SE300A

Static Exciter

From Serial # 624306

The Power-Tronics SE300A Static Exciter is a self-contained, heavy-duty complete chassis Static Exciter. The SE300A Static Exciter is designed for continuous operation up to 63vdc at 25adc!

The SE300A is uniquely designed to fit in a compact footprint while being passively convection cooled for a long, maintenance-free service life. Because of its unique modular design, the SE300A minimizes downtime should a repair ever be necessary! All serviceable parts are easily removable without the need to remove the chassis from the mounting cabinet or tray.

Over 30 years of field use and design refinement makes the SE300A a time-proven design, utilizing high-reliability components, and a unique modular design to simplify repair. The SE300A is designed to provide a lifetime of service and is specifically built to minimize failures and potential downtime!

The SE300A is capable of parallel operation with other generators or with a utility buss. The VRMSE-A control module includes an internal 0-10VDC or 4-20mA interface module to allow a wide variety of VAR, PF, or other PLC controls to remotely control the unit. An optional motorized potentiometer allows remote operation by dry contact switching or older pulsed-DC control schemes.

Specifications

Input Voltage:	120 - 240vac
Frequency:	50 or 60 Hz
Voltage Regulation:	+/- .25% From NL to FL
Parallel Operation	Yes
Output Voltage Range:	0-52vdc @ 120vac input 0-105vdc @ 240vac input
Maximum Forcing Output:	105vdc @ 30adc
Rated Continuous Output:	63vdc @ 25adc
Minimum Field Resistance:	1.25Ω @ 32vdc output 2.5Ω @ 63vdc output
Min Residual Build up Voltage:	5vac
Under Frequency Protection:	Yes, VPH reduction
Physical Size:	10 x 10 x 4 in.
Weight:	4 lb.
Integrated Control Module:	VRMSE-A
Optional Control Module:	VRMSE-A/MAN
Internal Build-Up Provisions:	Yes, Residual AC Flash
Repairable:	Yes
Internal Protection:	Fuses, cartridge type
External Voltage Adjustment:	Yes
System Operating Indicator:	Yes
Optional External Controls	Yes
Integrated 0-10VDC / 4-20mA Interface:	Yes

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Electrical Power Controls

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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 static exciter receives ample airflow
ALWAYS use adequate fusing
NEVER hold the static exciter in your hand or lap when energized
NEVER install the static exciter in a place it can be exposed to the elements or moisture
NEVER mount the static exciter over a screw, bolt, rivet, 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 cover
NEVER touch any exposed part of the SE300A during operation
NEVER install a switch in the DC portion of the static exciter's wiring
NEVER USE A DIGITAL FREQUENCY METER (*It can give a false reading*!)

Functional Description

The SE300A Static Exciter is the result of over 30 years of engineering efforts and offers high-demand features at a competitive price point. The SE300A is a time and field-proven design and is engineered to greatly simplify setup while offering extreme reliability. When properly installed, the SE300A Static Exciter is designed to provide a lifetime of service.

A Generator voltage regulator has several automated tasks it must perform in order to provide reliable, clean, and regulated electricity. It must build-up the generator, regulate the terminal voltage within its design specifications, and protect both itself and the generator should a fault situation arise.

The SE300A Static Exciter is designed to replace older obsolete static exciters or rotating exciters with a minimum of connections and a minimum of required installation space. The SE300A Static Exciter contains an internal flashing circuit for guaranteed buildup, internal filter for voltage sensing, internal field-replaceable 30A fusing, and internal DC field noise suppression. The SE300A is also designed to be user-serviceable should a problem arise. Fuse or rectifier replacement in the field takes only minutes, thanks to the unique modular design of the SE300A.

Due to its extreme simplicity, the SE300A Static Exciter is uncommonly reliable and offers features and regulation accuracy usually only offered by much more complicated and often much more expensive static exciters.

Determining Correct Application Sizing

The SE300A Static Exciter is designed for use with 120-240VAC input. It contains internal suppression for use with brush-type generator sets. Before installation, it is necessary to verify that the SE300A is the correct product for your application.

To determine if the SE300A is the correct product 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, verify that your generator fits the specifications below:

- ☐ Exciter full load voltage is 32VDC or less, and your exciter field resistance is 1.25Ω or greater. **USE 120V INPUT**
- ☐ Exciter full load voltage is 63VDC or less, and your exciter field resistance is 2.5Ω or greater. **USE 208-240V INPUT**

WARNING: BRUSH AND SLIP RING CONNECTION PROBLEMS ARE THE #1 SOURCE OF VOLTAGE CONTROL PROBLEMS AND FAILURE OF STATIC EXCITERS!!! ***DO NOT INSTALL THE SE300A IF THE BRUSHES AND/OR SLIP RINGS ARE NOT IN EXCELLENT CONDITION!!!***

STOP AND CORRECT BRUSH AND SLIP RING CONNECTION PROBLEMS IF ANY OF THE FOLLOWING CONDITIONS ARE PRESENT:

- ☐ **GROOVES IN SLIP RINGS**
- ☐ **ROUGH SLIP RING APPEARANCE OR GHOSTING (CHATTERING)**
- ☐ **OIL CONTAMINATION ON BRUSHES OR SLIP RINGS**
- ☐ **DULL, ROUGH, STRIPED, PITTED, OR METALLIC APPEARANCE OF BRUSH FACES**
- ☐ **FIELD RESISTANCE MEASURED BETWEEN SLIP RING BRASS AND FIELD RESISTANCE MEASURED BETWEEN FIELD LEADS EXCEEDS 1-2% DIFFERENCE**

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 SE300A. **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!

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).

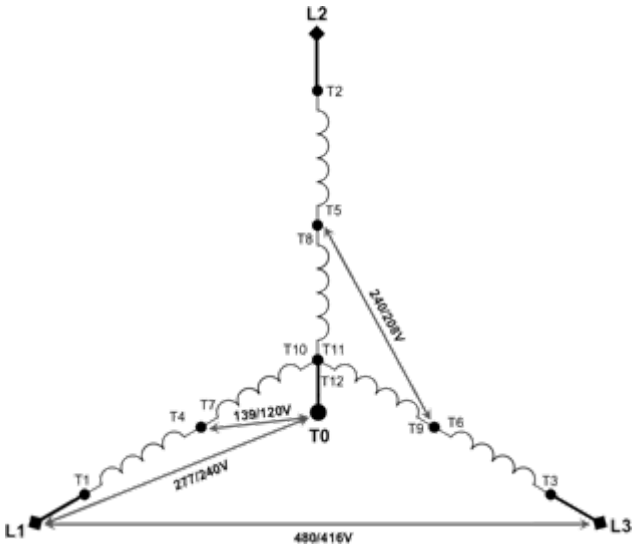
- Next, calculate your maximum exciter field amperage using your measured field resistance and your calculated exciter voltage using the following formula:

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

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.

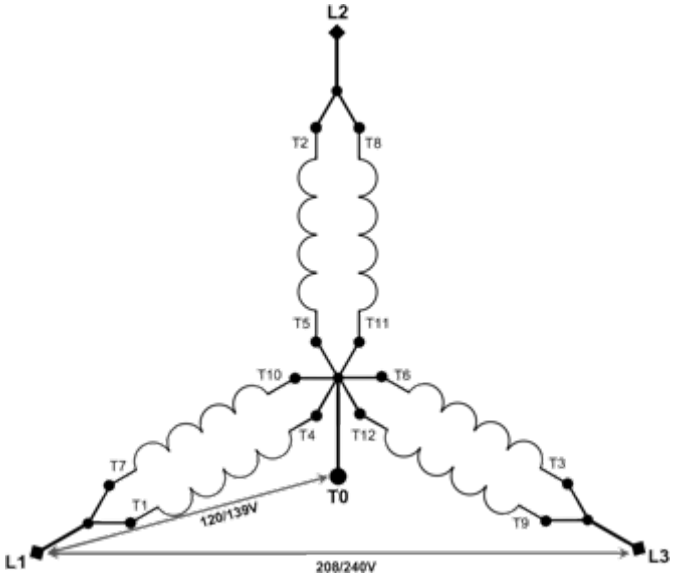
Using the values you just measured and calculated, see the specifications on the previous page to determine whether the SE300A is the correct product for your application.

Common 12-Lead Generator Wiring Diagrams



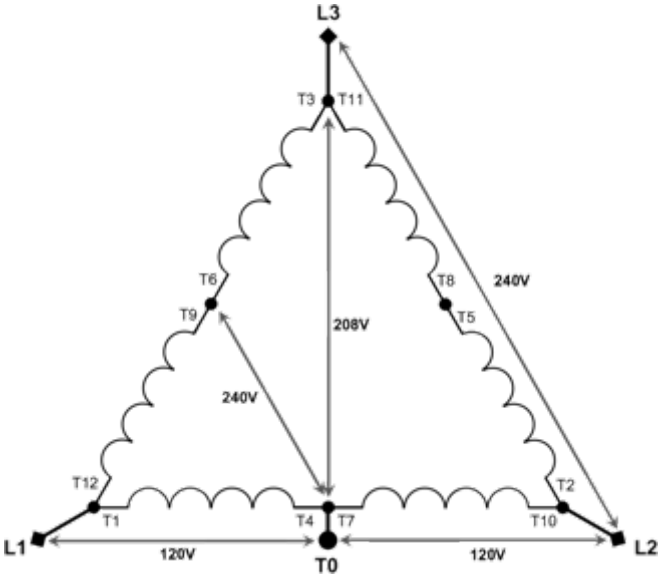
Series Wye (416/480V 3ø)

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



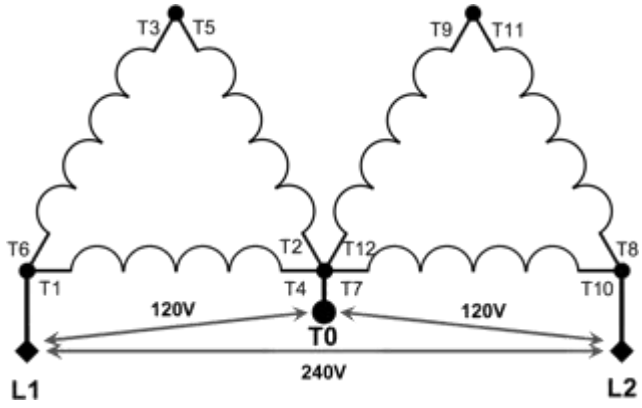
Parallel Wye (208/240V 3ø)

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!

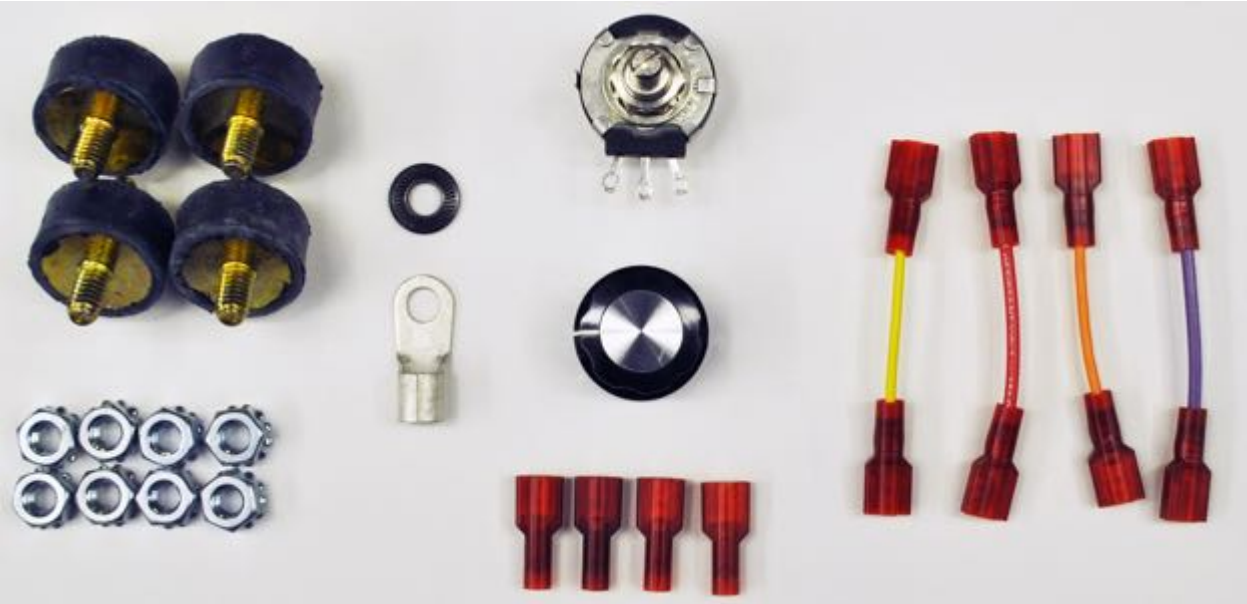


Double-Delta (120/240V 1ø)

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!

Included Parts & Accessories

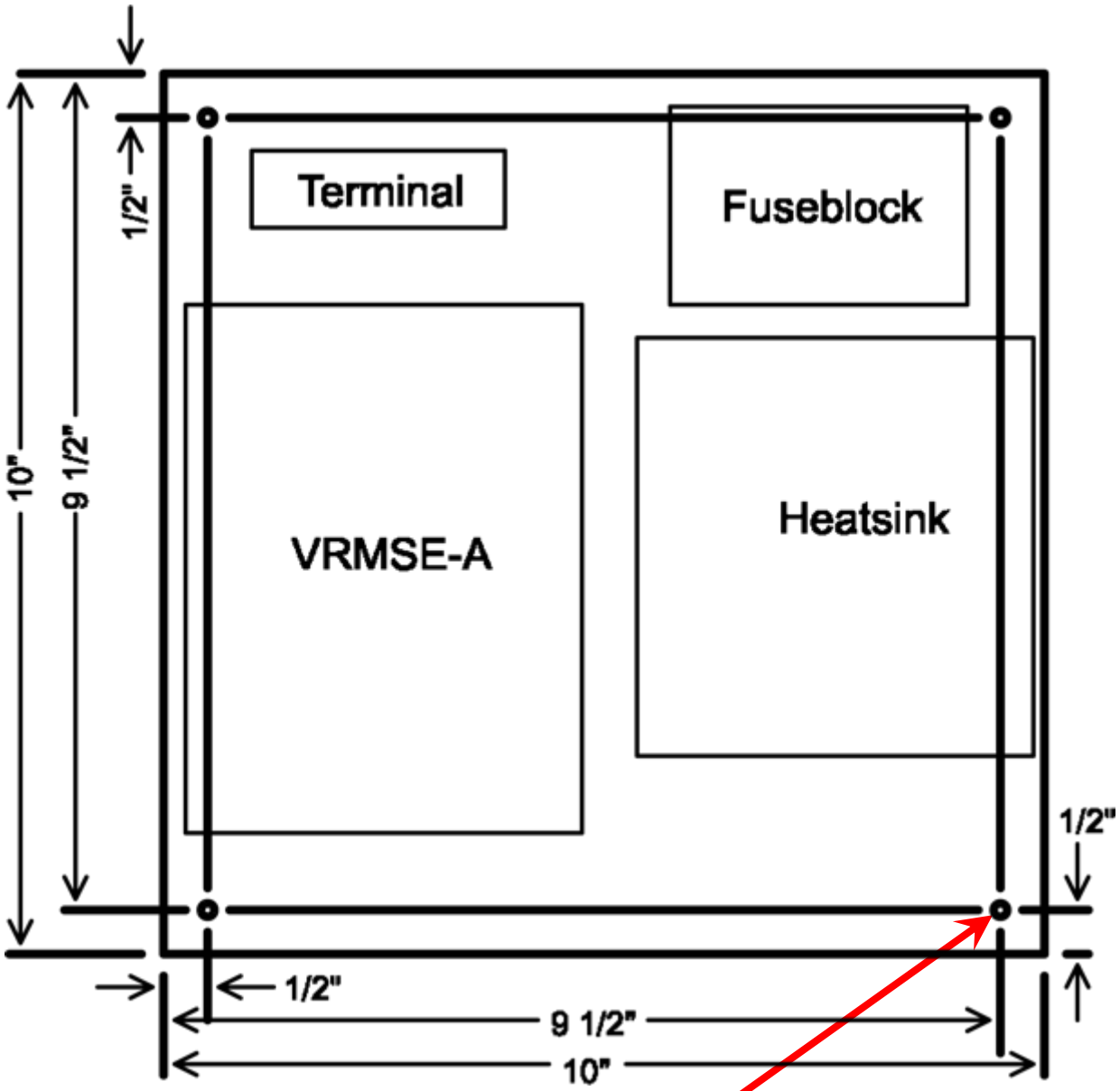
The SE300A Static Exciter includes the following parts and accessories to ensure a quick and easy installation:



Included Parts List:

☐ **Vibration Isolators**	**Qty: 4**
☐ **¼-20 Self-Locking Nuts**	**Qty: 8**
☐ **#16-14AWG Compression Terminal**	**Qty: 1**
☐ **¼" Bellville Washer**	**Qty: 1**
☐ **100K 2W Long-Life Potentiometer**	**Qty: 1**
☐ **Panel Knob for Potentiometer**	**Qty: 1**
☐ **#22-18AWG .250 Female Terminals**	**Qty: 4**
☐ **Yellow Jumper Wire (Factory Installed)**	**Qty: 1**
☐ **Red Jumper Wire**	**Qty: 1**
☐ **Orange Jumper Wire**	**Qty: 1**
☐ **Purple Jumper Wire**	**Qty: 1**

Mounting Dimensions & Chassis Ground



Chassis Should Be Grounded For Safety!!!

Use Supplied Compression Terminal And Bellville Washer Provided In Accessories Kit

Attach to Bottom Right Mounting Point.

Torque to 125 in•lbf (15N•M)

Input Power & Field Connection Diagram

(**See page 10** for control wiring information)

The SE300A is a Half-Wave rectified static exciter, which allows a maximum of 52VDC @ 30A with an input voltage of 120VAC, or 105VDC @ 30 ADC with an input voltage of 240VAC.

This product is typically used on slip-ring generators with full load field voltages of 32 or 63VDC or less and full load exciter field amperages between 5 and 25ADC.

Note that the maximum input voltage to the SE300A Static Exciter is 240VAC! DO NOT input 277VAC into the SE300A! Severe damage to the unit will result! For use on 480V systems, use a **480-240V step-down transformer rated at 3KVA** or connect the regulator to the winding center taps T7 and T9 (**See Page 6**).

Connecting the input of the SE300A to 2 different phases of the generator as shown in the diagram below will result in greater regulation accuracy than when connecting line-neutral.

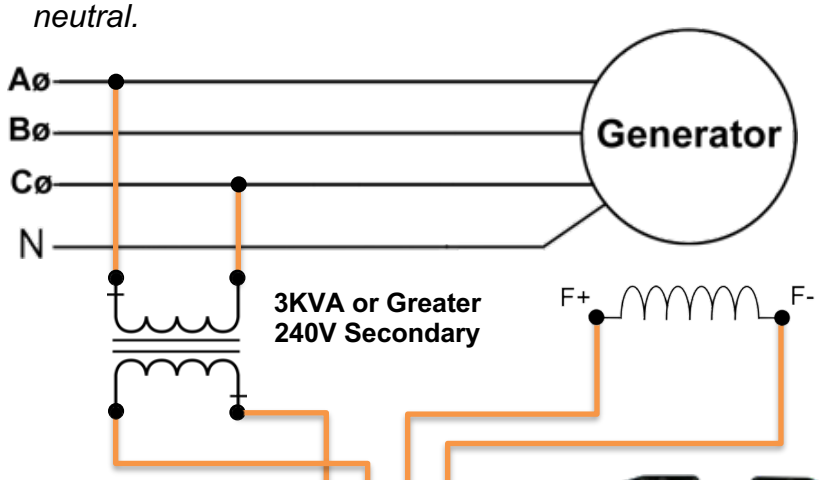
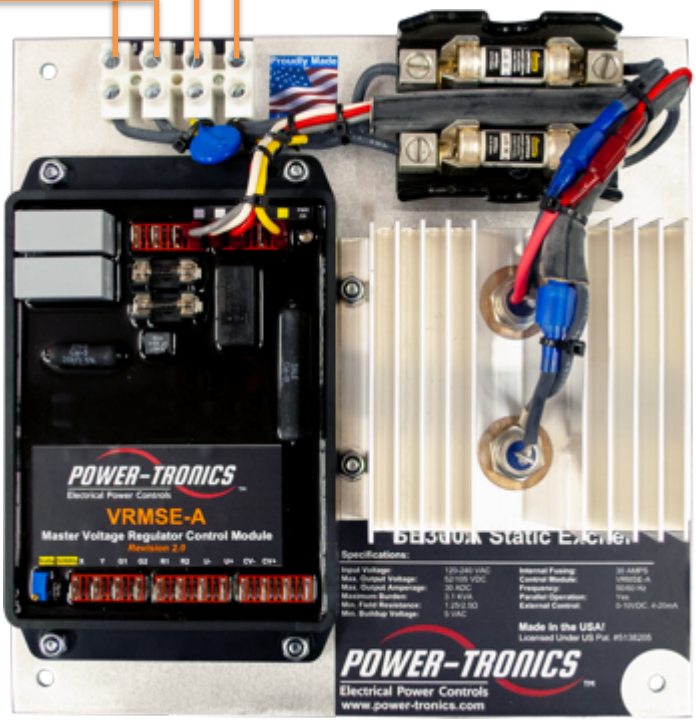


Diagram Assumes a 208-240V Generator
For 480V Generators, use a 3KVA (or larger) **Transformer** with a **240V Secondary** *OR* Connect to the Generator winding center taps at **T7 and T9.**

NOTE:
Diagram shows an isolation transformer, which is recommended for ALL installations. An isolation transformer will save your engine bearings should the rotor ever short to ground!

Note Polarity Marks On Transformer!



NEVER install a switch or breaker on the DC or Exciter side of the voltage regulator!

Only install a switch or disconnect on the AC Side of the regulator!

See Pages 12-15 for Control Wiring Diagrams

VRMSE-A Control Module

The VRMSE-A Control Module is an integrated device designed to replace multiple discrete components in previous generations of Static Exciters. It incorporates an Automatic Voltage Regulator, AC Filtering, Automatic Residual AC Flashing Circuit, and integrated 0-10VDC / 4-20mA Interface Module.

The unitary design simplifies installation in the field, and greatly simplifies replacement if a fault occurs with the control module. The unit has 4 color-coded wires with quick-connect terminals, and can be quickly swapped out in under 5 minutes without the need to remove the chassis from its enclosure or tray.

Status LED

Internal Voltage Adjustment **25 Turn Pot!**

50/60Hz Selection Jumper Remove for 50Hz Operation

0-10V/4-20mA Selection Jumper ***Remove for 0-10V Operation***

Terminal Descriptions:

Colored Terminals:
Chassis Wiring (Color-Coded)

X & Y:
Paralleling CT Input
Factory-Installed Yellow Jumper

G1 & G2:
Gate Enable Pins
Short G1 & G2 To Run Exciter
Switch or Relay Recommended
If No Switch, Install Red Jumper

R1 & R2:
Remote Adjustment Input

U- & U+:
Output From Internal 0-10V Interface Module

CV- & CV+:
Input for 0-10V or 4-20mA Signal

VRMSE-A/MAN Control Module (Factory Option)

The VRMSE-A/MAN Control Module is an optional control module featuring a passive regulation circuit and manual stability control. It incorporates an Automatic Voltage Regulator, AC Filtering, Automatic Residual AC Flashing Circuit, and integrated 0-10VDC / 4-20mA Interface Module.

The VRMSE-A/MAN is sometimes a better choice for hydro-turbine installations or any application where aggressive control of the exciter is desired. Due to the way the different regulation circuitry functions, the VRMSE-A/MAN is often better suited for erratic grid conditions or generators with slow magnetic characteristics.

Internal Voltage Adjustment **25 Turn Pot!**

Status LED

Internal Stability Adjustment **25 Turn Pot!**

50/60Hz Selection Jumper Remove for 50Hz Operation

0-10V/4-20mA Selection Jumper ***Remove for 0-10V Operation***

Terminal Descriptions:

Colored Terminals:
Chassis Wiring (Color-Coded)

X & Y:
Paralleling CT Input
Factory-Installed Yellow Jumper

G1 & G2:
Gate Enable Pins
Short G1 & G2 To Run Exciter
Switch or Relay Recommended
If No Switch, Install Red Jumper

R1 & R2:
Remote Adjustment Input

U- & U+:
Output From Internal 0-10V Interface Module

CV- & CV+:
Input for 0-10V or 4-20mA Signal

Standard Control Wiring Diagram

This wiring diagram shows the default control wiring configuration for the SE300A.
Power wiring is shown on Page 9.

This diagram assumes an isolated (unit/islanded) operating environment with manual remote adjustment.

NOTE:
Yellow Jumper is Factory Installed!

NOTE:
If not using a switch, Install Red Jumper from Accessory Kit

100KΩ @ 2w

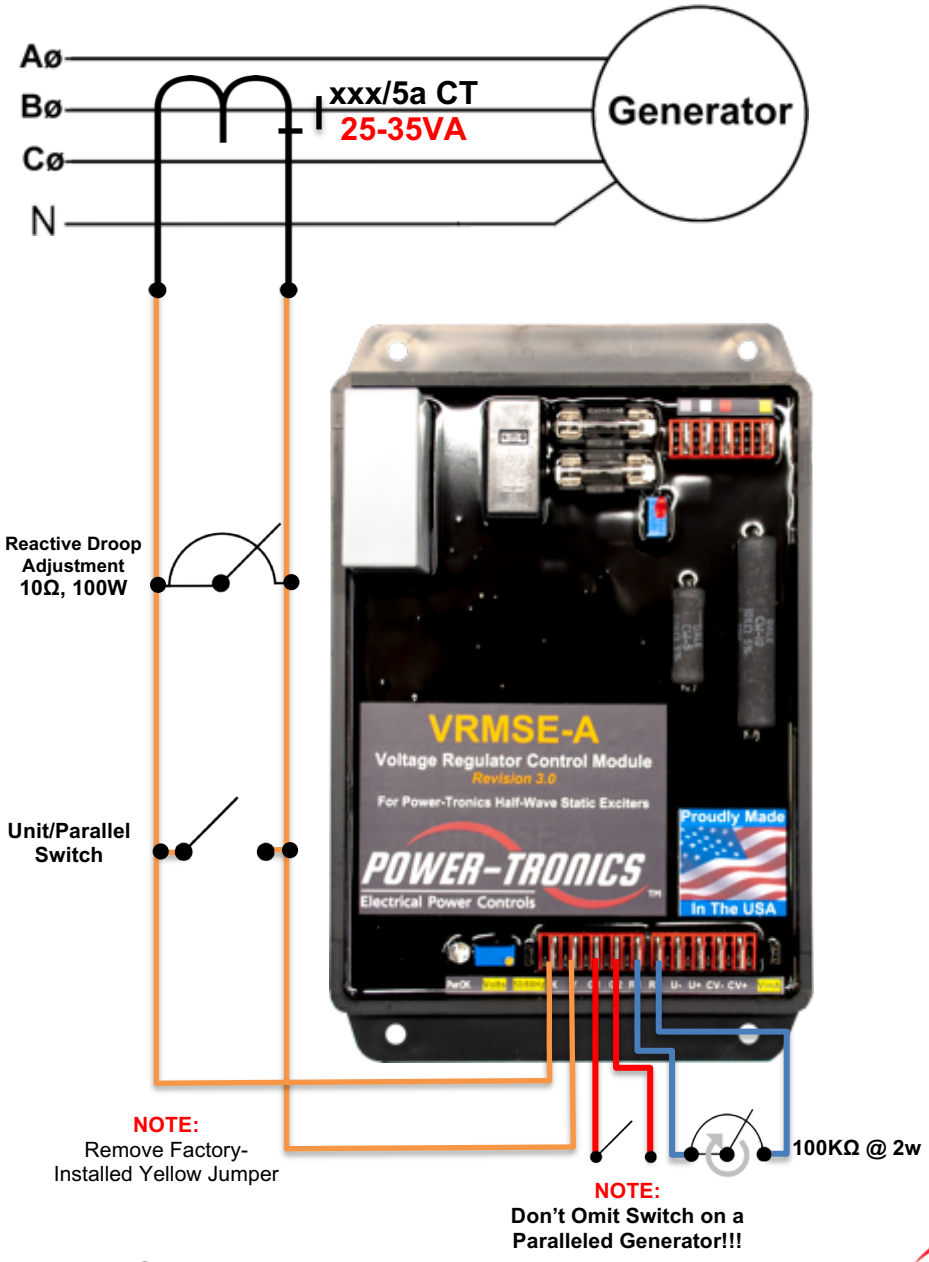
NOTE:
It is not necessary to jumper terminals R1 and R2 if not using the Remote Voltage Adjustment!

Parallel Control Wiring Diagram

To use the SE300A Static Exciter 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 SE300A. **Power wiring is shown on Page 9.**

This diagram assumes a paralleled operating environment with manual remote adjustment.

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 (2Ω for VRMSE-A/MAN control modules) 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 capacity!**

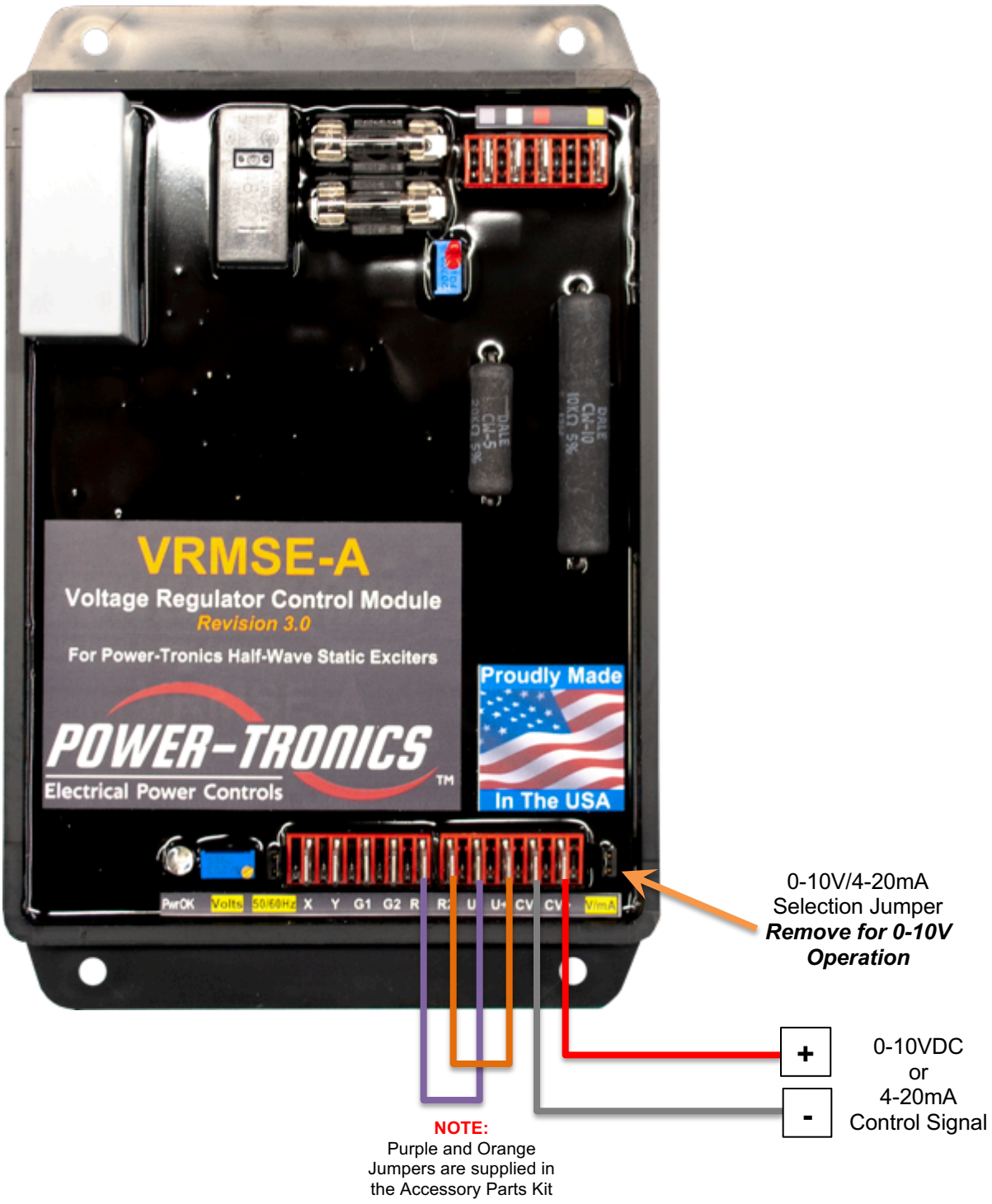


If using the internal 0-10VDC Interface module, See Pages 14-15 for Control Wiring Diagrams

NOTE:
Don't Omit Remote Adjustment on a Paralleled Generator!!!

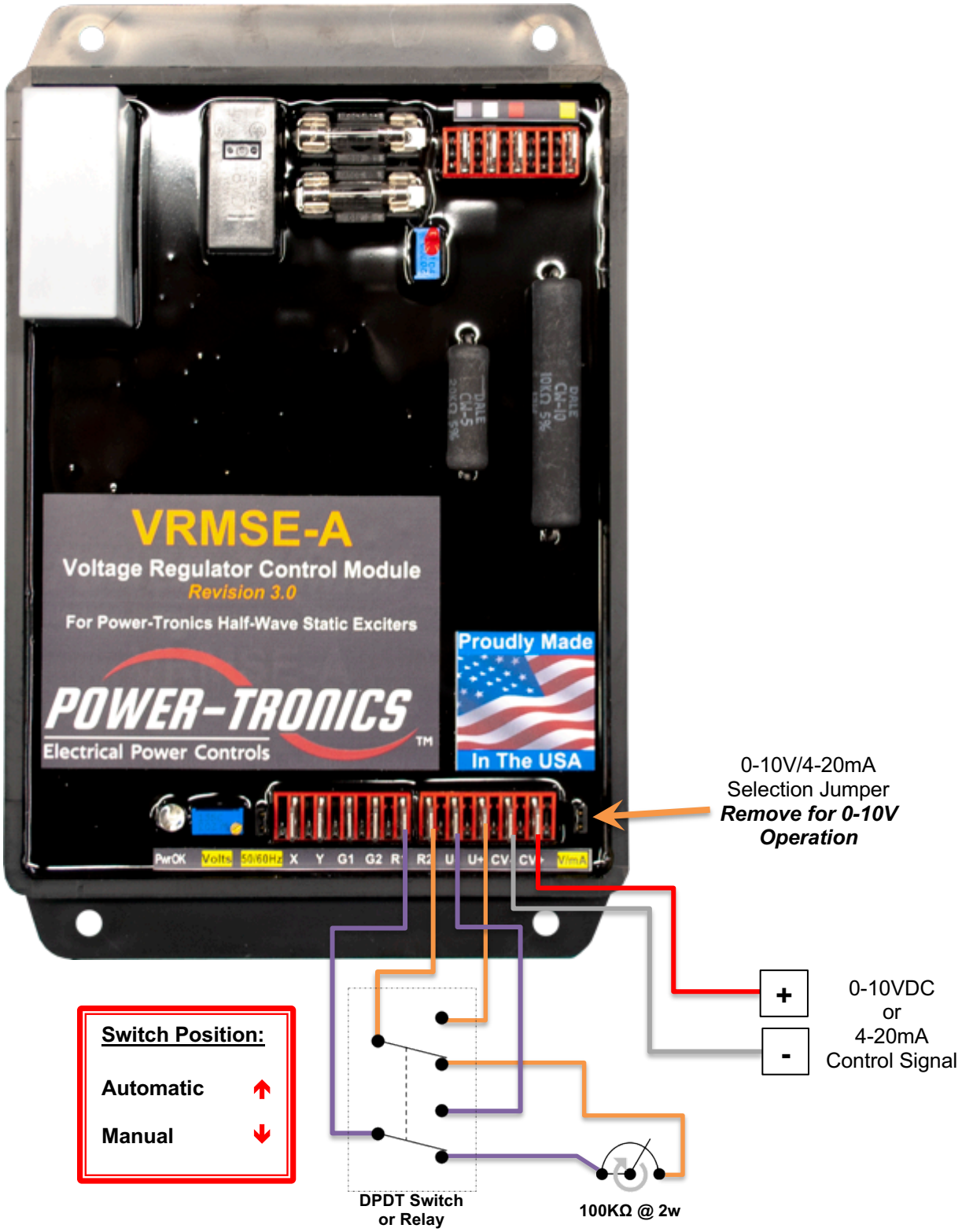
Fully Automatic Remote Adjustment Wiring Diagram

This wiring diagram shows ONLY the control wiring configuration for fully-automatic Remote Control of the SE300A. **Control wiring is shown on Pages 12 and 13.**



Automatic / Manual Selectable Remote Adjustment Wiring Diagram

This wiring diagram shows ONLY the control wiring configuration for fully-automatic Remote Control of the SE300A. **Control wiring is shown on Pages 12 and 13.**



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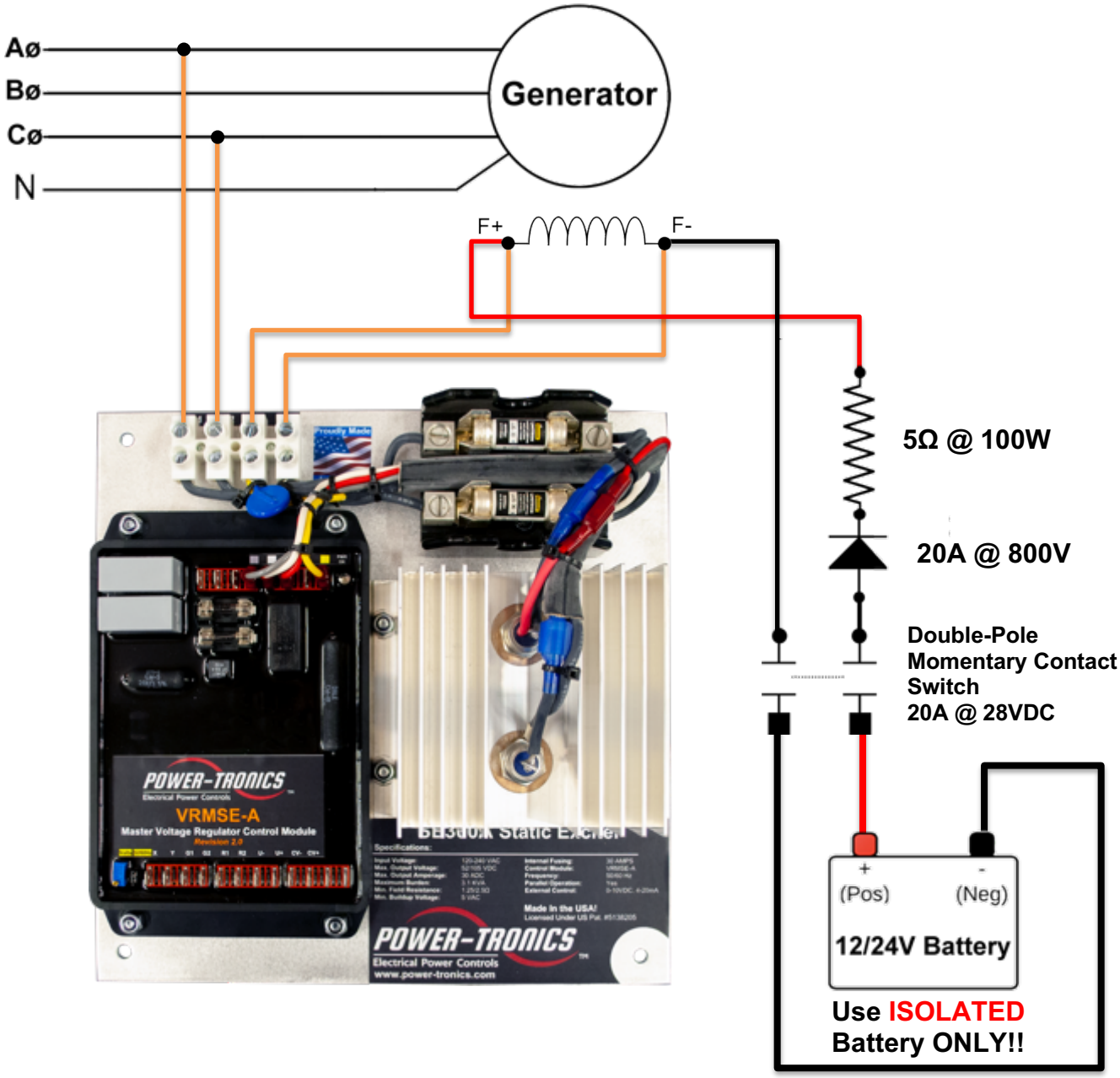
Adding an External Manual Battery Flash

The diagram below shows how to add a manual battery flash circuit to the SE300A.

If you prefer an automatic battery flash solution, the Power-Tronics ABF10 Automatic Battery Flash Module provides an automated battery flashing solution using a standard 12 or 24V isolated battery source.



Initial Setup and Commissioning

1. Install the SE300A and wire according to the correct wiring diagram and control wiring diagram **(Pages 9-14)**.

2. If installing the SE300A on a brush-type generator, verify that the brushes and brush riggings are isolated, ungrounded, and connected ONLY to the SE300A.

3. If operating on a 50Hz generator, remove the 50/60Hz Selection Jumper on the VRMSE-A.

4. Turn the internal voltage control (VOLTS) on the VRMSE-A Control Module 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.

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

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

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

8. Set the internal voltage adjustment (VOLTS) on the VRMSE-A Control Module to the desired voltage setting for the generator output by turning the adjustment screw clockwise (right).
Note that the voltage adjustment is a 25-turn pot!

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

10. 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.

11. 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.

12. If using the internal 0-10VDC interface module, manually vary the input voltage signal to observe the behavior of the exciter in response to a control voltage change. By default the unit ships factory preset for full range from 0-10VDC (Effective range +/-20VAC from 240VAC setpoint).

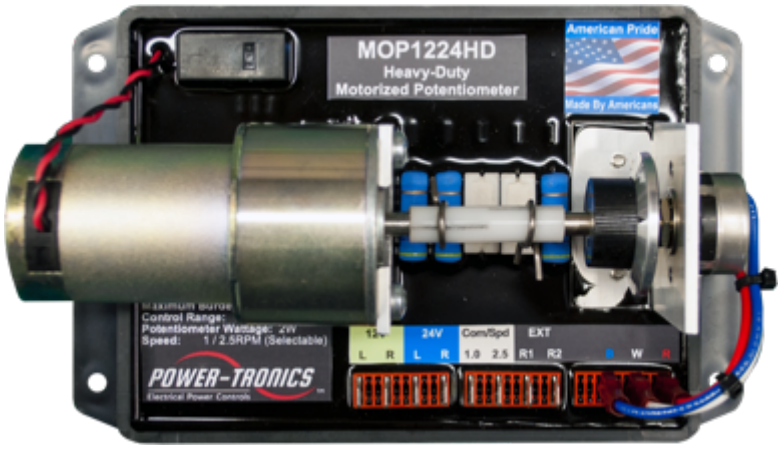
13. If your external control device uses a +/-9V or +/-10V control signal, you can still use it with the VRMSE-A's internal interface module by manually setting a +5V offset in your control scheme. The unit will recognize 0-10V control signals and will ignore any negative control signals.

14. 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.

Optional Power-Tronics Add-On Modules

Power-Tronics offers an array of optional add-on modules for the SE300A Static Exciter. For more information on any of the modules below, visit our online catalog at:

www.power-tronics.com



MOP1224HD

Motorized Potentiometer

Allows the SE300A to be externally controlled by older automated controllers using pulsed signals or dry contacts for control!

HVD2

High Voltage Disconnect

Saves your generator and connected equipment from runaway voltage conditions! Disconnects power to the voltage regulator instantly in the event of high voltage!

ABF10

Automatic Battery Flash Module

Adds Automatic Battery Flash to installations with low residual or requiring guaranteed buildup!

For Technical Support:
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Call Us at: (830) 895-4700

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Application Troubleshooting

Problem:	Possible Cause
No Voltage	1 3 5 7 9 11 13 15 20 21
Pulsating Voltage	4 5 6 12 16
Flickering Voltage	4 6 7 14 21 22
High Voltage	6 7 8 9 12 13 17 18 20 21 22
Voltage Drop on Load	5 8 10 12 16 23 24
Low Voltage	5 8 12 13
Poor Voltage Regulation	2 4 10 12 13 16 23 24
No Voltage Control	13 19 20 21 22 23 24

Possible Causes:

1. Residual input voltage to the exciter is below 3.5vac or fuses are open on the chassis or 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.
21. Poor brush contact to commutator or sliprings.
22. Damaged, pitted, or grooved slip ring surface.
23. Current transformer has reversed polarity or is not shorted during non parallel operation.
24. Input to regulator is from an auxiliary winding and not the generator main stator.

Bench Check Procedures

1. Wire the SE300A as shown in the figure below.

2. Connect one 120 volt 50 to 150 watt incandescent light bulb to the F+ and F- Terminals.

3. Install a temporary jumper wire between terminals X and Y and another jumper between terminals G1 and G2 on the VRMSE-A Control Module.

4. Turn the internal voltage adjustment (VOLTS) on the VRMSE-A Control Module fully Counter-Clockwise (Left) before beginning the testing procedures below.

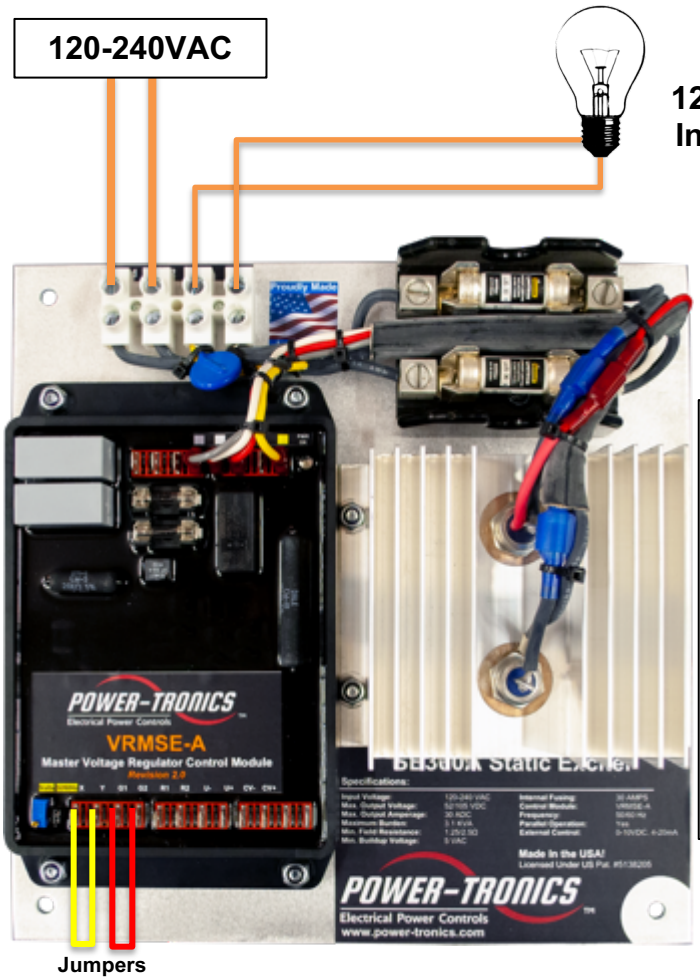
5. Input 120-240VAC fused at no more than 5A into the SE300A. **The test light should be OFF**.

6. ***Slowly*** turn the internal voltage (VOLTS) adjustment on the VRMSE-A Control Module Clockwise (Right) until the light glows. **The test light should light to *FULL* Brightness.** ***NOTE: It may take several turns of the adjustment screw before the lights illuminate!***

7. ***Slowly*** turn the internal voltage (VOLTS) adjustment on the VRMSE-A Control Module Counter-Clockwise (Left) until the light goes dark. **The test light should be OFF**. ***NOTE: It may take several turns of the adjustment screw before the lights go dark!***

8. Turn off power and disconnect the SE300A from your power source. Inspect all electronic components on the SE300A to ensure they are isolated from touching any part of the SE300A housing.

9. **If you were able to successfully perform all of these tests, the SE300A is good.**



Fuse Replacement Information:

VRMSE-A:
- **Rating: 5A @ 250VAC**
- **Qty:** 2
- **PTI Part #** 5R3-403
- **Cooper–Bussman Part #** BK/GDB-5A

SE300A:
- **Rating: 30A @ 600VAC**
- **Qty: 2**
- **PTI Part #** 5R3-466
- **Cooper–Bussman Part #** JJS-30
- **Mersen Part #** A6T-30

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!!!):	

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 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.