



BOYER BRANSDEN



THE POWER BOX AND DYNAMO REGULATOR

- BATTERY FREE RUNNING OR BACK UP
- CAN BE USED WITH OR WITHOUT BATTERY
- NEVER GOES FLAT IN WINTER
- CAN SIMPLY CONVERT 6V MACHINES TO 12V
- PROTECTS AGAINST OVERCHARGING WHEN USED WITH BATTERY
- CAN POWER ELECTRONIC IGNITION, STANDARD IGNITION AND LIGHTS
- CAN DELAY POWER TO LIGHTS UNTIL ENGINE IS RUNNING
- MAKES ROAD GOING CLASSICS MORE PRACTICAL
- SAVES WEIGHT ON RACE BIKES

Boyer Bransden Ignitions
Electrifying Performance

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BOYER BRANSDEN POWER BOX

The power box is a self regulating rectifier with an internal current and voltage storing capacitor. Connecting directly to the alternator the output is approximately 15 volts with no current being drawn and 14.5 volts with some load. These values are just right for charging a 12 volt battery or running the electrics direct. The unit has been designed using the latest power technology semi-conductors to provide stable, direct current from standard permanent magnet alternators. Three types are available: Single phase, Bi phase and Three phase. In each case a charging lamp control, or lighting delay circuit, which prevents the lights being turned on until after the engine is started, is available. Ensure you have the desired unit before fitting.

Single phase and Bi phase units control 200 watts and three phase units control 300 watts.

As a rule of thumb Single phase power boxes are suitable for use with most British Bikes, pre 1975 with alternators two, or three wire. Bi phase are suitable for use with most Italian and French machines equipped with three wire alternators. Three phase will suit some British machines post 1975 with three wire alternators and the majority of Japanese three wire machines.

GENERAL INSTRUCTIONS - (ALSO SEE SPECIFIC WIRING DIAGRAM)

Input - ANY PERMANENT MAGNET ALTERNATOR TWO OR THREE WIRE (wattage refer above). NOTE POWER BOXES ARE NOT COMPATIBLE WITH 5 WIRE BRUSH AND SLIP RING ALTERNATORS (BATTERY EXCITED)

Output - 13/14 volts DC (charging 12 volts)

Mount the unit in free air - this may be in the battery box as long as there is some air around the unit for cooling. Use rubber mountings where severe vibration may cause damage. Never connect the battery the wrong way round. A fuse must be placed in one of the battery connections. When running without a battery no fuse is required. Under these circumstances it is permissible to short the output in order to stop the engine. This will not damage the power box.

FITTING

Single phase/Bi phase: Mounting 4 x 5mm holes at 45mm x 77mm spacing. Unit height 35mm. Weight 200gms.

Three phase: Mounting 4 x 6mm holes at 70mm x 70mm spacing. Unit height 64mm weight 350gms.

Connections red positive, black negative. FOR FULL DETAILS SEE WIRING DIAGRAM SUPPLIED WITH UNIT.

6 TO 12 VOLT CONVERSIONS USING A SINGLE PHASE POWER BOX REGULATOR

THE ADVANTAGES OF 12 VOLT CONVERSION

Most 6 volt permanent magnet alternator charging systems have no regulator to control the voltage output. Some use the headlight switch to change over the charging coils when the lights are used. The load provided by the battery and bulbs holds the voltage to approximately 7.5 volts, the value of a charged 6 volt battery. IF THE BATTERY BECOMES FAULTY OR DISCONNECTED THE OUTPUT OF THE ALTERNATOR WILL RISE TO PEAK AT OVER 200 VOLTS, THE RECTIFIER AND/OR ELECTRONIC IGNITION WILL BE DESTROYED. WE THEREFORE RECOMMEND THAT NO ELECTRONIC IGNITION BE FITTED TO MACHINES WITH THIS TYPE OF 6 VOLT CHARGING SYSTEM.

Converting to 12 volts is going to provide more stable and reliable electrics, it will also improve lighting. Current through the cables is halved and the output from the alternator will be up by at least 25% with no extra load to itself.

A typical alternator at 2000 rpm will charge approximately 8 amps into a 6 volt battery - 48 watts (volts x current). If the

battery is replaced with a 12 volt unit the current will drop to 6 amps giving 72 watts. In practice this is closer to 84 watts as the battery voltage on charge is nearer 14 volts. At just under 15 volts the battery is fully charged. At this point, without a regulator, the current is no longer stored by the battery and is lost as heat. The battery would eventually boil dry or explode. This will not occur with a correctly fitted Boyer Bransden power box in place. In addition it is possible to start the machine despite a discharged battery.

WHAT TO DO

The change to 12 volts is carried out by: fitting 12 volt bulbs, not forgetting instrument and warning lights, fitting 12 volt battery with in line 15-25 amp fuse, fitting 12 volt ignition coils (6 volt coils can be used with some electronic systems or by fitting a 1.5 ohm ballast resistor in series). The horn will work on 12 volts.

Remove the rectifier and disconnect the wires. The power box can be connected to these. The two yellow wires connect directly to the alternator. Two of the original wires can be used and any connection to the headlight switch can be disconnected, some machines have a resistor wire in the wiring harness, this can also be disconnected at one end and is no longer needed. The third wire on the alternator is connected to one of the other two (see wiring diagram). The earth terminal on the rectifier is normally the centre bolt, the wires on this can be bolted back to the chassis, along with the red wire if positive earth, or black wire if negative earth from the power box. The opposite wire is then the main power feed to the ammeter or battery and connects to the appropriate wire removed from the rectifier. The conversion is now complete.

For starting with a flat battery remove the fuse and kick, or bump start, rev up and while running fast replace the fuse. The battery will then start to charge, if healthy.

POWER BOX DYNAMO REGULATOR

The dynamo regulator unit is designed to replace the mechanical voltage regulator and cut-out used on many motorcycles using the LUCAS E3 TWO BRUSH DYNAMO. This dynamo is designed to charge a 6 volt system, but when connected to a Boyer Bransden Dynamo Regulator Unit it will charge 12 volts at over 120 watts without placing undue load on the dynamo windings. It will also replace the electronic aftermarket direct current regulator units.

The dynamo regulator unit uses a very efficient switching device controlled at over 500 times/sec., it's on/off ratio is adjusted electronically by a circuit measuring the dynamo voltage, this switch controls the magnetic field of the dynamo stator without the power loss in the stator coil winding present with a normal direct current system. Also incorporated is a method of maintaining the magnetic field when the switching device is in the off condition. This control is so good that even without a battery, lighting circuits and horn can be run direct from the dynamo without flicker. (Ignition can only be fed when a battery is fitted as no voltage is available at kick-start speeds).

With a 6 volt system, charging will start at 1200 RPM; on a 12 volt system 1600-1800 RPM is required. Reduced output voltage will be available from 500 RPM upwards. If lighting is run direct without a battery then the bulbs will be at half brilliance at tick over and full output at 2500 RPM.

Battery charging is by voltage control with current regulation, if higher charging currents are prolonged. Stability is maintained by internal thermistor control.

A dynamo that has been rewound for 12 volts will start charging at a lower RPM and will work well with this unit.

Four units are available - 6 volt positive earth, 6 volt negative earth, 12 volt positive earth and 12 volt negative earth. Size: 66mm x 62mm x 35mm. Weight: 200 grams. 4 x 6mm mounting holes. The Lucas voltage control cover can be fitted over the regulator box to give an original appearance.