

ELECTRONIC VOLTAGE REGULATOR HVR-10E

The electronic regulator **HVR-10E** is made with state-of-the-art electronic components which permit to obtain, with reduced dimensions, all needed functions to control any type of alternator.

The main features of this regulator are:

- Voltage static error within the limit of $\pm 1\%$
- Wide stability range to guarantee the most suitable dynamic response to any situation (type of drive motor, different loads)
- Adjustable protection from over-excitation caused by anomalous loads
- Fixed protection for low frequency operation

Technical features:

- Supply voltage: $200V_{AC} \pm 25\%$
- Generator output voltage setting with multi-turn trimmer (VG)
- Maximum field current: $9A_{DC}$
- Permanent field current: $7A_{DC}$
- Single-phase sensing voltage: $90V_{AC} \div 440V_{AC}$
- Intervention level adjustment of the over-excitation protection with multi-turn trimmer (OL)
- Fixed level setting of the under-frequency protection

VOLTAGE REGULATION

The voltage regulator is set during testing in order to obtain a single-phase generator output voltage of $230V_{AC}$.

In case of any necessary adjustment on the voltage value, act on the VG trimmer, considering that voltage can be increased in clockwise direction.

OVERLOAD PROTECTION

The over-load protection is made to protect the alternator from over-load conditions, from high inductive load, or from low RPM operation.

The protection limits the rotor voltage to the pre-set value. The protection is delayed to allow the necessary transient over-loads.

This factory pre-set value, by Linz Electric, may be modified through the OL trimmer as follows:

- By moving the OL trimmer clockwise, the rotor voltage intervention threshold is reduced; this means that the generator output voltage, after a programmed delayed time, will reduce its value as load decreases.
- On the other hand, moving the OL trimmer counter-clockwise, the rotor voltage intervention threshold is increased; this means that the generator output voltage will reduce its value as load increases.

UNDER-SPEED PROTECTION

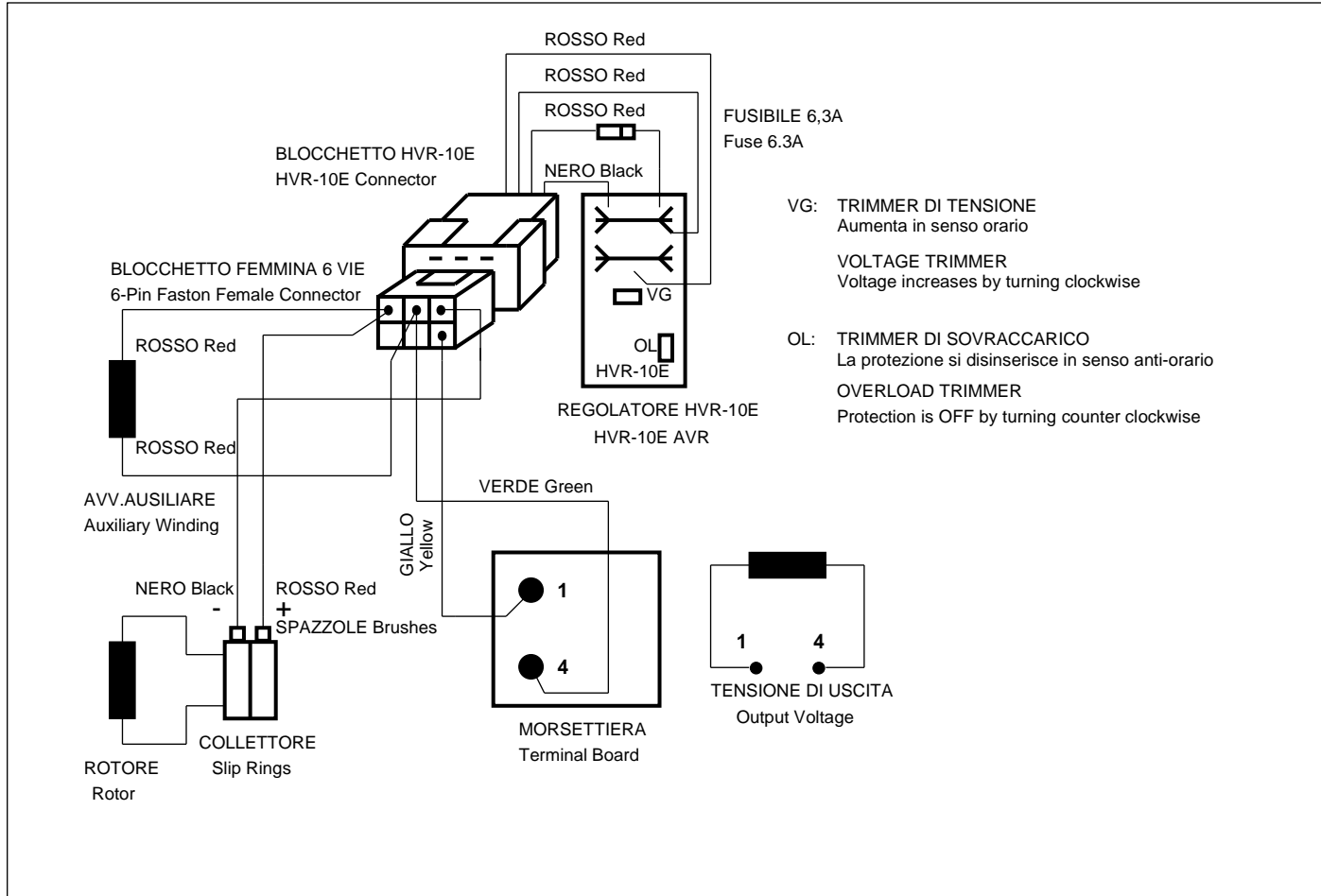
Low-frequency protection is set by Linz Electric in order to decrease the generator output voltage as the frequency is below 45Hz.

ATTENTION

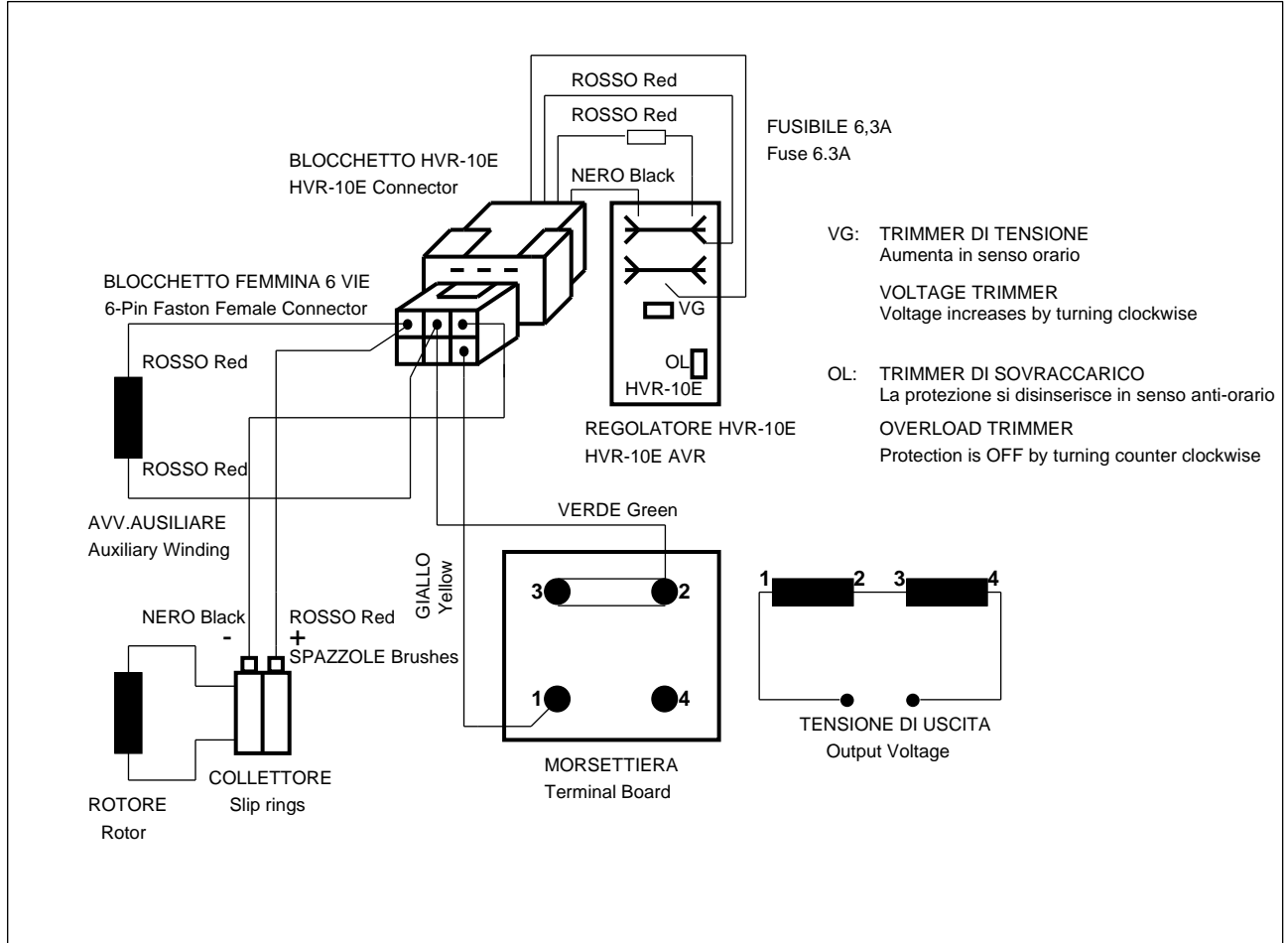
To avoid any damage to persons or equipment, it is necessary that any repair of the voltage regulator is made by qualified personnel, only.

CONNECTING THE HVR-10E REGULATOR ON LINZ ELECTRIC ALTERNATORS

230V_{AC} Sensing Voltage



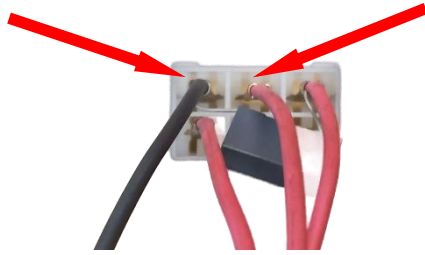
115Vac Sensing Voltage



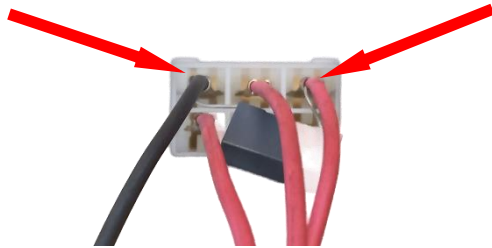
TESTING THE REGULATOR STAND-ALONE

To test the correct operation of the regulator, follow the steps below:

- 1) With the regulator completely disconnected and isolated,
 - a. Check fuse: if blown or open, replace with a brand new one
 - b. With multimeter in " Ω " Ohm mode, read resistance on 6-pin connector,
 - i. across BLACK wire and RED wire with fuse (view from AVR):



- ii. across BLACK wire and RED wire at the right end (view from AVR):



Readings in both cases should be greater than 200 Ω

2) If the previous tests are OK, set up a testing bench following the diagram below

Set Variac at its minimum position

Switch #1 must be OFF

AVR VOLTAGE SENSING: 230V_{AC}¹

3) Close Switch #1

Slowly increase Variac voltage up to **75V_{AC}**: the light bulb should switch ON

Increase Variac voltage up to **130V_{AC}**: at first, the light bulb should switch OFF, then it should switch ON soon after

4) Increase Variac voltage up to **210V_{AC}**: the light bulb should stay ON and reach its maximum brilliance

5) Wait 15÷30 seconds approx.: the light bulb should switch OFF then it should switch between ON and OFF with a 1 second cycle, approx.

AVR VOLTAGE SENSING: 115V_{AC}²

(Factory Setting for Replacement HVR 10E AVR's)

3) Close Switch #1

Slowly increase Variac voltage up to **75V_{AC}**: the light bulb should switch ON

Increase Variac voltage up to **130V_{AC}**: at first, the light bulb should switch OFF, then it should switch ON soon after

4) Increase Variac voltage up to **210V_{AC}**: the light bulb should switch OFF and stay OFF

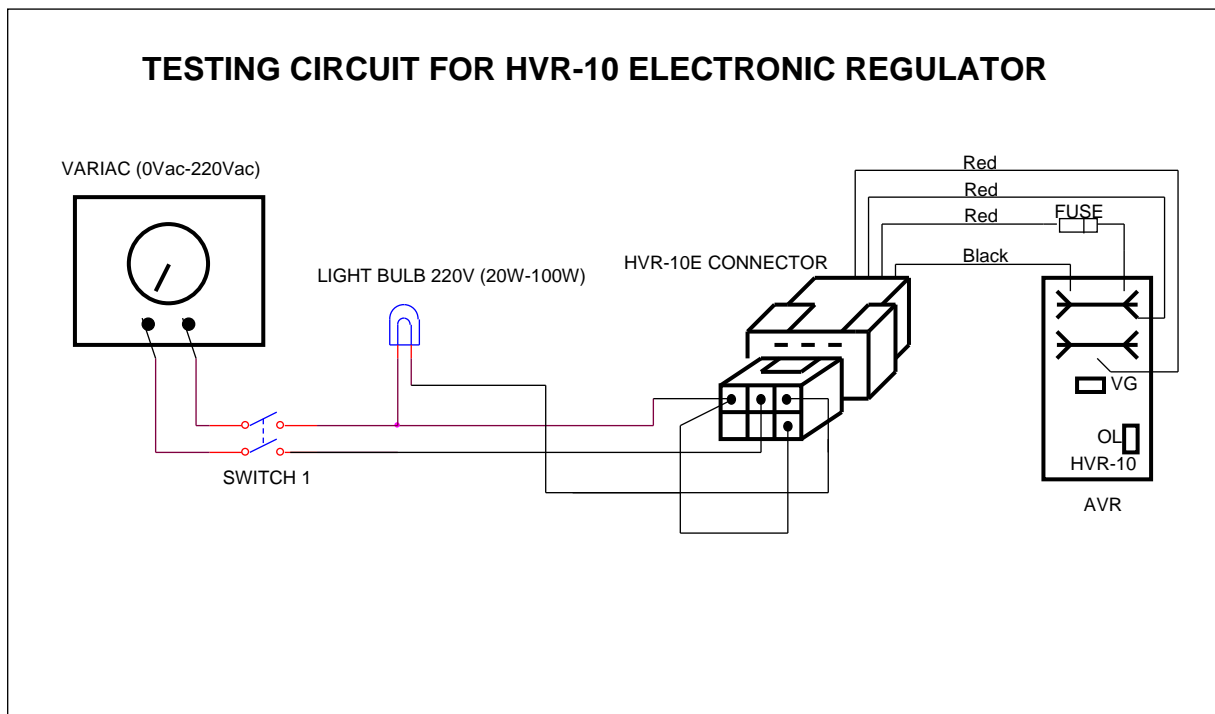
5) Slowly turn VG trimmer clockwise until the light bulb turns ON, reaching its maximum brilliance

¹ 230V_{AC} Voltage Sensing: for single voltage machines (2 power cables on the terminal board)

² 115V_{AC} Voltage Sensing: for dual voltage machines (4 power cables on the terminal board)

- 6) Wait 15÷30 seconds approx.: the light bulb should switch OFF then it should switch between ON and OFF with a 1 second cycle, approx.

If the conditions described above are satisfied, then the regulator works properly.



DIMENSIONS

