

PM300E

Voltage Regulator  
Instruction Manual



## 1. INTRODUCTION

The PM300E 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, and safety notice statements.



**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.

## 2. SPECIFICATION

### Sensing Input

Voltage 190 ~ 240V 50/60Hz

### Power Input

Voltage 190 ~ 240V 250/300Hz

### Output Power Continuous

63 VDC max at 3.0 ADC (190 W)

### Exciter Field DC Resistance

15 to 100 ohm

### Voltage Regulation

<  $\pm 1\%$  (with 4% engine governing)

### Voltage Build-up

Residual voltage at AVR terminal > 10VAC

### Burden

500VA

### External Volts Adjustment

$\pm 5\%$  with 1000 ohm rheostat

$\pm 10\%$  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

### Surrounding air temperature

-40 ~ 60 °C

### Storage temperature

-65 ~ 85 °C

### Dimensions

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

### Weight

200g  $\pm 2\%$

## 3. INSTALLATION

### 3.1 Mounting

The PM300E voltage regulator can be mounted in any plane. See Figure 1 for mounting dimensions.

### 3.2 Connections

See figure 3 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

T7 & T9 for sensing inputs on regulator terminals E1 & E3/4. For 120V only connections, a step-up potential transformer with ratio 1:2 will be required: clearly identify required lead connections.

### 3.3 Fuse

4Amp 250V - 5 X 20 mm fuse is supplied with the regulator. Marathon Fuse Part No.: A-527066-1

## 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 50 Hz or 60 Hz. The screwdriver adjustable potentiometer sets the roll-off frequency from 54-61 Hz in the 60 Hz setting or from 45-51 Hz in the 50 Hz setting.

The PM300E has the roll-off point preset to 58 Hz in the 60 Hz mode and 48 Hz in the 50 Hz mode. To change the roll-off point, adjust engine speed to the desired rated speed. (50 or 60 Hz). 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.

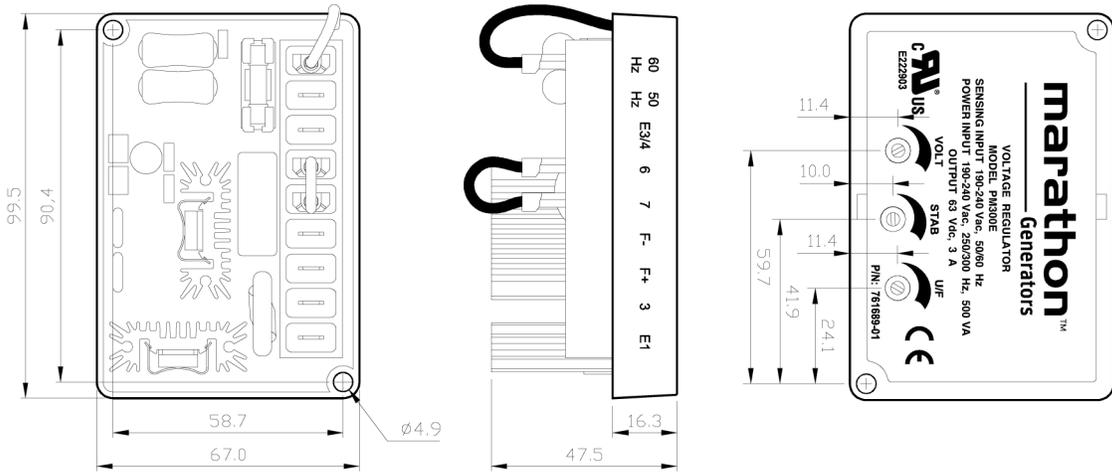


Figure 1 Outline and Drilling Diagram

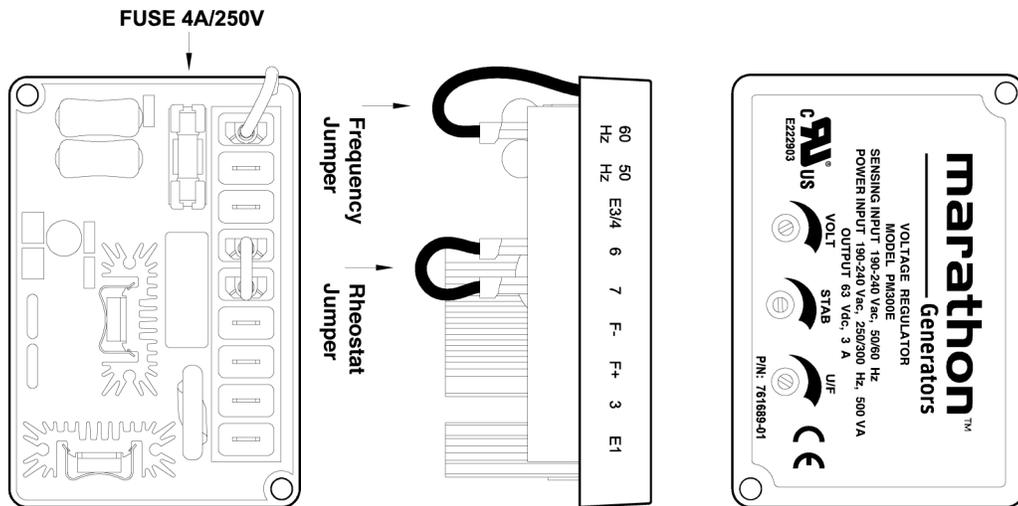


Figure 2 Jumper and Potentiometer Control Locations

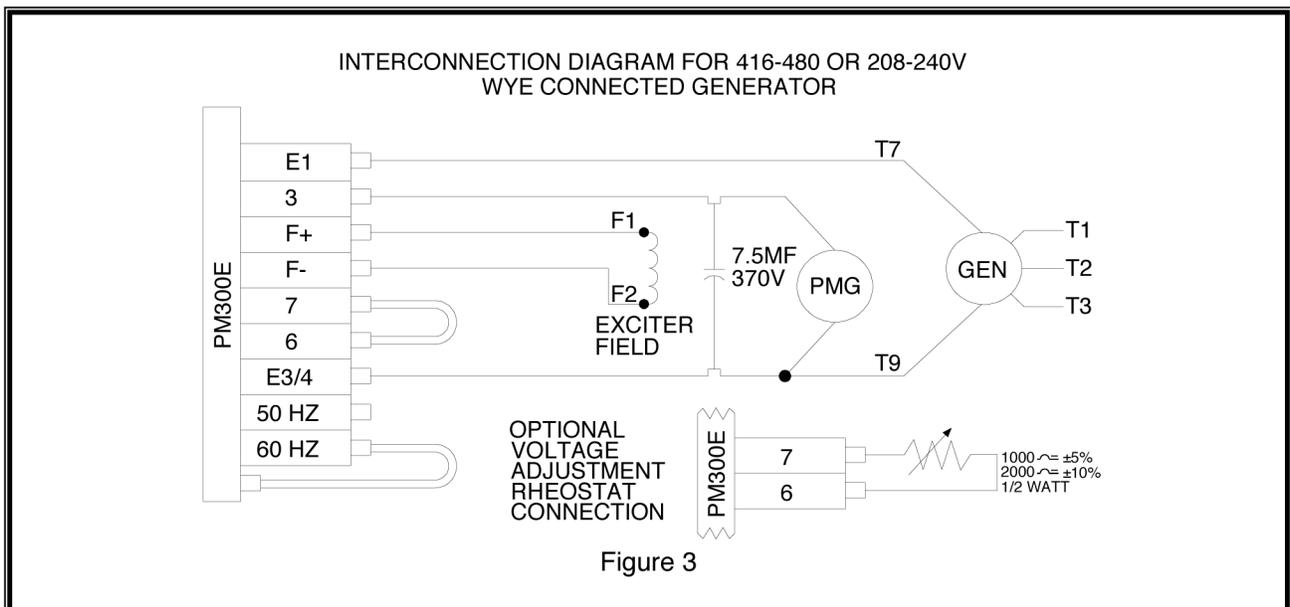


Figure 3

<b>SYMPTOM</b>	<b>CAUSE</b>	<b>ACTION</b>
Residual Voltage - No Output	No voltage at regulator power input wires.  Field leads F1, F2 not connected. Power input leads not connected. Blown or missing fuse. Defective regulator. Defective generator.	Check wiring diagram for proper connections. Defective PMG. Shorted PMG capacitor. Connect field leads F1, F2. Connect power input leads 3, 4. Replace fuse. Replace regulator. Consult generator manual.
Output Voltage Low	Incorrect connections.  Voltage adjust turned down.  Remote voltage adjust is turned down.  Defective regulator.	Check wiring diagram for proper connections. Rotate voltage adjust CW until desired voltage is reached. Rotate remote voltage adjust CW until desired voltage is reached. Replace regulator.
Output Voltage High	Voltage adjust turned too high.  Remote voltage adjust is turned too high.	Rotate voltage adjust CCW until desired voltage is reached. Rotate remote voltage adjust CCW until desired voltage is reached.
Output Voltage High - No Adjustment	Sensing leads not connected to 190 - 240 Volts. Defective Regulator	Check wiring diagram for proper connection. 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.

# marathon™

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Generators

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