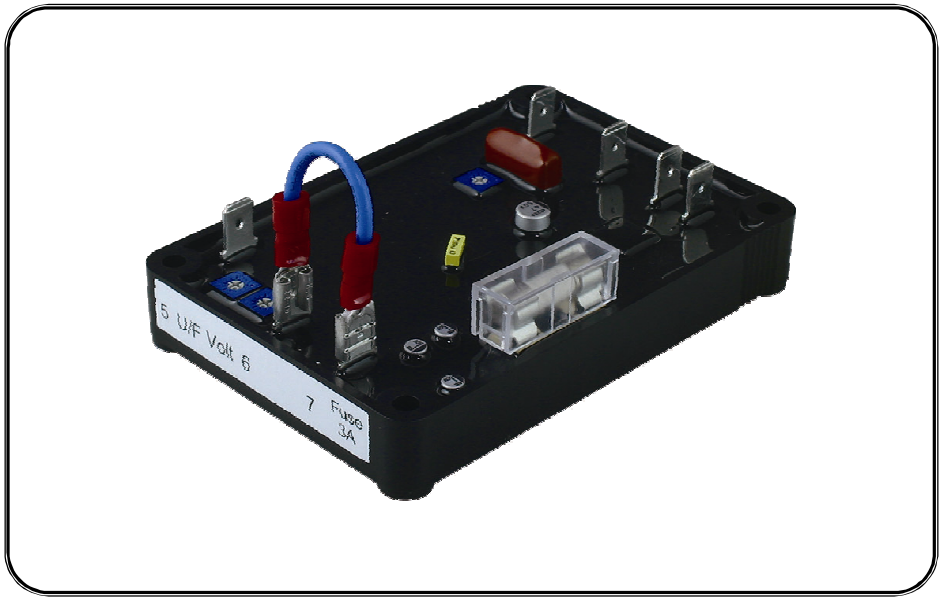
EA63-2.5C

Generator Automatic Voltage Regulator
Operation Manual



Self Excited Automatic Voltage Regulator

1. INTRODUCTION

Sensing Input

Voltage 400 VAC (320 ~ 530 VAC) or
Single Phase 50 / 60 HZ

Power Input

Voltage 120 ~ 260 VAC,
Single Phase 50 / 60 HZ

Output

Voltage Max. 50 VDC @ 120 VAC input
Max. 63 VDC @ 220 VAC input
Current Continuous 2.5A
Intermittent 4A for 60 sec
Resistance Min. 25 ohm

Voltage Regulation

< ± 1% (with 4% engine governing)

Voltage Build-up

Residual voltage at AVR terminal > 5 VAC

Thermal Drift

0.05% per °C change in AVR ambient

External Volts Adjustment

±15% with 5K ohm 1 watt trimmer

EMI Suppression

Internal electromagnetic interference filtering

Unit Power Dissipation

Max. 10 watt

Under Frequency Protection

Knee point adjustable range 45 ~ 55 Hz

Dimensions

101mm L * 69mm W * 22mm H

Weight

107g ± 2%

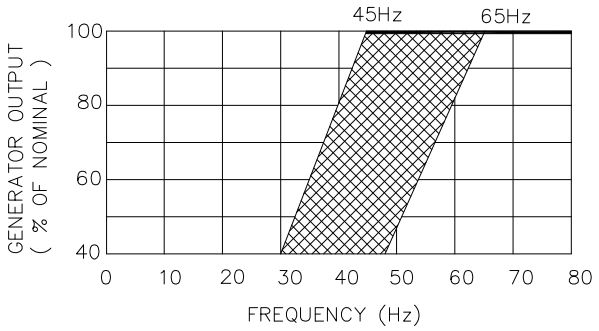


Figure 1 Typical Frequency Compensation Curves

Typical Frequency Compensation Curves (See Figure 1)

a. When the frequency of the generator is lower than the factory setting, the rated phase voltage will decrease to protect the regulator or exciter because of over exciter current,

b. Factory Setting : 45Hz ±4%

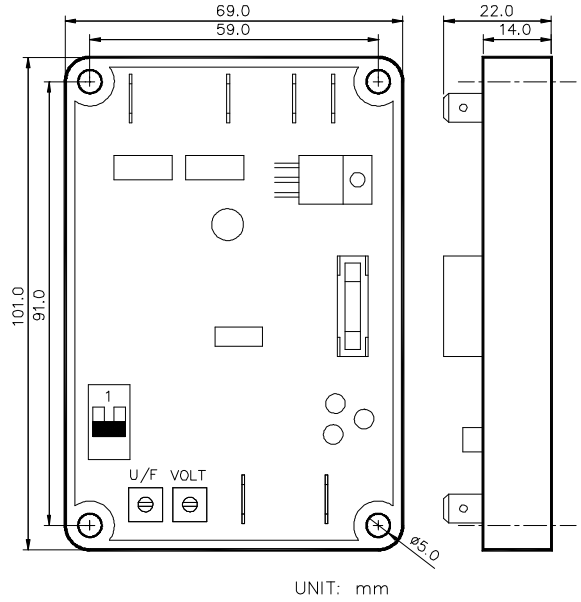


Figure 2 Outline Diagram

Mechanical Specifications

1. AVR can be mounted directly on the engine, genset, switchgear, control panel, or any position that would effects operation. For mounting, please see Figure 2.

2. Terminal : "Fast-On" terminals 6.35mm (1/4 inch).

All voltage readings are to be taken with an average-reading voltmeter Meggers and high-potential test equipment must not be used. Use of such equipment could damage the AVR.

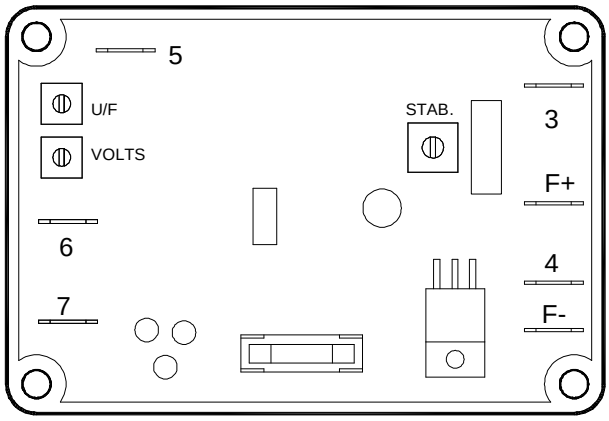


Figure 3 Potentiometer and Connector Locations

2. WIRING

2.1 Operation

1. F+, F- : Connect Exciter Field Power Circuit F+, F
2. 3, 4, 5 : Connect 3, 4 and 5 to the generator N, R, T.

   3, 4 : Power Input terminal

   4, 5 : Sensing Input terminal (See Figure 4).
3. 6, 7 : Remove the jumper wire across terminals 6 and 7 and install a 5000 ohm rheostat. The two terminals must be by-pass when the external potentiometer is needless.
4. The corner frequency can be adjusted by the U/F ADJ rheostat on the AVR. Clockwise rotation results in raising the corner frequency.

- Adjust U/F Rheostat fully CCW.
- Start the generator and set at rated voltage.
- Adjust the generator frequency to the desired knee point frequency.
- Slowly adjust the U/F ADJ rheostat clockwise (CW) until the generator voltage just begins to decrease.
- "Stability Adjustment" clockwise slowly to change the feedback time between AVR and the generator. If the adjustment is too big, it might cause the voltage instable. If too small, the load voltage will change too much at heavy load.
- The suggestion is to trace by the multi-meter DCV. Adjust "stability adjustment" and try to make the multi-meter waving smaller. It can also improve the full load's voltage drift rate.

3. OPERATION PROCEDURE

Complete the following steps before proceeding with system start-up.

3.1 Preliminary Set-Up

1. Verify that the Regulator specifications conform to the requirements of the generator system.
2. Ensure the voltage regulator is correctly connected to the generator system.
3. Set the regulator "VOLT ADJ" and external "VOLT ADJ" as follow:

   Regulator "VOLT ADJ" : Fully CCW

   Remote "VOLT ADJ" : Centered

2.3 System Start-Up

1. Perform preliminary set-up as described in the above paragraphs.
2. Start prime mover and bring up to rated speed. Voltage should build up. If not, perform Field Flashing.
3. Slowly adjust the regulator VOLT ADJ CW until the generator output voltage reaches the normal value.

NOTE

If voltage does not build up to rated value, check generator for short or excessive load.

4. Ensure the regulator and the generator under normal operating conditions. The voltage regulation should less than ± 1%. If the regulator is poor：

- The generator frequency is too slow that is less than the keen point of under frequency protection.
- The output wave of the generator is deformation.
- The ratio of capacity load is too high.
- Replace a new regulator and try again.

4. FIELD FLASHING

When the regulator is operated with the generator for the first time, the polarity of residual magnetism may be reversed or too small to achieve the necessary build-up voltage for the regulator. If reversing the field connections does not induce build-up, and the residual voltage is less than the specified value of 5 VAC, shut down the Prime-mover and proceed with the following steps

1. With the Prime-mover at rest and the regulator's field output wires disconnected, apply a DC source (NOT grounded) of not more than 6~12 VDC with Positive to F+ and Negative to F-, in series with a current-limiting resistor of 3~5 ohms 20 watt. (The set battery is a suitable source.)
2. Allow approximately 3 seconds before removing.
3. With the voltage regulator disconnected, start the prime mover and measure the "residual" voltage available at the auxiliary winding. If this voltage is greater than 5 VAC, reconnect voltage regulator, and voltage build-up should be successful. If less than 5VAC is measured, repeat field flashing procedure.
4. If repeating steps a. and b. does not result in generator voltage build-up, and residual is greater than 5 VAC, replace the voltage regulator.

CAUTION

Over excite may damage the AVR or the exciter.

4.1 Maintenance

Please regular maintain the regulator, keep the surface clean and avoid oil and mist adhering on the surface. All connectors, wires, and external potentiometer should be installed tightly and to prevent erosion.

NOTE

All AC voltage readings are to be taken with an "Average" reading voltmeter.

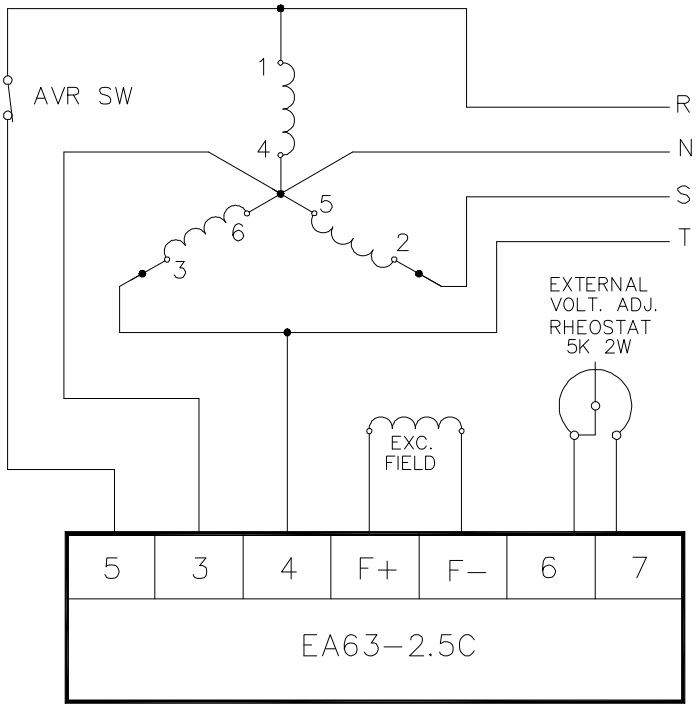


Figure 4 277 / 480V 3Ø 4W