

# SS300

## *Generator Automatic Voltage Regulator Operation Manual*



## 1. INTRODUCTION

The SS300 voltage regulator is an encapsulated electronic voltage regulator which controls the output of a brushless AC generator by regulating the current into the exciter field.

### Read And Save These Instructions

Before installing, using, or servicing this product, carefully read and fully understand the instructions including all warnings, cautions, & safety notice statements.

## 2. SPECIFICATION

### Sensing Input

Voltage 190 ~ 240V 50/60Hz

### Power Input

Voltage 190 ~ 240V 250/300Hz

### Output Power Continuous

63 VDC at 3.0 ADC (190 W)

### Output Power Forcing

105 VDC at 5 ADC (525 W)  
(240 VAC Input Power)

### Exciter Field DC Resistance

Min. 15 ohm

### Voltage Regulation

< ±1% (with 4% engine governing)

### Voltage Build-up

Residual voltage at AVR terminal > 10VAC

### Burden

500VA

## 3. INSTALLATION

### 3.1 Mounting

The SS300 voltage regulator can be mounted in any plane. See Figure 1 for mounting dimensions.

### 3.2 Connections

See figure 2 for typical High Wye (416-480V) or Low Wye (208-240V) connections. For High Delta (240V) or 120/240V single phase Zig-Zag, use generator leads T1 & T3 for sensing inputs on regulator terminals E1 & E3/4. For 120V only single phase or three phase Low Delta (120V) connections, a step-up potential transformer with ratio 1:2 will be required for sensing inputs.

### WARNING

**Electrical Shock Hazard : Only qualified personnel who are trained in electrical safety practices should install or repair electrical generators and their accessories. Shaft rotation produces voltage in generators even when no excitation is applied. Do not open terminal box or touch unprotected terminals while the generator shaft is rotating. Failure to do so may cause serious injury or death to personnel.**

### External Volts Adjustment

±5% with 1000 ohm rheostat

±10% with 2000 ohm rheostat

### EMI Suppression

Internal electromagnetic interference filtering

### Under Frequency Protection

54 ~ 61 Hz for 60Hz Operation

45 ~ 51 Hz for 50Hz Operation

### Unit Power Dissipation

Max. 8 watt

### Operating temperature

-40 ~ 60 °C

### Storage temperature

-65 ~ 85 °C

### Dimensions

99.5mm L \* 67mm W \* 47.5mm H

### Weight

200g ± 2%

### 3.3 Fuse

4Amp 250V - 5 X 20 mm fuse is supplied with the regulator.

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## 4. ADJUSTMENT AND SETTING

### 4.1 Voltage Adjust

- The screwdriver adjustable potentiometer adjusts the generator output voltage. Adjustment clockwise increases the generator output voltage.
- When using a remote voltage adjust rheostat, remove the jumper wire across terminals 6 and 7 and install a 2000 ohm 1/2 watt (minimum) rheostat. (See Figure 3). This will give  $\pm 10\%$  voltage variation from the nominal. (For  $\pm 5\%$  voltage variation use a 1000 ohm 1/2 watt rheostat).

### 4.2 Stability Adjust

- The screwdriver adjustable potentiometer adjusts the system stability. Adjustment clockwise increases the stability. Increasing the stability increases the response time of the generator.

Conversely, decreasing the stability decreases the response time of the generator.

- There are two small jumpers on the regulator. (See Figure 3).

### 4.3 V/Hz Roll-Off Frequency Selection

- Use jumper to select 50Hz or 60Hz. The screwdriver adjustable potentiometer sets the roll-off frequency from 54-61Hz in the 60Hz setting or from 45-51Hz in the 50Hz setting.
- The SS300 has the roll-off point preset to 58Hz in the 60 Hz mode and 48Hz in the 50Hz mode. To change the roll-off point, adjust engine speed to the desired rated speed. (50 or 60Hz). Set the voltage to the desired setting at rated speed. Adjust engine speed to the desired roll-off point. Turn the potentiometer counter-clockwise until the voltage starts to drop off. Then adjust the potentiometer clockwise until the voltage returns to rated.

Re-adjust engine speed to rated speed.

## 5. START-UP PROCEDURE

### 5.1 Preliminary SET-UP

- Ensure the voltage regulator is correctly connected to the generator. Refer to the specific connection diagram supplied with the generator.

Set the regulator voltage adjust to full counter-clockwise (minimum voltage level).

Set the remote voltage adjust (if used) to the center position.

Set the stability control full clockwise (maximum stability level).

- Connect the positive lead of a 100V D.C. voltmeter to F1 and the negative lead of the voltmeter to F2 or use an appropriate AC voltmeter on the generator output leads.

### 5.2 System START-UP

- Start and run the generator at no load and rated speed. The generator voltage should build up to a minimum level. (Actual level is dependent upon connection). If it does not build up, refer to the trouble shooting section of this manual.

- Slowly adjust the voltage control until the generator voltage reaches the nominal value. If used, adjust the remote voltage rheostat to set the generator voltage to the exact value desired.

- Turn the stability adjust counter-clockwise until instability is shown on either of the voltmeters mentioned in the "PRELIMINARY SET-UP" section. With the system operating in an unstable condition, slowly adjust the stability control clockwise until generator stability is reached.

Interrupt regulator power for a short time (approximately 1-2 seconds).

- If the generator remains stable, no further adjustment is necessary. If the generator does not remain stable, increase the stability slightly and interrupt regulator power again.

This procedure should be repeated until system stability is reached and maintained.

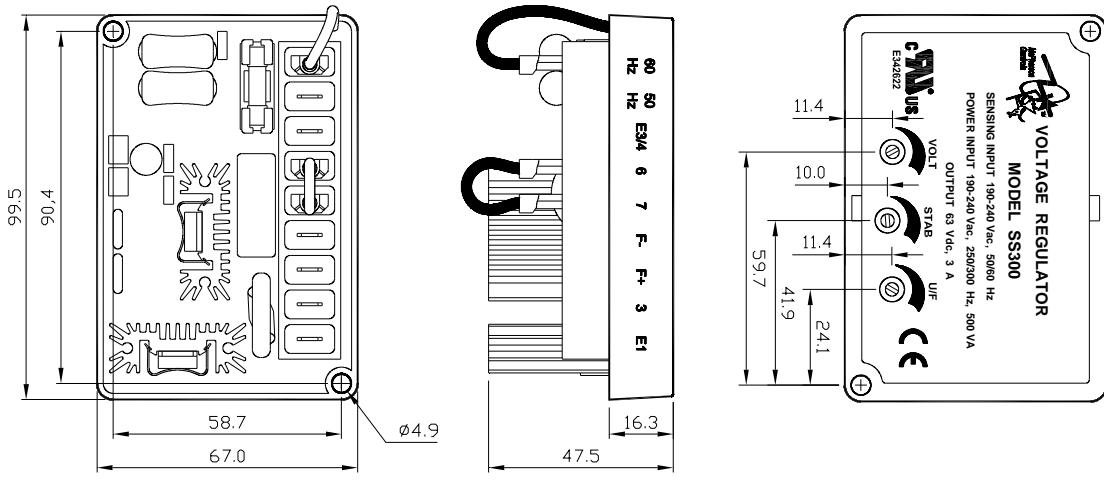


Figure 1 Outline and Drilling Diagram

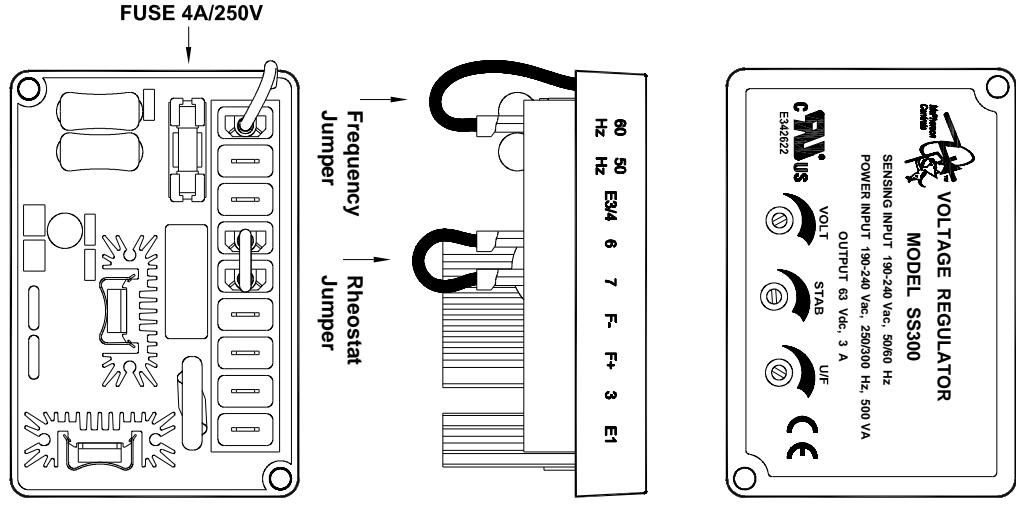


Figure 2 Jumper and Potentiometer Control Locations

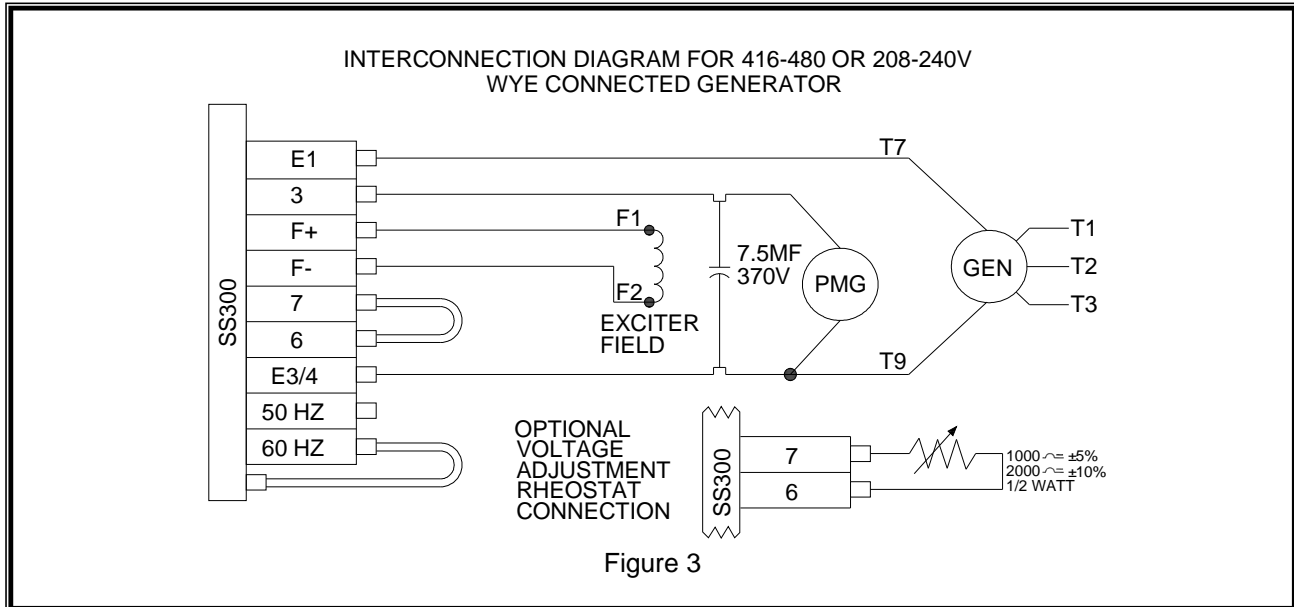


Figure 3

## 6. TROUBLE SHOOTING

SYMPTOM	CAUSE	CORRECTION
Residual Voltage - No Output	No voltage at regulator power input wires.	Check wiring diagram for proper connections. Defective PMG. Shorted PMG capacitor.
	Field leads F1, F2 not connected.	Connect field leads F1, F2
	Power input leads not connected.	Connect power input leads 3, 4.
	Blown or missing fuse	Replace fuse
	Defective regulator	Replace regulator
	Defective generator	Consult generator manual
Out voltage low	Incorrect connections	Check wiring diagram for proper connections
	Voltage adjust turned down.	Rotate voltage adjust CW until desired voltage is reached
	Remote voltage adjust is turned down	Rotate remote voltage adjust CW until desired voltage is reached.
	Defective regulator	Replace regulator
Out voltage high	Voltage adjust turned too high	Rotate voltage adjust CCW until desired voltage is reached
	Remote voltage adjust is turned too high	Rotate remote voltage adjust CCW until desired voltage is reached
Output Voltage High - No Adjustment	Sensing leads not connected to 190 - 240 Volts	Check wiring diagram for proper connection
	Defective Regulator	I Replace regulator.
Remote Voltage Adjust Operates Backwards	Voltage adjust wire backwards	Reverse the wiring of the remote voltage adjust
Generator Output Voltage Hunting	Stability adjust not set properly	Rotate the stability adjust in a CW direction until hunting stops
Poor Regulation	Meter is true RMS reading meter	Regulator is average sensing. Use average reading meter

※ Use only original supplied spare protection fuse for fuse replacement.

※ Please accept our sincere apology if any modification in performance, specification or appearance is made without prior notice.