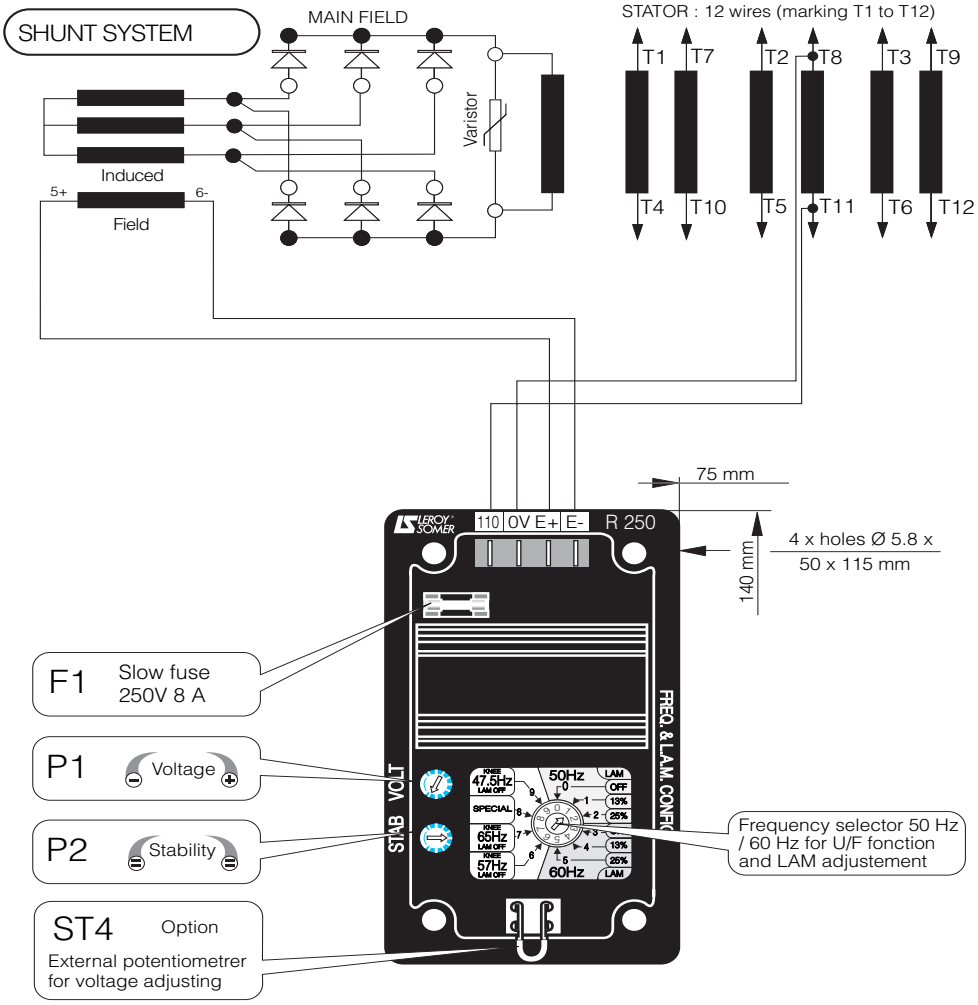
1 - SUPPLY

1.1 - SHUNT excitation system

The SHUNT excitation alternator is auto-excited with a **R 250** voltage regulator.

The regulator controls the excitation current according to the alternator's output voltage. With a very simple conception, the SHUNT excitation alternator does not have a short circuit capacity.



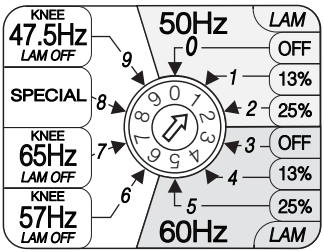
2 - R250 A.V.R.

2.1 - Characteristics

- Voltage regulation: around ± 0,5 %.
- Supply range/voltage detection 85 to 139 V (50/60Hz).
- Rapid response time (500 ms) for a transient voltage variation amplitude of ± 20 %.
- Voltage setting **P1**.
- Stability setting **P2**.
- Supply protected with an 8 A fuse, slow action (supports 10 A for 10 s).

2.2 - U/F Fonction and LAM

The threshold position (50 Hz - 60 Hz) to action the U/F fonction as well as the LAM setting type is selected using the potentionmeter.



WARNING: The jumper settings must correspond to the rated operating frequency (see the nameplate on the alternator).
Risk of destruction for the alternator.

The threshhold position and LAM fonction settings are done with the jumper.

Operating at 50 Hz: (U/F gradient)

0: threshold at 48 Hz without LAM for impacts between 30 and 40% of the rated load.

1: threshold at 48 Hz with LAM 13% for impacts between 40 and 70% of the rated load.

2: threshold at 48 Hz with LAM 25% for impacts > 70% of the rated load.

Operating at 60 Hz: (U/F gradient)

3: threshold at 58 Hz without LAM for impacts between 30 and 40% of the rated load.

4: threshold at 58Hz with LAM 13% for impacts 40 and 70% of the rated load.

5: threshold at 58Hz with LAM 25% for impacts > 70% of the rated load.

Specific operating

6: threshold at 57Hz without LAM for speed variations at a steady state > 2 Hz

7: threshold at 65Hz without LAM for variable speed and tractelec / gearlec (U/F gradient).

8: special: the factory setting 48Hz 2U/F gradient ; a special programme is possible on request. This programme must be specified before ordering, during the project study.

9: threshold at 47.5 Hz without LAM for speed variations at a steady state > 2 Hz

2.3 - R250 A.V.R. option

Potentiometer for voltage setting, 1000 Ω / 0,5 W min: setting range ± 5 %.
- Remove the **ST4** jumper.

2.4 - LAM characteristics (Load Acceptance Module)

2.4.1 - Voltage drop

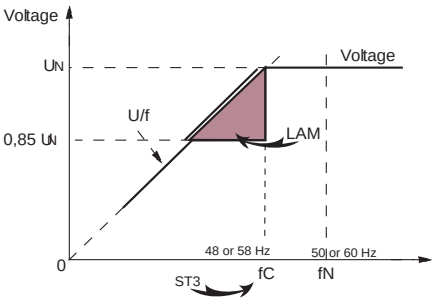
The LAM system is integrated in the A.V.R. It is active as standard. It can be adjusted to 13% or 25%.

- Role of the «LAM» (Load Adjustment Module):

On application of a load, the rotation speed of the generator set decreases. When it passes below the preset frequency threshold, the LAM causes the voltage to drop by approximately 13% or 25% and consequently the amount of active load applied is reduced by approximately 25% to 50%, until the speed reaches its rated value again.

Hence the "LAM" can be used either to reduce the speed variation (frequency) and its duration for a given applied load, or to increase the applied load possible for one speed variation (turbo-charged engines).
To avoid voltage oscillations, the trip threshold for the "LAM" function should be set approximately 2 Hz below the lowest frequency in steady state.

It is advised to use the "LAM" at 25% for load impacts > at 70% of the genset rated power.

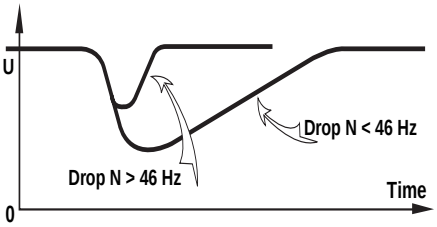


2.4.2 - Gradual voltage return function

During load impacts, the function helps the genset to return to its rated speed faster thanks to a gradual increase in voltage according to the following principles:

- if the speed drops between 46 Hz and 50 Hz, the rated voltage follows a fast gradient as it is restored.

- if the speed drops below 46 Hz, since the engine needs more help, the voltage follows a slow gradient as it returns to the reference value.



3 - INSTALLATION - COMMISSIONING

3.1 - Electrical checks on the AVR

- Check that all connections have been made properly as shown in the attached wiring diagram.
- Check that the position of the jumper corresponds to the operating frequency.
- Check whether the ST4 jumper or the remote adjustment potentiometer have been connected.

3.2 - Settings

The different settings made during the trial are to be done by qualified personnel. Respecting the load speed specified on the nameplate is vital in order to start a settings procedure. After operational testing, replace all access panels or covers.
The only possible settings on the machine are to be done with the A.V.R.

3.2.1 - R250 settings (SHUNT system)

Initial potentiometer positions
- voltage setting potentiometer **P1** for the A.V.R.: full left
- remote voltage setting potentiometer: in the middle.

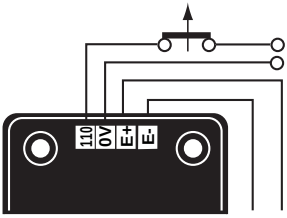
Operate the alternator at its rated speed: if the voltage does not rise it is necessary to re-magnatise the magnetic circuit.
- slowly adjust the voltage potentiometer of the A.V.R. **P1** until the output voltage reaches its rated value.
- Stability setting with **P2**.

3.2.2 - Special type of use

WARNING

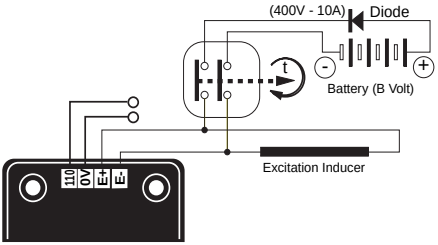
Excitation circuit E+, E- must not be left open when the machine is running: A.V.R. damage will occur.

3.2.2.1 - R250 field weakening (SHUNT)



The exciter is switched off by disconnecting the A.V.R. power supply (1 wire - 0 or 110V).
Contact rating: 16A - 250V AC

3.2.2.2 - R250 field forcing



The battery must be isolated from the mass.

Exciter field may be at line potential.

4 - SPARE PARTS

4.1 - Designation

Description	Type	Code
A.V.R.	R 250	AEM 110 RE 019

4.2 - Technical support service

Our technical support service will be pleased to help you with any information needed.

For replacement part orders, it is necessary to indicate the type and the code number of the A.V.R.

Please contact your usual correspondant.

An extensive network of service centres is available to rapidly supply any necessary parts.
In order to ensure the correct operation and safety of our machines, we strongly recommend that original manufacturer's spare parts are used.
Failure to do so, will discharge the manufacturer from liabilty in the case of damage.