

R230 A.V.R.

1 - SUPPLY

1.1 - SHUNT excitation system

The alternator with Shunt excitation is self-excited with an R 230 voltage regulator.

2 - R230 A.V.R.

2.1 - Characteristics

- Voltage regulation: around $\pm 0.5\%$.
- Voltage supply/sensing range 85 to 139 V (50/60 Hz)
- Rapid response time (500 ms) for a transient voltage variation amplitude of $\pm 20\%$
- Voltage setting **P1**
- Stability setting **P2**.

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 ST3 frequency selection jumper is on the correct frequency setting.
- Check whether the ST4 jumper or the remote adjustment potentiometer have been connected.

3.2 - Settings



The machine is tested and set at the factory. When first used with no load, make sure that the drive speed is correct and stable (see the nameplate). After operational testing, replace all access panels or covers.

The only possible adjustments to the machine should be made on the AVR.

3.2.1 - R 230 settings (shunt system)

Initial potentiometer settings

- **P1** potentiometer (AVR voltage adjustment): fully anti-clockwise.
 - Remote voltage adjustment potentiometer: centre position.
- Run the alternator at its rated speed. If the voltage does not increase, the magnetic circuit should be remagnetized (see section 2.3).
- Turn the AVR voltage adjustment potentiometer **P1** slowly until the output voltage rated value is obtained.
 - Adjust the stability setting using **P2**.
 - Sealed potentiometer **P3** is factory set at 48 Hz for 50 Hz and 58 Hz for 60 Hz

3.2.2 - Special type of use

WARNING

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

The regulator monitors the exciter excitation current as a function of the alternator output voltage. Very simple in design, the alternator with shunt excitation has no sustaining short-circuit capacity.

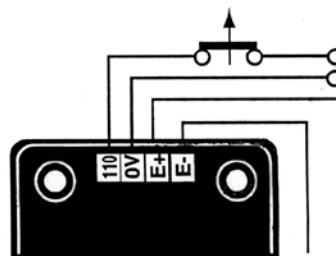
- Power supply protected by 8 A fuse, slow-blow action (tolerates 10 A for 10 s)
- Frequency: 50 Hz with **ST3** jumper - 60 Hz without ST3 jumper
- Factory-set underspeed protection **P3**.

2.2 - R230 AVR option

Potentiometer for remote voltage adjustment, 1000 Ω / 0.5 W
min: adjustment range $\pm 5\%$.

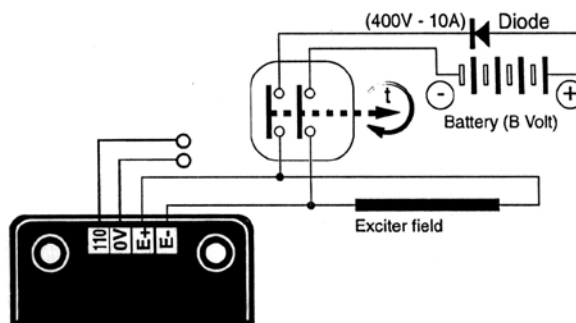
- Remove the **ST4** jumper.

3.2.2.1 - R230 field weakening (SHUNT)



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

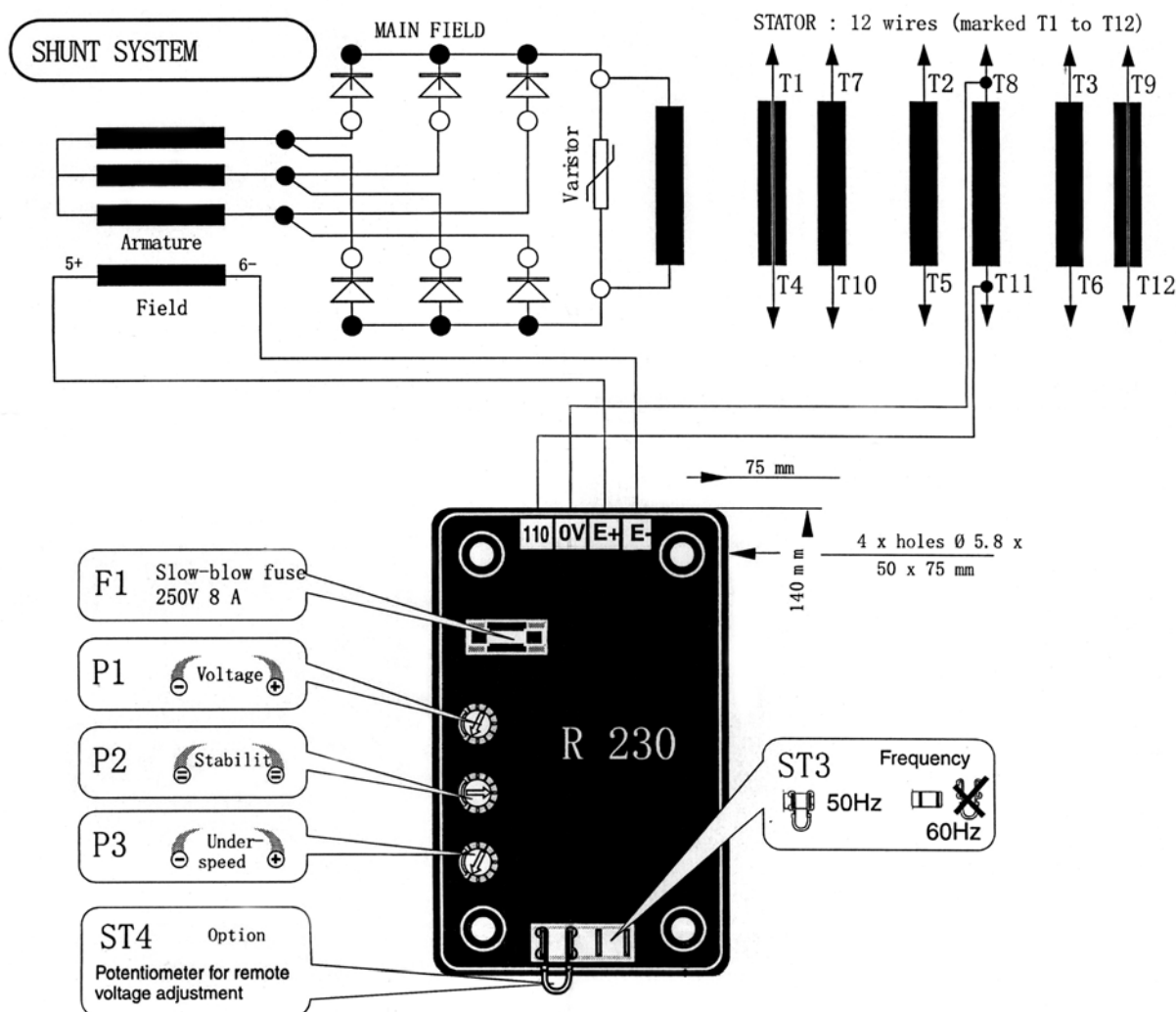
3.2.2.2 - R230 field forcing



Battery must be isolated from the earth.



Exciter field may be at line potential.



3.3 - Electrical faults

| Fault | Action | Effect | Check/Cause |
|--|--|--|---|
| No voltage at no load on start-up | Connect a new battery of 4 to 12 volts to terminals E- and E+, respecting the polarity, for 2 to 3 seconds | The alternator builds up and its voltage is still correct when the battery is removed. | - Lack of residual magnetism |
| | | The alternator builds up but its voltage does not reach the rated value when the battery is removed. | - Check the connection of the voltage reference to the AVR - Faulty diodes - Armature short-circuit |
| | | The alternator builds up but its voltage disappears when the battery is removed | - Faulty AVR - Field windings disconnected - Main field winding open circuit - check the resistance |
| Voltage too low | Check the drive speed | Correct speed | Check the AVR connections (AVR may be faulty) - Field windings short-circuited - Rotating diodes burnt out - Main field winding short-circuited - Check the resistance |
| | | Speed too low | Increase the drive speed (Do not touch the AVR voltage pot. (P2) before running at the correct speed.) |
| Voltage too high | Adjust AVR voltage potentiometer | Adjustment ineffective | Faulty AVR |
| Voltage oscillations | Adjust AVR stability potentiometer | If no effect : try normal / fast recovery modes (ST2) | - Check the speed : possibility of cyclic irregularity - Loose connections - Faulty AVR - Speed too low when on load (or U/F bend set too high) |
| Voltage correct at no load and too low when on load (*) | Run at no load and check the voltage between E+ and E- on the AVR | | - Check the speed (or U/F bend set too high) |
| | | | - Faulty rotating diodes - Short-circuit in the main field. Check the resistance - Faulty exciter armature. |
| (*) Caution : For single-phase operation, check that the sensing wires coming from the AVR are correctly connected to the operating terminals | | | |
| Voltage disappears during operation | Check the AVR, the surge suppressor, the rotating diodes, and replace any defective components | The voltage does not return to the rated value. | - Exciter winding open circuit - Faulty exciter armature - Faulty AVR - Main field open circuit or short-circuited |