



Hard Wired  
Reliability

## Installation and Operation Manual

# 2020 SCA Standby Battery Charger



205B Konrad Cres. Markham, ON, L3R8T9, [www.chargers.ca](http://www.chargers.ca)  
"Building Canada's toughest battery Chargers for over a century."

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**Congratulations on your purchase of a quality-built, Canadian-made Vulcan Battery Charger**, with more than a century of experience, Vulcan Electric is renowned for its robust, heavy-duty charger designs. This SCA charger is the Engineer's Choice for charging the starting battery on a critical Standby Generator System. With its proven capabilities, the SCA's heavy duty design will provide many years of trouble-free service in the most demanding conditions.

### Operating Features

The SCA battery charger is a robust, automatic SCR controlled constant voltage with current-limiting design. During the recharging process, the battery charger will output at its full rated current (indicated by the red **Current Limit** LED) until the battery terminal voltage approaches the float voltage. At that point the charger output current will begin to taper down, and the red **Current Limit** LED will go out, and the green **Float Charge** LED will light. This approach to charging will rapidly recharge the battery while minimizing "battery gassing," prolonging battery life. A 1% digital Panel meter is standard on all units up to 36 Volts DC. See **Section C**.

### The Product Label

This model is available with a wide range of charger output voltages and currents, so check your product label and ensure you have the correct charger and DC output voltage for your batteries. The product label identifies the model, CSA approval and corresponding serial number, included options, input voltage and current ratings, as well as the DC output voltage and current. Please review and ensure that you have the correct charger for your application. The model number indicates charger features as follows: **Example: SCA 24/10 is an SCA-type, 24-volt DC, 10-Amp charger.**

### Feature designations include:

- **LVTD**: Low-Voltage Alarm
- **AC**: AC Fail Alarm
- **N30D6**: 30-day Automatic Equalize
- **NDD**: 1% Digital Panel meter
- **BCT1**: Kit Form Charger
- **HV**: High-Voltage Alarm
- **NC**: No Charge Alarm
- **EP**: Environmental Coating
- **DS**: Drip Shield

Once you determine that you have the correct charger for your application, please inspect the unit for shipping damage prior to installation. Immediately report any damage to the shipping company.

## Section A: Charger Installation Procedures

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**WARNING: The following procedures must be followed exactly to avoid injury, fire, or risk of electric shock.**

Inspect your charger thoroughly prior to installation to ensure that the unit is not damaged and that parts have not loosened during shipping. Inspect the product nameplate and cross reference the information with the packing slip and your order to ensure you have received the correct charger.



Your Charger is in a NEMA 1 Cabinet, mount the charger in a dry location that is free from vibration and offers sufficient ventilation. Slots and openings have been added to the cabinet for the purpose of ventilation. To ensure reliable operation of the charger, and to prevent it from overheating, these openings must not be blocked or covered. An optional Drip Shield (**DS**) is available as well as the environmental Package (**EP**) for further protection.



Do not install electronic or electrical equipment including this battery charger in the battery compartment. Lead acid batteries emit hydrogen and oxygen gases during recharge therefore, you must vent the battery compartment to prevent these gases from accumulating. Never smoke or use open flame when working around batteries. Always wear appropriate safety apparel, including eye protection, when handling or working around batteries.



When installing and connecting the charger to the batteries, remember that DC cables connected to the battery should be as short as possible. See **Section B** for our suggested DC cable sizing Chart. Vulcan Electric recommends using only copper wire. In Canada, all wiring must be completed in accordance with the Canadian Electrical Code and all local electrical codes to ensure a safe installation. Connections to the battery posts must be made with

permanent connectors that provide a reliable low-resistance connection. **Alligator clips are not a suitable connection.** Clean your batteries' contacts regularly. **Only qualified personnel should attempt to install this product.**

## Section B: Connecting the Battery, AC Supply and Alarms to the Charger

Please refer to the nameplate of your particular unit to confirm the charger's ratings and installed options. All SCA chargers are wired with AC input circuit protection and an output DC circuit breaker. Comply with all applicable electrical codes to ensure a safe installation. Only qualified personnel should install this charger.

1. The battery is connected to the terminals on the left, marked "BATT". Red is positive, and black is negative. Make sure that the battery voltage corresponds to the battery charger voltage, and that your polarity is correct. Ensure that you use sufficiently sized cable between the charger and batteries, see the chart below for our recommended cable sizes. The "total length of DC charger cable" is the total cable length inclusive of the negative and positive cables.
2. A terminal marked "GRD" is provided for the charger to be grounded. Do not operate this unit in an ungrounded state.
3. Connect the AC (nominal) supply to the terminals on the right, designated "AC INPUT". **The battery must be connected prior to energizing Charger.**



Charger Output Current	TOTAL LENGTH OF DC CHARGER CABLE (Negative and Positive)					
	10'	20'	30'	40'	50'	
(A)						
6	14	12	10	10	8	
10	14	10	8	8	6	
15	10	10	8	6	6	
20	10	8	6	6	4	
30	8	6	4	3	2	
50	6	4	3	1	#0	
75	4	3	1	#0	#1/0	
100	2	1	#0	#1/0	#2/0	
These are minimum cable sizes as recommended by Vulcan Electric. If local codes or ordinances or customer specifications require heavier cable, then they take precedence over our recommended cable sizes						

The **LVTD**, **HV**, **AC** and **NC** alarm options use Form "C" relays with normally closed and normally open termination options for an external alarm, as well as an LED on the cabinet face. The alarm board is centrally located between the D C Output Terminals on the left, and the A C Input Terminals on the right. (See the screen-printing on the board for the appropriate alarm terminal locations. The maximum rating of the relays in the alarm circuits is **1 ampere, 120 volts AC**. This maximum applies to all alarm lamps or bells connected through the alarm terminals. Do not exceed these limits under any conditions. Please note the **LVTD** alarm has a standard 1-2-minute time delay. (See Optional Alarm descriptions below)

## Section C: Normal Operation

Turn the Main Switch to the ON position. The "AC ON" pilot light will illuminate to confirm power is available to the charger.

1. If the battery is discharged, the charger will begin to charge it at the maximum charger rating, and the red "Current Limit" LED will light to confirm charging has begun.
2. When the battery terminal voltage approaches the predetermined float voltage setting, the red "Current Limit" LED will go out, and the green "Float Charge" LED will light. At this point, the charger's output current will rapidly decrease (with respect to the battery terminal voltage) and then stabilize at the required "float" output to maintain

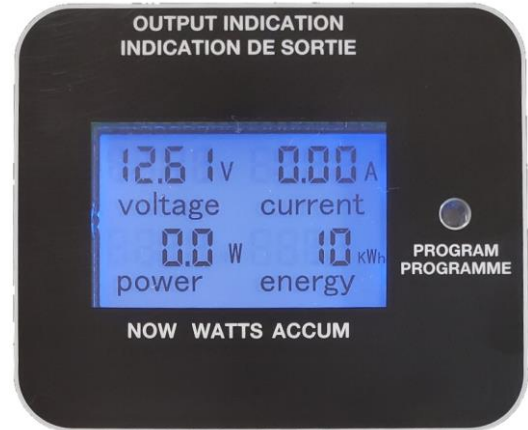
## NDD Panel meter Display

The 2019 units in 12 through 36 volts DC come Standard with a 1% Digital panel meter with 4 readouts:

1. DC voltage readout
2. DC amps
3. DC power, the current wattage output
4. DC energy, the accumulated wattage output over time.

There are also two “blinking display alarms” for low and high voltage alarms that are preset at the rated setting as set out in **Section F**.

Please note these are visual only there is no output for remote signaling. See **Section E** for the optional Alarms.



## Section D: Equalize Function

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**Standard Manual Equalize-** a standard manual two-position switch marked “Normal” and “Equalize” is supplied on units specified without an auto equalize option. For manual operation, this switch must be kept at “Normal”. Every 30 days, this switch should be placed on “Equalize” for a period of six hours. This will help balance the cell voltage and prolong the life of the battery. See **Section H** for more information.

**NOTE:** Be sure to remember to return the switch to the “Normal” position after six hours. This Equalize function is manual, and will not turn off automatically. Damage to your batteries may occur if the charger is left in the Equalize mode for too long.

**Optional Automatic Equalize-** Models with a 30-Day Automatic Equalize (N30D6) include an electronic timer and controller that will monitor time and automatically cycle the Equalize function for six hours every 30 days. See **Section H** for more information. You may initiate the Equalize function manually using the Momentary Toggle On and Toggle Off Activation Switch marked with Start and Stop, and located beside the Equalize LED.

This switch can be operated as follows:

1. If you manually activate the timer, the charger will enter an Equalize Mode for six hours.
2. If you manually deactivate the timer within the 6-Hour Cycle, the 30-day Cycle will not change.
3. If you allow the Equalize function to complete the 6-Hour Cycle, the 30-day timer will reset to Day 1.
4. If left alone, the charger will automatically enter and complete a 6-Hour Equalize Cycle every 30 days, following the last complete cycle.

## Section E: Optional Alarms

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The four optional main alarms located on the alarm board are form C contacts, 1-amp maximum current and include:

1. **LVTD:** The Low Battery Voltage Alarm with a standard 1-2-minute delay to prevent nuisance tripping during cranking is set at the factory, and will activate if the battery voltage drops below 1.8 volts per cell. (VPC)
2. **• HV:** The High Battery Voltage Alarm is set at the factory and will activate if the battery voltage rises above 2.5 VPC If an engine alternator raises the battery voltage over the factory preset voltage setting.
3. **• AC:** The A C Fail Alarm monitors the AC input and AC circuit protection and activates if there is a loss of AC power from the source, or if the AC circuit protection trips.
4. **• NC:** The No Charge Alarm monitors the DC breaker and the SCR, and will activate if the charger output fails. The No Charge alarm relay will change state to indicate an alarm under the following circumstances:
  1. An SCR fails in which case the output from the charger is half-wave rectified, or,
  2. Both SCR's fail in which case the output from the charger is 0, or,
  3. The battery develops an open cell, or,
  4. The battery is disconnected from the charger, or an interruption of the DC wiring is present, or
  5. The DC circuit breaker in the charger opens, or,
  6. If the AC power is interrupted.

## Section F: Charger Settings

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**Note:** All SCA pots are carefully pre-set at the factory and should NOT require changing in the field. Do not attempt to adjust the charger, should your Charger require recalibration please have your technician contact us by calling the Vulcan Electric hotline at 1-800-268-6949, phone 905-513-1550, or fax 905-513-1557, or Email: sean@chargers.ca, for instructions on the correct procedure. Ask for the pot settings procedure 2020. Only qualified personnel should adjust your charger. The following charts indicate standard settings:

**Nominal Set Voltages** (For flooded lead acid batteries) (Generic values, check battery manufacturer requirements)

Nominal Voltage	No. of Cells	Float Voltage	Equalize Voltage	Low Voltage Alarm	High Voltage Alarm
12V	6	13.5V	14.5V	11.0V	15.0V
24V	12	26.5V	28.5V	22.0V	30.0V
32V	16	35.3V	38.0V	29.3V	40.0V
36V	18	39.7V	42.8V	33.0V	45.0V
48V	24	53.0V	57.0V	44.0V	60.0V
120V	60	132.5V	142.5V	108.0V	145.0V

12 & 24 Volt      Engine starting  
32 Volt            Shipboard  
48 Volt            Switchgear, telecom, solar P.V. systems  
120 Volt          Emergency lighting, switchgear, electromagnets  
\* Application Dependant

**Nominal Set Voltages** (For NiCad batteries) (Generic values, check battery manufacturer requirements)

Nominal Voltage	No. of Cells	Float Voltage	Equalize Voltage	Low Voltage Alarm	High Voltage Alarm
12V	10	14.2V	15.2V	12	16
24V	20	28.4V	30.4V	24	32
36V	30	42.6V	45.6V	36	48
48V	40	56.8V	60.8V	48	64
120V	100	142.0V	152V	*	*

\* Application Dependant

**Nominal Set Voltages** (For GEL AGM batteries) (Generic values, check battery manufacturer requirements)

Nominal Voltage	No. of Cells	Float Voltage	Equalize Voltage	Low Voltage Alarm	High Voltage Alarm
12V	6	13.5V	13.5V	11.0V	15.0V
24V	12	26.5V	26.5V	22.0V	30.0V
32V	16	35.3V	35.3V	29.3V	40.0V
36V	18	39.7V	39.7V	33.0V	45.0V
48V	24	53.0V	53.0V	44.0V	60.0V
120V	60	132.5V	132.5V	108.0V	145.0V

## Section G: Charger Maintenance

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This battery charger requires little maintenance other than the occasional inspection, blowing out of dust, and a check to ensure the ventilation openings are free of obstruction. Qualified personnel should inspect the charger regularly.

## Section H: General Battery Health Information

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**Information- (Battery University)** Stationary batteries are almost exclusively lead acid and some maintenance is required, one of which is equalizing charge. Applying a periodic equalizing charge brings all cells to similar levels by increasing the voltage to 2.50V/cell, or 10 percent higher than the recommended charge voltage.

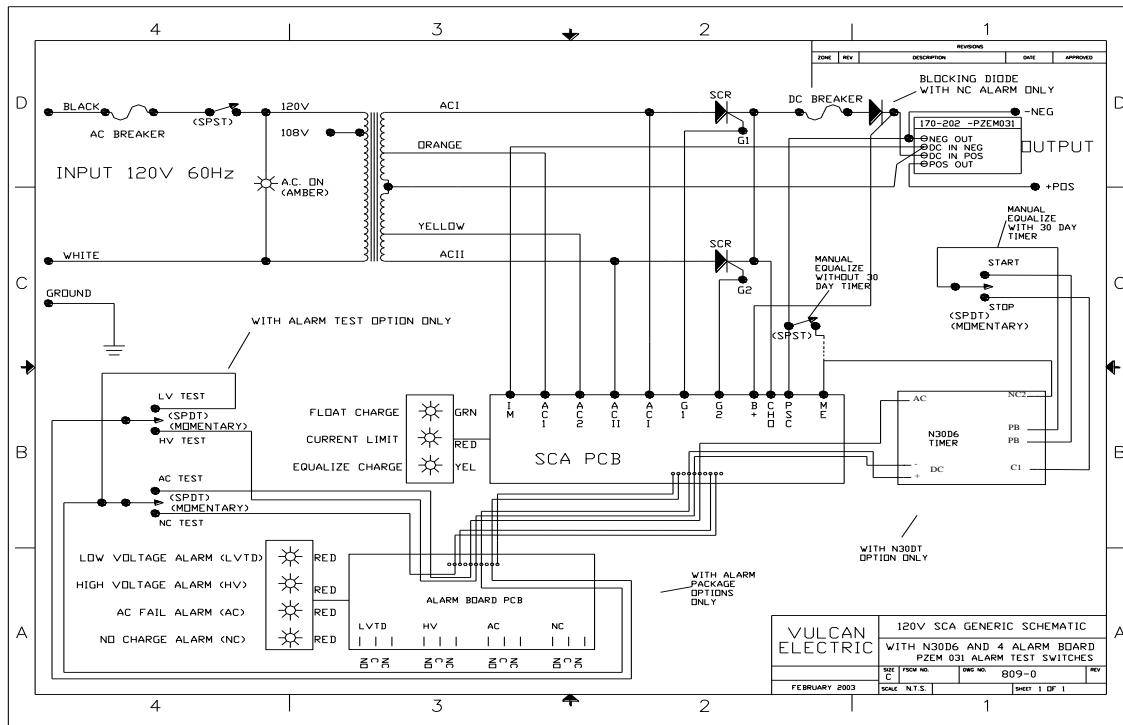
An equalizing charge is nothing more than a deliberate overcharge to remove sulfate crystals that build up on the plates over time. Left unchecked, sulfation can reduce the overall capacity of the battery and render the battery unserviceable in extreme cases.

An equalizing charge also reverses acid stratification, a condition where acid concentration is greater at the bottom of the battery than at the top. Experts recommend equalizing services once a month to once or twice a year. A better method is to apply a fully saturated charge and then compare the specific gravity readings (SG) on the individual cells of a flooded lead acid battery with a hydrometer. Only apply equalization if the SG difference between the cells is 0.030.

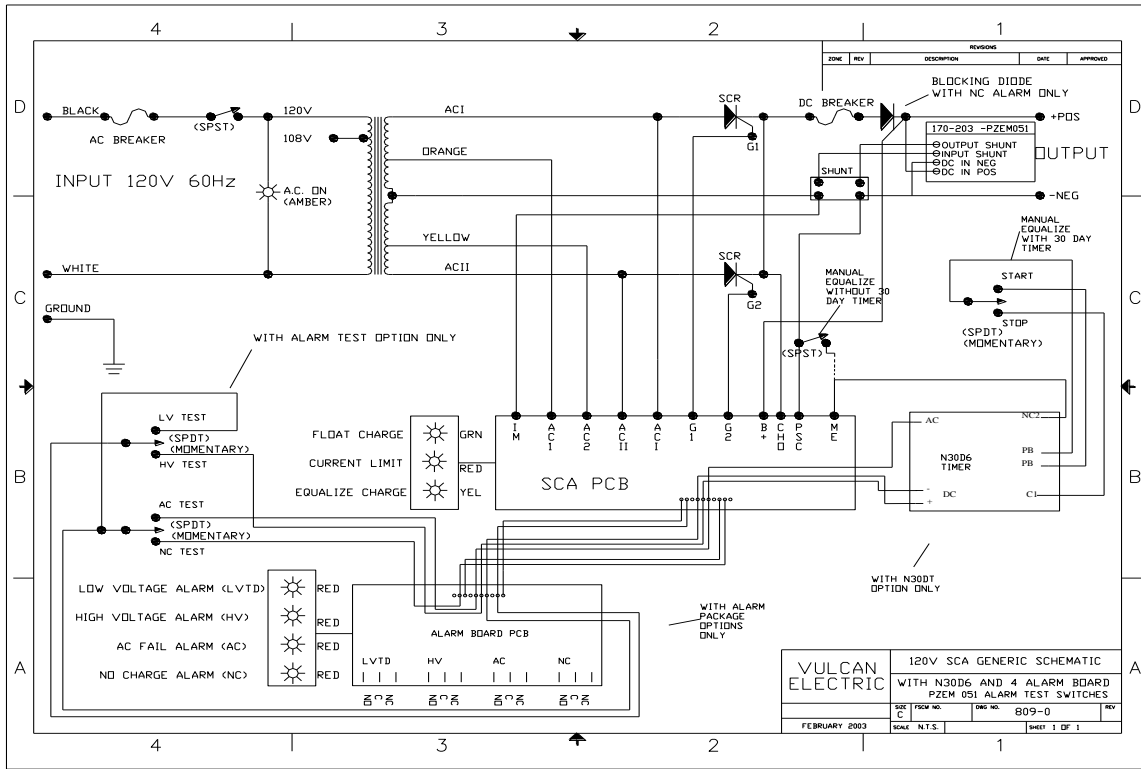
During equalizing charge, check the changes in the SG reading every hour and disconnect the charge when the gravity no longer rises. This is the time when no further improvement is possible and a continued charge would have a negative effect on the battery. The battery must be kept cool and under close observation for unusual heat rise and excessive venting. Some venting is normal and the hydrogen emitted is highly flammable. The battery room must have good ventilation as the hydrogen gas becomes explosive at a concentration of 4 percent.

## Section I: Wiring Schematics

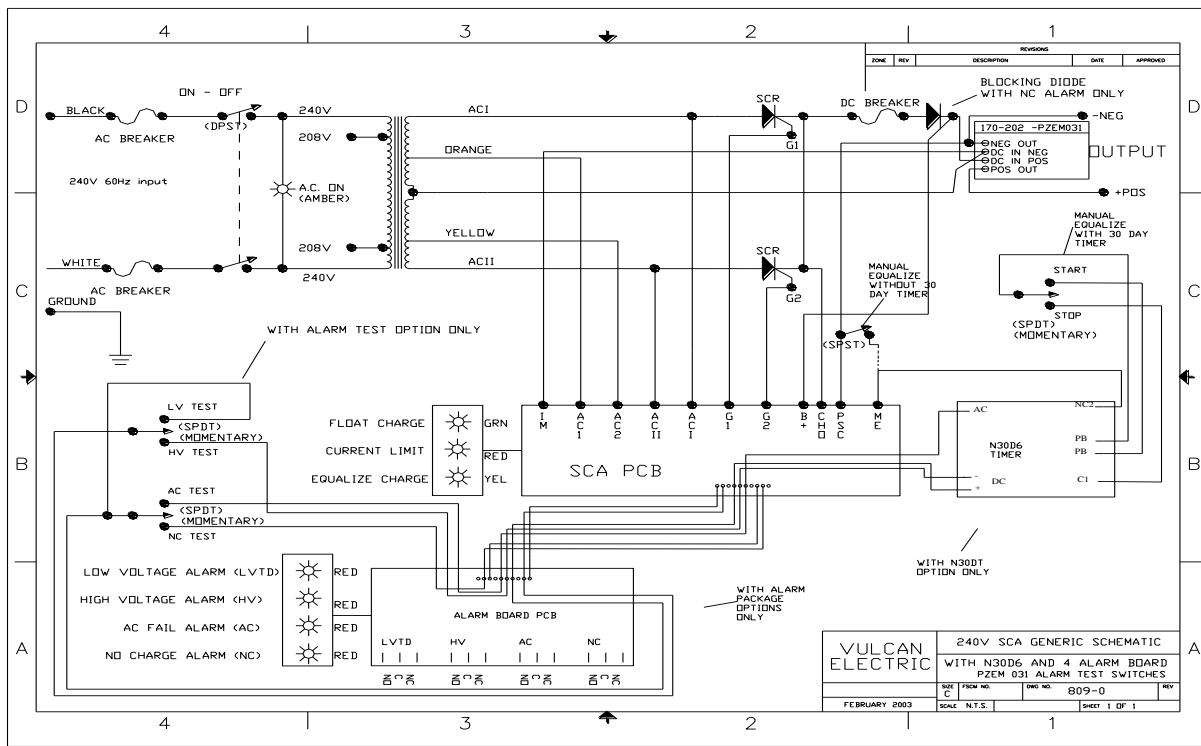
### Generic Wiring Schematic 120VAC 12-36 VDC Up to 10 Amps DC Output



# Generic Wiring Schematic 120VAC 12-36 VDC 15-100 Amps DC Output

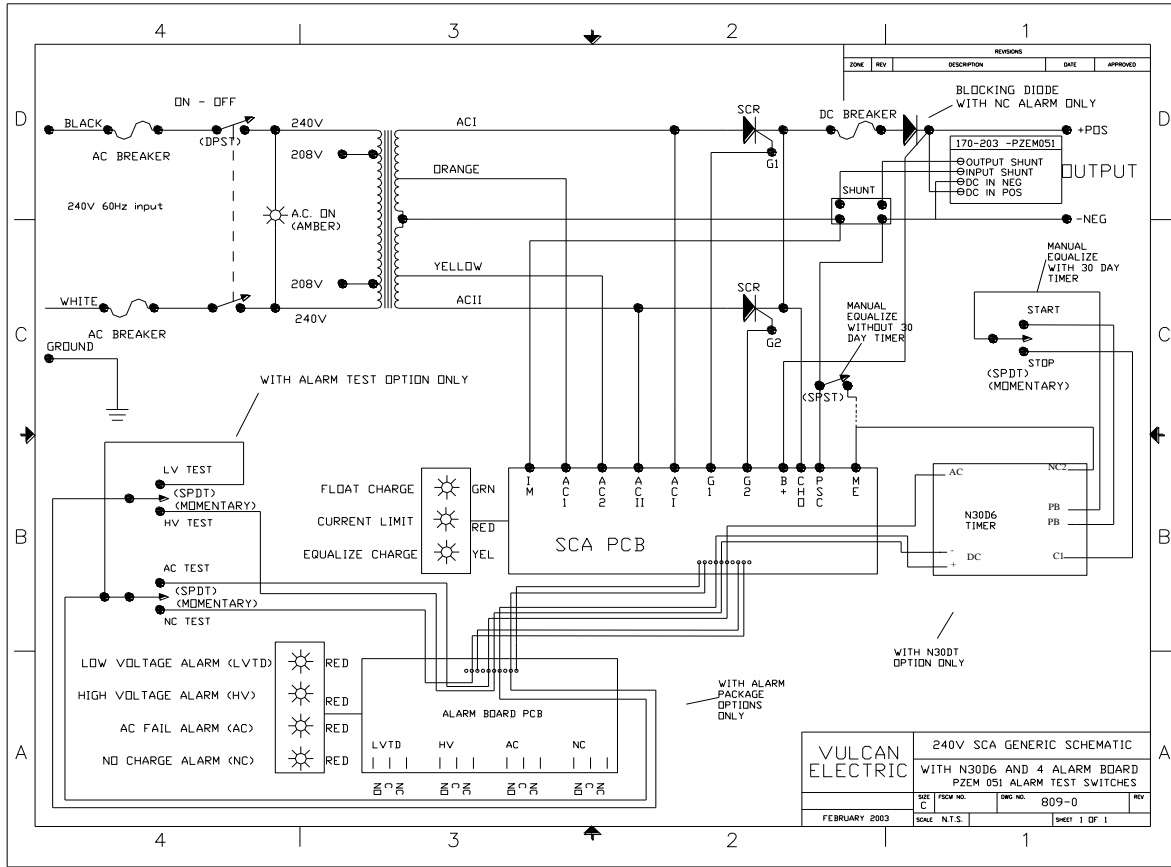


# Generic Wiring Schematic 240VAC 12-36 VDC Up to 10 Amps DC Output

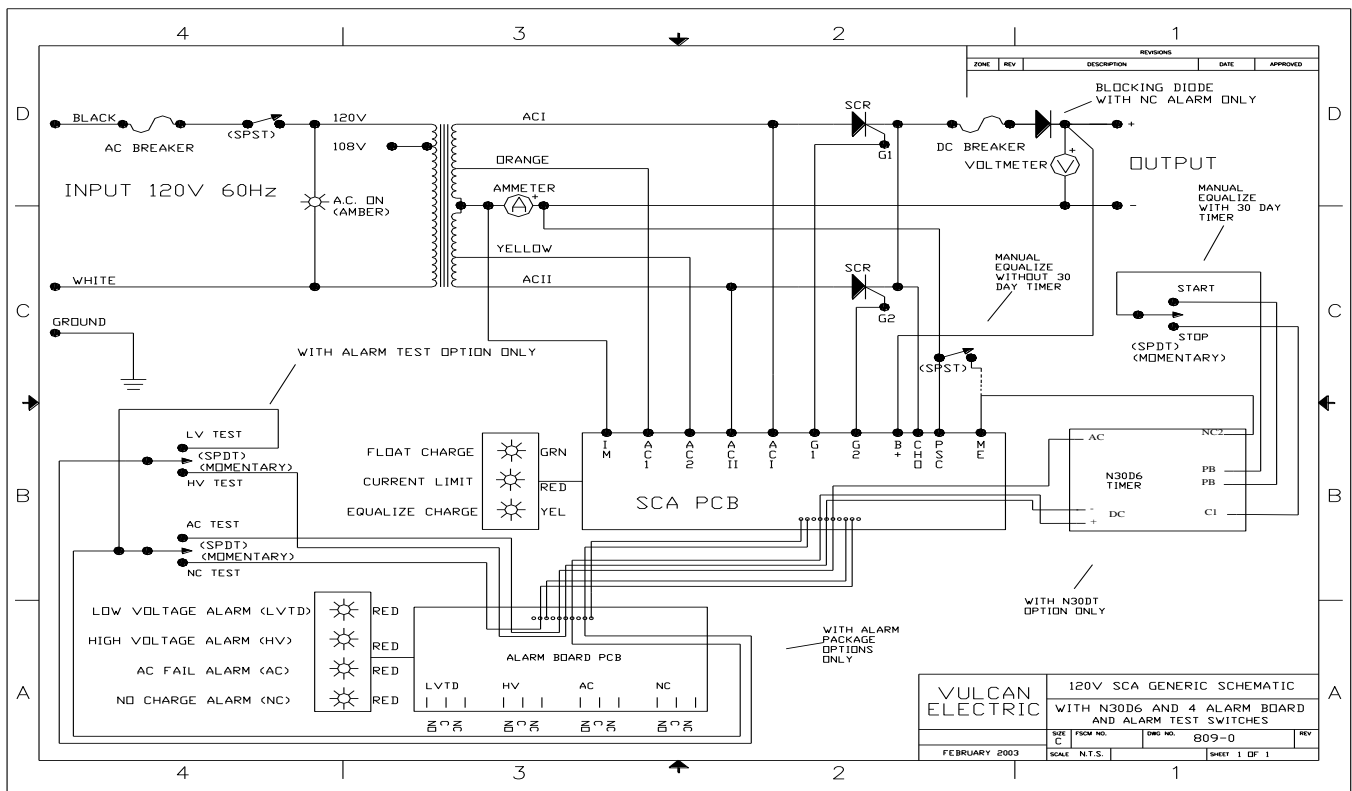




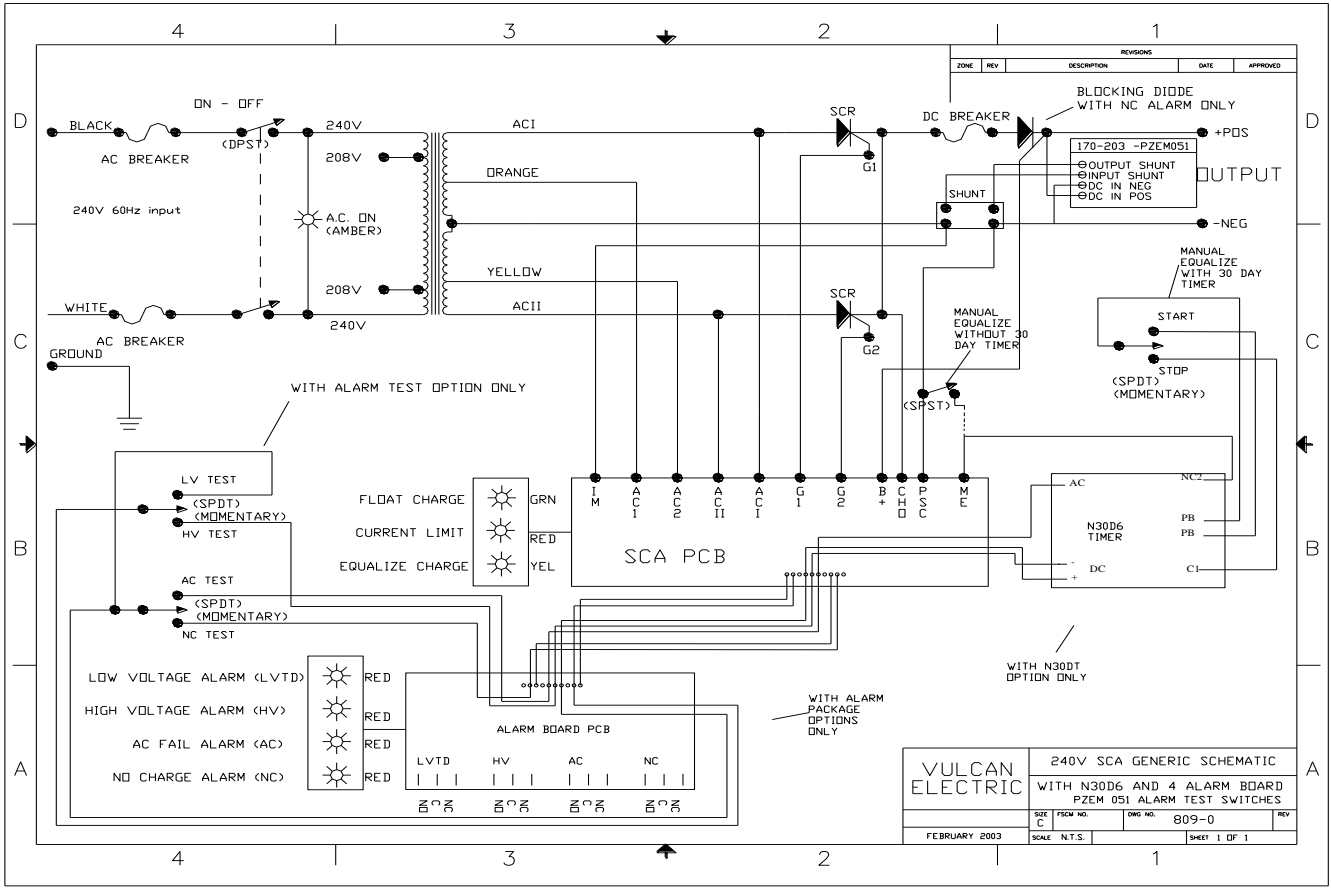
# Generic Wiring Schematic 240VAC 12-36 VDC 15-100 Amps DC Output



# Generic Wiring Schematic 120VAC 48-120 VDC



# Generic Wiring Schematic 208-204VAC 48-120 VDC





## Ten Year SCA Type Charger Limited Warranty

Vulcan Electric manufactures its hardware products from parts and components that are new in accordance with industry-standard practices. **Vulcan Electric warrants this SCA charger to be free from defects in workmanship or materials for one year from the date of purchase. The rectifier is warranted for an additional four years, and the transformer is warranted for ten years from the date of purchase.**

During this period, Vulcan Electric will, at its options, repair or replace the defective product free of charge. This warranty will be considered VOID if the unit has suffered any physical damage or alteration, either internally or externally, and does not cover damage arising from improper use, or from use in an unsuitable environment. This warranty will not apply where the product has been misused, neglected, improperly installed, or repaired by anyone than Vulcan Electric or an Authorized Service Depot. In order to qualify for the warranty, the product must not be disassembled or modified without prior authorization by Vulcan Electric.

Repair or Replacement are your sole remedies and Vulcan Electric shall not be liable for damages, whether direct, incidental, special, or consequential, even though caused by negligence or fault.

Vulcan Electric owns all parts removed from repaired products. Vulcan Electric uses new parts made by various manufactures in performing warranty repairs and building replacement products. If Vulcan Electric repairs or replaces a product, its warranty term is not extended.

User is responsible for determining whether this Vulcan Electric product is fit for a particular purpose and suitable for user's method of application.

Vulcan Electric shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including, but not limited to, contract, negligence, warranty, or strict liability.

**THIS IS VULCAN ELECTRIC'S ONLY WARRANTY, AND THE COMPANY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

### **To Obtain Warranty Service:**

If your Vulcan Electric Charger requires service, please return it to the place of purchase. If you are unable to contact your merchant, or the merchant is unable to provide service, contact: [sean@chargers.ca](mailto:sean@chargers.ca)

**Vulcan Electric Inc.**

**205B Konrad Cres. Markham, Ontario, L3R 8T9**

**Telephone: (905) 513-1550, Fax: (905) 513-1557**

**Website [www.chargers.ca](http://www.chargers.ca)**

You must obtain a Return Authorized Number from Vulcan Electric before returning a Vulcan Electric Charger directly to Vulcan. Do not return a Vulcan Electric Charger without first obtaining a Return Authorization Number. When you contact Vulcan Electric to obtain service, be prepared to supply the Serial number of your Vulcan Electric Charger. The serial number is located on the front of the unit. The following information needs to be supplied:

- A description of the problem
- Serial number of the unit (serial number is located on the front of the unit) name and address of the dealer, where you purchased the unit, and date of purchase.
- Package the unit safely, preferably using the original box and packing materials, Include the Return Authorization Number, a return address where the repaired unit can be shipped, a contact name and telephone number, and brief description of the problem.

**SHIP ALL UNITS PREPAID.**