Power-Tronics, Inc. Electrical Power Control Systems
P.O. Box 291509 Kerrville, Texas USA 78029 Phone: 830.895.4700 Email: pti@power-tronics.com Web: www.power-tronics.com

SEM250A

Static Exciter Module

The Power-Tronics SEM250A Static Exciter Module is the newest replacement model for the long-running SE350 Static Exciter Module. It is a self-contained external rectifier assembly for all Power-Tronics XR and UVR series voltage regulators, and allows a standard Power-Tronics voltage regulator to control exciter fields with current requirements up to 25 amps DC at 63VDC!

The SEM250A is a unique design, intended to sit on top of the voltage regulator to simplify installation and reduce installation space. Because of it's unique modular design, it reduces the need to stock special voltage regulators for higher current exciter fields, reducing the amount of products needed to be kept in stock and vastly simplifying voltage regulator replacement!

The SEM250A is a very robust design and is intended to operate for a lifetime. However, should repair ever be necessary, the SEM250A is extremely simple to repair, minimizing downtime!

The SEM250A is also capable of operating in a tandem condition with 2 SEM250A modules connected to a single voltage regulator for exciter fields requiring up to 50 amps DC at 63VDC continuous!

The SEM250A Static Exciter is compatible with all Power-Tronics UVR, XR, and certain older VR series voltage regulators, as well as the Power-Tronics PC500X, UVR500PC, and XR500PC phase controllers!

Specifications

Input Voltage:	120 / 208 or 240vac
Frequency:	N/A
Output Voltage:	0-52vdc @ 120vac input 0-105vdc @ 240vac input
Maximum Continuous Output:	25adc
Maximum Forcing Output:	30adc
Minimum Field Resistance:	1.3Ω @ 32vdc output 2.6Ω @ 63vdc output
Physical Size:	3.25 x 3.50 x 4.75 in.
Weight:	8 oz
Repairable:	Yes
Compatible Voltage Regulators:	XR8, XR500 Series, UVR500 Series, VR504A

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Introduction and Functional Description

Caution: Read This Installation Manual Carefully and Entirely!

Warning: Do not use digital equipment to read voltage, Hz, or amperage during this installation. Use only Analog sensing equipment! Failure to do so may result in damage to equipment or in personal injury!

ALWAYS perform all setup procedures off-line
ALWAYS wear eye protection
ALWAYS strip wire insulation properly or use insulated connectors
ALWAYS use analog metering equipment when setting up the regulator
ALWAYS ensure the regulator receives ample airflow
ALWAYS use adequate fusing
NEVER hold the regulator in your hand when energized
NEVER install the regulator in a place it can get wet or is exposed to the elements
NEVER mount the regulator over a screw, bolt, rivet, welding seam, or other fastener
NEVER remove the regulator cover while the unit is in operation
NEVER insert a screwdriver or other object under the regulator or SEM250A cover
NEVER touch any exposed part of the SEM250A during operation
NEVER install a switch in the DC portion of the regulator's wiring
NEVER USE A DIGITAL FREQUENCY METER (It *can give a false reading*!)

Functional Description

The SEM250A Static Exciter Module has a proven track record of over 20 years of extreme reliability and robustness. It offers an inexpensive and unique way to upgrade a standard voltage regulator to a miniature static exciter with a minimum of connections and a minimum of installation space.

The SEM250A is designed to work with Power-Tronics UVR and XR series voltage regulators and UVR, XR, and PC series phase controllers. Coupled with one of these products, the SEM250A allows field excitation of 63VDC at 25ADC continuous for a single unit, or 63VDC at 50ADC continuous for tandem units.

Regulation accuracy depends on the voltage regulator the SEM250A is used with. If used with the XR8 series Universal Voltage Regulator, the voltage regulation will be within +/-.25%. Other voltage regulators will regulate within their printed specifications.

The SEM250A does not contain internal fusing and must be fused externally. Always use 25A 250VAC fast-blow fuses with the SEM250A Static Exciter Module!

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Determining Which Hookup Configuration to Use

STOP! **DO NOT use the instruction manual that came with your voltage regulator when using the SEM250A Static Exciter Module! Use this manual instead! It contains the most up to date information available regarding your product!**

The SEM250A Static Exciter Module is capable of being connected several different ways to accommodate a wide variety of generator exciter configurations. It is necessary to choose the proper mode of operation for your generator in order to get the best regulation and fastest response time possible.

To determine the proper connection for your generator you need to know any two of the following 3 specifications from the rating plate of your generator:

1: Exciter Field Voltage (in DC Volts) [Generally given in full load Voltage on nameplates]
2: Exciter Field Resistance (in Ohms) **[See Note Below]**
3: Exciter Field Amperage (in DC Amps) [Generally given in full load Amps on nameplates]

Using the specifications obtained from your generator exciter, select a Connection (A, B, or C) from the chart below:

- **Exciter Field Resistance ≥2.5Ω & Exciter Full-Load Voltage ≤63VDC Use connection A (See Page 7)**
- **Exciter Field Resistance ≥1.5Ω & Exciter Full-Load Voltage ≤63VDC Use connection B (See Page 9)**
- **Exciter Field Resistance ≥1.5Ω & Exciter Full-Load Voltage ≤32VDC Use connection C (See Page 11)**
- **Exciter Field Resistance ≥1Ω & Exciter Full-Load Voltage ≤32VDC Use connection D (See Page 13)**

Note about Field Resistance:

- When measuring field resistance on a brushless generator, simply measure the resistance of the exciter field through your field leads with a multimeter.
- When measuring field resistance on a brush-type generator, measure the resistance through both the field leads as well as directly on the slip rings themselves. **The readings you obtain should ideally be the same, but *no more than 1% difference.*** If you show more than 1% difference in reading your generator has brush and ring contact problems and will need cleaning or maintenance before installing the SEM250A. **Failure to correct brush and ring contact problems will result in severe damage to the voltage regulator as well as possible PERMANENT damage to the slip rings themselves! NEVER use emery cloth, carborundum stones, "comm sticks", or Tuner cleaner to dress or clean slip rings**. They will make a bad problem much, much worse! Only use Garnet or Flint sandpaper and clean with a clean rag soaked with Acetone for best results!

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If you do not have any of the specifications of your generator's exciter, or if you don't know where to start when trying to determine your exciter specs, please see the section below for instructions on measuring and calculating your exciter specifications.

- Measure your exciter field resistance using a multimeter on your field leads. Record this value. If you have a brush-type generator, also take a resistance reading on your slip rings: the value you obtain on the slip rings should be no more than 1% difference from the value you obtained through the field leads.

- Next, start and run the generator and apply 12V from a battery through your field leads and record the AC voltage produced by the generator. To determine your full load exciter field voltage, use the following formula:

$$E_{Exc.} = \frac{E_{Gen.Conf.}}{\left(\frac{E_{Gen.Output}}{E_{Battery}}\right)} * 2$$

Where $E_{Gen.Conf.}$ is your Generator's configured voltage (e.g.: 120, 208, 240, 480V, etc.), $E_{Gen.Output}$ is your recorded output voltage, and $E_{Battery}$ is your battery voltage (12V usually).

- Next, calculate your maximum exciter field amperage using your measured field resistance and your calculated exciter voltage using the following formula:

$$I = \frac{E}{R}$$

Where I is your maximum exciter field current, E is your calculated field voltage from the above formula, and R is your measured field resistance.

Using the values you just measured and calculated, see the chart on the previous page to determine which connection you should use to connect the SEM250A to your generator.

For Example:

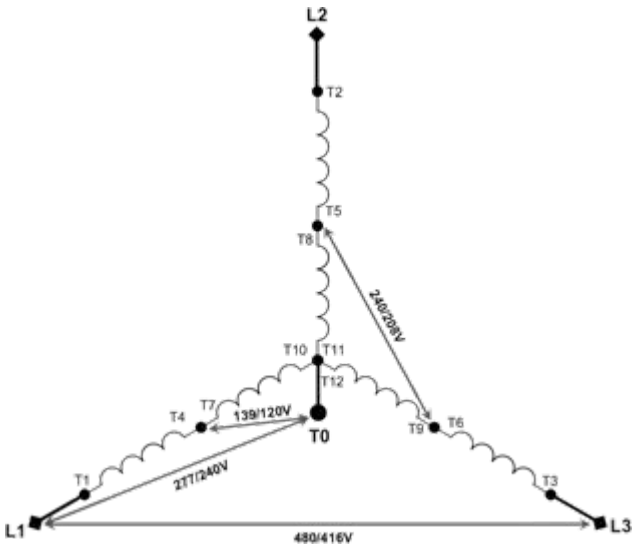
Measured Field Resistance: 3.4Ω
Battery Voltage: 12V
Generator Configuration: 480V Wye

12V applied to the field yields 396VAC L-L. $E_{Exc.} = \frac{480}{\frac{396}{12}} * 2$

$E_{Exc.}$ = 29.09VDC (Full-Load Voltage)

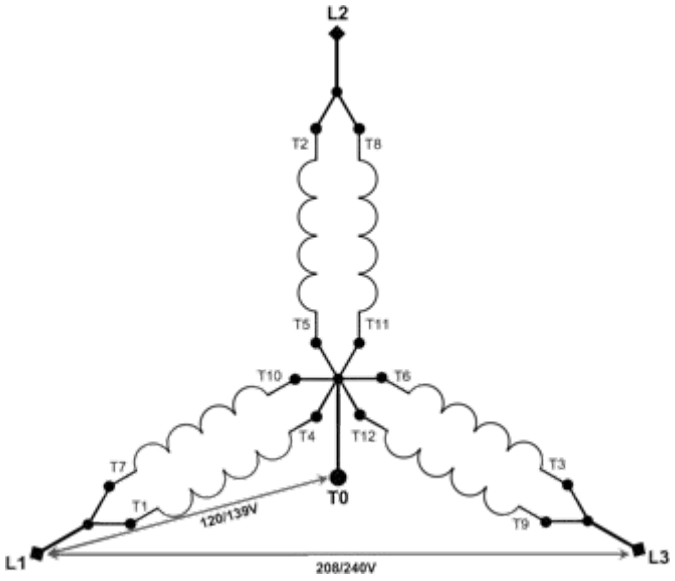
This generator would use **Connection C**.

Common 12-Lead Generator Wiring Diagrams



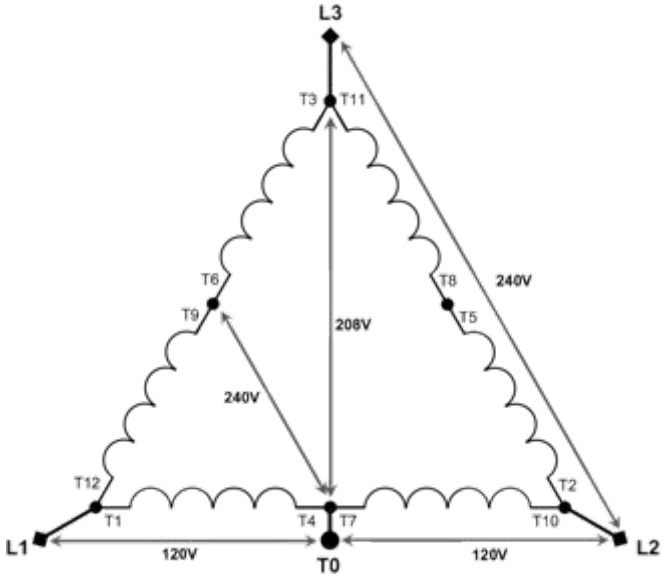
Series Wye (416/480V 3ø)

Voltage L-L: 416/480V
Voltage L-N: 240/277V
Voltage CT – N: 120/139V



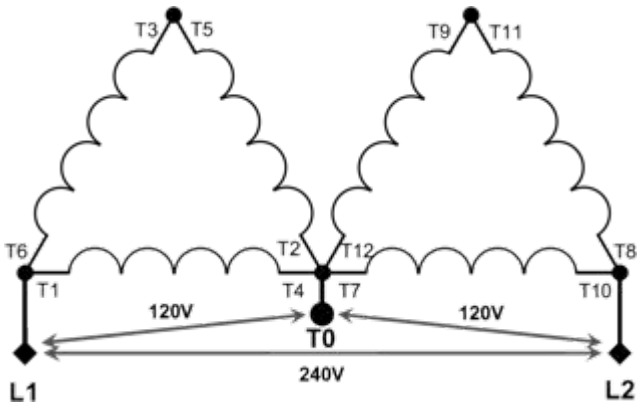
Parallel Wye (208/240V 3ø)

Voltage L-L: 208/240V
Voltage L-N: 120/139V
NOTE: 208V is Standard Voltage



Series Delta (240V 3ø)

Voltage L-L: 240V
Voltage L1/L2-N: 120V
Voltage L3 – N: 208V
NOTE: L3-N is a "High Leg" 208V instead of 120V!



Double-Delta (120/240V 1ø)

Voltage L-L: 240V
Voltage L-N: 120V
Preferred Single-Phase Connection.
Don't Use Zig-Zag if Possible.
NOTE: Derate generator by 1/3 rated capacity when using this connection!

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Connection A (Standard Hookup)

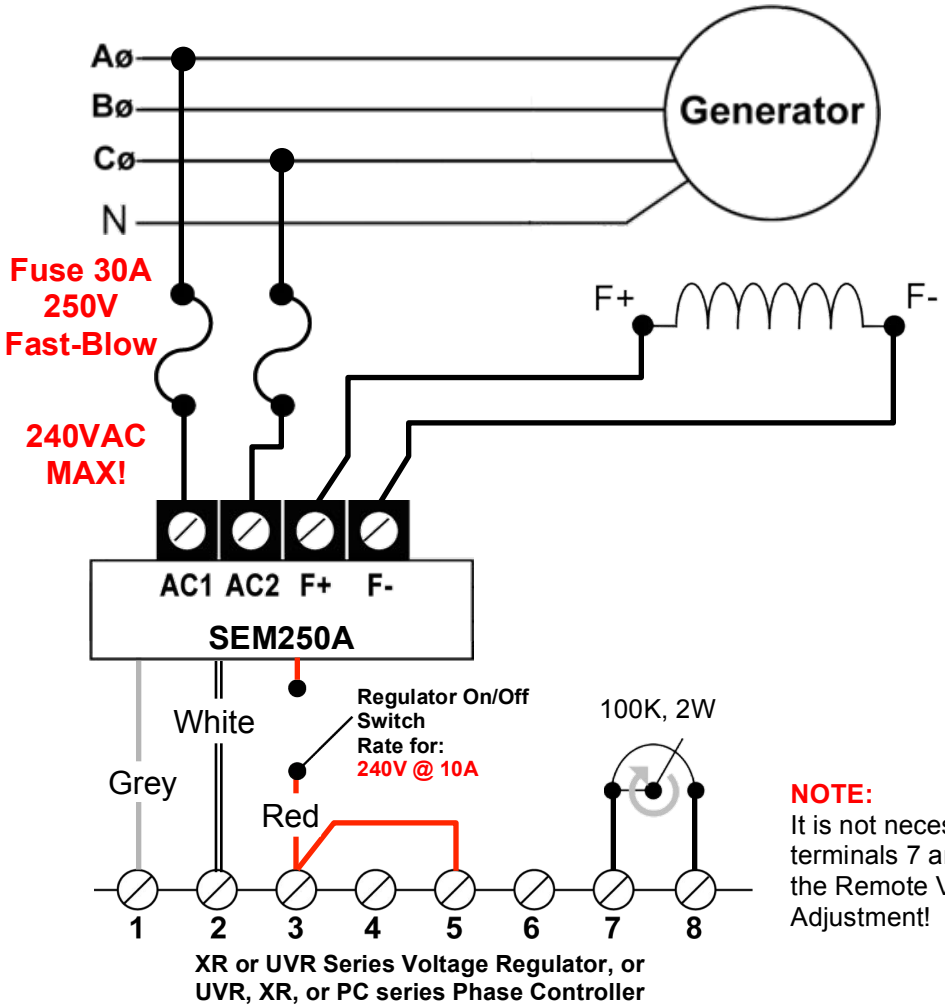
(**See page 8** if the generator will be paralleled using this connection)

Connection A is a Half-Wave rectified configuration, which allows a continuous output of **63VDC @ 25A** with an input voltage of 240VAC.

This connection is typically used on brushless and slip-ring generators with full load field excitation voltages less than 63VDC and full load exciter field amperages less than 25A.

Note that the maximum input voltage to the SEM250A Static Exciter Module is 240VAC! DO NOT input 277VAC into the SEM250A! Severe damage to the unit will result! For use on 480V systems, either connect the regulator to the winding center taps T7 and T9 (**See Page 6**) or use a **480-240V step-down transformer rated at 3KVA.**

Connecting the input of the SEM250A to 2 different legs of the generator as shown in the diagram below will result in greater regulation accuracy than when connecting line-neutral.



NOTE:
If the generator is to be operated below 50/60 Hz, a disconnect or switch should be installed in series with red wire as shown in the drawing at left.

NEVER install a switch or breaker on the DC or Exciter side of the voltage regulator!
Only install a switch or disconnect in the red wire, or on the AC side of the SEM250A!

NOTE:
It is not necessary to jumper terminals 7 and 8 if not using the Remote Voltage Adjustment!

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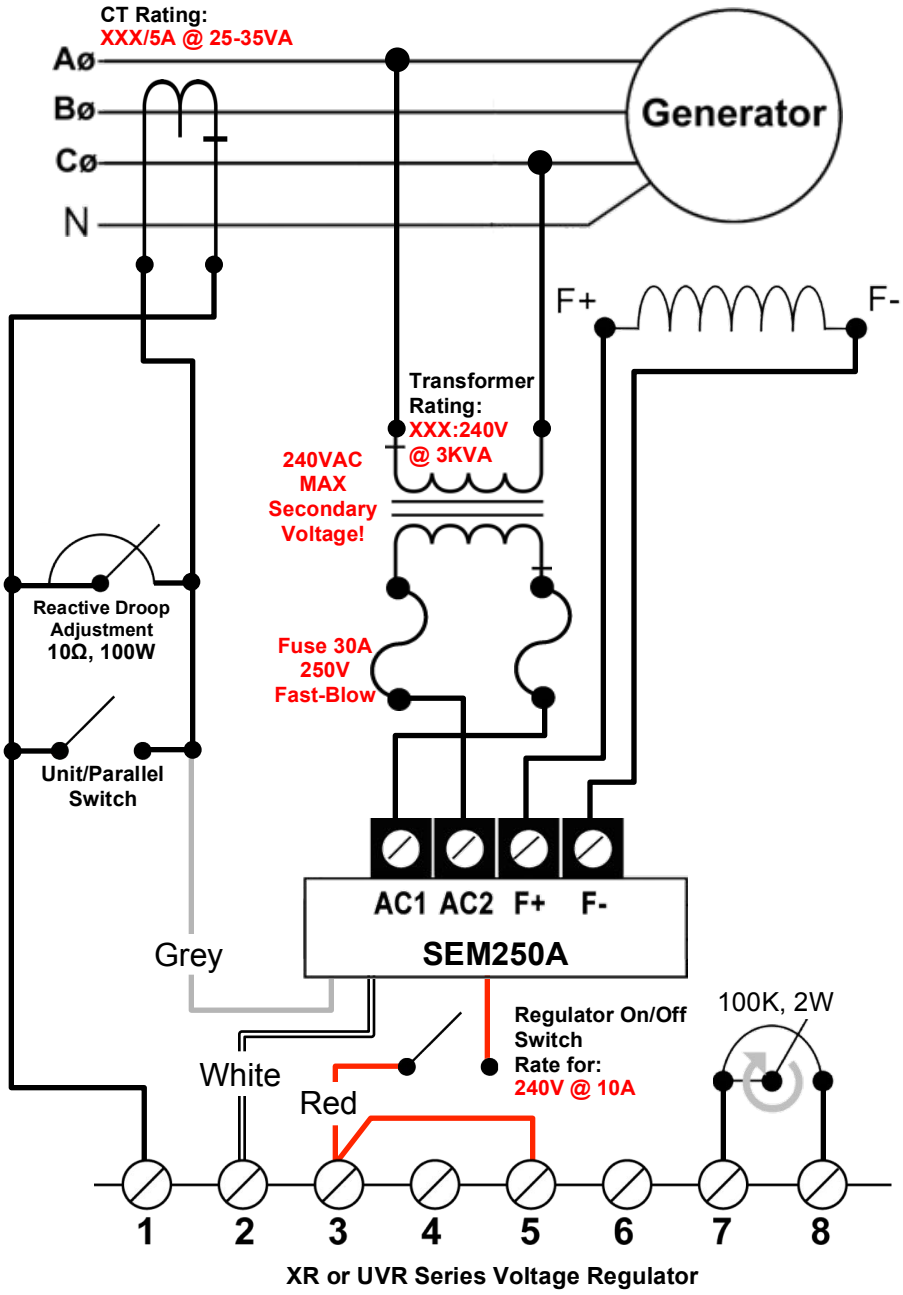
Parallel Configuration for Connection A

To use the SEM250A Static Exciter Module in a parallel configuration either with another generator or with a buss such as a utility, use the diagram below for proper hookup with the SEM250A configured for Connection A.

NOTE: Power-Tronics products parallel using the Reactive Droop compensation method. This allows our products to parallel with existing systems easily while also allowing islanded operation with the flip of a switch. When initially installing the droop resistor, set it for approximately 7Ω before final adjustment later. If the droop is excessive when load testing, reduce the resistance a bit at a time until satisfactory droop is achieved. **CT should be sized at 25-35VA burden!**



Setup Tips:

- Isolation Transformer is recommended for best results, but is optional if 208/240V is present on generator.
- Observe proper transformer polarity! Polarity marks are shown in the drawing at left!
- Size CT as closely to rated generator output amperage as possible for best paralleling results. **An oversized CT will result in poor paralleling or loss of control!**
- If generator terminal voltage rises, or if generator exports VARS excessively under load, reverse CT leads.
- If the reactive droop resistor/rheostat gives erratic results or inconsistent resistance, lightly sand the exposed wire with 400 grit sandpaper to improve connection between wire and slider.

Connection B

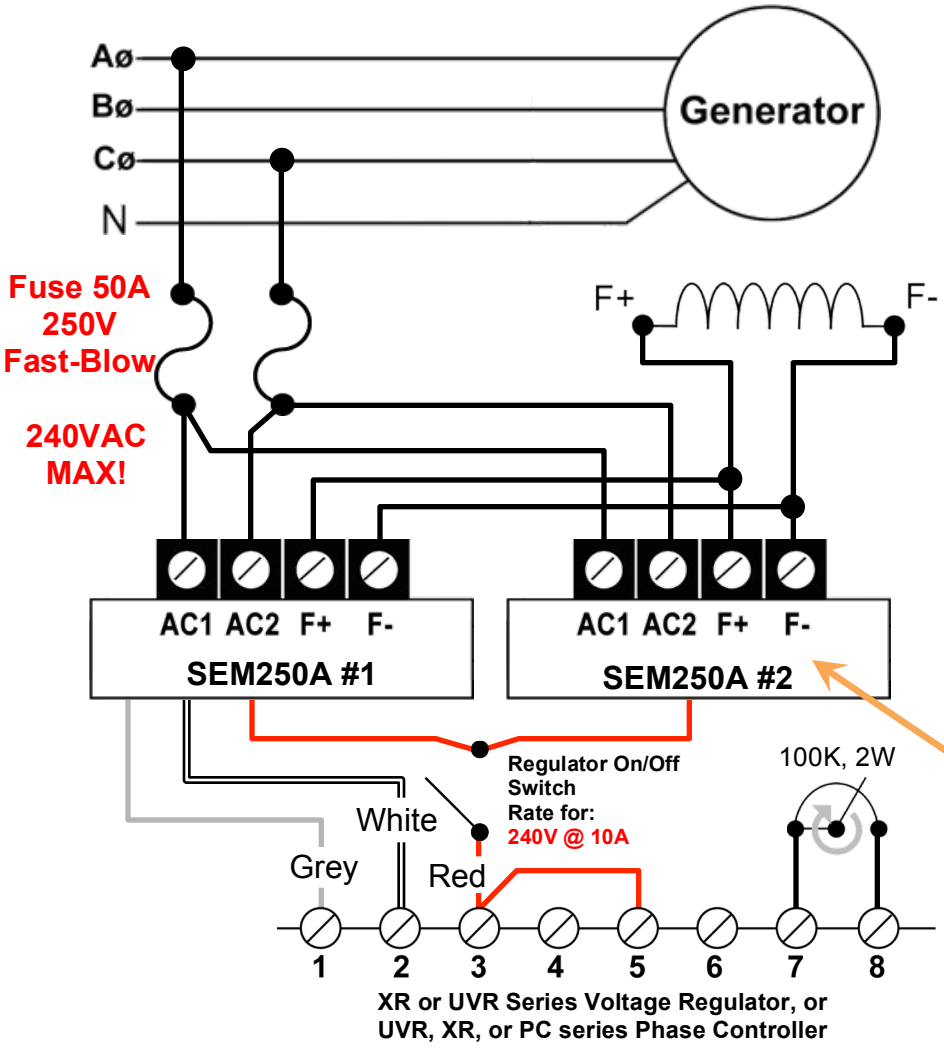
(**See page 10** if the generator will be paralleled using this connection)

Connection B is a Half-Wave rectified configuration, which allows a continuous output of **63VDC @ 50A** with an input voltage of 240VAC.

This connection is typically used on brushless and slip-ring generators with full load field excitation voltages less than 63VDC and full load exciter field amperages greater than 25A, but less than 50A.

Note that the maximum input voltage to the SEM250A Static Exciter Module is 240VAC! DO NOT input 277VAC into the SEM250A! Severe damage to the unit will result! For use on 480V systems, either connect the regulator to the winding center taps T7 and T9 (**See Page 6**) or use a **480-240V step-down transformer rated at 6KVA.**

Connecting the input of the SEM250A to 2 different legs of the generator as shown in the diagram below will result in greater regulation accuracy than when connecting line-neutral.



NOTE:
If the generator is to be operated below 50/60 Hz, a disconnect or switch should be installed in series with red wire as shown in the drawing at left.

NEVER install a switch or breaker on the DC or Exciter side of the voltage regulator!
Only install a switch or disconnect in the red wire, or on the AC side of the SEM250A!

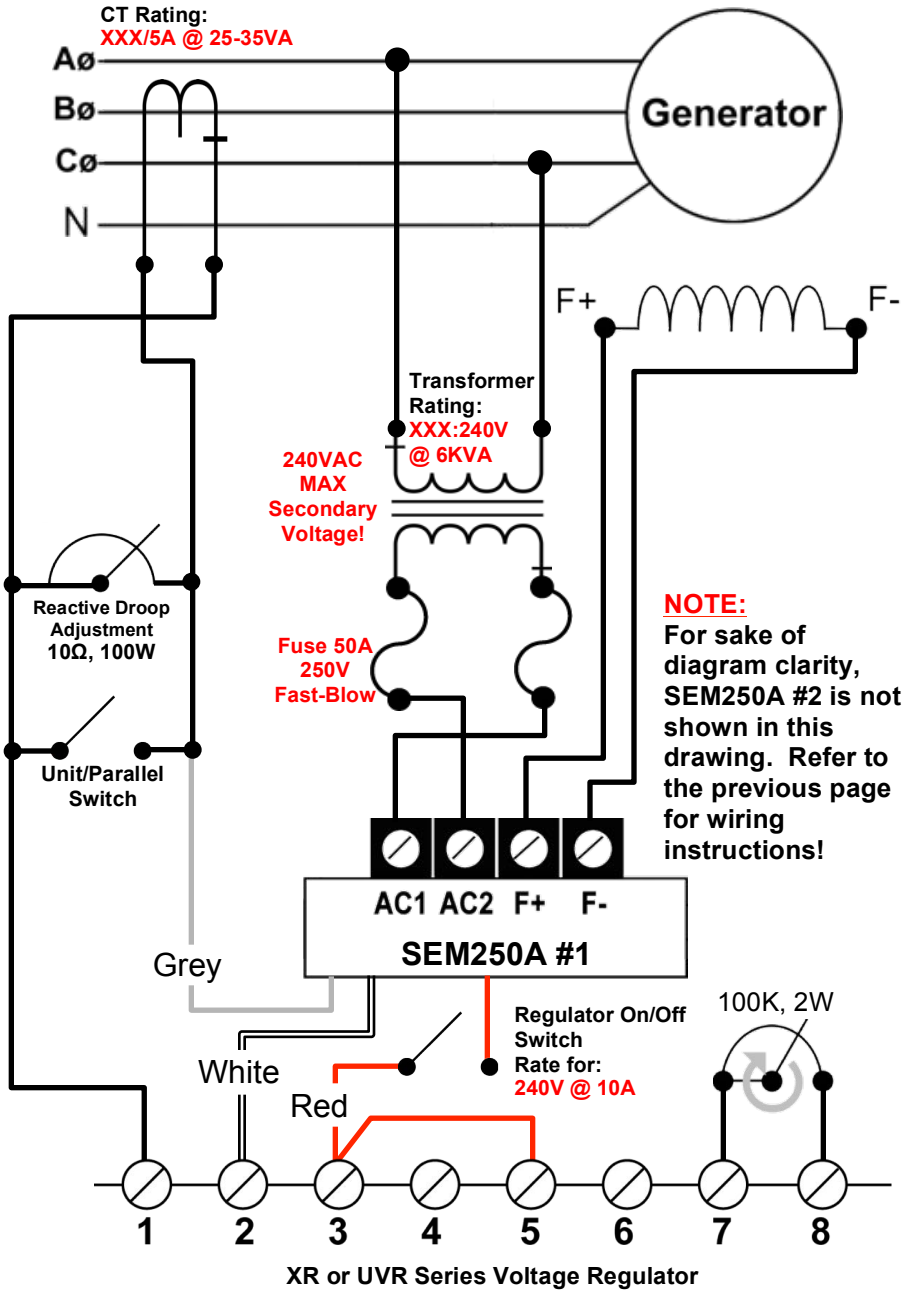
NOTE:
Insulate and do not use the Grey and White wires from SEM250A #2!

NOTE:
It is not necessary to jumper terminals 7 and 8 if not using the Remote Voltage Adjustment!

Parallel Configuration for Connection B

To use the SEM250A Static Exciter Module in a parallel configuration either with another generator or with a buss such as a utility, use the diagram below for proper hookup with the SEM250A configured for Connection B.

NOTE: Power-Tronics products parallel using the Reactive Droop compensation method. This allows our products to parallel with existing systems easily while also allowing islanded operation with the flip of a switch. When initially installing the droop resistor, set it for approximately 7Ω before final adjustment later. If the droop is excessive when load testing, reduce the resistance a bit at a time until satisfactory droop is achieved. **CT should be sized at 25-35VA burden!**



Setup Tips:

- Isolation Transformer is recommended for best results, but is optional if 208/240V is present on generator.
- Observe proper transformer polarity! Polarity marks are shown in the drawing at left!
- Size CT as closely to rated generator output amperage as possible for best paralleling results. **An oversized CT will result in poor paralleling or loss of control!**
- If generator terminal voltage rises, or if generator exports VARS excessively under load, reverse CT leads.
- If the reactive droop resistor/rheostat gives erratic results or inconsistent resistance, lightly sand the exposed wire with 400 grit sandpaper to improve connection between wire and slider.

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Connection C

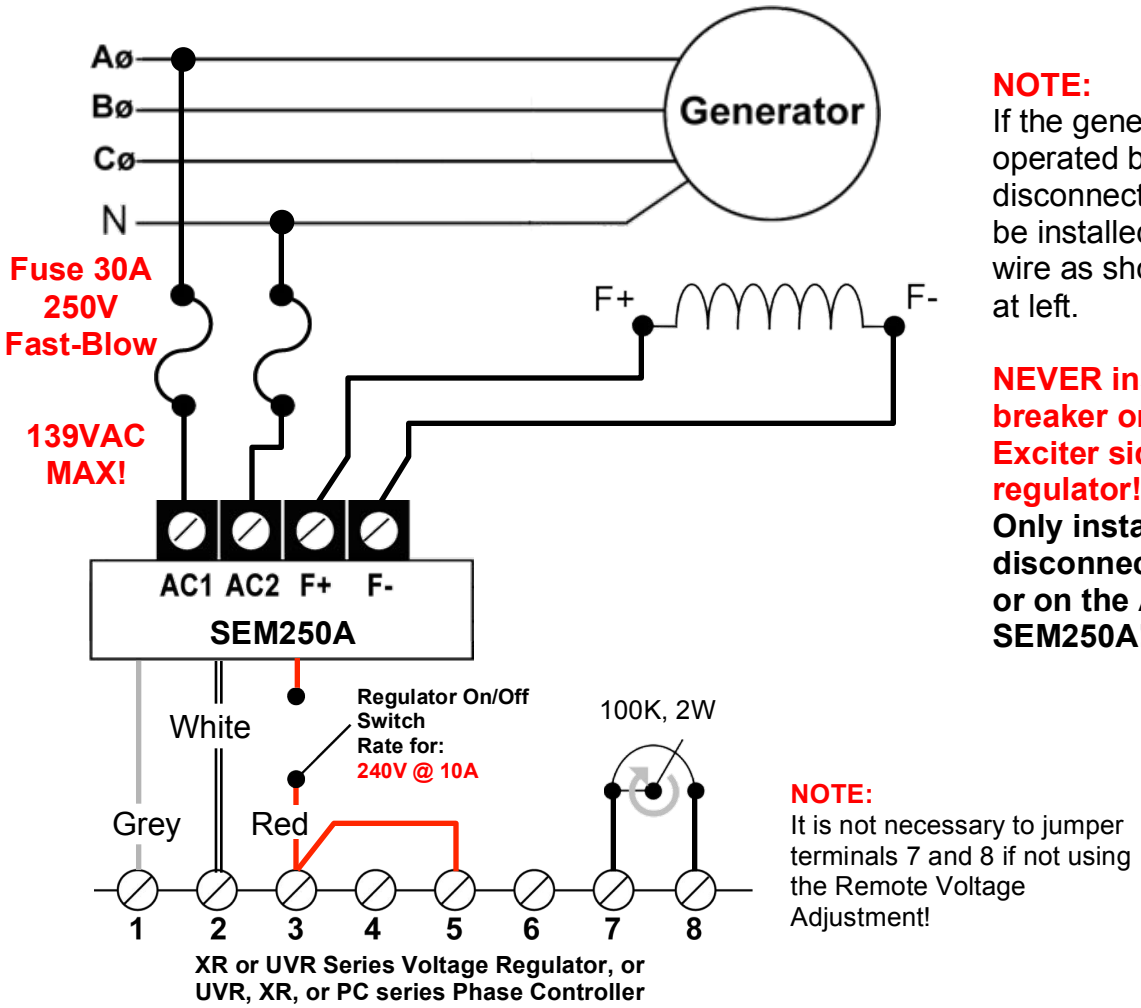
(**See page 12** if the generator will be paralleled using this connection)

Connection C is a Half-Wave rectified configuration, which allows a continuous output of **32VDC @ 25A** with an input voltage of 120VAC.

This connection is typically used on brushless and slip-ring generators with full load field excitation voltages less than 32VDC and full load exciter field amperages less than 25A.

Note that the maximum input voltage to the SEM250A Static Exciter Module in this configuration is 139VAC! DO NOT input 208/240VAC into the SEM250A in this configuration! Severe regulation problems and possible damage to the regulator or exciter field can result! ***For use on 480V systems* 480-120V step-down transformer rated at 1.5KVA.**

Make sure Terminal AC2 is connected to the Generator Neutral. Failure to verify this wiring before energizing the generator can result in severe damage or a voltage runaway condition!



XR or UVR Series Voltage Regulator, or UVR, XR, or PC series Phase Controller

NOTE:
If the generator is to be operated below 50/60 Hz, a disconnect or switch should be installed in series with red wire as shown in the drawing at left.

NEVER install a switch or breaker on the DC or Exciter side of the voltage regulator!
Only install a switch or disconnect in the red wire, or on the AC side of the SEM250A!

NOTE:
It is not necessary to jumper terminals 7 and 8 if not using the Remote Voltage Adjustment!

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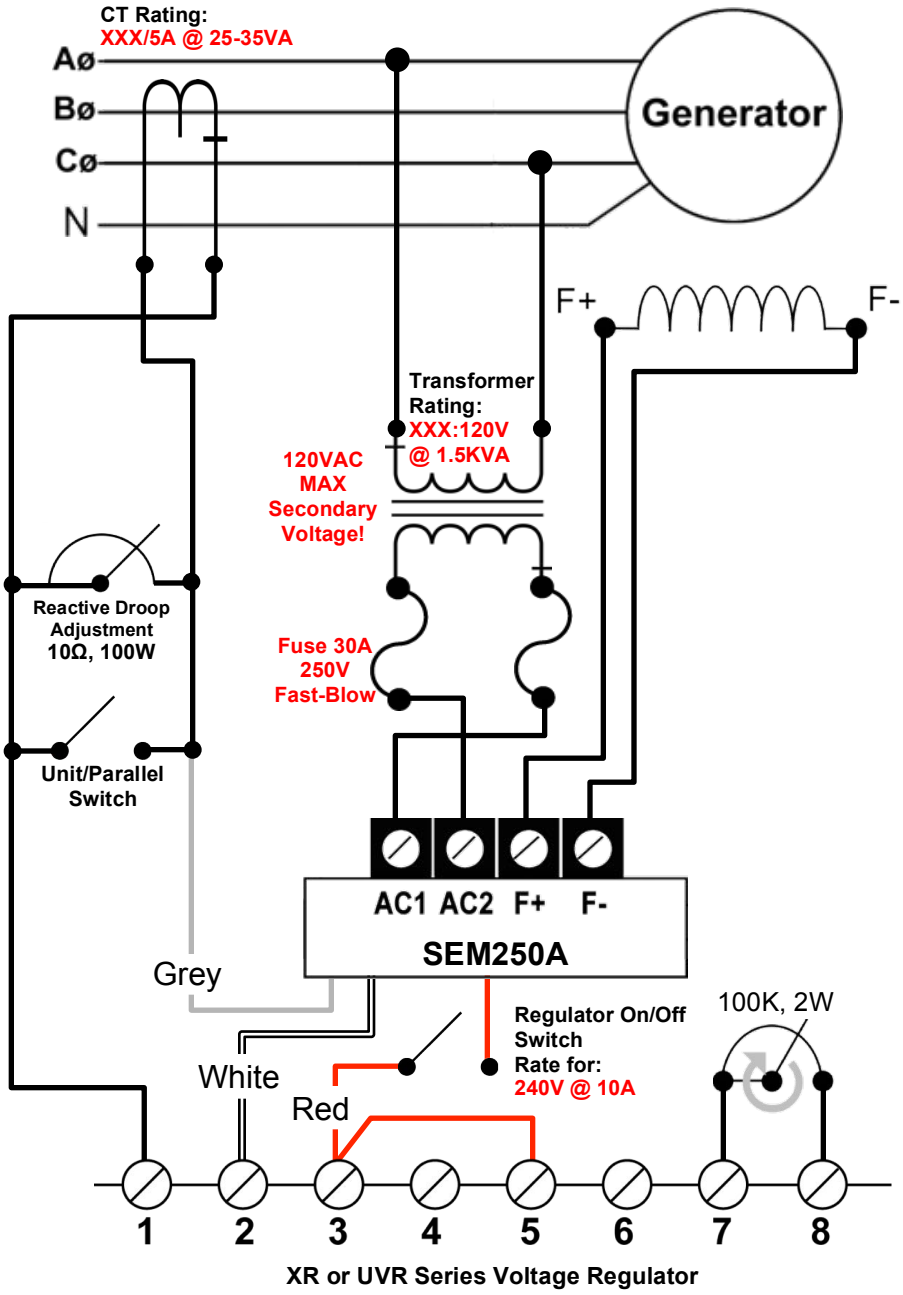
Parallel Configuration for Connection C

To use the SEM250A Static Exciter Module in a parallel configuration either with another generator or with a buss such as a utility, use the diagram below for proper hookup with the SEM250A configured for Connection C.

NOTE: Power-Tronics products parallel using the Reactive Droop compensation method. This allows our products to parallel with existing systems easily while also allowing islanded operation with the flip of a switch. When initially installing the droop resistor, set it for approximately 7Ω before final adjustment later. If the droop is excessive when load testing, reduce the resistance a bit at a time until satisfactory droop is achieved. **CT should be sized at 25-35VA burden!**



XR or UVR Series Voltage Regulator

Setup Tips:

- Isolation Transformer is recommended for best results in this mode, even if 120/139V is present on generator.
- Observe proper transformer polarity! Polarity marks are shown in the drawing at left!
- Size CT as closely to rated generator output amperage as possible for best paralleling results. **An oversized CT will result in poor paralleling or loss of control!**
- If generator terminal voltage rises, or if generator exports VARS excessively under load, reverse CT leads.
- If the reactive droop resistor/rheostat gives erratic results or inconsistent resistance, lightly sand the exposed wire with 400 grit sandpaper to improve connection between wire and slider.

Connection D

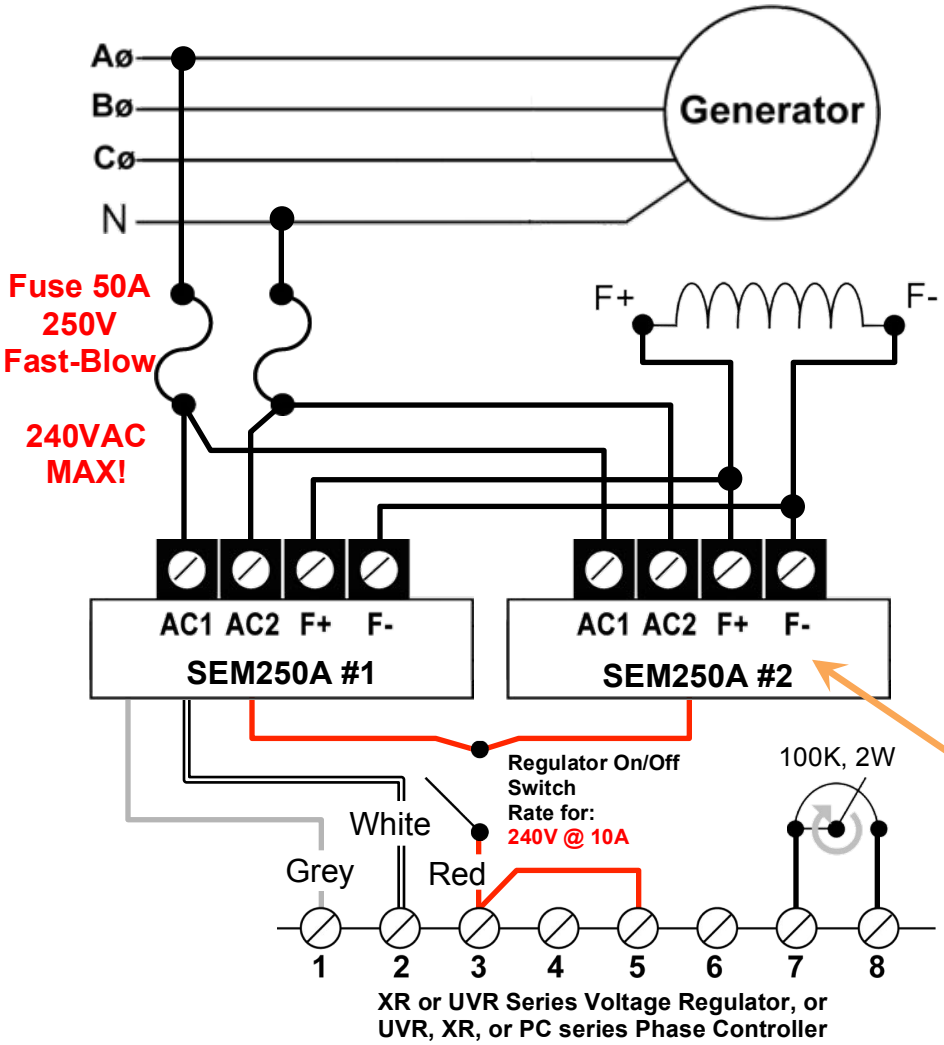
(**See page 14** if the generator will be paralleled using this connection)

Connection D is a Half-Wave rectified configuration, which allows a continuous output of **32VDC @ 50A** with an input voltage of 120VAC.

This connection is typically used on brushless and slip-ring generators with full load field excitation voltages less than 32VDC and full load exciter field amperages greater than 25A, but less than 50A.

Note that the maximum input voltage to the SEM250A Static Exciter Module in this configuration is 139VAC! DO NOT input 208/240VAC into the SEM250A in this configuration! Severe regulation problems and possible damage to the regulator or exciter field can result! ***For use on 480V systems* 480-120V step-down transformer rated at 3KVA.**

Make sure Terminal AC2 is connected to the Generator Neutral. Failure to verify this wiring before energizing the generator can result in severe damage or a voltage runaway condition!



NOTE:
If the generator is to be operated below 50/60 Hz, a disconnect or switch should be installed in series with red wire as shown in the drawing at left.

NEVER install a switch or breaker on the DC or Exciter side of the voltage regulator!
Only install a switch or disconnect in the red wire, or on the AC side of the SEM250A!

NOTE:
Insulate and do not use the Grey and White wires from SEM250A #2!

NOTE:
It is not necessary to jumper terminals 7 and 8 if not using the Remote Voltage Adjustment!

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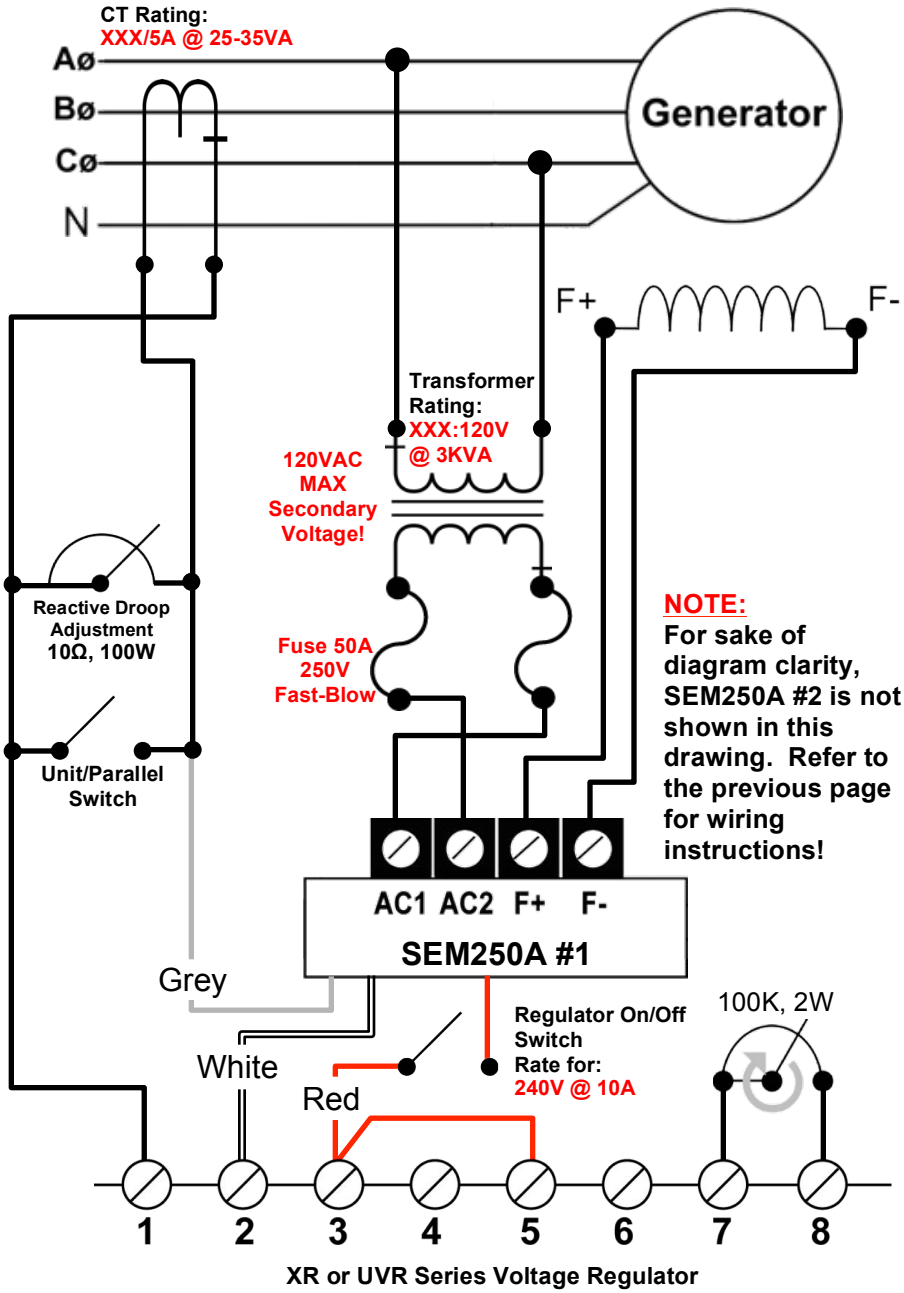
Parallel Configuration for Connection D

To use the SEM250A Static Exciter Module in a parallel configuration either with another generator or with a buss such as a utility, use the diagram below for proper hookup with the SEM250A configured for Connection D.

NOTE: Power-Tronics products parallel using the Reactive Droop compensation method. This allows our products to parallel with existing systems easily while also allowing islanded operation with the flip of a switch. When initially installing the droop resistor, set it for approximately 7Ω before final adjustment later. If the droop is excessive when load testing, reduce the resistance a bit at a time until satisfactory droop is achieved. **CT should be sized at 25-35VA burden!**



Setup Tips:

- Isolation Transformer is recommended for best results in this mode, even if 120/139V is present on generator.
- Observe proper transformer polarity! Polarity marks are shown in the drawing at left!
- Size CT as closely to rated generator output amperage as possible for best paralleling results. **An oversized CT will result in poor paralleling or loss of control!**
- If generator terminal voltage rises, or if generator exports VARS excessively under load, reverse CT leads.
- If the reactive droop resistor/rheostat gives erratic results or inconsistent resistance, lightly sand the exposed wire with 400 grit sandpaper to improve connection between wire and slider.

Initial Setup and Commissioning

1. Install the SEM250A module and wire up to the correct wiring diagram (Connection A, B, C, or D).

2. If installing the SEM250A on a brush-type generator, verify that the brushes and brush riggings are isolated, ungrounded, and connected ONLY to the SEM250A.

3. Turn the internal voltage control on the regulator 15 or more turns counter clockwise (left) or until you hear the screw click. This procedure is necessary in case the original factory settings have been altered.

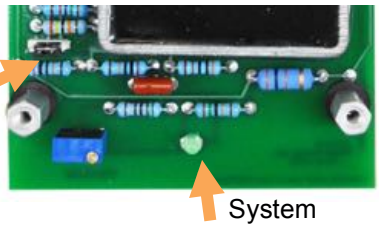
4. If you are using a remote voltage adjustment, set it at 50% of adjustment.

5. If the generator is to be paralleled, set the droop resistor between 6Ω and 10Ω.

6. Start up the prime mover and bring up to operating speed and turn on the regulator switch (if used).

7. Set the internal voltage adjustment regulator to the desired voltage generator output by turning the clockwise (right).
Note that the voltage adjustment

Frequency Selection
(XR500C and XR500D)
Remove jumper for 50Hz operation. This product's default setting is 60Hz.



8. Place the generator on line and observe the frequency and voltage.

9. If the generator is being paralleled, measure the droop during loading and adjust the droop resistor as necessary. Reducing droop resistor resistance will reduce droop.
NOTE: Loading the generator with a purely resistive load-bank may cause undesirable droop characteristics such as no droop, very slight droop, or even rising terminal voltage. Measure droop with a mixed load for best results.

10. If paralleling and the terminal voltage rises or excessive amperage exportation occurs during loading with a mixed load connected, reverse the CT leads and try again.

11. Observe voltage regulation during no-load and full-load conditions. Once the voltage is set and regulating characteristics are satisfactory the installation procedure is complete.

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Application Troubleshooting

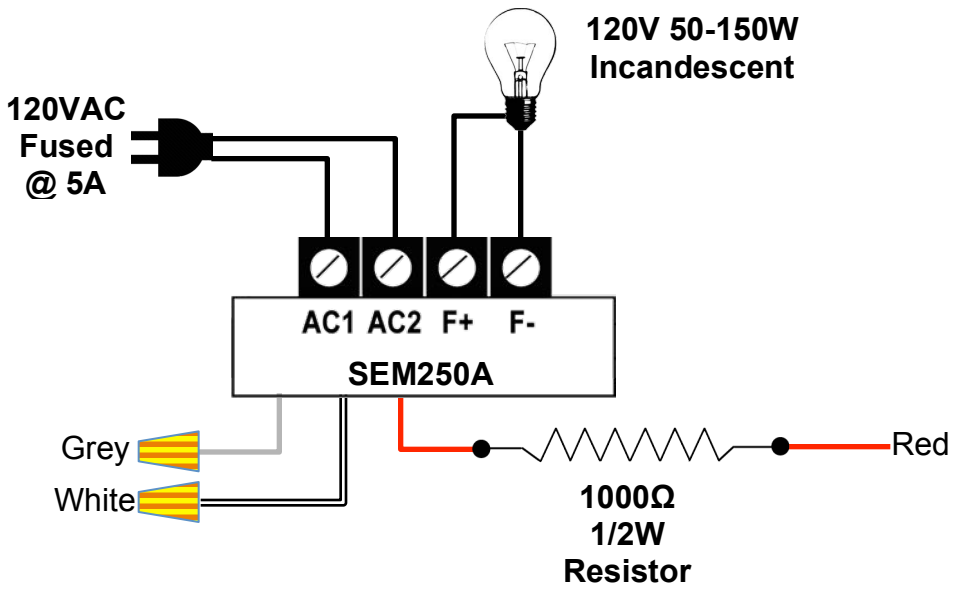
Problem:	Possible Cause
No Voltage	1 3 5 7 9 11 13 15 20
Pulsating Voltage	4 5 6 12 16 20
Flickering Voltage	4 6 7 14 20
High Voltage	6 7 8 9 12 13 17 18 20
Voltage Drop on Load	5 8 10 12 16
Low Voltage	5 8 12 13
Poor Voltage Regulation	2 4 10 12 13 16 20
No Voltage Control	13 19 20

Possible Causes:

1. Residual input voltage to the voltage regulator is below 3.5vac or fuses are open in the regulator.
2. Unbalanced generator load.
3. Open exciter field or defective generator.
4. Non linear load or defective connection in exciter field.
5. Open diode in exciter or shorted rotor in generator.
6. Loose component in voltage regulator.
7. Loose wiring connections.
8. Input voltage to regulator is too low.
9. Exciter field is grounded.
10. Non linear load or wrong selection for regulator hookup.
11. Exciter fields are reversed.
12. Wrong selection of regulator wiring configuration.
13. Defective voltage regulator.
14. SCR or Inverter drive effecting generator waveform.
15. Regulator needs external flashing circuit.
16. Isolation transformer is too small.
17. Isolation transformer is needed.
18. Exciter fields are not isolated from other circuits.
19. Input and field circuit are being fed by a common cable or conduit.
20. Incorrect hookup or wiring.

Bench Check Procedures

1. Wire the SEM250A as shown in the figure below.
2. Connect a 120 volt 50 to 150 watt light bulb to the F+ and F- Terminals.
3. Tape off and insulate the Gray and White wires.
4. Connect a 1000Ω resistor to the red wire on the SEM250A.
5. Input 120VAC fused at no more than 5A into the SEM250A. **The test light should be OFF**.
6. Touch the 1000Ω resistor connected to the red wire to the AC1 terminal. **The test light should light to *HALF* Brightness.**
7. Disconnect the 1000Ω resistor and red wire from the AC1 terminal. **The test light should be OFF**.
8. Turn off power and disconnect the SEM250A from your power source. Inspect all electronic components on the SEM250A to ensure they are isolated from touching any part of the SEM250A housing.
9. **If you were able to successfully perform all of these tests, the SEM250A is good.**



Power-Tronics, Inc. Electrical Power Control Systems
P.O. Box 291509 Kerrville, Texas USA 78029 Phone: 830.895.4700 Email: pti@power-tronics.com Web: www.power-tronics.com

Installation Warranty Form

It is very important that you fill out this form completely when installing a voltage regulator. This form serves as a history record on the application. This form also contains the information needed by Power-Tronics, Inc., for repair and troubleshooting of any product you may be having problems with.

Failure to fill out this form during installation will result in a cancellation of your warranty coverage! Filling out this form takes only minutes but will save hours or days later on if your product should require service!

Product Model:	Additional Module(s) or Options:
Serial #:	
Date of Installation:	
This Section for Brushless Generators Only	
Exciter Field Voltage:	Exciter Field Resistance:
This Section for Brush-Type Generators Only	
Shunt-Field Voltage:	Shunt-Field Resistance:
Rotor Resistance @ Brush Leads:	Rotor Resistance on Slip-Rings:
Rotor Excitation Voltage:	
Generator Wiring/Usage Information	
Generator Leads (Check One:) ☐12 ☐10 ☐6 ☐4 (3ø) ☐4 (1ø) ☐3	
Generator Wiring Mode (Check One:) ☐High-Wye ☐Low-Wye ☐Series Delta ☐Zig-Zag ☐Double-Delta ☐Single-Phase ☐Other	
Terminal Voltage:	Residual AC Voltage:
Rated KW:	Rated KVA:
Primary Load (Please Explain):	
Repair/Warranty Request Information	
Company Name:	
Contact Person:	
Telephone Number:	
Email Address:	
Ship-To Address (City, State, Zip, Country):	
Problem Description/History (Please be detailed!!!):	

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PRODUCT WARRANTY

Power-Tronics, Inc., assumes no liability for damages due to incorrect voltage or other voltage related damages resulting from either output of the generator or input to the generator exciter system. These problems should be protected with external devices provided by the customer such as ***fuses, surge suppressors, over/under voltage and frequency controls.***

Power-Tronics, Inc., warranties **only parts and workmanship** of this product for a **period of 3 years from the original date of purchase from Power-Tronics, Inc.** Under warranty, Power-Tronics, Inc. will replace, exchange or repair the defective product **without labor or parts cost to the customer.** Remaining warranty of the original product will be transferred to the replaced or repaired product. To obtain warranty, a copy of the original Installation Warranty Form must be sent in with the defective product, which clearly shows the purchase date and serial number of the defective part. A repair request form must be sent in with the product before repairs will begin. You can obtain this form by contacting Power-Tronics, Inc.

Send repairs to: Power-Tronics, Inc., 2802 Cobbler Ln., Kerrville Texas USA 78028.

Send in repairs only by UPS or FedEx. **USPS will NOT deliver to our facility!**

Any *one* of the following conditions will void the warranty:

- Overheating of the power supply resistor(s) on the printed circuit card.
- Overheating of the SCR or freewheeling diode.
- Physical damage to the printed circuit card, housing or components.
- Unauthorized repair or alteration of printed circuit card.
- Installation by anyone other than a qualified professional generator service technician.
- Conductive or corrosive contamination of the circuit card.
- Removal of our company identification from the product.
- Removal of any conformal coating of the printed circuit card or components.
- Overheating of foil on the printed circuit card.
- Inappropriate or infeasible application.
- Use with any external device other than manufactured by Power-Tronics, Inc.
- **Failure to fill out the attached warranty card during installation**

No other warranty is expressed or implied.