INSTRUCTIONS

FOR AVC110-6B VOLTAGE REGULATOR

9317700104

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INTRODUCTION

The AVC110-6B voltage regulator is designed for use on 50/60 hertz, brushless generators rated at 50 to 625 kVA. The AVC110-6B includes frequency compensation, over-excitation shutdown, a solid-state buildup circuit EMI filtering, a droop input and an accessory input.

WARNING!

To prevent personal injury or equipment damage, only qualified personnel should install, operate, or service this device.

ELECTRICAL SPECIFICATIONS

Output Power

Maximum Continuous:	110 Vdc, 6 Adc, 660 W
Ten Second Forcing:	200 Vdc, 10 Adc, 2,000 W (at 240 Vac input)

Exciter Field DC Resistance

Minimum:	18.3 Ω

Power Input

Operating Range:	180 to 277 Vac, 1-phase, 50/60 Hz or 125 Hz PMG

Sensing Input

Range:	180 to 277 Vac, 1-phase, 50/60 Hz

Regulation Accuracy

No Load to Full Load:	Better than ±0.5%

EMI Suppression

Internal, electromagnetic interference (EMI) filter

Overexcitation Shutdown

Field voltage shuts down after time delay if exciter field voltage exceeds adjustable setpoint (approximately 75 to 125 Vdc). See *Overexcitation Shutdown* for description.

Voltage Buildup

Internal provisions for automatic voltage buildup from generator residual voltage as low as 5 Vac.

Droop Input

Maximum Rating:	5 Aac, <10 VA

Adjustable up to 6% for 0.8 power factor via the QDC ADJ potentiometer.

Accessory Input

Application of a ±3 Vdc signal causes a ±30% change is setpoint. Note: +3 Vdc applied on terminal A with respect to terminal C causes a –30% setpoint change.

PHYSICAL SPECIFICATIONS

Terminations

#6 screws

Temperature Ratings

Operating:	–40 to 60°C (–40 to 140°F)
Storage:	–40 to 70°C (–40 to 158°F)

Vibration Ratings

5 to 29 Hz:	1.5 G
29 to 52 Hz:	0.036" double amplitude
52 to 500 Hz:	5 G

Shock Rating

15 G in each of three mutually perpendicular axes.

Agency Recognition

cURus recognition per UL Standard 508, File E97035 and CSA Standard C22.2 No. 14.

Weight

12.6 oz (357 g)

CONTROLS AND INDICATORS

AVC110-6B controls and indicators, illustrated in the outline diagram (top view), consist of light-emitting diode (LED) indicators, potentiometers, and jumper wires. The label/designator for each control and indicator is listed below along with a brief description.

JP1	50/60 Hz Jumper (Cut for 60 Hz operation)
JP2	Stability Select Jumper (Typically remains uncut for larger machines.)
OVX ADJ	Overexcitation Adjustment Potentiometer
OVX LED	Overexcitation LED
QDC ADJ	Droop Adjustment Potentiometer
STAB ADJ	Stability Adjustment Potentiometer
UFR ADJ	Underfrequency Adjustment Potentiometer
UFR LED	Underfrequency LED
VOLT ADJ	Voltage Adjustment Potentiometer

FUSES

AVC110-6B internal circuitry is protected by a replaceable fuse. If fuse replacement is required, us a fast-acting, 6.3 A, 250 V, 5 by 20 millimeter glass-body fuse, Schurter 0034.1524 or equivalent.

Although the AVC110-6B is protected with an internal fuse, it is recommended that a fuse with high interruption capability be installed per the interconnection diagram to protect wiring from faults before the regulator. Refer to the interconnection diagrams for fuse placement. Caution: the fuse must be installed according to the interconnection diagrams to avoid interrupting the field current.

V/HZ "CORNER FREQUENCY" SELECTION AND ADJUSTMENT

The AVC110-6B is preset for a 50 hertz system with the corner frequency set at 47 hertz. Cutting JP1 (50/60 Hz jumper) sets the regulator for use with a 60 hertz system.

The corner frequency can be adjusted by the UFR ADJ potentiometer. Clockwise rotation raises the corner frequency (shifts the curve to the right). To set the corner frequency:

1. Adjust the UFR ADJ potentiometer fully counter-clockwise.

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2. Start the generator and set at rated voltage.
3. Adjust the generator frequency to the desired knee-point frequency.
4. Slowly adjust the UFR ADJ potentiometer clockwise until the generator voltage just begins to decrease and the UFR LED lights.

OVEREXCITATION SHUTDOWN

The overexcitation shutdown function removes the field current, after a time delay, if the field voltage exceeds the setpoint. The time delay is inversely proportional to the magnitude of the detected overvoltage condition. At twice the setpoint, the field voltage is removed after a minimum of 10 seconds.

The instantaneous overexcitation shutdown function removes field current if the field voltage exceeds approximately 240 Vdc.

After output power is removed, the regulator can be reset by decreasing the input voltage to less than 6 Vac for a minimum of 2 seconds. This may be accomplished by stopping the prime mover or by interrupting the regulator input power (terminals 3 and 4) with a reset switch.

STABILITY ADJUST

The STAB ADJ potentiometer adjusts the response rate of the generator output voltage to a change in load.

For smaller machines, the stability select jumper (JP2) is typically cut to provide a faster response characteristic. When JP2 is left intact, a slower reaction time is obtained for use with larger generators. Therefore, it is recommended that JP2 be left uncut until performance is verified.

OPERATING PROCEDURES

The following system operating procedures provide instructions for adjusting the AVC110-6B voltage regulator. Symptoms resulting from a faulty regulator and certain generator system problems are included, together with suggested remedies.

CAUTION

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

Preliminary Setup

Complete the following steps before proceeding with system startup.

1. Verify that the voltage regulator specifications conform with the generator system requirements.
2. Ensure that the voltage regulator is correctly connected to the generator system.
3. Install fuses as described in *Fuses*.
4. Set the VOLT ADJ potentiometer fully counter-clockwise. Center the remote VOLT ADJ potentiometer (if used).
5. Set the QDC ADJ potentiometer fully counter-clockwise.
6. Center the STAB ADJ potentiometer.
7. If the accessory input is not used, jumper terminals A and C.
8. If the droop input is not used, short terminals 1 and 2.

System Startup

Perform the procedures under *Preliminary Setup* before proceeding with system startup. An average-reading voltmeter should be used for all voltage readings.

1. Start the prime mover and bring it up to rated speed.

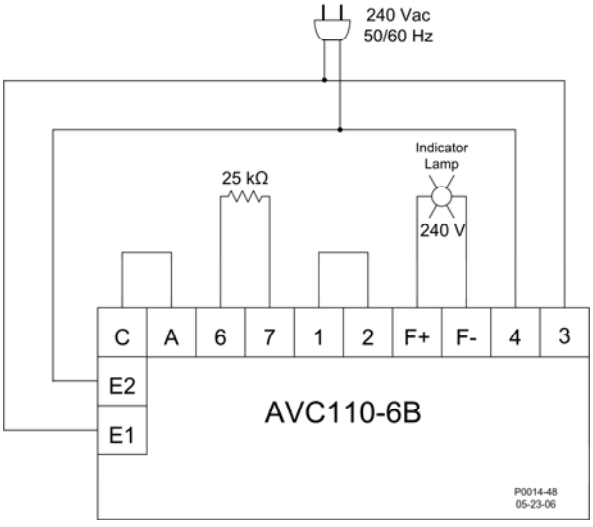
   Generator voltage should build up. If it does not, perform field flashing.
2. Slowly adjust the VOLT ADJ potentiometer clockwise until the generator output voltage reaches the nominal value. If used, adjust the remote VOLT ADJ potentiometer to set the generator voltage to the value desired.

   Voltage should build up to the rated value. If voltage does not build up, check the generator for a short-circuit or excessive load.
3. Check regulator performance under normal operating and loading conditions. Adjust the STAB ADJ potentiometer as desired.

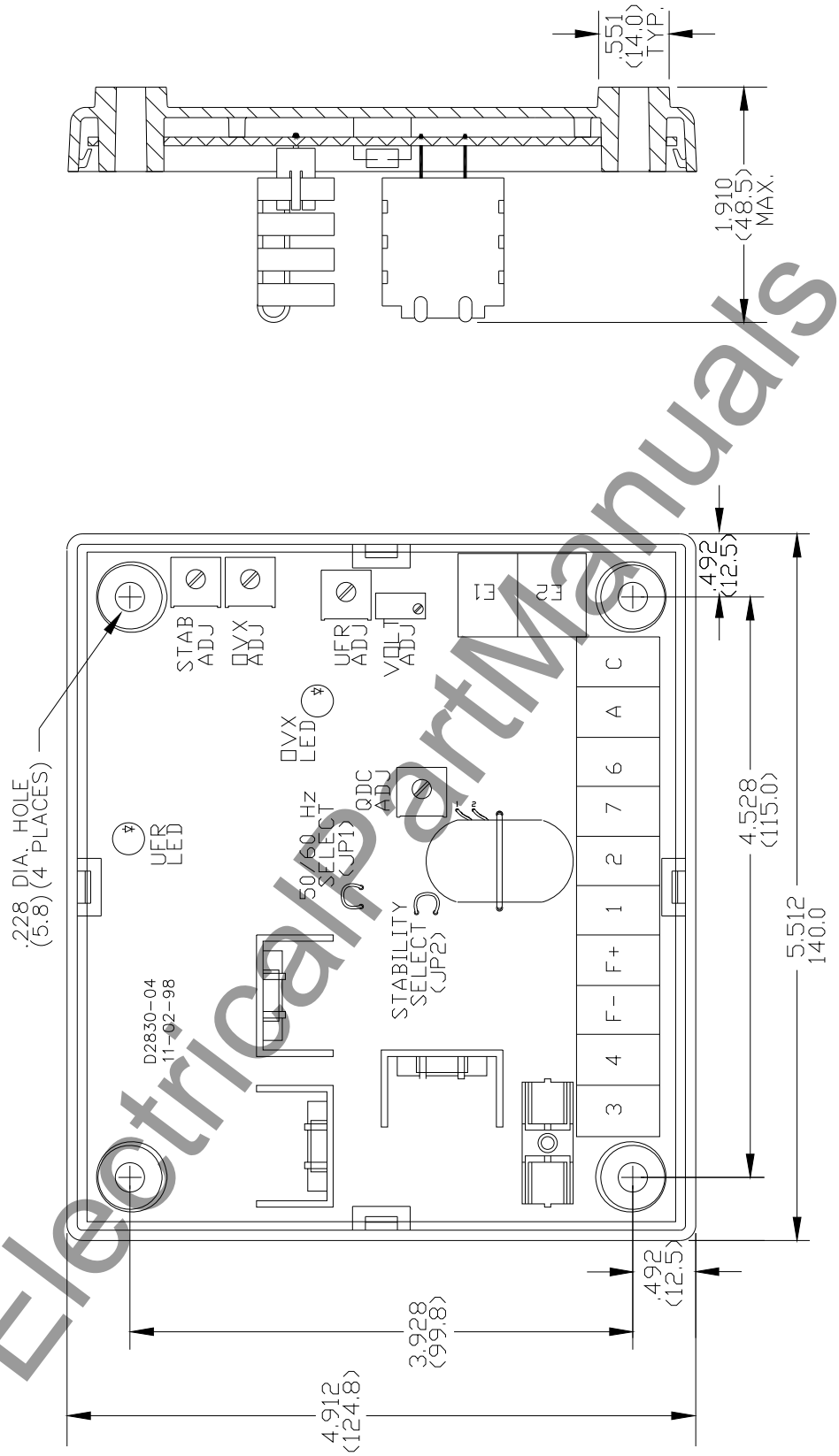
   Voltage regulation should be better than ±0.5% no-load to full-load. If regulation is not within this range, verify that the prime mover is at rated speed. Voltage reduction under load may be due to speed changes from no load to full load, causing the frequency compensation (V/Hz) circuit to reduce voltage at lower frequencies.

Operational Test

1. Connect the test setup as shown in the operational test diagram. Do not apply power. Ensure that the light bulb is rated for 240 Vac and less than 100 W.
2. Adjust the VOLT ADJ potentiometer fully clockwise and center the STAB ADJ potentiometer.
3. Apply 240 Vac, 50/60 Hz power to the regulator. The light bulb should light.
4. Slowly adjust the VOLT ADJ potentiometer counter-clockwise. At the regulation point, the light bulb should turn off. Small adjustments above and below this level should cause the light bulb to go off and on.



Operational Test Diagram



Outline Diagram

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Revision C

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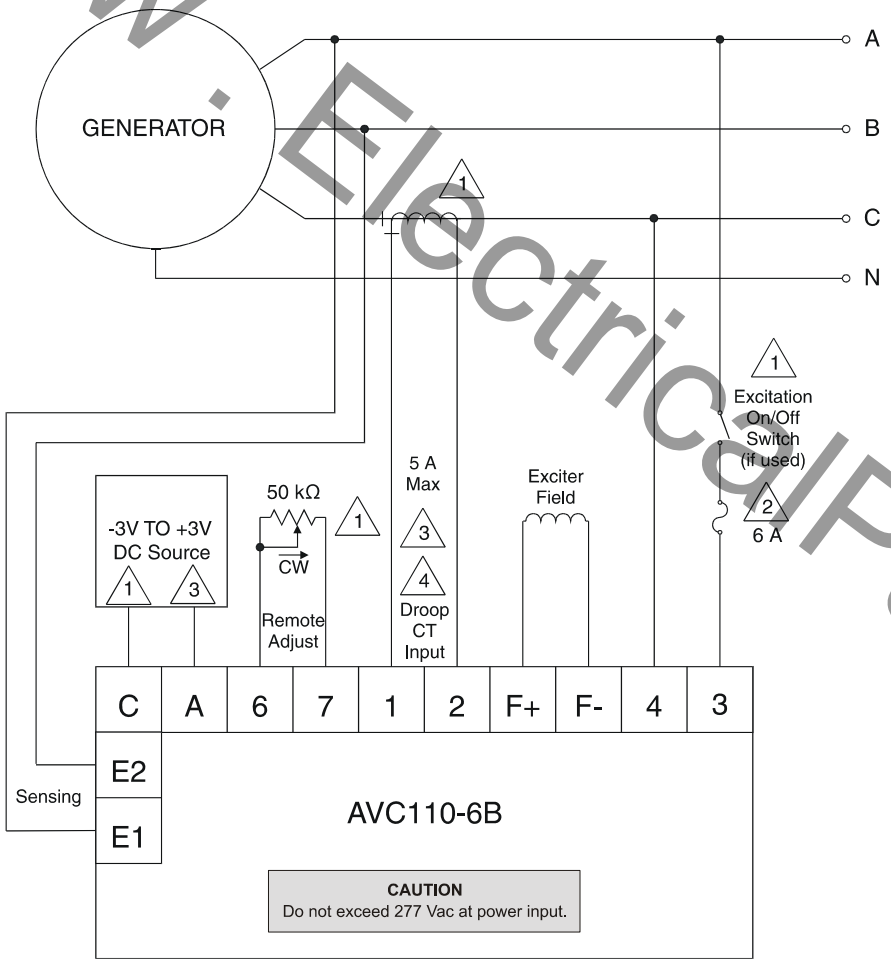
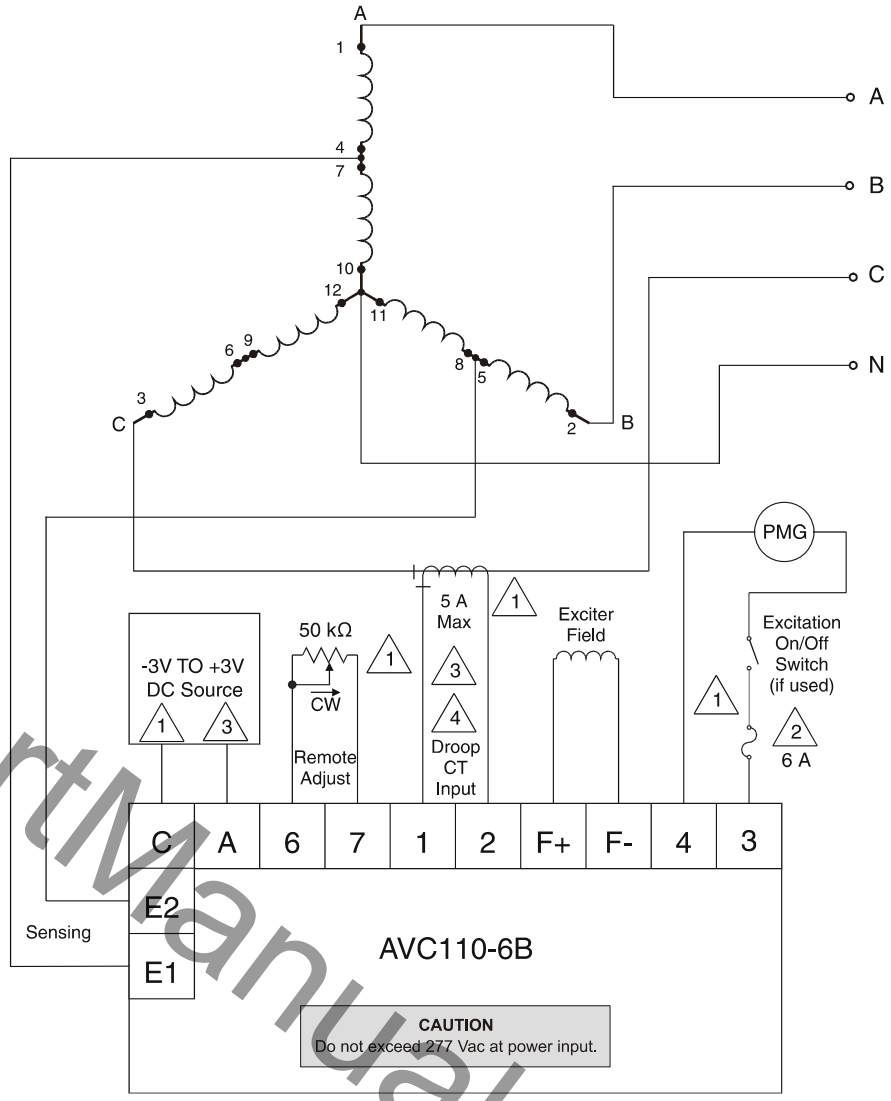


1 Item not supplied by Basler Electric.
2 Select fuse with high interrupting capacity.
3 Jumper these terminals if not used.
4 Connections shown for ABC phase sequence.

Interconnection Diagram, 240 V Nominal, 3-Phase, 4-Wire, Wye Connection



1 Item not supplied by Basler Electric.
2 Select fuse with high interrupting capacity.
3 Jumper these terminals if not used.
4 Connections shown for ABC phase sequence.

Interconnection Diagram, 277/480 V Nominal, 3-Phase, 4-Wire, Wye Connection