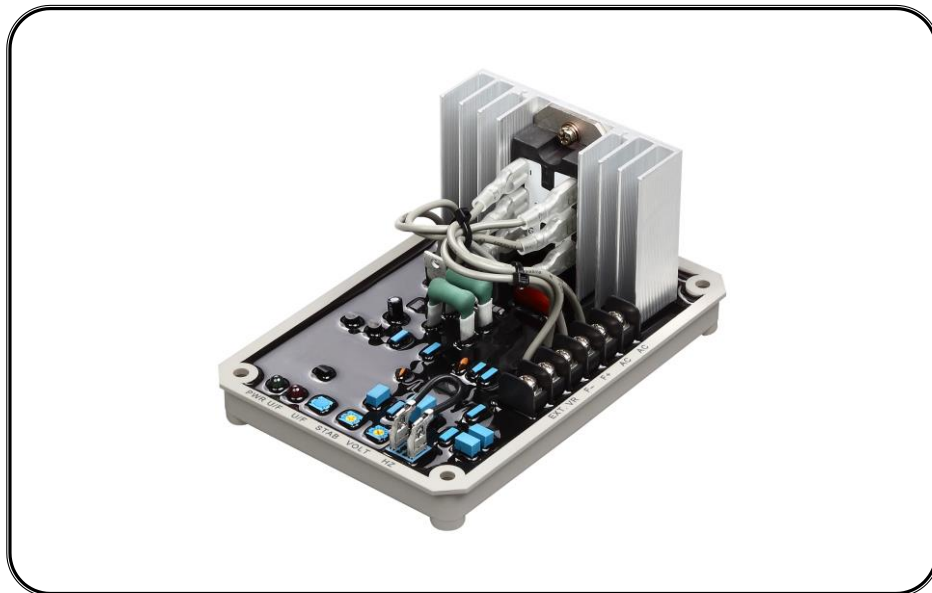


EA05AF

Generator Automatic Voltage Regulator Operation Manual



Self Excited Automatic Voltage Regulator
5 Amp AVR For Full Wave Generators

SECTION 1 : SPECIFICATION

Sensing & Power Input

Voltage 160 – 260 Vac, 1 phase 2 wires
 Frequency 50/60 Hz, DIP Switch selectable

Excitation Output

Voltage Max. 170 Vdc @ power input 240 Vac
 Current Continuous 5A
 Intermittent 7A for 10 secs.
 Resistance Min. 15 ohms, Max. 100 ohms

External Voltage Adjustment

Max. +/- 10% @ 5K ohms 1 watt potentiometer

Voltage Regulation

Less than +/- 1% (with 4% engine governing)

Build Up Voltage

5 Vac residual volts at power input terminal

Soft Start Ramp Time

2 secs. +/- 10%

Static Power Dissipation

Max.8 watts

Under Frequency Protection (Factory Presets)

50 Hz system presets knee point at 45 Hz
 60 Hz system presets knee point at 55 Hz

Environment

Operating Temperature -40 to +65 °C
 Storage Temperature -40 to +80 °C
 Relative Humidity Max. 95%
 Vibration 3.3 Gs @ 100 – 2K Hz

Voltage Thermal Drift

Less than 3% at temperature range -40 to +70 °C

Dimensions

162.0 (L) x 112.0 (W) x 77.0 (H) mm

Weight

421 g +/- 2%

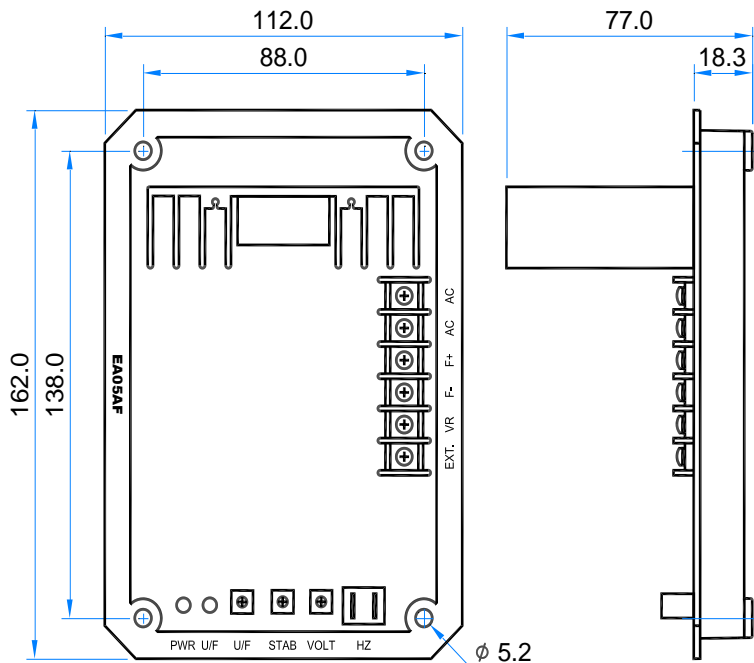


Figure 1 Outline Drawing

Unit : mm

U/F Adjustment
 STAB Stability Adjustment
 VOLTS Volt Adjustment

ATTENTION

1. AVR can be mounted directly on the engine, genset, switchgear, control panel, or any position that will not affect operation. For dimension reference, please see Figure 2.
2. 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.
3. Improper setting of under-frequency protection could cause the output voltage of the unit to drop or become unstable under with changes in load. Avoid making any changes to the U/F setting unless necessary.

SECTION 2 : WIRING (Refer to Figure 4, 5)

- 2.1 Linked the generator field to F+ and F-.
- 2.2 Linked sensing input to "AC".
- 2.3 Linked external trimmer to "Ext.VR".
- 2.4 Selected 50 Hz or 60 Hz system.

SECTION 3 : NOTE

- 3.1 Note before installation (Refer to Figure 1)
- 3.2 Note when generator running
 - 3.2.1 The temperature of AVR may be over 60 °C when generator set is running.
 - 3.2.2 Please don't touch the heat-sink there is a warning mark, when generator set is running.
- 3.3 Procedure of generator running
 - 3.3.1 Setting
 - (1) Check the connect wires are correct.
 - (2) Check protect fuse is 15A 250V.
 - (3) Turn the volt trimmer fully anticlockwise.
 - (4) Turn the external trimmer to midway position if fitted.
 - (5) Turn the stability trimmer fully anticlockwise.
 - (6) Connect a 110 Vdc voltmeter to field F+, F- terminals.
 - (7) Connect a 300 Vac voltmeter to generator output voltage terminals.
 - 3.3.2 Start the generator
 - (1) Start generator with no load. Adjust the speed at correct position.
 - (2) Carefully turn volt trimmer clockwise until rated voltage is reached.
 - (3) Turn stability trimmer clockwise until the output voltage is not stable, carefully turn stability trimmer anticlockwise until rated stable voltage is reached. That is the best match point between AVR and generator.

SECTION 4 : ADJUSTMENT

- 4.1 Under frequency adjustment
 - 4.1.1 Linked " HZ, HZ " terminals at 60 Hz system, open when 50 Hz.
 - 4.1.2 Under frequency setting procedure, if necessary.
 - (1) Start the generator set and the output voltage is normally.
 - (2) Adjust the generator speed controller until under frequency point is reached.
 - (3) Carefully turn U/F trimmer until the U/F LED is illuminated. (50 Hz is setting at 45 Hz, 60 Hz is setting at 55 Hz when outgoing).
- 4.2 Voltage adjustment
 - 4.2.1 Carefully turn volt trimmer until rated voltage is reached.
 - 4.2.2 Fitted a external VR 5000 ohms 1 watt between " Ext.VR " terminal, if necessary.

- 4.3 Stability adjustment
 - 4.3.1 Carefully turn stability trimmer until output voltage is stable.

SECTION 5 : FIELD FLASHING

When the regulator is installed correctly but the generator is failed to generate power. Besides carbon brushes were worn out, here are two possible causes below.

- 5.1 The polarity of field is inverse
Solution : Exchange the connection of F+ and F-.
 - 5.2 The residual voltage is less than 5 Vac, Solution 1 :
 - 5.2.1 Shut down generator, disconnect the wiring between AVR and generator then flash the field. Flashing duration = 3 seconds. (See wiring in Figure 2)
Resistor 3 – 5 ohms for full wave AVR
Resistor 5 – 10 ohms for half wave AVR
- Warning!! Over field flashing may damage the field winding of generator.**
- 5.2.2 Restart generator and measure the residual voltage by AC Voltmeter, if it is still less than 5 Vac, repeat the previous process, after several times, the residual voltage still cannot be built, Kutai EB500 is strongly recommended, see Figure 2.

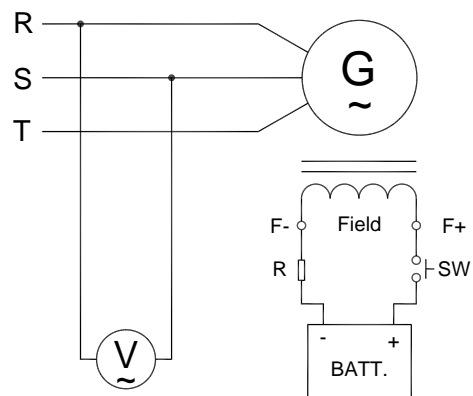
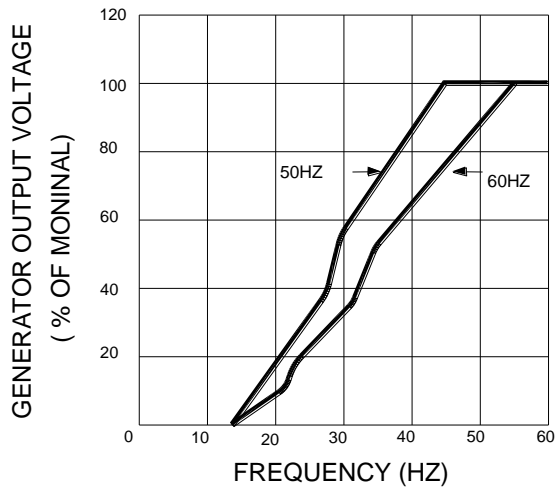


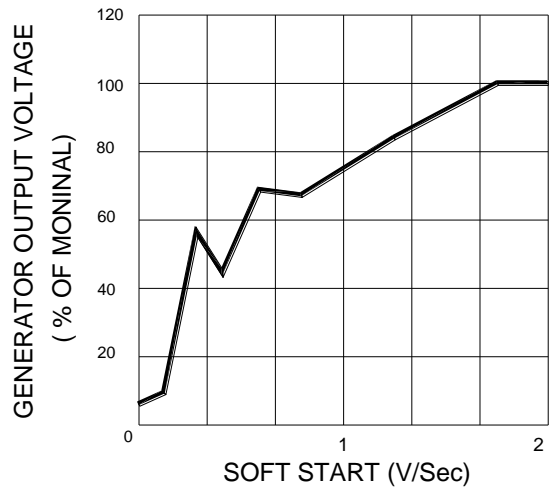
Figure 2

WARNING

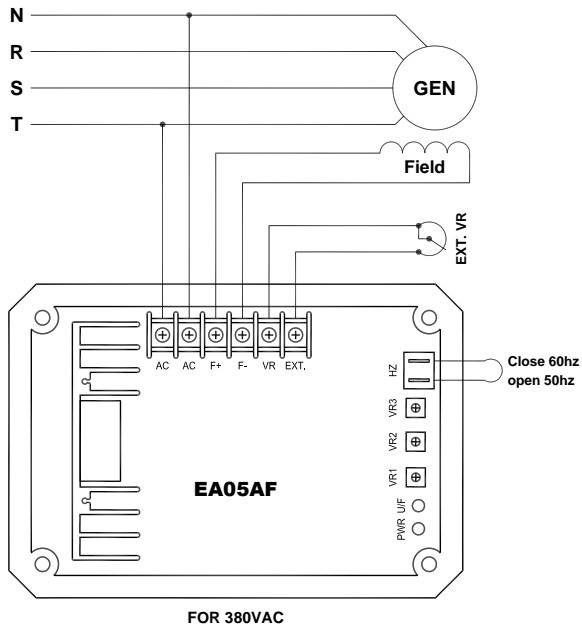
This Automatic Voltage Regulator is not equipped with loss-Sensing Protection function / Over Excitation Protection. An additional Over-Voltage Protection device for load may be required to avoid possible damage to the equipment or severe personal injury or death.



Frequency Compensation Curves
Figure 2

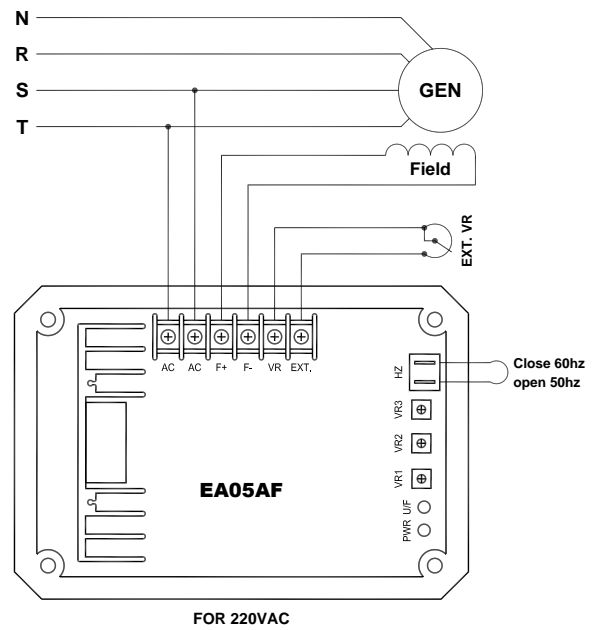


Soft Start Curve
Figure 3



FOR 380VAC

Figure 4



FOR 220VAC

Figure 5

- ※ Use only the replacement fuses specified in this user manual.
- ※ Appearance and specifications of products are subject to change for improvement without prior notice.