. An ignition switch with an accessory position seems like a convenient option, however it may not be able to pass the current required (up to 20 amps) without damage, or introducing too much voltage drop in the circuit (a .4v drop may stop the regulator).

A better option is to use the ignition switch ACC position to provide power to the supplied 6v relay, with the relay contacts then switching the actual input power to the Converter, via the required fuse of course.

## OUTPUT CONNECTIONS

Connect the Red and Black DC OUTPUT wires via an appropriate connector and fuse to your radio. A switch is an optional item here.

A fuse must be installed in the RED wire to the radio and the rating of the fuse must not exceed 10 AMPS.

**THE RED OUTPUT WIRE MUST ALWAYS GO TO THE POSITIVE OF THE RADIO, NOT TO THE RADIO FRAME**

**THE BLACK OUTPUT WIRE MUST ALWAYS GO TO THE FRAME OF THE RADIO.**

Do not attempt to isolate the radio from the car chassis. Besides being almost impossible to do safely, it is not necessary.

## SPECIFICATIONS

Model CE412V

Input voltage allowable 4.0 to 36 volts, DC only

Output voltage fixed at 12.4 volts DC,  $\pm 2\%$

Output current 7 amps with  $>6.3$  volts input - do not use with a device attempting to draw greater than 7 amps

Output current 5 amps with 5.5 volts input

Output current 2 amps with 4 volts input

Integral automatic temperature controlled fan cooling

Ambient temperature allowable from -20 to +80 degrees C (-4 to +175 F)

Standby current (no output load) 220mA @ 6.5v input

Dimensions 150 x 55 x 95mm (6 x 2.1 x 3.75 in)

Weight 685 Grams (1.5 lb)

All specifications subject to change or design improvements without notice

## WARRANTY

***In the event of malfunction or failure Cruising Electronics will, at their sole discretion, either repair or replace the unit, providing that:***

Malfunction has occurred within 12 months from the date of purchase

Any or all of the above listed ratings of the unit have not been exceeded

The unit has been properly and permanently installed, with correctly rated cables, fuses, switches and any other ancillary items which could reasonably be regarded as necessary to effect a safe and workmanlike installation.

The unit has not been exposed to any fluid, corrosive or hazardous substance, or excessive airborne particles

The unit is returned freight paid to Cruising Electronics or their nominated agent

Proof of purchase is provided.

## DISCLAIMER

**Under no circumstances can Cruising Electronics be held responsible or accept liability for any consequential damages or loss whatsoever incurred as a result of installing and/or operating this device in any situation, with or without any other device attached**

## CRUISING ELECTRONICS

17 MOREY ROAD, CABLE BAY 0420, NORTHLAND, NEW ZEALAND

Telephone (027) 2552852 International 64 27 2552852

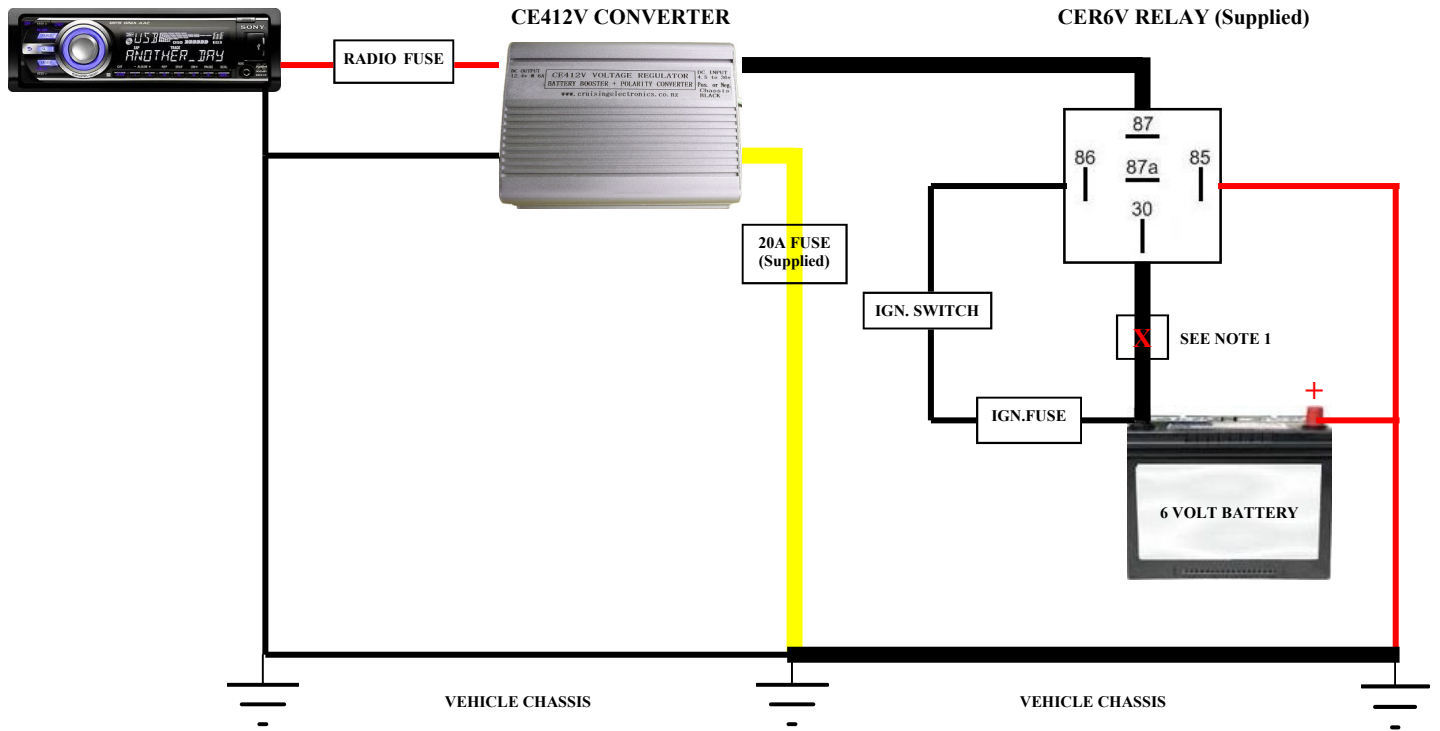
Email: [don@cruisingelectronics.com](mailto:don@cruisingelectronics.com)

Website: [www.cruisingelectronics.com](http://www.cruisingelectronics.com)

**WIRING DIAGRAM FOR 6 VOLT POSITIVE CHASSIS VEHICLE, USING CONVERTER CE412V AND 6 VOLT RELAY CER6V**

**IF THE VEHICLE IS 12 VOLT POSITIVE CHASSIS, REPLACE THE 6 VOLT RELAY WITH A COMMON 12V MODEL**

■ ■ ■ DENOTES HEAVY DUTY CABLES—SEE WRITTEN INSTRUCTIONS FOR SIZING

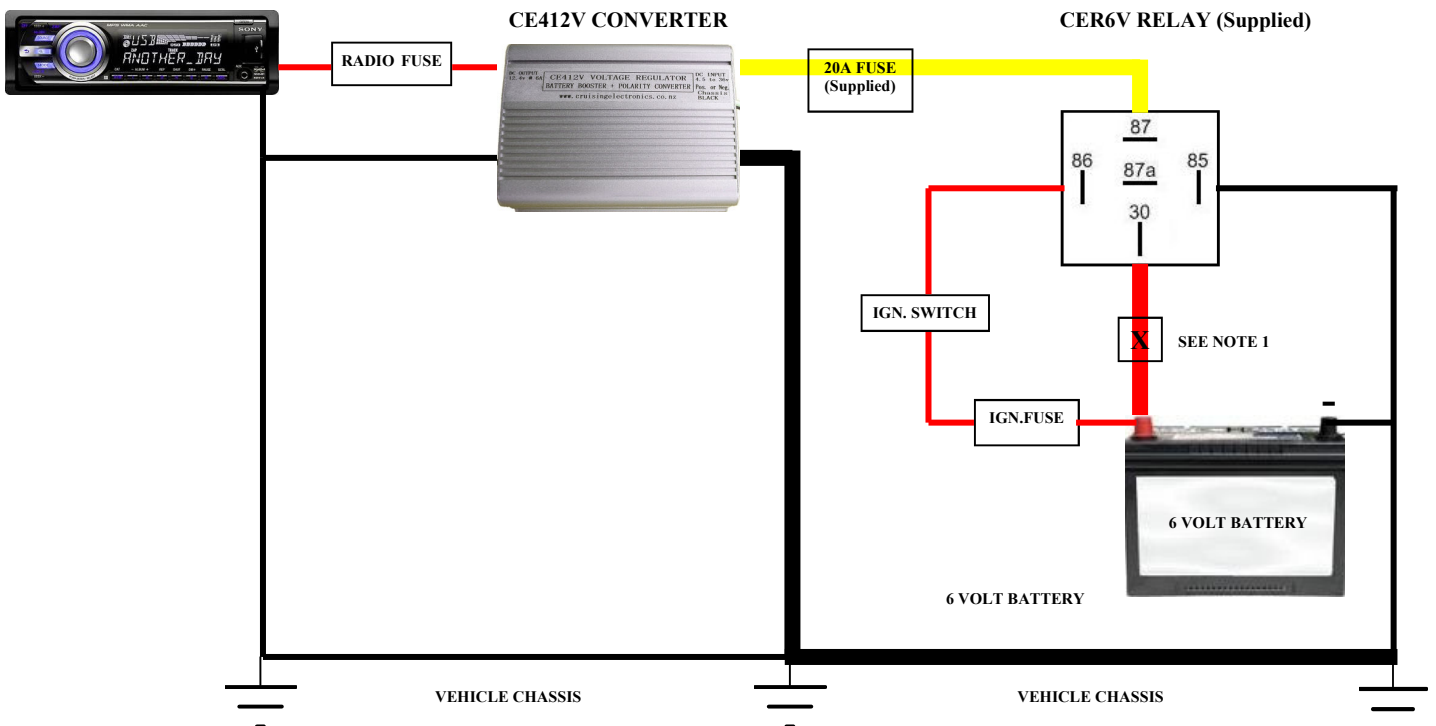


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**NOTES:**1/ It is recommended that a 30 amp circuit breaker or fuse be installed at this point.

**WIRING DIAGRAM FOR 6 VOLT NEGATIVE CHASSIS VEHICLE, USING CONVERTER CE412V AND 6 VOLT RELAY CER6V**

■ ■ ■ DENOTES HEAVY DUTY CABLES—SEE WRITTEN INSTRUCTIONS FOR SIZING



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