

EA06

Generator Automatic Voltage Regulator Operation Manual



Suitable for use on single and three phase selfexcited
brushless generators

Compatible with Mecc Alte* UVR-6* & SR-7* AVR
Not a genuine Mecc Alte* regulator
Name and model numbers are for reference purpose only
and does not imply they are genuine.



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1. Summary

Voltage regulator EA06A uses 3 separate sensing inputs (1-2, 3-4, 5-6 for the R.S.T phases), it works on single or three phases and is capable of averaging the output voltages on any Y · YY or Δ connection, It can be installed in almost any modern generator that uses less than 6 amp field load.

In addition it has adjustable Under Frequency and Over Voltage, protecting the generator from overloading and over exciting.

Three built in LED indicate (Green) for Normal, (Red) for Under Frequency and (Yellow) for Over Excitation.

It also has EMS filters to prevent electrical noise feedback from the AVR back to the generator.

2. Specification

Sensing Input

Range 170~280VAC / 270~520VAC
(Single phase or 3 phase selectable by wiring) 50/60 Hz

Power Input + to 2 50~280V 50/60HZ

Output F+ · F- Max. Output 63(VDC)
6A (Continuous). Max. 7A (intermittent 10sec.)

Field Resistance DC Resistance 10~100 Ω

Voltage Build-up Residual Voltage < 5 VAC 25Hz

External VR 100K Ω 1/2W +/-5%

Voltage Regulation
< 1% (with 4% engine governing)

Over Excitation Protection

25~55VDC @ 0.1~20sec.

Under Frequency Protection

Adjustable Range 42~60 Hz

EMI Suppression

Internal electromagnetic interference filtering

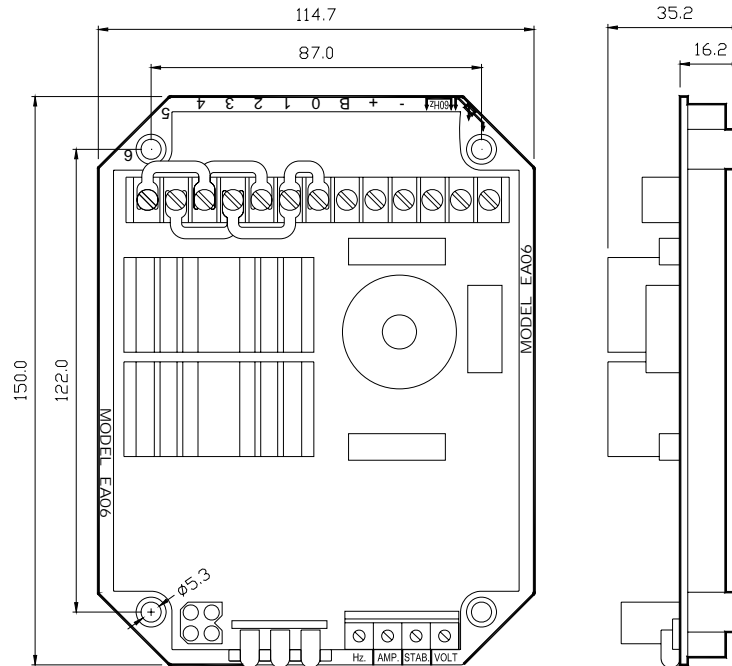
Operating Temp. -40~65

Storage Temp. -40~80

Unit Power Dissipation Max. 5 Watt

Dimensions L 150 H35.2 W 114.7 mm

Outline Dimension Protection Fuse Specification: 20mm 6.3A / 250V



Outline Drawing UNIT : MM



Secure all wiring connection. Do not install AVR at a place with high vibrations to prevent loose connections. For safety do not touch the heat sink while in operating.

3. Wiring & Adjustments

3.1 AVR Field Excitation (+) (-)

- (1) Connect AVR terminals (+) (-) to generator field winding (F+) and (F-).

NOTE: Field Resistance must be between 10 ~ 100 Ohms

- (2) If field resistance is less than 10 Ohms, add a resistor to the field to bring the overall field resistance to over 10 Ohms. Check proper wattage on this resistor

3.2 Sensing Input 1 & 2 3 & 4 5 & 6

- 2.3.1 The 3 independent sensing inputs, have input equals to 220V (center), and can be used in Wye or Delta. They are connect to the generator (3 phases) output, for example R-T S-T R-T, This inputs can also be connections in single phase (See Diagrams)

- 2.3.2 Power Input terminal (+) & 2
Used with independent power windings from (50~280V)

- 3.3 Frequency Selection Terminals Marked (60 Hz)
Normally shorted for 60 Hz. operation
Open for 50 Hz. operation

- 3.4 External Voltage Adjustment VR terminals
Remove short & install a 100K Ω 1/2W remote pot

3.5 Do not use Terminals B and 0

3.6 Voltage Adjustment VOLT

Adjust the generator voltage output by using the VOLT adjustment on the AVR -- rotating clockwise increase voltage.

Remember to keep VR terminals shorted together if external voltage adjustment is not used.

- 3.7 External Volt Adjustment SEE 3.4 above

3.8 STAB. Stability Adjustment

1. The STAB adjustment changes the respond time of the generator to any change in load. A wrong setting makes the generator unstable. For example: an over adjusted STAB causes sudden over voltages when the generator is overloaded.
2. Use an analogue type voltmeter when adjusting the stability control. Look for a stable pointer on the voltmeter when the generator goes from no load to full load.

3.9 Circuit Protection AMP

- 3.9.1 AMP. Over Excitation Protection (Overload protection) exciter output (25 to 55VDC)
Set the AMP Overload protections (from 25 to 55VDC) set the maximum excitation voltage for your generator type. If over excitation occurs the regulators needs to be reset, STOP the engine and wait 20 sec. increase the AMP setting and try again. If you again go into Over Excitation the YELLOW LED turns ON.

The higher he overload setting the shorter the AVR's reaction time)

3.9.1 Hz. Under Frequency Protection knee point setting. (Factory Preset)

1. Start generator
2. At (60Hz) Set engine Governor to 57Hz
Adjust Hz control until RED Hz LED turns ON
3. At (50Hz) Set engine Governor to 47Hz
Adjust Hz control until Hz RED LED turns ON

4. Operation

4.1 Before starting the generator

4.1.1 Initial Setting

- A. Confirm that this AVR matches the system requirements
- B. Check the wiring
- C. Check frequency settings
- D. Verify the generator voltage conforms to the AVR settings
- E. Set VOLT. Adjustment fully counterclockwise
- F. Set STAB. Adjustment to center
- G. Set AMP. Adjustment fully clockwise

4.1.2 Starting Generator

- A. Verify all setting and recheck wiring.
- B. Start generator and set engine speed.
- C. Adjust the output voltage, if the voltage becomes unstable. Adjust the STAB. Control to stops the oscillation.

NOTE: over adjustment sometimes causes output voltage oscillations. Check Stability when a load is suddenly applied, or when the load fluctuates constantly.

Adjust the STAB to the point where the oscillation starts and then turn back 1/6 of a turn.

- D. If voltage cannot be adjusted check if the generator frequency is off (See if the Under Frequency Protection was activated RED LED). Also, check if the residual voltage is less than 5VAC, if less, then field flash the generator to build up residual voltage.
 - E. Make sure the generator and AVR are operating normally.
 - F. The output voltage should be within 1% from full to no load
- (1) Generator frequency (Hz)
 - (2) Deformed generator output waveform
 - (3) Capacitive load (PF leading)
 - (4) Replace the AVR and restart
 - (5) Under/over excitation voltage protection activated (Overload protection).YELLOW LED

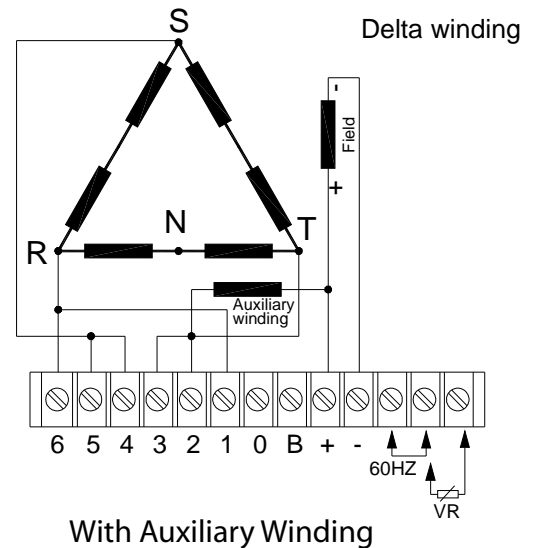
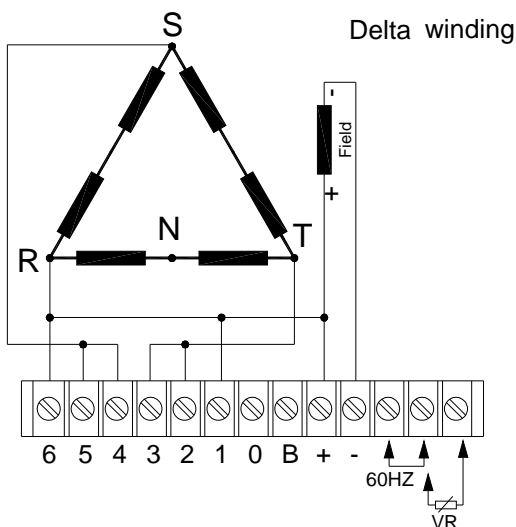
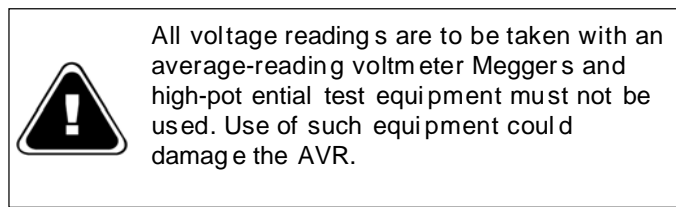
4.1.3 Field Flashing

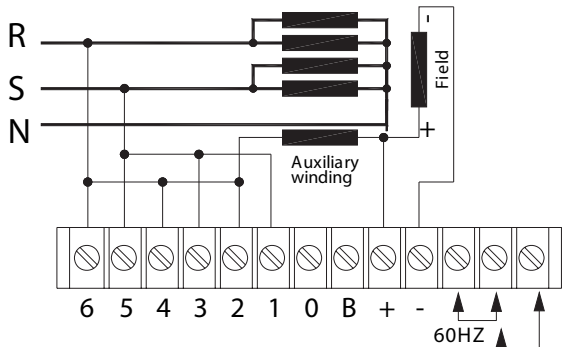
In a new installation the field polarity voltage may be connected backwards, or the voltage not high enough or the wrong engine speed. If the generator does not build-up voltage, stop the engine and go on with the next steps.

- A. Remove terminals F+ and F- from the AVR and apply 12 DC volts (not grounded) to F+ and F- on the generator exciter field, use a current limiting resistor 3 to 5 ohms 20 watt on one of the field wires.
- B. Connect the battery for about 3 seconds, do not run the engine.
- C. Reconnect the AVR and restart the engine and recheck the residual voltage at the output leads of the generator. If the voltage is greater than 6VAC reconnect the AVR.
- D. Repeat field flashing if residual is less than 3VAC.

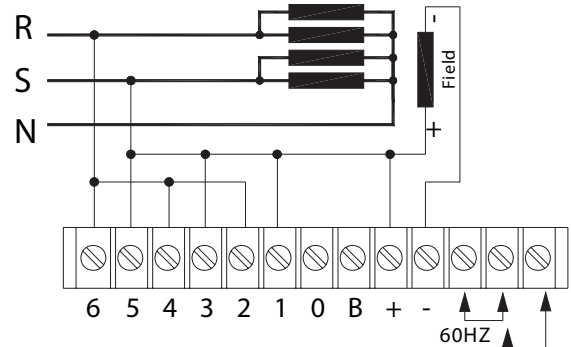
4.1.4 Maintenance

Make sure the AVR surface is clean and free from oil and moisture. All connection terminals and wirings must be firmly tightened with no signs of visible oxidation or erosion

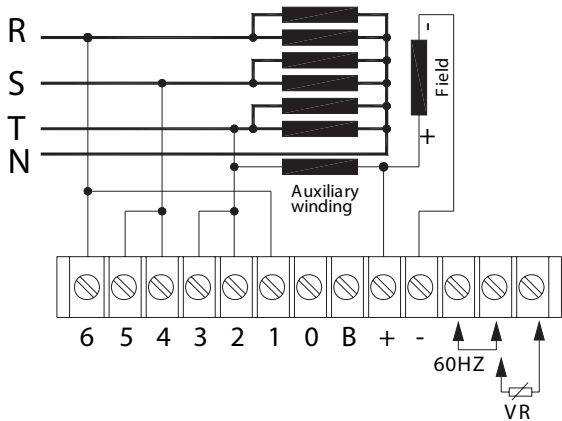




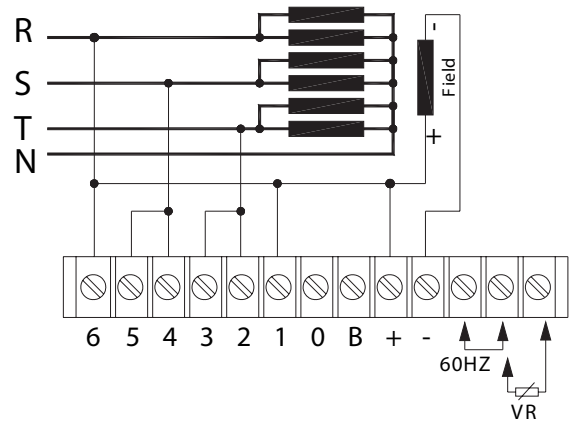
1 Phase sensing with Auxiliary Winding



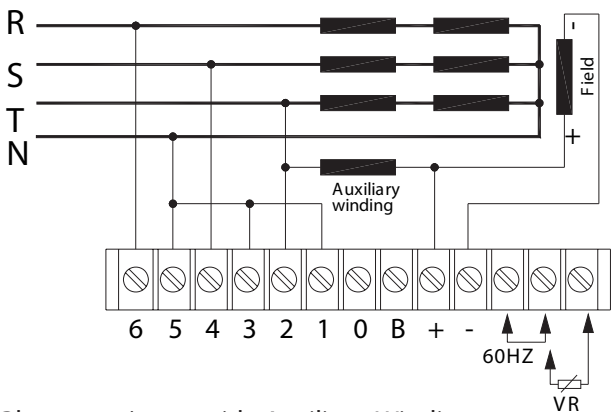
1 Phase 208/120v



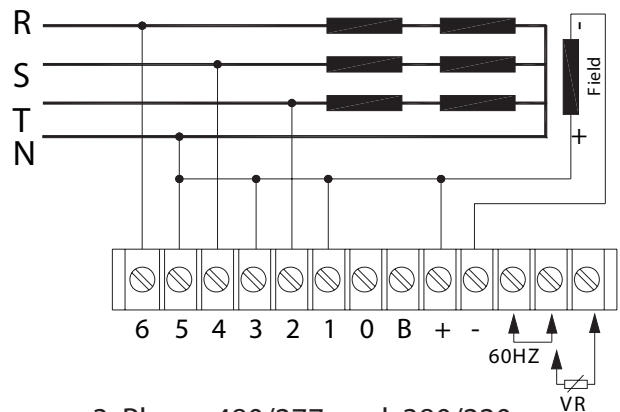
3 Phase 208/120v with Auxiliary Winding



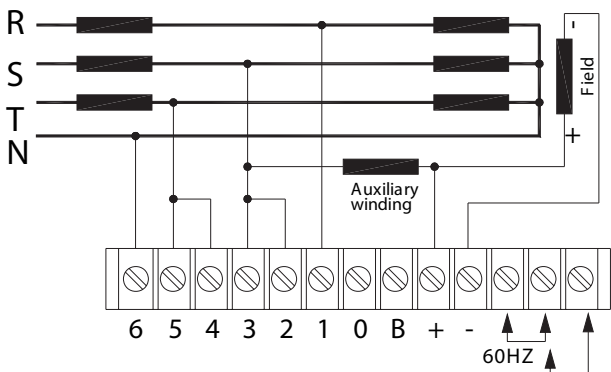
3 Phase 208/120v



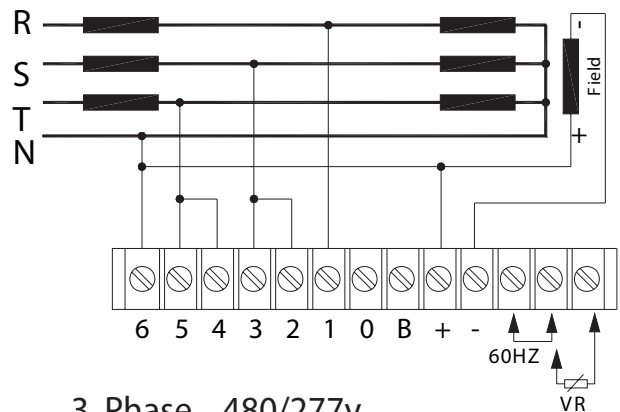
3 Phase 480/277v with Auxiliary Winding



3 Phase 480/277 and 380/220v

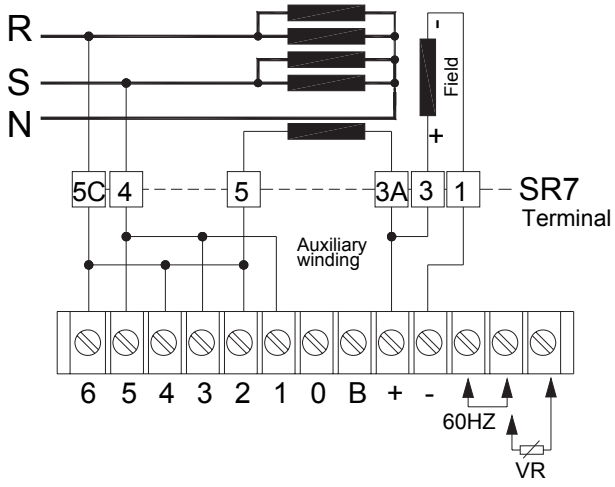


3 Phase 480/277v with Auxiliary Winding

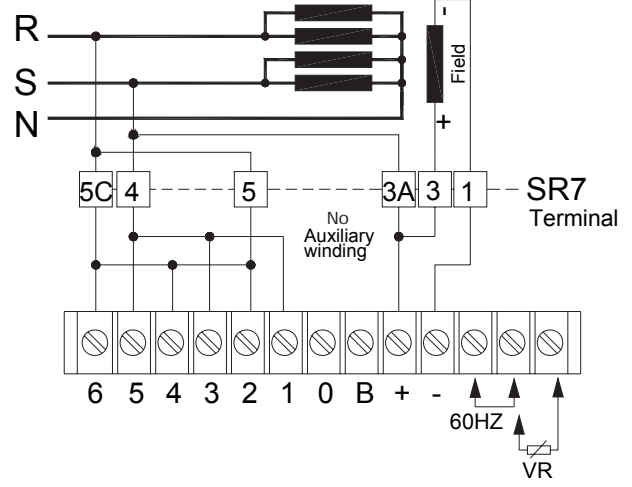


3 Phase 480/277v

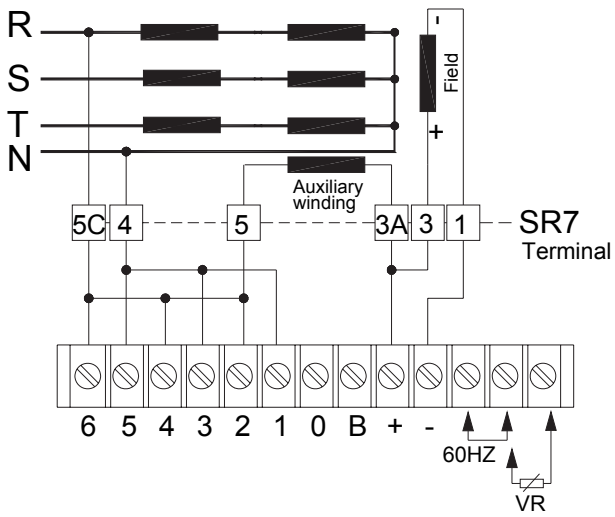
EA06 Replace Mecc AltSR7*



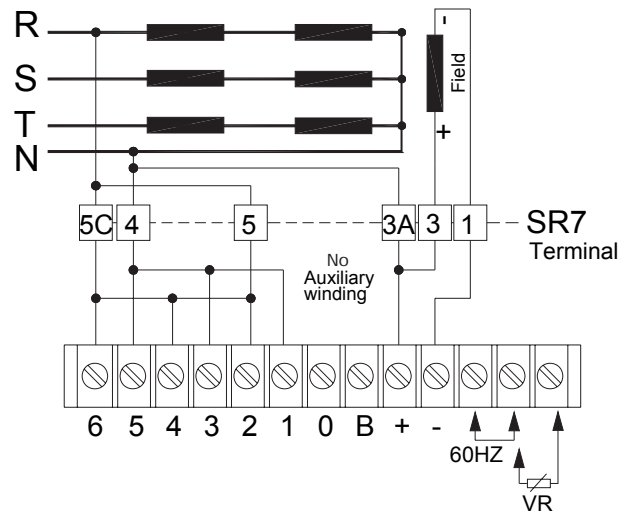
1 ϕ 220V with Auxiliary winding



1 phase 240/120 volts Zig Zag



3 phase 380/220 and 480/277 with Auxiliary Winding



3 phase 380/220 and 480/277

※ Use Only Original Fuse

※ Modification in performance, specification or appearance is made without prior notice