



ABF40

Automatic Battery Flash Unit

The Power-Tronics ABF40 Automatic Battery Flash Unit is a convenient and compact automated flashing module for all Power-Tronics SE series Static Exciters. The ABF40 offers an easy method to add a fully automatic battery flash unit to any generator.

Specifically designed for automated battery flashing of rotor-fed and high current exciters, the ABF40 is an optional unit designed for use with Power-Tronics Static Exciters on generators with AC residual voltage too low to reliably build voltage automatically, brush-type generators, and for any installation where guaranteed buildup is required. Operation is completely automatic and installation into a Power-Tronics regulating system is quick and easy.

The ABF40 Automatic Battery Flash Unit is made with industry standard components to facilitate future maintenance. The components selected are in excess of those required for operation to withstand the harshest environmental conditions and provide extreme reliability. The control relay is housed in a steel enclosure to protect against any foreign contaminants that may be present.

As with all Power-Tronics products, the ABF40 Automatic Battery Flash Unit is compatible with all previous and current SE1000, SE1500, SE2000, SE3000, and SE6000 series Static Exciters and is a simple upgrade for installations using Power-Tronics BU120/240, BU500, CFM12, or AFM500X series buildup modules!

Specifications

Sensing Voltage:	100-240vac
Frequency:	50-400Hz
Buildup Pullout Voltage:	25-30vac
Output Voltage:	12vdc
Maximum Continuous Output:	40adc
Minimum Field Resistance:	0.3Ω
Control Module:	ABF10-12V
Battery Source:	Customer-Supplied 12V battery
Battery Charger:	Customer-Supplied
Fusing:	Customer-Supplied
Physical Size:	8 x 6.5 x 5 in.
Weight:	3 lbs



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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 regulating system

ALWAYS ensure the ABF40 receives ample airflow

NEVER hold the ABF40 in your hand when energized

NEVER install the ABF40 in a place it can get wet or is exposed to the elements

NEVER mount the ABF40 over a screw, bolt, rivet, welding seam, or other fastener

NEVER disconnect the wiring while the unit is in operation

NEVER insert a screwdriver or other object under the ABF40

NEVER install a switch in the DC portion of the module's wiring

NEVER touch any exposed part of the ABF40 while in operation

NEVER USE A DIGITAL FREQUENCY METER (*It can give a false reading!*)

Functional Description

The ABF40 Automatic Battery Flash Unit is a proven design based on industry-standard flashing procedures and safety policies. The ABF40 provides a very compact automatic flashing or battery-flashing source to any Power-Tronics Static Excitation system quickly, easily, and safely.

When the generator is first energized, the voltage regulator typically begins its buildup mode where it brings the generator up to a given point before it goes into its regulation mode. Sometimes, however, the generator may have extremely low residual AC voltage or just have a hard time building up. In these situations, the voltage regulator has a difficult time building up the voltage to a point it can regulate. The solution in most situations like this is to flash the generator.

The ABF40 provides a fully automatic method to flash the generator during startup. Automatic flashing is often used on generators with sliprings and brushes and for generators with very low residual AC voltage (typically less than 3VAC) or in installations where a guaranteed buildup is required, such as hospitals, nursing homes, or correctional facilities.

The ABF40 Automatic Battery Flash Unit is based on time-proven flashing methods and features an extremely robust and reliable design. Both voltage inputs and battery inputs are unfused to attempt to force buildup even during a fault condition. Because of its simplicity and modular design, the ABF40 is quickly and easily serviced should the need ever arise.

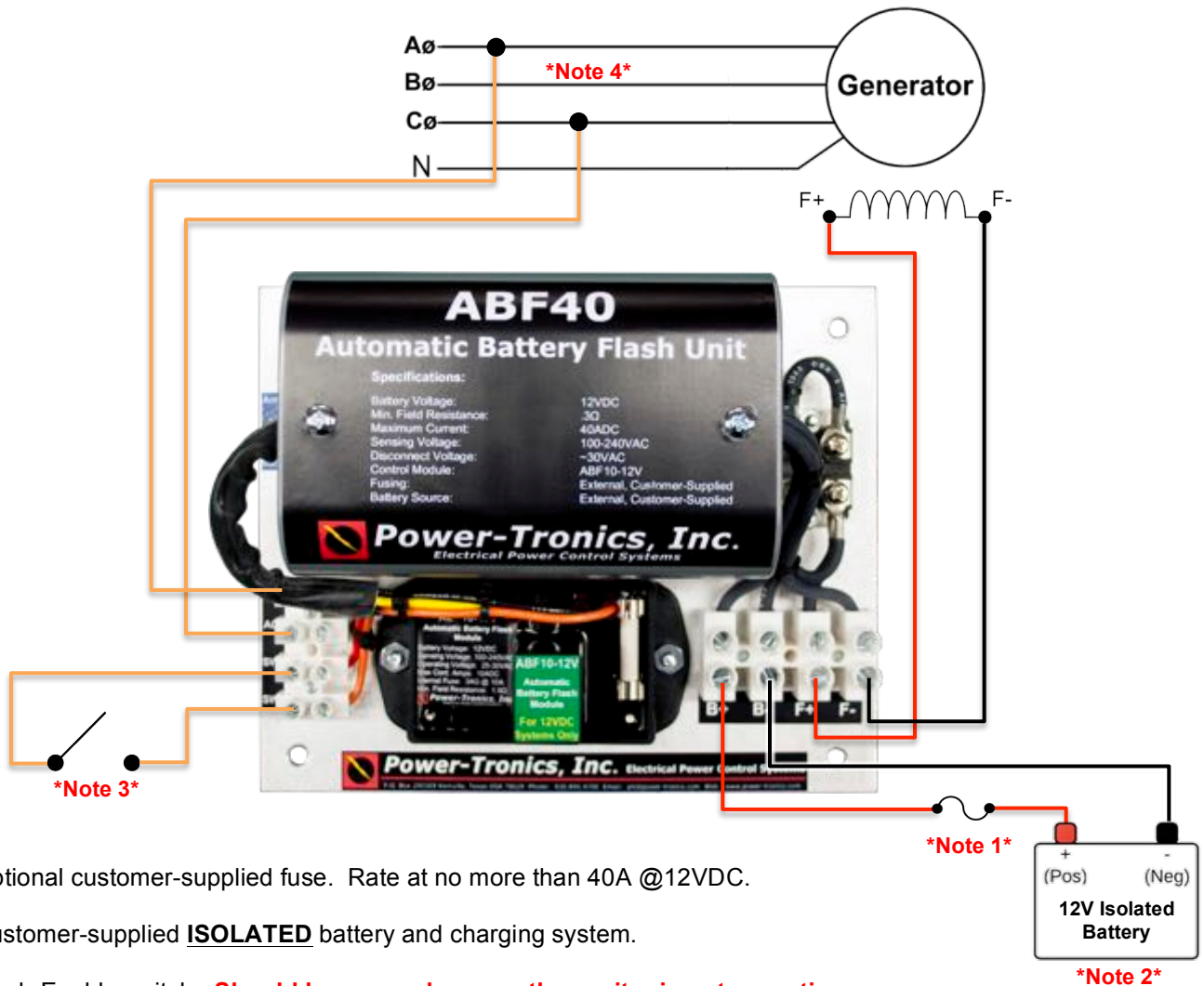


Hookup Diagram

This configuration uses an external customer-supplied 12V battery to build the terminal voltage to a point that the automatic voltage regulator can take over and perform its function. The ABF40 will automatically disconnect itself when the sensed voltage reaches approximately 25-30vac.

Take special care to follow the wiring directions precisely! DO NOT use a battery voltage different from that marked on the ABF40 unit! Severe damage to the ABF40 will result!

Note that the maximum input voltage to the ABF40 Automatic Battery Flash Unit is 240VAC! DO NOT input 277VAC into the ABF40! Severe damage to the unit will result! For use on 480V systems, either connect the unit to the winding center taps T7 and T8 or use a 480-240V step-down transformer.



Note 1: Optional customer-supplied fuse. Rate at no more than 40A @12VDC.

Note 2: Customer-supplied **ISOLATED** battery and charging system.

Note 3: Flash-Enable switch. **Should be open whenever the exciter is not operating.** Rate at 12VDC, 10A or greater.

Note 4: If using the ABF40 on a 480V or higher generator, connect terminals AC1 and AC2 to the center taps of the stator leads T7 and T8, or use a step-down transformer as appropriate to supply 240vac to the ABF40.



Initial Setup and Commissioning

1. Refer to your Static Exciter's instruction manual for initial setup and commissioning of the Static Exciter.
2. Wire the ABF40 into your generator and regulating system as shown in the hookup diagram on page 4. The ABF40 is capable of being used on generators with field resistances down to 0.3Ω . **Ensure that the battery selected for flashing is isolated and dedicated ONLY to the ABF40.** Failure to use an isolated battery can lead to a runaway or loss of control condition!
3. Verify that your wiring is correct, and then proceed to test the generator for proper buildup. Start the prime mover and bring up to speed, enable the Static Exciter, then close the Flash-Enable switch to verify proper flashing. When satisfactory buildup is achieved installation is complete.
4. If desired, the Flash-Enable switch may be opened after the generator has built voltage.

Indicator Lamps on ABF10 Control Module



“Operating” Indicator Lamp
Illuminates Above 30VAC

“Flashing” Indicator Lamp
Illuminates When Battery is Applied to Field



Application Troubleshooting

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

Possible Causes:

1. Open or loose connection, poor brush and slip ring contact, 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. Defective ABF40 Automatic Battery Flash Unit.
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. Exciter field is grounded.
22. Drained battery.
23. Welded relay contacts.



Bench Test Procedure

If you suspect a problem with your ABF40, it is possible to perform a bench test to verify functionality of the unit and determine if a repair or service is necessary. To perform a bench test on the ABF40, follow the directions below:

1. Verify that the battery is connected to terminals B+ and B- on the ABF40.
2. Connect a multimeter capable of reading 12VDC to F+ and F-.
3. Install a jumper between terminals SW1 and SW2. **You should hear the relay click after a delay of approximately 1 second and read 12VDC at terminals F+ and F-.**
4. Apply 120-240VAC to terminals AC1 and AC2. **You should hear a click as the relay drops out and read 0VDC on F+ and F-.**
5. Remove the 120-240VAC from terminals AC1 and AC2. **You should hear a click as the relay picks up after a short delay and read 12VDC on F+ and F- on TB2.**
6. Remove the jumper from SW1 and SW2. **You should hear a click as the relay drops out and read 0VDC on F+ and F-.**

If your ABF40 passed all of the operational tests above, the unit is good. If any one of the tests failed or you are unsure of the result, please contact Power-Tronics for assistance.



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:	
<u>This Section for Brushless Generators Only</u>	
Exciter Field Voltage:	Exciter Field Resistance:
<u>This Section for Brush-Type Generators Only</u>	
Shunt-Field Voltage:	Shunt-Field Resistance:
Rotor Resistance @ Brush Leads:	Rotor Resistance on Slip-Rings:
Rotor Excitation Voltage:	
<u>Generator Wiring/Usage Information</u>	
Generator Leads (Check One:) <input type="checkbox"/> 12 <input type="checkbox"/> 10 <input type="checkbox"/> 6 <input type="checkbox"/> 4 (3 \emptyset) <input type="checkbox"/> 4 (1 \emptyset) <input type="checkbox"/> 3	
Generator Wiring Mode (Check One:) <input type="checkbox"/> High-Wye <input type="checkbox"/> Low-Wye <input type="checkbox"/> Series Delta <input type="checkbox"/> Zig-Zag <input type="checkbox"/> Double-Delta <input type="checkbox"/> Single-Phase <input type="checkbox"/> Other	
Terminal Voltage:	Residual AC Voltage:
Rated KW:	Rated KVA:
Primary Load (Please Explain):	
<u>Repair/Warranty Request Information</u>	
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.