S.R.7/2

1.1.1 Terminals connection

Figure 5 shows the functions of the terminals numbered 1 to 7, as follows:

terminal 1) excitation field negative

terminal 2) connect to terminal 3 if SR7/2 is supplied with less than 160 Vac.

terminal 3),3A) excitation field positive and regulator supply

terminal 4), 4A) regulator sensing voltage

terminal 5), 5A), 5B), 5C) common to regulator feeding, regulator sensing and external potentiometer

terminal 6) connect to 5A for operation at 60 Hz

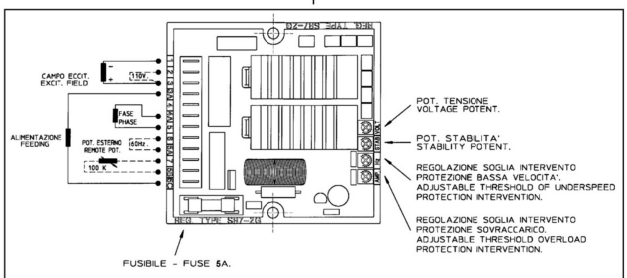
terminal 7) external potentiometer.

is also the sensing. This connection is necessary when the generator does not have auxiliary winding for supplying the regulator.

2) The supply and sensing are separate.
This is the case of a generator equipped with auxiliary winding for regulator supply. Supply is always connected to terminals 3A (or 3) and 5C (or 5, 5A, 5B) of the regulator.

In both these cases (1 and 2) the SR7/2 supply can vary from 80 to 270 Vac. But it should be noted that terminals 2 and 3 should be bridged for supply with voltage between 80 and 160 Vac. while the same terminals should be left open if the voltage is between 160 and 270 Vac.

Sensing: should be connected to terminals 4A and 5 and can vary from between 80 to 350 Vac. The sensing is single phase only and therefore normally connected to one alternator phase.



Sono elettricamente connessi assieme i terminali 3 con 3A, 4 con 4A, 5 con 5A, 5B e 5C.
Following terminals are electrical connected together : 3 with 3A, 4 with 4A, 5 with 5A, 5B and 5C

fig. 5

1.2.2) Possible connections

Exciter field: the exciter field negative should be connected to terminal 1 of the electronic regulator (normally dark blue or black), while the positive (normally red or yellow) should be connected to terminal 3.

Supply: There are two possibilities.
1) The supply coincides with the sensing.
In this case the SR7/2 supply-sensing should be connected to terminals 4A and 5 (in the case of three-phase generators, terminal 5 is normally connected with the star point). Terminals 3A and 4 should be connected to each other in such a way that the supply

Operation at 60 Hz: When operating at 60 Hz, terminals 5A and 6 should be connected to each other in order to keep the low frequency protection correctly regulated.

External potentiometer: the 100 kohm (0,5W) external potentiometer that permits a ± 5 % distanced regulation of the voltage should be connected to terminals 5B and 7.

1.2.3) Functions of the regulator potentiometers

"VOLT"
With this potentiometer it is possible to adjust the voltage generated by the alternator in a very simple way: if the screw is turned clockwise the voltage increases, if turned anticlockwise it decreases.

-) Stability calibration
To adjust regulator stability, slowly turn the "STAB" trimmer clockwise until the light that was previously connected between phase and neutral begins flashing slightly. Turn the "STAB" trimmer anticlockwise until the light becomes perfectly stable.

-) Overload protection calibration
To adjust the "AMP" overload protection apply a nominal load to the alternator then decrease the speed by 10% and turn the "AMP" trimmer fully anticlockwise. After a pause of 15-20 seconds, the generator voltage value should decrease. In these conditions, slowly turn the "AMP" trimmer clockwise until the output voltage value is at 97% of the nominal value. When returning to normal speed, the generator voltage return to nominal value. If this does not happen, repeat the calibration.

-) Low speed protection calibration
If the machine is to work at 60 Hz, make sure that the "60 Hz" terminals of the electronic regulator are bridged. To adjust the low frequency protection, make the generator run at a speed that is equal to 90% of the nominal one. Slowly turn the "Hz" trimmer in an anticlockwise direction until the generator voltage begins to decrease. When the speed is increased, the generator voltage should normalise. Take the speed back to the nominal value.

If during all the above tests the described behaviour happens, the regulator being examined is suitable for operation.

"STAB"
This potentiometer optimises alternator performance. If turned clockwise the stability decreases, i.e. the response time decreases but the voltage tends to be less stable. If turned anticlockwise, the response time increases and the voltage tends to be more stable.
In order to adjust this potentiometer correctly, we advise using the very simple method given below. The generator must be working, starting from zero load, and the potentiometer must be at maximum stability (turned fully anticlockwise). Slightly turn clockwise until you notice that the light generated by the filament lamp oscillates. At this point, turn the potentiometer slowly anticlockwise until the light stabilises.

"Hz"
With this potentiometer, which is normally pre-calibrated then sealed by the producer, it is possible to adjust the low frequency protection intervention.
To recalibrate this protection, you must take the generator to a normal zero load condition, turn the potentiometer clockwise until the limit position is reached, then decrease the nominal speed by 10%. After this turn the potentiometer anticlockwise and measure the voltage value until it has decreased by 5V.

When the speed decreases by more than 10% of the nominal value, the voltage also decreases proportionally, blocking generator overheating. Even if we advise calibrating this protection at 10% of the nominal value, it is obviously possible to calibrate the threshold at other values.

"AMP"
With this potentiometer it is possible to adjust the intervention level of the overload protection. This protection system has an intervention delay, which permits a temporary overload, necessary for example when starting motors or similar applications.
To modify this protection you must overload the generator by 15% of the nominal load, turn the potentiometer to minimum (anticlockwise) and wait about twenty seconds. During this period of time the voltage value decreases. In this condition and while turning the potentiometer clockwise, fix the generator voltage value at 10% less than the nominal one. At this point, while the initial overload is being removed, the voltage increases to the nominal value.

Fuse
The SR7/2 electronic regulator is equipped with a fuse, which protects the alternator from overheating in cases of regulator malfunction. The fuse can be replaced easily, but the new one must have the same characteristics as the one being replaced (250V-5A, quick acting, F type).

1.2) TEST PROCEDURES

1.2.1) Workbench test procedure

1) Prepare the connected regulator as shown in figure 6.

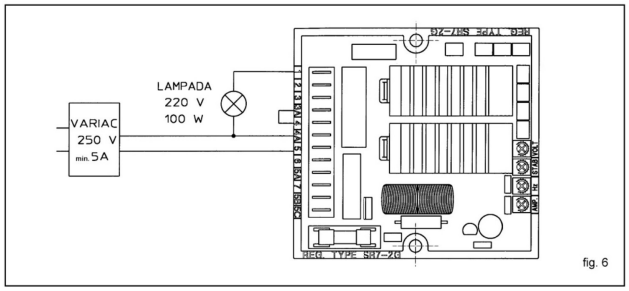


fig. 6

2) Before supplying the circuit with current, turn the "VOLT" and "STAB" potentiometers anticlockwise and the "Hz" and "Amp" potentiometers clockwise to their relevant limits. Position the variac adjustment in correspondence with the minimum value.

3) Switch on the variac and, while slowly increasing the voltage value, make sure that the light switches on and then immediately off. When a voltage of around 200 Vac is reached the light should remain off.

4) If the "VOLT" trimmer is turned slowly clockwise, you should note that the intensity of the light varies from minimum to maximum. Take the "VOLT" potentiometer back to the minimum position.

8) Slowly turn the "VOLT" trimmer clockwise until the light is at medium intensity. Turn the "Hz" trimmer anticlockwise, checking that the light switches off. Take the "Hz" trimmer to an intermediate position and the "VOLT" trimmer to a position that gives medium light intensity. If terminals 5 and 6 are short-circuited the light should switch off, subsequently short-circuiting terminals 5 and 7 causes the light to switch on at maximum intensity.

If during all the above tests the described behaviour happens, the regulator being tested is suitable for operation.

1.2.2) Machine test procedure

The regulator should be connected as shown in the relevant diagram in figure 7.

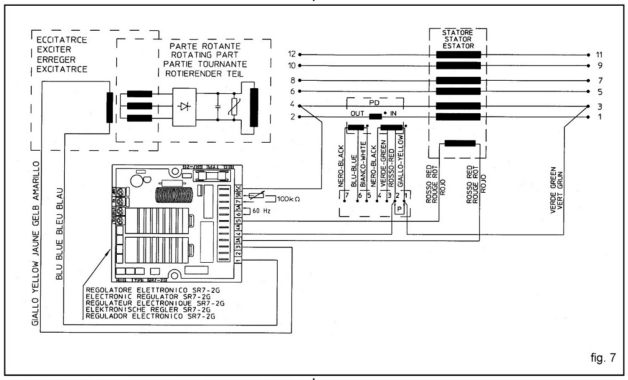


fig. 7

5) Take the "STAB" trimmer to maximum and repeat point 4. You should note that the light intensity variation caused by the "VOLT" trimmer adjustment is quicker. Take the "STAB" and "VOLT" trimmers to minimum.

6) If the "VOLT" potentiometer is turned to maximum (clockwise) the light shines at maximum intensity. About 20 seconds after the "AMP" trimmer is turned to minimum (anticlockwise), the overload protection intervenes and switches off the light. The light should switch on again after a short period.

7) Slowly turn the "AMP" trimmer to maximum and check that the light switches on at maximum intensity. Take the "VOLT" trimmer back to minimum.

-) Before starting the system, turn the "VOLT" and "STAB" trimmers fully anticlockwise and the "AMP" and "Hz" trimmers fully clockwise.

-) Connect a light between the generator phase and neutral (select the working voltage of the light in relation to the nominal value of the generator phase-neutral voltage).

-) Voltage calibration
The output voltage may oscillate when the generator is at no load, at nominal speed and with the "VOLT" voltage trimmer at minimum. If this happens, slowly turn the "VOLT" trimmer clockwise. The generator voltage should rise and stabilise itself. Increase the voltage to the nominal value.