

# EA04A

## **Generator Automatic Voltage Regulator Operation Manual**



Self Excited Automatic Voltage Regulator

Direct Replacement for Basler VR63-4 and VR63-4A\*

\* Use for reference only and not genuine Basler product.

Use with Kutai EP200 Paralleling Module for parallel operation



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## SECTION 1 : SPECIFICATION

### Sensing Input

Voltage 90 – 132 Vac / 171 – 264 Vac  
Frequency 45/65 Hz, DIP switch setting

### Power Input

Voltage 90 – 240 Vac, 1 phase 2 wires  
Frequency 45/65 Hz

### Excitation Output

Voltage Max. 32 Vdc @ power input 120 Vac  
Max. 63 Vdc @ power input 240 Vac  
Current Continuous 4A  
Intermittent 7A for 60 secs.  
Resistance Min. 15 ohms, Max. 100 ohms  
Fuse Spec. Slow blow 5 x 20mm S505-5A / 250V

### External Voltage Adjustment

Max. +/- 15% @ 1K ohms 1 watt potentiometer

### Voltage Regulation

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

### Build Up Voltage

5 Vac residual volts at power input terminal

### EMI Suppression

Internal electromagnetic interference filtering

### Static Power Dissipation

Max.8 watts

## SECTION 2 : FREQUENCY COMPENSATION

The frequency compensation characteristic to improve system load pickup performance by restraining voltage recovery until frequency has also started to recover.

For 50 Hz system, the regulator is preset at the factory for a 45 Hz “corner frequency”. For 60 Hz systems, a 55 Hz “corner frequency”. is achieved by cutting the external Hz jumper wires on the generator. Be sure to insulate the two wires so that they are not exposed.

## SECTION 3 : OVEREXCITATION SHUTDOWN

If the exciter field voltage exceeds 45 +/- 5 Vdc (110 Vac system voltage) / 100 +/- 5 Vdc (220 Vac system voltage), the regulator automatically removes the field current after a time delay. The time delay is inversely proportional to the magnitude of the detected over voltage condition and when reached 67 +/- 5 Vdc (110 Vac system voltage) / 135 +/- 5 Vdc (220 Vac system

### Under Frequency Protection (Factory Presets)

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

### Over Excitation Shutdown

110 Vac system voltage  
45 +/- 5 Vdc delay shut down  
67 +/- 5 Vdc Immediate shut down

220 Vac system voltage

100 +/- 5 Vdc delay shut down  
135 +/- 5 Vdc Immediate shut down

### Voltage Thermal Drift

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

### Environment

Operating Temperature -40 to +60 °C  
Storage Temperature -40 to +85 °C  
Relative Humidity Max. 95%  
Vibration 1.5 Gs @ 5 – 30 Hz  
5.0 Gs @ 30 – 500 Hz

### Dimensions

100.0 (L) x 68.5 (W) x 33.0 (H) mm

### Weight

230 g +/- 2%

voltage), the field voltage is removed within 0.2 seconds.

After shutdown, reset the regulator by decreasing voltage below 6 Vac either by stopping the prime mover or interrupting the regulator input with a reset switch for 2 seconds or more.

## SECTION 4 : VOLTAGE ADJUST RHEOSTAT

Screwdriver adjustable potentiometer adjusts generator output voltage. Adjustment CW increases voltage.

When using remote voltage adjust rheostat (VAR), the VAR wire on the regulator should be cut and the rheostat connected to both ends. A 1K ohm and 1 watt resistance is adequate for most applications. See Interconnection Diagrams.

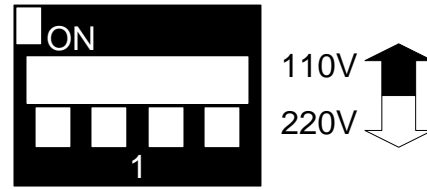
## SECTION 5 : FIELD FLASHING

When the regulator is operated with the generator for the first time, the polarity residual magnetism may not correct or the magnitude not enough. If the generator does not build-up after startup, shut down the prime mover and proceed with the following steps :

- 5.1 With the prime mover at rest, apply a DC source (not grounded) of not more than 12V, to terminals F+ (positive) and F- (negative) in series with a limiting resistor of 3 – 5 ohms.
- 5.2 Allow approximately 3 seconds before removing the dc source.
- 5.3 Start prime mover and measure voltage at regulator leads 3 and 4. If voltage is greater then 5 volts, voltage build-up should be successful. Repeat field flashing procedure if less than 6V residual is measured.
- 5.4 If repeating steps 1 and 2 does not result in generator voltage build-up, replace the voltage regulator.

## SECTION 6 : DIP SW SELECTION

When the regulator is operated with the generator.



Sensing & Power Input  
Voltage Selection

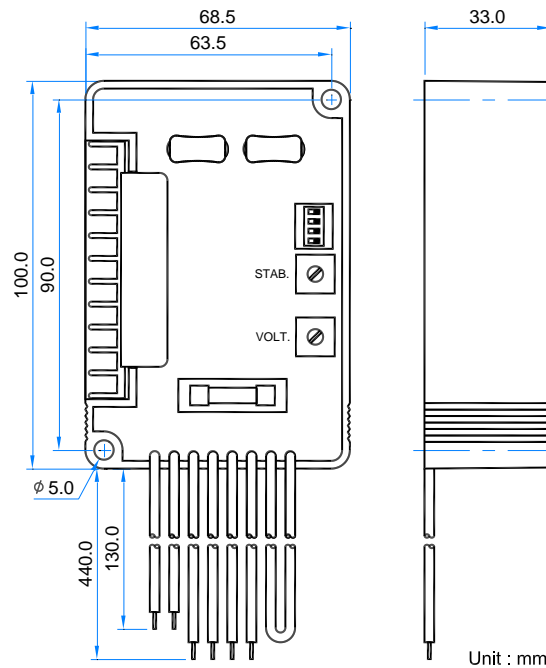
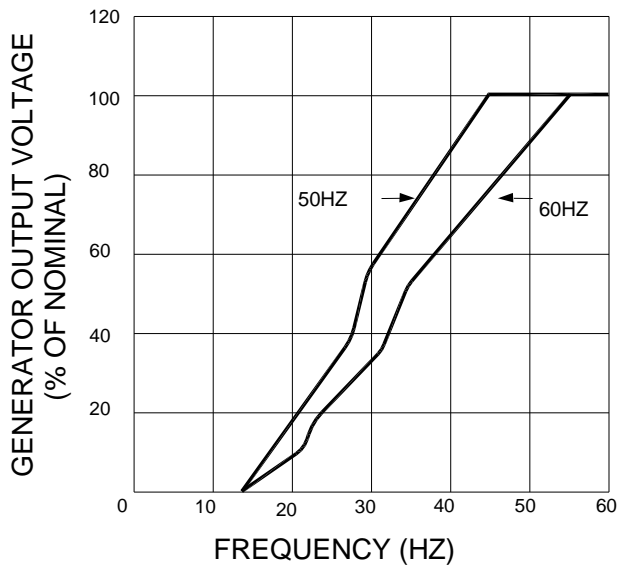


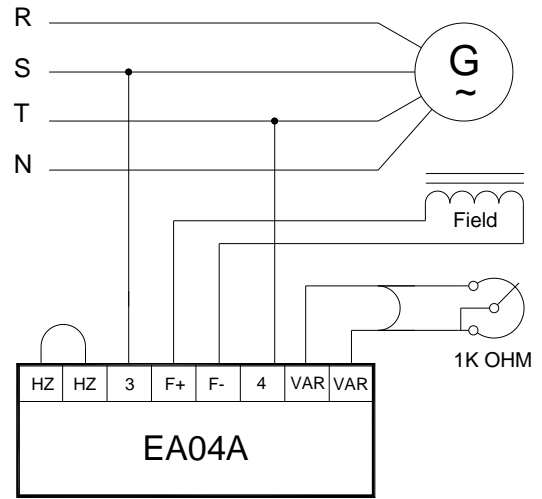
Figure 1 Outline Drawing

### 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 1.
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.



Frequency Compensation Curves  
Figure 2



Interconnection Diagram, 208 – 240V Nominal  
Figure 3

**WARNING**

Please make sure you have read and understand the contents of the instruction manual prior to installation. Incorrect wiring connection may result in irreversible damage to the product and other equipments.

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