Universal Hybrid Analog-Digital Voltage Regulator Operation Manual

Self Excited Analog/Digital 5Amp AVR
For use in shunt and generators with auxiliary windings
Warning!

1. Only qualified technicians should install and operate the AVR.

2. The voltage regulator may be installed at any suitable location on the generator set (dimensions are shown in Fig. 1). It is recommended that unit is mounted vertically with the green resistors on the regulator upwards to achieve the best cooling effect.

3. All AC voltage sensing readings are average value only.

4. Before using a Megger or a Withstand Voltage Tester, removes the wires connecting to the AVR to prevent high voltage damage to the regulator.

5. Use only the replacement fuses specified in this manual.

6. Appearance and product specifications are subject to change or improvement without prior notice.

Section 1. Specifications

Sensing Input (A to C) Average Reading

- Voltage: 170 – 520 Vac Single-phase, 2-wire
  - 220/440 Vac (DIP switch setting)
  - 170 – 260 Vac @ 220 Vac
  - 340 – 520 Vac @ 440 Vac
- Frequency: 50/60 Hz (DIP switch setting)

Soft Start Ramp Time
3 seconds +/- 10%

Static Power Dissipation
8 watts EMI

Suppression
Internal electromagnetic interference filtering

Under Frequency Protection (Factory Setting)
- At 50 Hz - knee point set at 45 Hz
- At 60 Hz - knee point set at 55 Hz

Voltage Thermal Drift
-40°C to +70 °C · < 3%

Low Frequency Knee Point Thermal Drift
-40°C to +70°C · < +/- 0.1 Hz

Operating Environment
- Operating Temperature: -40°C to +70 °C
- Storage Temperature: -40°C to +85 °C
- Relative Humidity: < 95%
- Vibration: 5g @ 60 Hz

Dimensions
- 121.0 (L) x 81.0 (W) x 44.5 (H) mm
- 4.76” (L) x 3.19” (W) x 1.75” (H) inch

Weight
- 270 g +/- 2%

Over Excitation Voltage Protection
>35% Input Power Voltage, Delay 5 seconds. This function can be turned off.

External Voltage Adjustment (EXT.VR)
- +/- 3.5% 1 KΩ 1 watt potentiometer
WARNING

Some generators even when working at high voltage are factory set to sense at lower voltages. Remember to set the ADVR DIP SW 2 to the sensing voltage not the working voltage of the generator even do sometimes it can be the same. If you have a 480/277V generator but you have the sensing wires C and A connected to 240 Volts move DIP SW 2 to ON.

Another example are rental units with multi-voltage output with a switches for Y, YY, Delta & ZZ output, but sensing is always at 240V from T7 and T9 even though the generator is running sometimes at 480/277V.
Section 3. DIP Switch settings, Indicator Lights and Adjustments

O/E LED
The over excitation LED is activated after a 5 sec. delay when the output voltage is 35% higher than the input voltage. The SW3 setting determines whether this function is on.

VOLT Voltage Adjustment
The adjustment range is set by SW2.

STAB Stability Setting
With No Load, slowly adjust the STAB clockwise to when the voltage becomes unstable, then back clockwise about 1/5 turn.

U/F LED
Under Frequency Protection LED

<table>
<thead>
<tr>
<th>SW</th>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50Hz</td>
<td>60Hz</td>
</tr>
<tr>
<td>2</td>
<td>220V</td>
<td>440V</td>
</tr>
<tr>
<td>3</td>
<td>ON: O/E DISABLE</td>
<td>OFF: O/E ENABLE</td>
</tr>
</tbody>
</table>

EXT. VR: Ext trim-pot, 1KΩ 1W. Keep terminals shorted when not in use.

F+ & F- Connect to generator excitation

Adjustments after generator is started

1. First, set VOLT and STAB trim-pots completely counterclockwise, set the engine governor to 50 or 60 Hz. Now slowly turn the VOLT trim-pot clockwise to increase the working voltage (If you have an external Trim-pot set it to center position). Keep EXT. VR shorted when not in use.

2. Next, slowly adjusting the STAB trim-pot (clockwise) this changes the response time of the AVR to changing loads. If the setting is too high the voltage is unstable, but if set too low the response is sluggish. We recommend using an analog DC voltage meter on F, F+ and adjust STAB for the lowest amount of voltage fluctuation. (needle movement)

3. Last, setting the Under Frequency (U/F) trim-pot. (The U/F is Factory preset and needs no adjustments) put in rare applications --- Use the U/F LED as a guide. When this LED is ON the circuit is operational turning off the regulators output. To recalibrate, adjust the generator speed to the new U/F kneel point, usually 5 Hz under rated speed (Hz) then set the U/F trim-pot to the point at which the U/F LED just changes from off to on.
Section 7. Connection Diagrams

Fig 4  208, 220V sensing connection

Fig 5  220, 240V sensing

Fig 6  380, 440, 480V sensing

Fig. 7 Using Auxiliary Winding

Factory Setting

ADVR-054

SW | ON | OFF
---|----|----
1 | 50Hz | 60Hz
2 | 220V | 440V
3 | ON : O/E DISABLE | OFF : O/E ENABLE

ADVR-054

SW | ON | OFF
---|----|----
1 | 50Hz | 60Hz
2 | 220V | 440V
3 | ON : O/E DISABLE | OFF : O/E ENABLE