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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 D₊ pin 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.

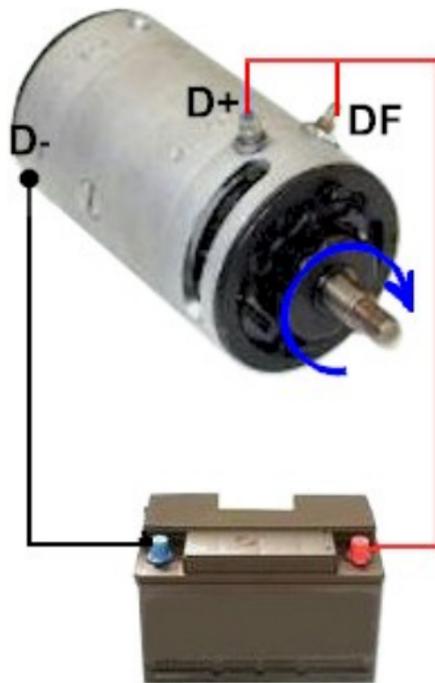
This regulator replaces the original regulator. The original regulator has to be disconnected.

2 Find out if REG5 or REG5a is the correct one

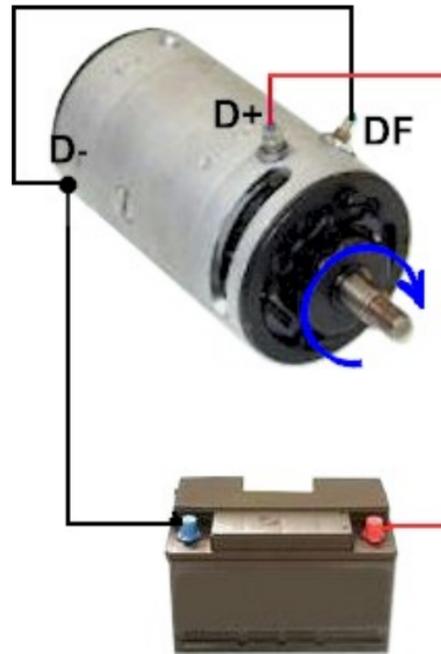
REG5 is compatible with alternators with positive regulated field winding, whereas REG5a is compatible with alternators with negative regulated field winding. How to find out if the field winding is internally connected to D_+ or ground? It is hard to measure unless one can reliably measure in the milliohms range. Therefore, it's easier to use the alternator as a motor.

If the alternator is mounted in the bike, one has to loosen the belt as well as remove the D_+ and DF connections. Procedure: Connect D_- to ground. Then temporarily connect D_+ and DF to 12 V. If the rotor starts spinning, then regulator type REG5 is the correct one for this alternator.

If the rotor does not spin, connect DF to ground and D_+ to 12 V. If the rotor starts spinning, then regulator type REG5a is the right one.



Test circuit for regulator REG5.



Test circuit for regulator REG5a.

3 Scope of Delivery



4 Mounting

The regulator is not water proof. However, the electronics are coated with a special coating, so water can't cause any damage. That having said, the regulator should be mounted in a well ventilated location in a way that water entering the regulator has a change to drain. For example with the connection terminal facing down. Water residing in the regulator permanently is not desired and might shorten the lifetime.

The more air flow the regulator is exposed to, the more power the regulator can drive. So if a high wattage alternator is used, more care should be taken in placing the regulator in a well ventilated spot.

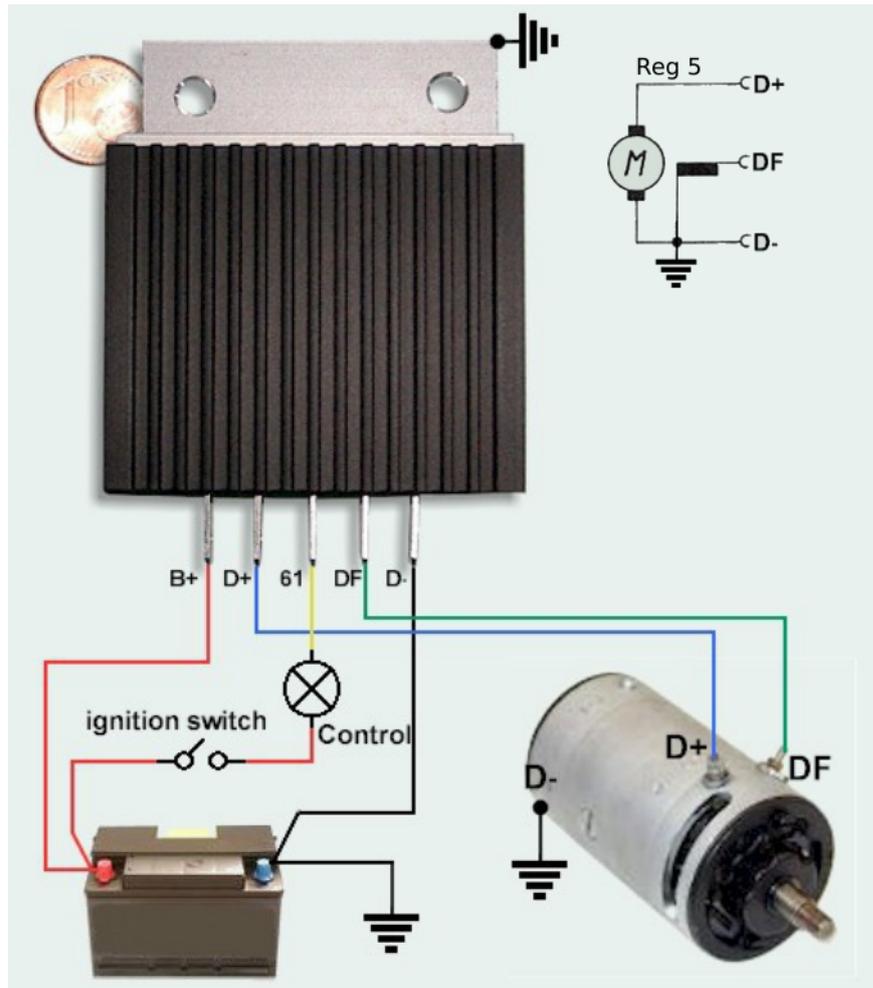


Figure 1 General schematic of how the regulator is connected.

5 Electrical Connections

Connector	Function
B+	Battery, charging current
D ₊	Alternator
61	Charge control light, not optional
DF	Field winding, alternator
D ₋	Ground

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 $68\ \Omega$, 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.

The regulator housing is connected to minus (ground). It's not required to run a separate connection to the regulator housing. Using the D₋ connection is sufficient.

The 61 connection can be run with a thinner wire, e. g. $1.5\ \text{mm}^2$. The remaining connections should have a larger wire diameter to minimise losses, e. g. $1.5\ \text{mm}^2 - 2.5\ \text{mm}^2$.

All connections are mandatory, except if specifically mentioned that they're optional.

The provided 6.3 mm crimp connections can be crimped using special crimp pliers or also with regular pliers (although not advisable). In the latter case it might make sense to solder the crimp connections to the wire to guarantee a good connection.

6 Settings

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 *counter-clockwise*. If it's too high, turn the dial the other way.

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

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