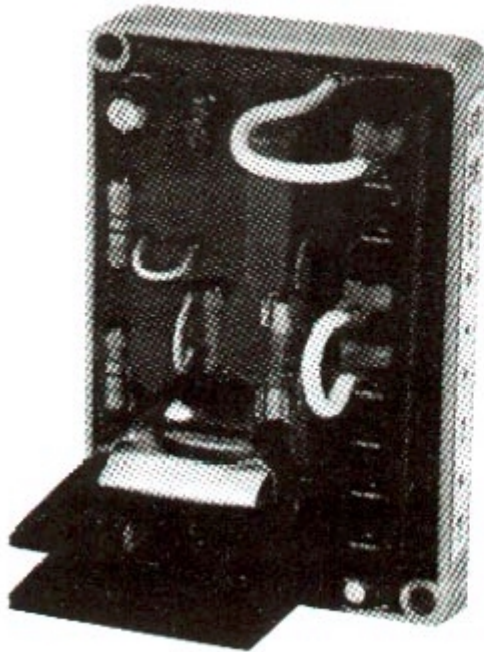


# PM300

# VOLTAGE REGULATOR

# INSTRUCTION MANUAL



 **MARATHON<sup>®</sup>**  
**ELECTRIC**

*A Subsidiary of Regal-Beloit Corporation*

## INTRODUCTION

The PM300 voltage regulator is an encapsulated electronic voltage regulator that controls the output of a brushless AC generator by regulating the current into the exciter field.

<b>SPECIFICATION</b>	<b>PM300 REGULATOR</b>
Sensing	190-240 Vac 50 / 60 Hz
Power Input	190-240 Vac 250 / 300 Hz
Burden	500 VA
Output Power- Continuous	63 Vdc at 3.5 Adc (190w)
Output Power - Forcing(240 Vac Input Power)	105 Vdc at 5 Adc (525w)
Regulation	1 .0%
Remote Voltage Adjustment Range	± 10% with 2000 ohm rheostat ± 5% with 1000 ohm rheostat
Frequency Compensation	Adjustable
Roll off frequency	54-61 Hz for 60 Hz 45-51 Hz for 50 Hz
Operation	Weight6.5 oz.
Operating Temperature	- 40°C to + 60°C
Storage Temperature	- 65°C to + 85°C
Power Dissipation	8 watts maximum
Size	3.94" L X 2.66" W X 2.20: H
EMI Suppression	Internal Electromagnetic Interference Filter (EMI Filter )

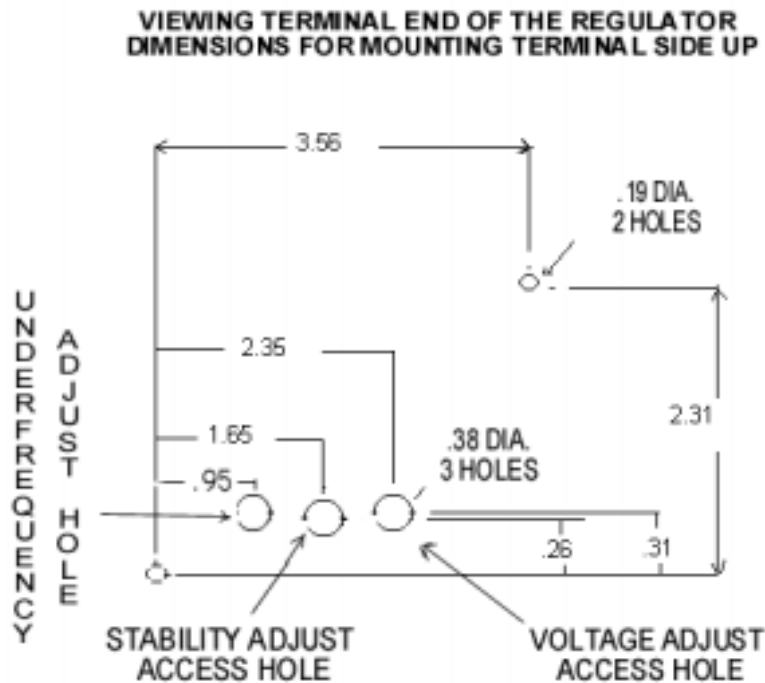
### WARNING

**TO PREVENT PERSONAL INJURY OR EQUIPMENT DAMAGE  
ONLY QUALIFIED PERSONNEL SHOULD  
INSTALL, OPERATE, OR SERVICE THIS DEVICE.**

**CAUTION: DO NOT megger or high-pot the generator with the regulator connected.  
DO NOT high-pot the regulator.**

## MOUNTING

The PM300 voltage regulator can be mounted in any plane, following is Figure 1 with the mounting dimensions.



## EXCITER POWER CIRCUIT

Connect the regulator wire F+ to the generator F+ or F1 field terminal.  
Connect the regulator wire F - to the generator F - or F2 field terminal.  
See Figure 2 for typical connection diagram

## SENSING CIRCUIT

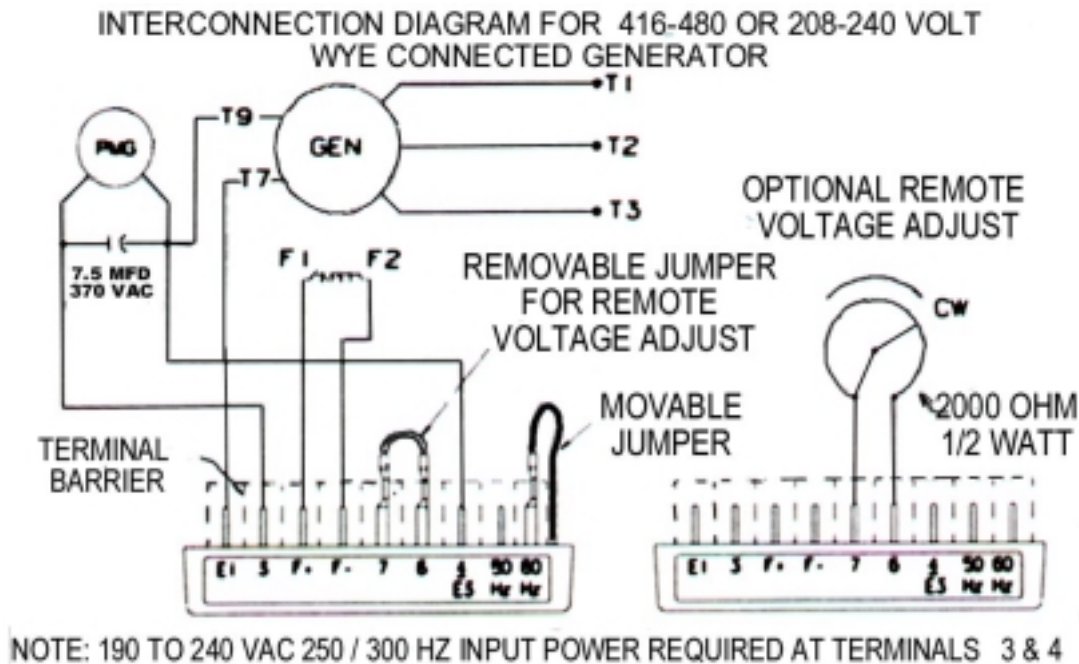
Sensing is achieved through terminals E1 and E 4.  
The voltage-sensing requirement of the PM300 is 190 to 240 Vac 50/60 Hz.  
Terminal E4 is common with terminal 4 from power input connection.  
See Figure 2 for typical connection diagram

## POWER INPUT CIRCUIT

Input power is achieved through terminals 3 and 4.  
The voltage-input requirement of the PM300 is 190 to 240 Vac 250 / 300 Hz.  
See Figure 2 for typical connection diagram

## FUSE

A 4 Amp, 250 V, 5 X 20 mm fuse is supplied with the regulator  
Littelfuse 218004 or Bussman GDC-4A. Marathon Electric Part A-527066),  
It can be located on the rear face of the voltage regulator.



**FIGURE 2**

### **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. This will give  $\pm 10\%$  voltage variation from the nominal. (For  $\pm 5\%$  voltage variation use a 1000-ohm 1/2-watt rheostat). See Figure 2.

### **STABILITY ADJUST**

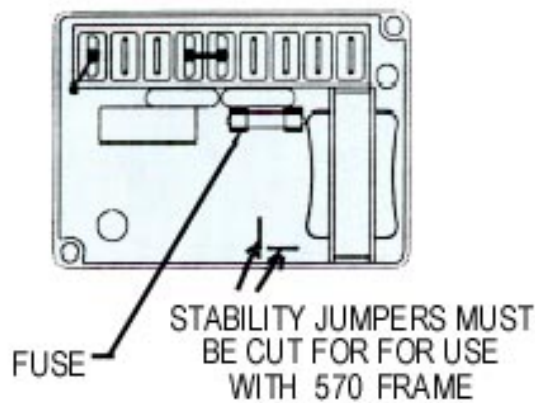
System stability is the ability of the generator to respond to load transients. Decreasing the stability makes the generator less sluggish and faster to respond to load transients. If the stability of the regulator is decreased too much, the generator will tend to hunt under steady state conditions.

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. These jumpers must be cut for proper operation of the 570 Frame MagnaMax product. For all other MagnaMax frames these jumpers should be left intact.

### **V/HZ ROLL-OFF FREQUENCY SELECTION**

The roll off point is the frequency where the generator voltage starts to decrease. This reduces the Kilowatt load to the engine, which allows the engine to recover in speed under any load transient condition. 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.



**FIGURE 3**

The PM300 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 counterclockwise until the voltage starts to drop off. Then adjust the potentiometer clockwise until the voltage returns to rated voltage. Re-adjust engine speed to rated speed.

## **STARTUP PROCEDURE**

### **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 100 V 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.

### **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 field flashing section in generator 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.

## TROUBLESHOOTING

Symptom	Cause	Action
Residual Voltage -No Output	<p>No voltage at regulator power input terminals.</p> <p>Field leads F1, F2 not connected.</p> <p>Power input leads not connected.</p> <p>Blown or missing fuse.</p> <p>Defective regulator.</p> <p>Defective generator.</p>	<p>Check wiring diagram for proper connections.</p> <p>Defective PMG</p> <p>Shorted PMG Capacitor</p> <p>Connect field leads F1, F2.</p> <p>Connect power-input leads 3,4.</p> <p>Replace fuse.</p> <p>Replace regulator.</p> <p>Consult generator manual.</p>
Output Voltage Low	<p>Incorrect connections.</p> <p>Voltages adjust turned down.</p> <p>Remote voltage adjust is turned down.</p> <p>Defective regulator.</p>	<p>Check wiring diagram for proper connections.</p> <p>Rotate voltages adjust CW until desired voltage is reached.</p> <p>Rotate remote voltages adjust CW until desired voltage is reached.</p> <p>Replace regulator.</p>
Output Voltage High	<p>Voltages adjust turned too high.</p> <p>Remote voltage adjust is turned too high.</p>	<p>Rotate voltages adjust CCW until desired voltage is reached.</p> <p>Rotate remote voltages adjust CCW until desired voltage is reached.</p>
Output Voltage High - No Adjustment	Defective regulator.	Replace regulator.
Remote Voltage Adjust Operates Backwards	Voltages adjust wired backwards.	Reverse the wiring of the remote voltage adjust.
Generator Output Voltage Hunting	Stability adjusts not set properly.	Rotate the stability adjusts in a CW direction until hunting stops.
Poor Regulation	Defective regulator.	Replace regulator.