

## INTRODUCTION

AVC63-4A voltage regulators are designed for use with 50/60 hertz brushless generators. Regulator features include frequency compensation, overexcitation shutdown, a solid-state buildup circuit, and electromagnetic interference (EMI) filtering.

## ELECTRICAL SPECIFICATIONS

### DC Output Power Ratings

Continuous:	4 Adc at 63 Vdc (252 W)
One-Minute Forcing:	6 Adc at 90 Vdc (540 W)
10-Second Forcing:	9 Adc at 134 Vdc (1,206 W)

### Exciter Field DC Resistance Range

15 to 100  $\Omega$

### AC Power Input

Operating Range:	95 to 139 Vac, $\pm 10\%$ , single-phase, 50/60 Hz
Burden:	450 VA

### Sensing Input Operating Range

95 to 139 Vac,  $\pm 10\%$  or 190 to 277 Vac,  $\pm 10\%$ , single-phase, 50/60 Hz

### Regulation Accuracy

Better than  $\pm 1.0\%$ , no-load to full-load

### Response Time

Less than 1.5 cycles for  $\pm 5\%$  change in sensing voltage

### EMI Suppression

Equipped with internal EMI filter

### Overexcitation Shutdown

Field voltage shuts down after a time delay if exciter field voltage rises above the normal operating range. See *Operating Features, Overexcitation Shutdown*.

### Voltage Buildup

Regulator has internal provisions for automatic voltage buildup from residual generator voltage as low as 6 Vac.

### Power Dissipation

15 W maximum

## PHYSICAL SPECIFICATIONS

### Terminations

Quarter-inch, quick-connect terminals accept Amp 154718-3 (positive-lock receptacle) or Amp 154719-1 (nylon receptacle).

### Temperature

Operating Range:	-40 to 60°C (-40 to 140°F)
Storage Range:	-40 to 85°C (-40 to 185°F)

### Vibration

Withstands 1.2 G at 5 to 26 Hz, 0.036" double amplitude at 27 to 52 Hz, and 5G at 53 to 1,000 Hz. Withstands up to 20 G in each of three mutually perpendicular axes.

### Weight

283 g (10 oz) net

### Dimensions

See Figure 1 for AVC63-4A dimensions.

## OPERATING FEATURES

### Corner Frequency Selection and Adjustment

The AVC63-4A corner frequency setting is factory-preset at 55 hertz for use with 60 hertz systems. For use with 50 hertz systems, a 45 hertz corner frequency setting is achieved by connecting a jumper across terminals HZ1 and HZ2.

The corner frequency is adjusted by the AVC63-4A UF ADJ control. Clockwise rotation raises the corner frequency (shifts the curve to the right). To adjust corner frequency:

1. Adjust the UF ADJ control fully counterclockwise.
2. Start and set the generator at its rated voltage.
3. Adjust the generator frequency to the desired kneepoint frequency.
4. Slowly adjust the UF ADJ control clockwise until the generator voltage just begins to decrease.

Figure 2 illustrates the AVC63-4A frequency compensation curves.

### Overexcitation Shutdown

If the exciter field voltage rises above the normal operating range, the overexcitation shutdown function removes the AVC63-4A output power after a time delay that is inversely proportional to the magnitude of the overvoltage detected. The time characteristic for this function is illustrated in Figure 3.

After output power is removed, the regulator can be reset by decreasing the input voltage below 6 Vac for a minimum of 2 seconds. This can be accomplished by stopping the prime mover or interrupting the regulator input with a reset switch.

### Stability Adjustment

The response rate of the generator output voltage to a change in load is adjusted through the AVC63-4A STAB control. Clockwise rotation increases the response time. This decreases the amount of voltage overshoot which increases stability. Counterclockwise rotation decreases the response time. This increases the amount of voltage overshoot which decreases stability.

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## FUSES

The AVC63-4A is protected by an internal fuse illustrated in Figure 1. A spare fuse, mounted on the back of the internal fuse, is provided with the AVC63-4A.

To protect your wiring from faults before the regulator, fuses with high interruption capability should be installed according to the interconnection diagrams (Figure 4, Figure 5, and Figure 6).

## OPERATING PROCEDURES

### Caution

Meggers and high-potential test equipment must not be used. Incorrect use of such equipment could damage the regulator.

The following procedures provide instructions for adjusting the AVC63-4A. Certain generator system problems are included along with suggested solutions.

Complete the *Preliminary Setup* procedure before proceeding with the *System Startup* procedure.

### Preliminary Setup

1. Verify that the AVC63-4A specifications conform to the requirements of the generator system.
2. Configure the regulator connections as follows:
  - a. If a remote voltage adjust rheostat will not be used, ensure that regulator terminals 6 and 7 are shorted with a jumper.
  - b. If a 55 Hz corner frequency for a 60 Hz system is desired, ensure that terminals HZ1 and HZ2 are open. If a 45 Hz corner frequency for a 50 Hz system is desired, short terminals HZ1 and HZ2 with a jumper.
  - c. For 120 Vac nominal sensing, ensure that terminals V1 and V2 are open. For 240 Vac sensing, short terminals V1 and V2 with a jumper.
3. Ensure that the AVC63-4A is connected to the generator system correctly. Connections for typical AVC63-4A applications are shown in Figure 4, Figure 5, and Figure 6.
4. Install the fuses as described in *Fuses*.
5. Adjust the AVC63-4A VOLT ADJ control fully counterclockwise. If a remote voltage adjust rheostat is used, adjust it to the center of its rotation.

### System Startup

### Note

The *Preliminary Setup* procedure must be performed before proceeding with system startup. All voltage readings are to be taken with an average reading voltmeter.

1. Start the generator and bring it up to its rated speed.

**Result:** Voltage should build up. If it does not, perform field flashing.

2. Slowly adjust the AVC63-4A VOLT ADJ clockwise until the generator output voltage reaches the nominal value. If used, adjust the remote voltage adjust rheostat to set the generator voltage to the desired level.

**Result:** Voltage should build to the rated value. If the voltage does not build to the rated value, check the generator for a short-circuit or excessive load.

3. Check regulator operation under normal operating and loading conditions.

**Result:** Voltage regulation should be better than  $\pm 1.0\%$  over the range of no-load to full-load. Voltage reduction under load may be due to a speed change from no-load to full-load. This may cause the frequency compensation circuit to reduce the voltage at lower frequencies.

## OPERATIONAL TEST

1. Connect the AVC63-4A as shown in Figure 7 but do not apply power yet. Ensure that the light bulb is rated for 120 Vac and less than 100 W.
2. Adjust the AVC63-4A VOLT ADJ control and/or remote voltage adjust rheostat fully counterclockwise. Adjust the AVC63-4A STAB control fully counterclockwise.
3. Apply 120 Vac, 50/60 Hz power to the AVC63-4A. The light bulb should be off.
4. Slowly adjust the AVC63-4A VOLT ADJ control clockwise. At the regulation point, the light bulb should illuminate. Small adjustments above and below this level should cause the light bulb to turn off and on. Note that the light bulb turns on and off rapidly.
5. Rotate the STAB ADJ control fully clockwise. Now adjust the VOLT ADJ control above and below the regulation point. The light bulb should still turn off and on, but the transition from off to on and on to off should be much slower.

## DRAWING NOTES

The following notes apply to the interconnection diagrams (Figure 4, Figure 5, and Figure 6) and the operational test diagram (Figure 7).

1. If an external rheostat is not used, short terminals 6 and 7.
2. Short terminals HZ1 and HZ2 for 50 Hz operation and leave terminals HZ1 and HZ2 open for 60 Hz operation.
3. Item is not supplied by Basler Electric.
4. For 120 Vac nominal sensing voltage, make no connection to terminals V1 and V2. For 240 Vac nominal sensing voltage, short terminals V1 and V2 together.
5. Select fuses with a high interrupting capacity. If a glass-type fuse is used, enclose it for safety.

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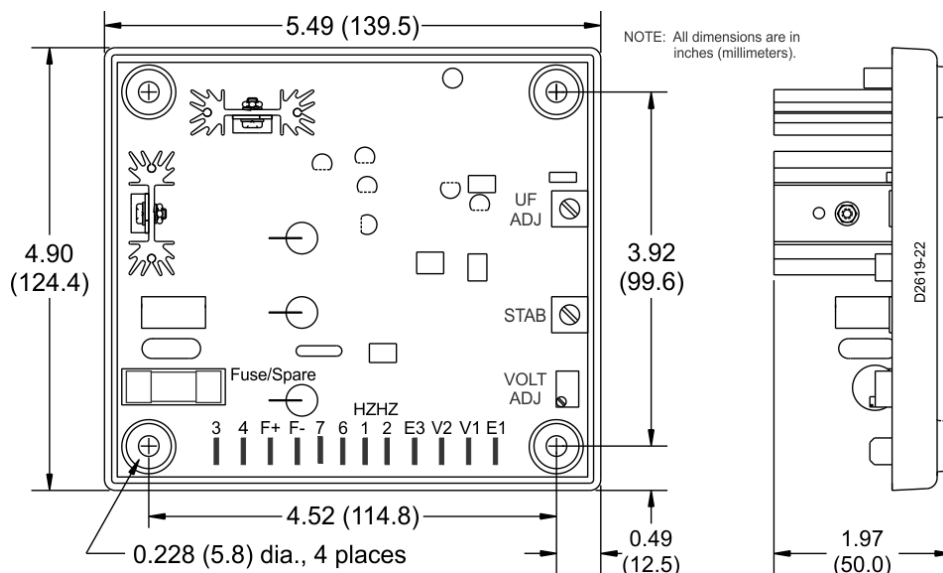


Figure 1. AVC63-4A Outline Diagram

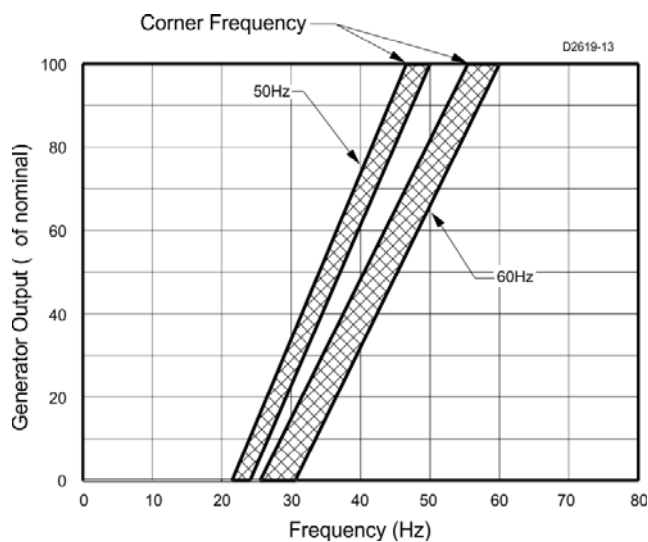


Figure 2. Frequency Compensation Curves

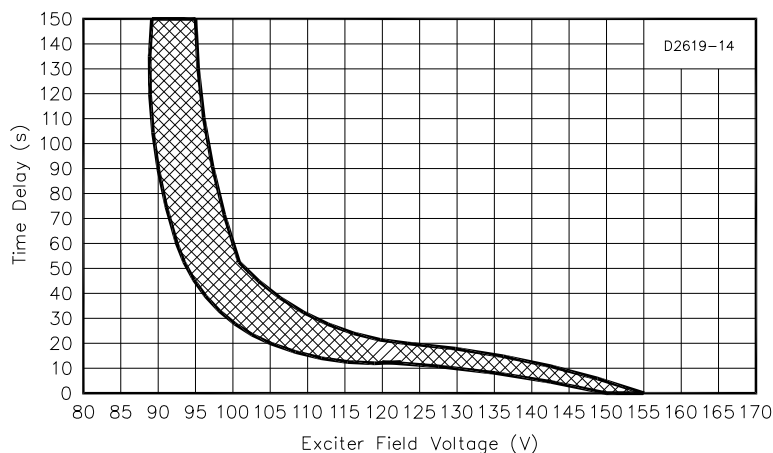
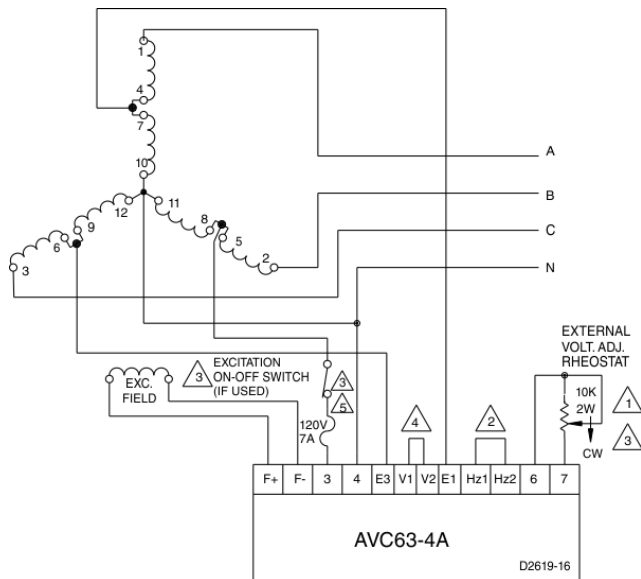
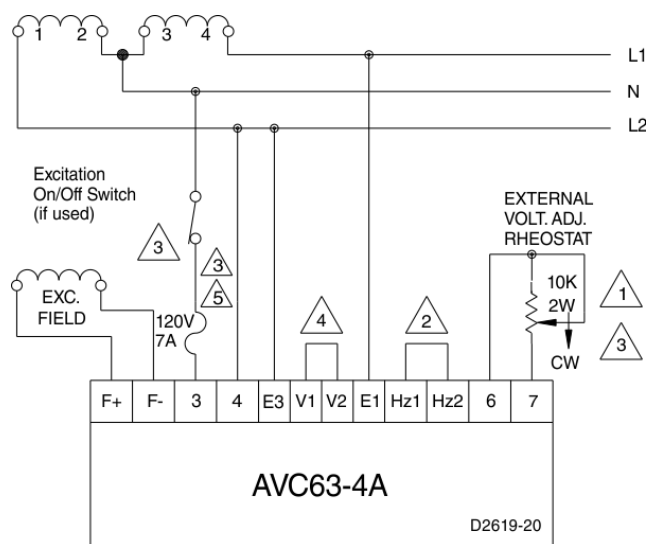


Figure 3. Typical Time Delay Characteristic Curves

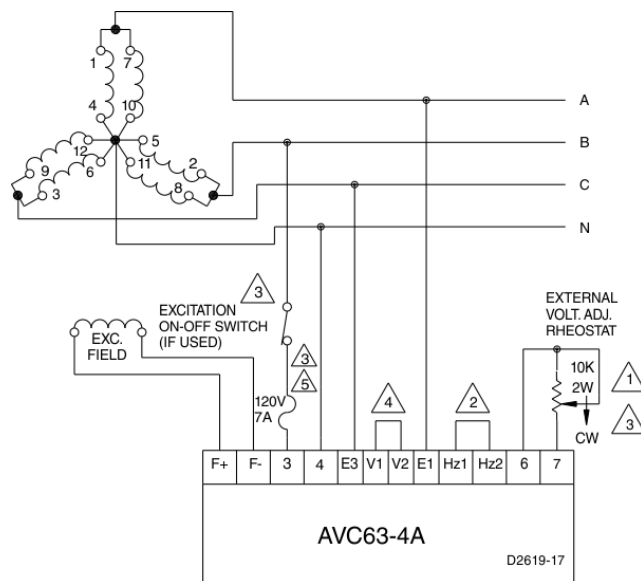
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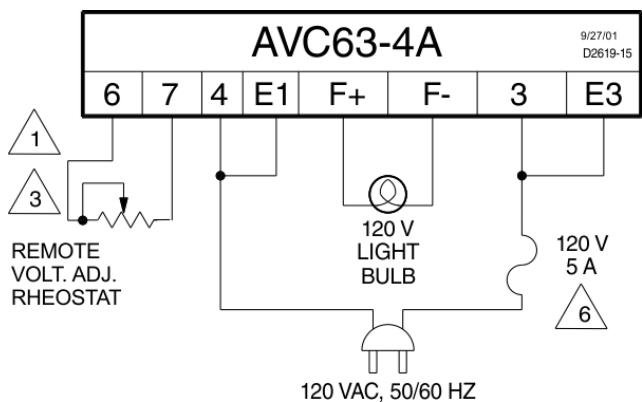
**Figure 4. Interconnection Diagram, 277/480 Vac Nominal, Three-Phase, Four-Wire, Wye Connection**



**Figure 6. Interconnection Diagram, 120-240 Vac Nominal, Single-Phase, Three-Wire Connection**



**Figure 5. Interconnection Diagram, 120/208 Vac Nominal, Three-Phase, Four-Wire, Wye Connection**



**Figure 7. Interconnection Diagram, Operational Test**