

AUTOMATIC VOLTAGE REGULATOR

S 125



BELTRAME
CENTRO SERVIZI ENERGIA



mastering

After over thirty years' experience in the alternators field, BELTRAME CSE has launched a new AVR. The newly developed S125 enables an optimal operation of brushless generators of new or old manufacturing, with dynamo exciter, even when it is facing the most difficult conditions of use. It employs the most sophisticated technologies offered by electronics and it enables the feeding of exciters with rated voltage up to 100 Volt, therefore it can be used on almost all machines currently available in the market. It ensures optimum alternator performances, under load, no load and transitory conditions, in particular during the start-up of asynchronous motors. In addition, it is equipped with internal protections against a persistent overload and against over-voltage, which could be dangerous for the machine and supplied appliances. All components are epoxy resin potted, in order to ensure a precise and safe reliability over time, in any environment and to avoid damages caused by vibrations. The S125 is cased in a strong plastic box. It is furthermore supplied with terminals for electric connection and with an internal fuse bloc equipped with a quick blowing fuse for the protection of the exciting stator against short circuits.

NOMINAL TENSION:

Δ 100÷260V at 50/60Hz
 Λ 300÷490V at 50/60Hz

EXCITATION:

$I_e = 5A \mid V_e \leq 100V$

OVERALL DIMENSIONS:

100mm x 55mm x 58mm
weight: 290gr.

MAIN FEATURES:

Steady state accuracy $\pm 1\%$
Continuous rated current 5A

Excitation rated
voltage ≤ 100 Vdc.

Working temperature
range -20/+65°C.

EQUIPMENT

Voltage adjustment trimmer;
 Stability control trimmer;
 V/Hz threshold setting trimmer;
 Max excitation current setting trimmer;
 Protection against over voltage;
 Minimum self-excitation voltage: 2 Volt;
 Wire jumper (1) for the possible connection to a potentiometer of 1000Ω - 1/4 Watt for remote voltage setting (variation range 10%);
 Wire jumper (3) for frequency selection 50 or 60Hz;
 Wire jumper (2) (red) for operation at 115 V.

The S125 is equipped with an auxiliary input connection to ensure an high short circuit current. To make this function operational, remove jump AB (see operating diagram)

If different voltage or frequency are needed, BELTRAME CSE will supply the regulator according to customer specifications.

PERFORMANCES

The new S125 AVR is suitable for every alternator type, and it ensures an high current (5A) in a very small case. It is completed with over-voltage protection (shown by a yellow led), and low speed protection (shown by a red led). The low speed protection is adjustable by means of a trimmer (freq) which allows to set the trigger point where the machine reaches the rated voltage (40-50 or 50-60 Hz); before the trigger point is reached, the generator output voltage is adjusted proportionally to the frequency; by starting from a residual of 2 V, the rated voltage is reached when the frequency is equal to the one set on the trimmer (freq), above the trigger point and up to the rated speed the voltage remains at the rated value. During this phase a compound like regulation can be obtained, with the advantages and precision of an electronic regulator. This system enables also the insertion of heavy loads without affecting the diesel engines efficiency, may they be turbo compressed or old ones. The S125 AVR has AB terminal blocks (see picture) to let in auxiliary winding (if alternator is arranged for it), and therefore the original regulator on the machine can be replaced leaving unchanged all the alternator functions. Complete with Maximum Excitement Current Protection function, controlled by trimmer named "Reg. Current".

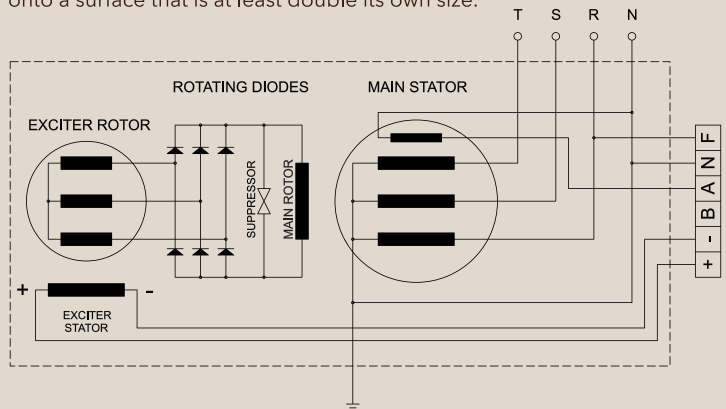
PIC. 1: Operating diagram for voltage regulator type S125 on brushless alternator.

NOMINAL TENSION:
 Δ 100÷260V at 50/60Hz
 λ 300÷490V at 50/60Hz

EXCITATION:
 $I_e = 5A \mid V_e \leq 100V$

ATTENTION: When there is no auxiliary winding, remember to jump "A" and "B" terminals.

N.W.: To use the regulator type S125 at full power (5A), fix the regulator onto a surface that is at least double its own size.



INSTALLATION AND ASSEMBLY

The regulator must be installed inside the machine or inside the control and command panel, in order to be protected against accidental contacts. Its Installation should be done in an easily and accessible place with a clean and dry air exchange is recommended. Use the two holes on the corners and 4MA screws to secure the regulator to the machine. When the S125 AVR maximum power (5A) is used, put the device on a surface at least twice the S125 AVR surface.

ACCEPTANCE

Regulators are normally supplied with standard packaging. With a small extra charge and upon customer request, a special packaging can be provided (for sea shipping, airfreight, etc). At the receipt of the package, check the AVR conditions with the carrier and if any damages is found, report it into the acceptance form.

STORAGE

If the regulators are not going to be used immediately, store them in a clean and dry place with a temperature between -30°C and +70°C. In case storage temperature favouring condensation, protecting terminals against humidity is essential. Check terminals regularly.

ELECTRIC CONNECTION

All the connection terminal blocks are placed in a multi pole socket (see the wiring diagram at PIC. 1)

INSTRUCTIONS FOR THE REGULATION

- For 115V output voltage, cut the red wire jumper.
 - To adjust the output voltage at the desired value, turn the Volt trimmer (turning it clockwise the value increases and vice-versa).
 - If a stability adjustment is required, turn the STAB trimmer (generally by turning it clockwise a better condition is achieved).
- N.B.: each variation of the STAB trimmer requires a voltage adjustment by means of the Volt trimmer.
- For the adjustment of the trigger point (low speed) use the Freq. trimmer (variation from 40 to 50 Hz or from 50 to 60 Hz), the red led goes

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off once the set value is reached.

In case of a machine working at 60 Hz, interrupt the Freq wire jumper. For remote control of output voltage (10%) cut the Volt wire jumper and connect a 1000Ω linear potentiometer between the two wire ends. If the calibrator wiring are close to power cables, shielded cable should be used. Connect the shield to the left of the two terminals, the other side of the shield remains floating.

To adjust the Excitation current, bring the generator at full load, then turn trimmer "Reg. Current" clockwise until the red led called IMax. will light. Now turn the trimmer "Reg. Current" anticlockwise few degrees.

INSTRUCTIONS FOR ELECTRIC CONNECTION

Before the S125 AVR is connected, please make sure that the value of the insulation towards grounding and among the phases of all windings is higher than 1MΩ at a temperature of 20°C. The value shall be measured with a manual or battery operated Megger providing 500 Volt direct voltage. In case this value is lower, insulation recovery is fundamental, as well as checking the machine is well cleaned. The S125 AVR is equipped with a protective extra-fast fuse 6.3 Amp 5x20 mm type. Before replacing fuse, stop the machine and remove the fuse holder's cover.

Remember to use only extra fast fuse FF 6,3 AMP.

By applying simple changes to the wiring diagram in picture 1, the S125 AVR can be used with all alternator types.

The S125 AVR can be equipped with an auxiliary input connection to ensure an high short circuit current. If the alternator has an auxiliary winding, remove the jumper between A and B terminal blocks, then connect the auxiliary winding to A terminal block, let B terminal block unconnected.