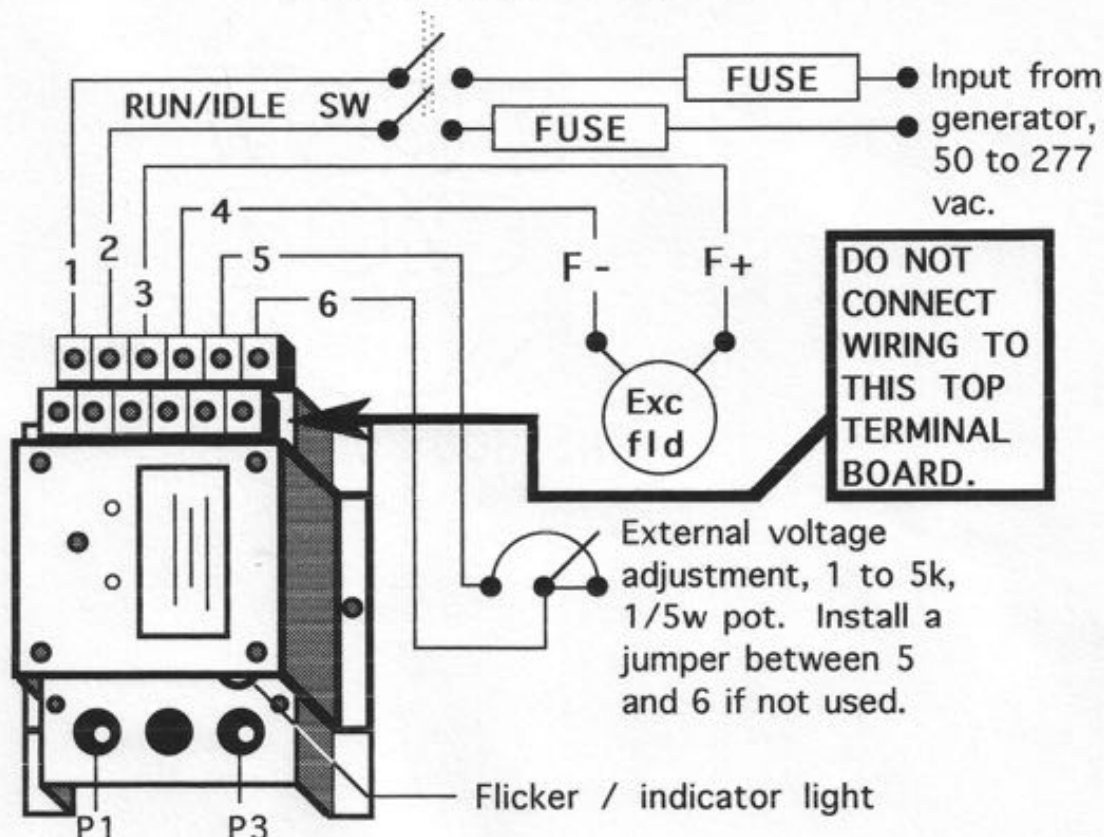


INSTALLATION INSTRUCTIONS

VR504A-210DC Voltage Regulator

Serial #04010092 and up



UNITED STATES PATENT NUMBER 5138205

Voltage input required:	50 TO 277 VAC
Operational output voltage range:	.75 TO 240 VDC
Maximum operational amperage:	5 ADC *
Minimum field resistance:	20 OHMS **
Operational frequency range:	40 TO 80 HZ
Regulation accuracy:	+/- .5%
Physical size:	1.25 in. X 6 in. X 4.75 in.
Total weight:	7 OUNCES
Internal fusing:	5 AAC
Maximum / minimum KW:	Unlimited
Minimum residual BUV:	3 VAC @ 50 HZ

* Higher amperages with optional SE350-200 adaptors.

** @120 vac input, 40 ohms @ 240 vac input.

1. Make sure that exciter field resistance is 20 ohms or more. Make sure that exciter fields are not grounded or connected to any other circuitry. If the field resistance is less than 20 ohms, a SE350-200 exciter module should be used with this regulator.

2. Input 50 to 277 vac to the input of the VR504A-210DC regulator. To limit the output voltage potential of this regulator for lower exciter voltages such as 32 vdc or less, 60 to 120 vac is suggested. For most applications, 208 to 240 vac is recommended.

Mfg by: Power-Tronics, Inc. Corpus Christi, Texas

3. Install a run/idle switch in the input voltage circuit if the generator is going to operate below rated generator rpm such as warm up or cool down idle.

4. For extra protection on field requirements of less than 5 adc, install a fuse rated to desired amperage into the input of the VR504A-210DC regulator.

DO NOT: Supply power and dc output thru a common cable unless each pair is shielded and one end connected to ground.

Connect input to the VR504A-210DC to volt meters or other instrumentation if a phase selector switch is used.

Open the dc output while the generator is operating.

SET UP AND OPERATION

NEVER USE A DIGITAL METER FOR SETTING UP A GENERATOR. USE ONLY A VANE TYPE MECHANICAL METER.

This regulator uses SCR phase control which results in incorrect readings in digital meters because of averaging time sampling of the digital meter.

1. Turn all control pots fully ccw.
2. Check all connections for proper hook up.
3. Start prime mover and bring up to rated speed.
4. Turn on power switch if used.
5. (When first installed, the build up voltage at the regulator will be approximately 36 vac and erratic) Slowly adjust P1 cw until the line voltage is reading 80% of desired setting. If at this time the voltage is erratic or pulsing, slowly turn P3 until the voltage stabilizes. This can be observed with the stability / indicator light located just above P3. As the adjustments of P3 are made, the voltage will rise. Keep voltage at 80% by also adjusting P1 lower to compensate. **Make all adjustments very slowly!** The indicator light will not glow until the voltage at the regulator is at or above 50 vac.
6. Install generator on line. Observe voltage and adjust if needed.

TROUBLE SHOOTING

No build up of voltage: With generator running at operating speed, check the residual voltage at 1 and 2 on the VR504A-210DC terminal strip. The voltage should be more than 3 volts ac. If the voltage is below this value, remove the exciter fields from the regulator and momentarily apply 12 vdc to them while the generator is running at speed. The voltage at 1 and 2 at the voltage regulator should increase to a much higher value during this test. If the voltage does not increase to a much higher value, check all wiring and fusing that lead to the regulator for open circuits.

If the voltage at 1 and 2 on the voltage regulator increases during the test, this could indicate that the regulator is damaged or defective or the internal fuses have blown.

If the line voltage did not increase on the generator when the exciter fields were connected to the 12 vdc, there is an internal problem in the generator such as an open exciter field, shorted or open diodes in the rectifier bank, open rotor or blown stator.

After this test, disconnect the 12 vdc from the exciter fields and re- connect the field leads to the regulator. Make sure that the lead that was connected to the positive of the 12 volts is connected to 3 and the lead that was connected to negative is connected to 4 on the voltage regulator.

Run the generator up to speed. Go ahead and set up the regulator as previously described. If there is no build up and the residual voltage at 1 and 2 is still too low, change the input voltage to 240 or 277 vac which should double the residual voltage at 1 and 2. If when hooked up with a 240 vac input, if the residual is still too low for build up, then an external flashing circuit will have to be installed.

Minor flickering of voltage: P3 is not set far enough cw. With generator disconnected from load, slowly turn P3 cw until flickering stops.

Voltage is high and uncontrollable: Low input voltage to 1 and 2, voltage regulator is defective or the exciter field is grounded. Another reason for this is that the exciter amperage exceeds the rating of the voltage regulator.

Intermittent flashes or glitches in voltage: Loose connection to regulator ac input or a defective exciter field with a carbon track or intermittent open in field coil or loose components in the voltage regulator due to excessive vibration.

Voltage rises with load: Unbalanced loading of generator leads or P3 needs to be adjusted more cw.

Voltage falls off with load: P3 is adjusted too far cw, adjust ccw until voltage droop is satisfactory. Another reason could be that the input voltage to 1 and 2 is too low for full load exciter voltage.

Voltage will not adjust to lower values: Input wiring to voltage regulator is supplied thru a cord or cable that is unshielded. Use loose wiring or shielded cables.

Voltage is affected when SCR heating or motor speed controls are used on generator: This is due to line notching caused by the SCR. Install a 2.5 uf 250 v capacitor across the 1 and 2 input of the regulator.

**If you need advice or technical assistance
please call:
POWER-TRONICS, INC.**