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Disclaimer

When purchasing this device, you are held responsible for any damage that may occur during installation or operation of this device. The manufacturer or seller are not held liable and hold no responsibility for any personal harm or property damage. Thank you for purchasing our CCPWM30A Constant Current Automatic Power Device. Please read contents carefully in order to understand the installing and operation procedures before getting started.

Safety Precautions

Read and follow these safety precautions to avoid hazards. If you do not understand these instructions or do not like to work on vehicles, please have a qualified mechanic do the installation for you. Incorrectly installing or using the CCPWM30A and/or the HHO System may result in serious damage to you and/or your vehicle.

It should take approximately half an hour to install this unit, so ensure that you have enough time to complete the installation. Be sure to work outside, no smoking at any time during the installation; make sure the engine is off and very importantly, not hot.

Your HHO System do not store hydrogen, subsequently there is no fire hazard when installed properly. However water electrolysis generates Hydrogen, an explosive gas, which means that you should **never light a match or smoke near or in front of the generators output** - the water tank could blow up!

Be careful with the generator working when the car is not moving. A small amount of hydrogen can accumulate in the air intake of the motor and could explode if you smoke or use an open flame near it.

Be sure to wear goggles and rubber gloves and only use professional tools; use common sense and general safety procedures used for any work carried out on automotive installations and maintenance.

Parts List

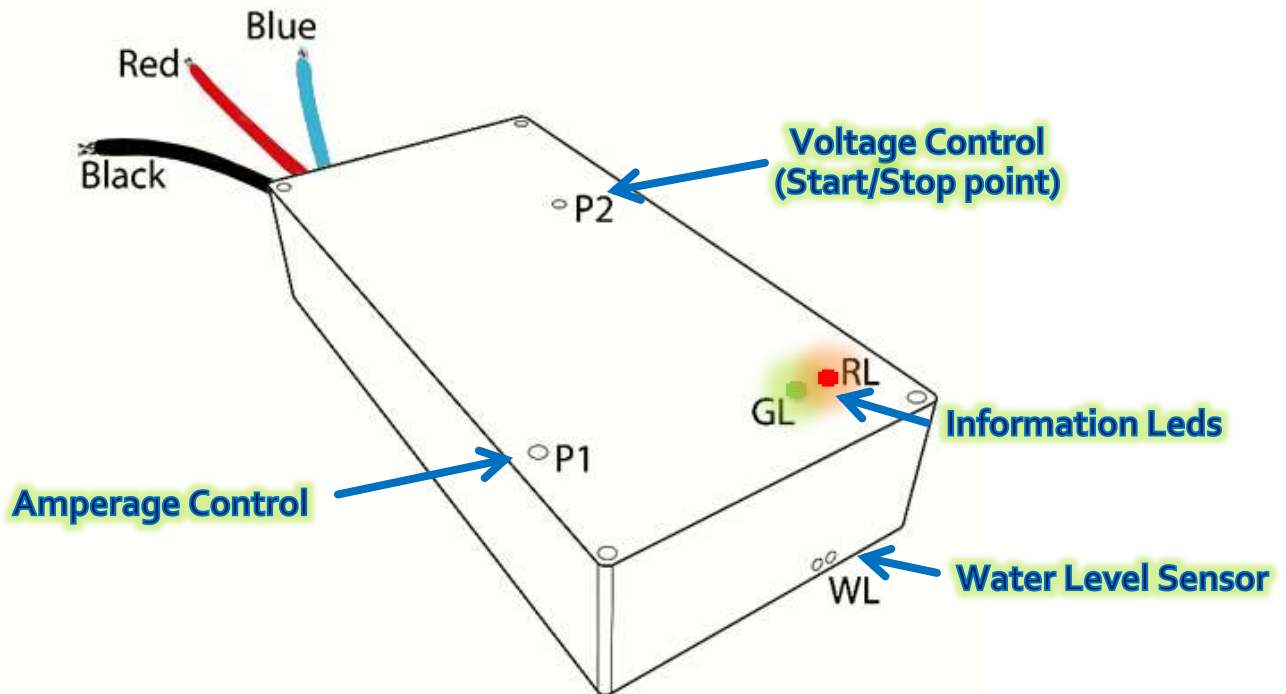
The CCPWM30A package includes the following items:

- 1 CCPWM30A Constant Current Automatic Power Switch Detection;
- 3 Yellow Butt Connectors.

Important: This product is intended for use on an car with 12V battery operation only. Working this devise with an independent power supplies may result in malfunction and/or damage the devise.

Technical Specifications

- Absolute Minimum and Maximum Operating Voltage: 12-15V
- Power ON Voltage: ~12.7V from factory (Adjustable by P2)
- Operation Current: ~3A for 14V from factory (Adjustable by P1)
- Absolute Maximum Current 30A
- PWM frequency 1KHz
- PWM Steps 254
- Absolute Temperature Range -15° to 55°C
- Absolute Maximum cable length 3 meters
- Water Level sensor: Normally Open for power on, Close for power off.



Pulse Width modulation

Pulse Width Modulation is a method of transmitting information on a series of pulses, changing the frequency, rather than a continuously varying analog signal. It will allow you to control the amperage going into the generator in a very easy way. This ability keeps the cell running at cool operating temperatures and prolongs the life of the cell while increasing the HHO output

Efficiency: HHO generators will run cooler than standard linear power amps, requiring substantially less heat sink mass;

Amperage control: the control of the amperage going into the generator will be very easy to control. The ability to control the amperage keeps the cell running at cool operating temperatures and prolongs the life of the cell while increasing the HHO output.

Main Features of the CCPWM30A

NEW TECHNOLOGY: The CCPWM30A (Constant Current Pulse Width Modulator) will allow you to have always the same amperage and HHO production regardless the electrolyte concentration, water temperature or water levels. The CCPWM is the best solution for the professional market because there will be no possibility of error. We can put more or less electrolyte and the amperage and HHO production will always be the same.

The CCPWM30A is also designed for making the automatic power supply of the HHO System without the need for relays or picking up the signal from the alternator/ignition key, making the system safer to use and easier to install. In general the new CCPWM30A will work based on the voltage of the car/truck:

- **Engine is stopped – voltage in car is 12V – PWM is not working;**
- **Engine is working – voltage in car/truck is 13,8V – PWM is working.**

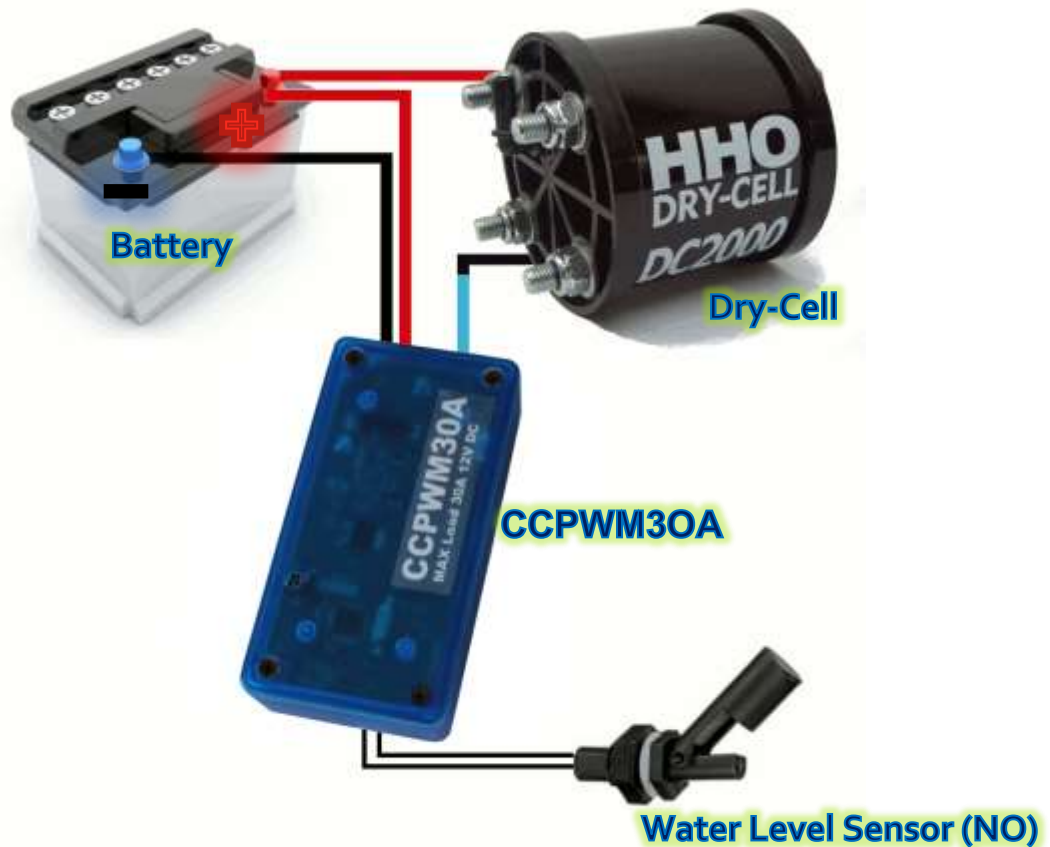
The CCPWM30A autodetect when the car engine is running and automatically switches ON the HHO System, without any additional requirements. The device will automatically power OFF when the car engine is turned OFF or not running.

The CCPWM is also capable to control a water level sensor inserted in the water tank turning the system OFF when the level drops from a certain point.

Electric Connections

1. Make sure your engine is not running during installation;
2. Mount the product as near of the battery as possible (maximum 3 meters), providing that it is well fixed. Please do not mount it over the battery.
3. Connect the black cable to the negative terminal of the battery.
4. Connect the red cable to the positive terminal of the battery.
5. Connect the blue cable to the negative coming from the HHO Cell.
6. Only use 4 mm section cable in your installation. Use the Yellow Butt Connectors.

Please refer to the illustration below for typical configuration of the electrical connections of the CCPWM30A:



Voltage Configuration (Start/Stop point)

The CCPWM30A is programmed from factory to turn ON whenever the voltage is higher than ~12.8V. When the voltage in the car is lower than this value the CCPWM will then turn OFF.

This voltage value can be regulated depending on each car performance. In this case, if your CCPWM30A do not turn ON when you start your engine, please follow the following steps:

1. Make sure your engine is not running.
2. If the green led is steady or blinking, use a screwdriver to rotate P2 slow in clockwise direction until the green led (GL) turns off.
3. Turn your engine on.
4. If the green led (GL) does not begin to blink, use a screwdriver to rotate P2 slow in reverse clockwise until the green led (GL) start to slow blink or fast blink.
5. After 5 seconds the green led (GL) will be steady or blinking very fast.

6. Stop your engine now. The green led (GL) should to turn off. If not, then please repeat steps 2 to 5 until you find a P2 position that satisfies both conditions of starting/stop.

Electrolyte and Amperage Control

Electrolysis of water is the decomposition of water molecule (H₂O) into oxygen (O₂) and hydrogen (H₂) gases due to an electric current passing in the water. Electrolysis of pure water requires excess energy in the form of potential to overcome various activation barriers. Without the excess energy the electrolysis of pure water occurs very slowly or not at all. This is in part due to the limited self-ionization of water. The efficacy of electrolysis is increased through the addition of an electrolyte (such as a salt, an acid or a base).

The electrolyte should be added to the water the first time that you use the system, and also when refilling, but in lower quantities. The more electrolyte you add to the water, the more amperage you will have in the system and also more HHO gas will be produced. But, **it is false to assume that a higher HHO gas production will mean a higher fuel savings.** There is an optimum point for all internal combustions engines. **The maximum amperage of the PWM will be set by the electrolyte concentration in the water. The PWM will only control the amperage below this value.**

After starting your engine, the green led (GL) will start blinking for 5 seconds until it turns steady. This means that the device is providing current to the HHO cell. From factory the amperage is set to 3A. To change this value you just need to rotate P1 (Amperage Control) clockwise or reverse clockwise.

When you are increasing amperage and you reach the end of the P1 rotate capacity this means means that your cell is receiving all the current the set by the electrolyte concentration in the water. Please do not exceed the maximum operating amperage of 30A.

Water Level Sensor

The water level should be placed in a way that, when the water level is above the minimum value, the signal coming from the CCPWM does not return to the CCPWM. That is, the water level circuit should operate as normally open (NO). Using our company models, the water level sensor should be placed up (please check last picture on this manual).

If you are not using a water level sensor in your system, no operation is required.



Led Information

The PWM30A has two leds, one green (GL) and one red (RL). Please check their meaning in the following table:

GREEN LED	RED LED	EXPLAIN
Slow Blink (750ms)	OFF	The device is beginning to work. After a power of the engine wait 5 seconds to start working.
Steady	OFF	The device is working. This means that the device is providing current to the cell, according to P ₁ value (See <i>Operation</i> for details)
Quick Blink (250ms)	ON	The device is out of water. If you are using the Out of Water facility (see <i>Installing the water level sensor</i> for details) this means that the device has stop because you run out of water

Troubleshooting

1. ***I installed the PWM30A but nothing happens.***

- Revise your installation conformity with the “*Electric Connections*” and “*Voltage Configuration (Start/Stop point)*” section of this manual;
- Verify the voltage in the car is above 12.6V.

2. ***I installed the water level sensor and there is water in the tank but the green led (GL) is fast blinking and the red led (RL) is on.***

- Check if the water level sensor is in the right position;
- Check if the water level sensor is working correctly.

3. ***I started the engine but the green led (GL) does not turn on.***

- Check if there is voltage present on the red and the black cables of the PWM;
- Check “*Voltage Configuration (Start/Stop point)*” section of this manual.

4. ***The engine is ON but the green led (GL) is always blinking. Never gets steady.***

- Check if battery voltage goes above 13.2V. If not, consider taking your car to a garage to check alternator.
- Verify HHO Cell cables and look for shortcut conditions.
- Configure the PWM30A again according to “*Voltage Configuration (Start/Stop point)*”.