Elektronik Sachse MHP GmbH & Co. KG

**Installation Manual**

**Regulator REG7 for Bosch three-phase alternator**

Item: REG7

version: 5bbf6cb

# Contents



# 1 Function

The Elektronik Sachse REG type regulators are modern electronic regulators that are very efficient and suitable for many different types of bikes, classic and modern. This regulator is not suitable for bikes with a positive ground.

A battery is required for this regulator to operate. It will not regulate without a battery. It can be used with lead acid or LiIon batteries, but not with super caps.

The voltage is measured on the W pins and compared to the target value. Depending on the voltage level, the regulator sends a higher or lower voltage to the field winding (DF), which in turn increases or decreases the voltage output of the alternator.

This regulator replaces the original regulator and diodes/rectifier (if applicable). The original regulator and rectifier has to be disconnected.

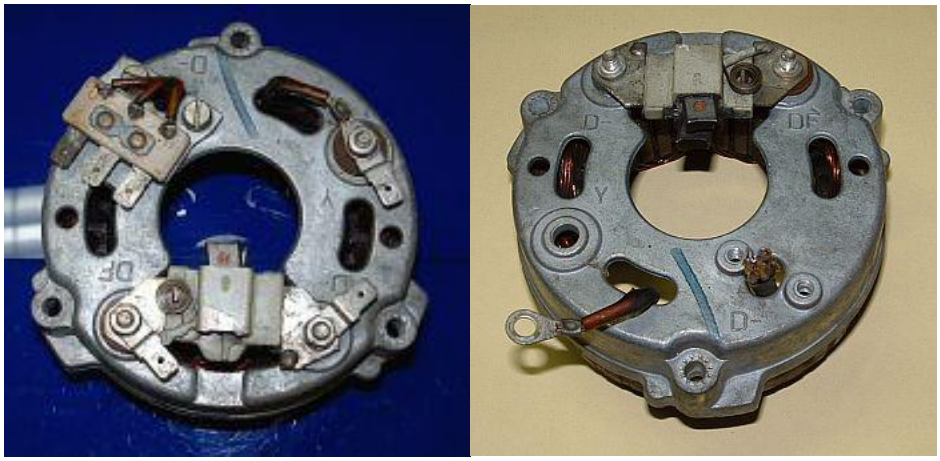
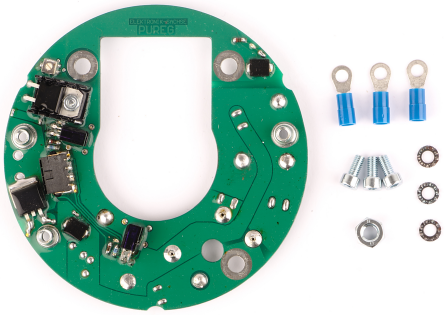



**Figure 1** Remove the connector block and Y-connection.

## 2 Scope of Delivery



## 3 Mounting

First remove the connector block of the alternator stator coils and the Y-connection. Don't cut the wires at the connector block, instead just unsolder them. With the Y-connection also the screw must be removed. Also unscrew the terminal lugs at D- and DF. See figure 1 on page 2.

Then put the printed circuit board onto the alternator and fix it with two nuts and serrated lock washers at D- and DF. At the ground connection put a 6 mm nut as a spacer between the printed circuit board and the alternator housing. See figure 2.

Secure all screws and nuts with serrated lock washers and coat all contact areas and screws (also the 6 mm nut) with battery pole fat.

**Figure 2** Use the nut as spacer

Finally solder the stator wires to the terminal pins (it doesn't matter which wire goes on which pin), fasten the Y-connection to the corresponding terminal with the 5 mm screw. See figure 3.

**Figure 3** Solder the three wires from the alternator

The result should look like figure 4.

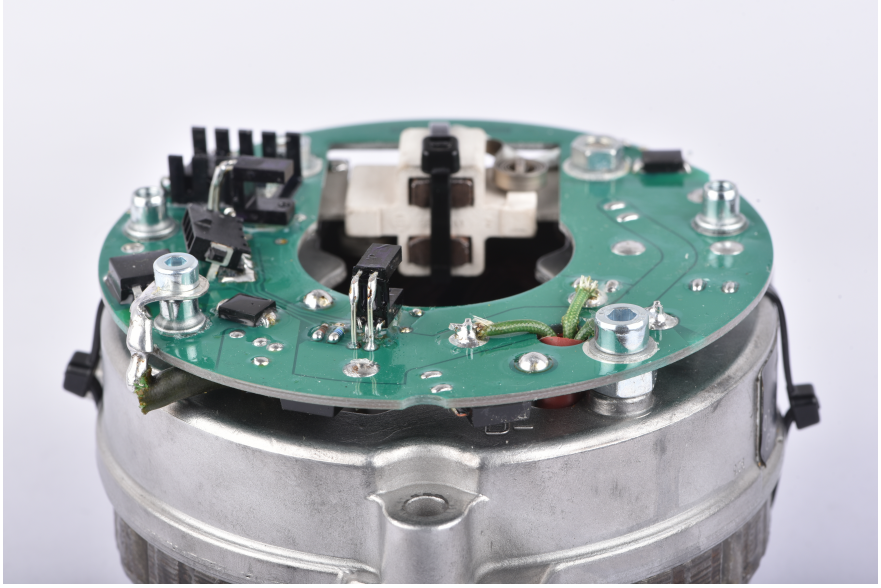


**Figure 4** The mounted regulator

# 4 Electrical Connections

The electrical connection consists only of two wires: (i.) a 2.5 $mm^2$ wire directly to the positive terminal of the battery (right screw connection, seen on the printed circuit board) and (ii.) a 0.5 $mm^2$ – 1 $mm^2$ wire to the charge control light (left screw connection under the small heatsink).

If no control light or a LED is used, a resistor of 60 Ω/5 W must be used instead of the lamp. Don't connect the terminal directly to the supply voltage!

Do not forget to bring the front brush back into the working position.

The electrical connection of the ignition (if present) is done according the instruction manual for Moto Guzzi (item: Z01-B). If no digital ignition (and no sector disk) is used, the stator can be fitted the normal way.

At last check the charging voltage. The voltage at the battery should be between 13.5 V – 14 V at approximately 3000 rpm, otherwise correct the charging voltage by the small trimmer (a suitable screwdriver is provided).

The charge control light is *not* optional for this regulator. The regulator utilises the charge control light current to generate a magnetic field in the field winding. If no charge control light is used, a 68 Ω, 5 W resistor can be used instead. Also if a LED is used instead of a traditional bulb, the current is too low and the abovementioned resistor needs to be put in place. The resistor needs to be connected *parallel* to the LED in this case.

Which of the three leads from the alternator (U, V, W) go on which connection on the regulator is of no importance.

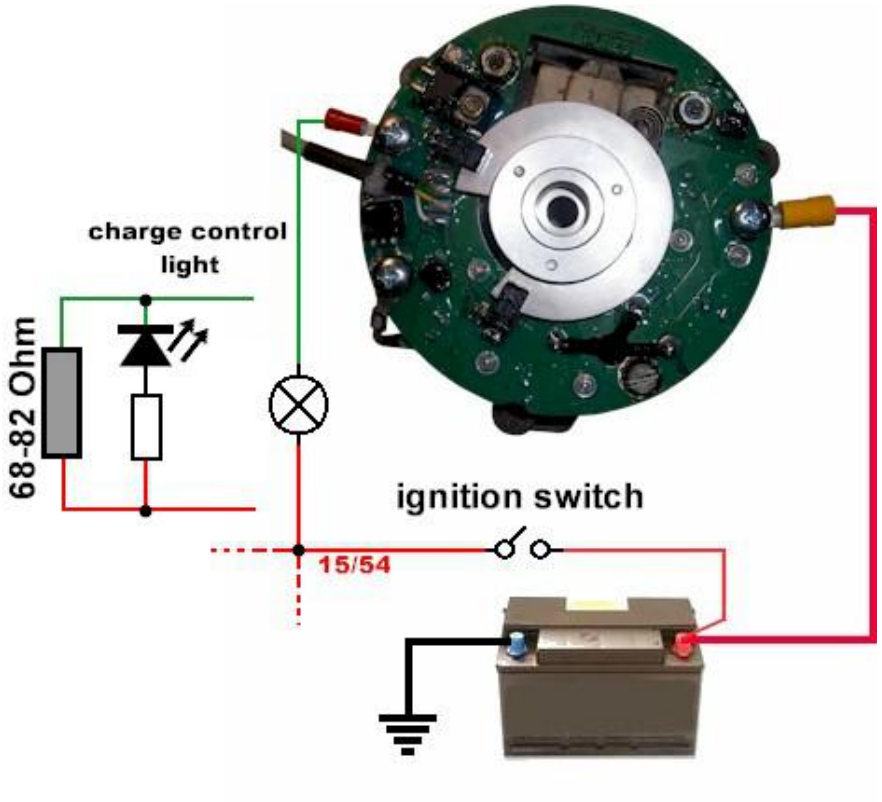



**Figure 5** General schematic of how the regulator is connected.

Some alternators don't feature a Y-connection. In that case leave it unconnected. The regulator works without connecting Y.

The 61 connection can be run with a thinner wire, e. g. 1.5 $mm^2$. The $B_+$ connection should have a larger wire diameter to minimise losses, e. g. 2.5 $mm^2$ – 6 $mm^2$.

**Figure 6** LED

Beside the right brush holder nut there is a small LED which is switched in parallel with the rotor, see figure 6. At normal working this should light almost constantly in lower rpm and flicker a little bit with increasing rpm. This shows that the current through the rotor is switched on and off, the regulator works.

If the LED lights already by turning on the ignition, either the brushes have no contact or the rotor is broken. The resistance, measured between both brush holder nuts, should be between 4 Ω – 8 Ω.

# 5 Settings

**Figure 7** Trimmer to select charging voltage.

All Elektronik Sachse REG type regulators have an adjustable charging voltage. The charging voltage can be changed according to the battery type used and ambient temperature. The regulators come with a default setting of 14 V, which is a sane default value and compatible with all types of batteries. So it's not necessary to readjust the charging voltage after installation.

To fine-tune the charging voltage, start with a well charged battery and turn off the headlights for the following procedure. Measure the voltage directly on the battery and rev up the engine. If the voltage on the battery is lower then the desired voltage, turn the rotary dial *clockwise*. If it's too high, turn the dial the other way.

The selectable voltage range is approximately 13 V – 15 V.

The trimmer to select the charging voltage is shown in figure 7.

**Elektronik Sachse MHP GmbH & Co. KG**
Busestraße 26a
28213 Bremen
Germany
☎ +49 (0) 54 09 90 69 82 6
✉ info@elektronik-sachse.de
⌨ www.elektronik-sachse.de