
INSTALLATION INSTRUCTIONS

Original Issue Date: **9/93**

Model: **8.5–2000 kW**

Market: **Industrial**

Subject: **Battery Trickle Charger Kits PAA-248952 and PAA-325344-SD**

The battery trickle charger maintains battery charge in applications where the generator set use is infrequent, or where the generator set is used for short periods.

The trickle charger is specifically designed for charging wet cell (lead-acid) batteries. Do not use the battery charger on any other type of battery.

NOTE

The trickle charger is a manual charger and requires monitoring of the battery's state of charge to correctly maintain the battery. The trickle charger is not suitable for generator sets equipped with controllers having a digital display controller because of the controller's current draw requirements. Use the float/equalize battery charger for generator sets equipped with the digital display controller.

WARNING



Sulfuric acid in batteries.
Can cause severe injury or death.

Wear protective goggles and clothing. Battery acid may cause blindness and burn skin.

WARNING



Explosion.
Can cause severe injury or death.
Relays in the battery charger cause arcs or sparks.

Locate the battery in a well-ventilated area. Isolate the battery charger from explosive fumes.

Battery acid. Sulfuric acid in batteries can cause severe injury or death. Sulfuric acid in the battery can cause blindness and burn skin. Always wear splashproof safety goggles when working near the battery. If battery acid splashes in the eyes or on the skin, immediately flush the affected area for 15 minutes with large quantities of clean water. Seek immediate medical aid in the case of eye contact. Never add acid to a battery after placing the battery in service, as this may result in hazardous spattering of battery acid.

Battery gases. Explosion can cause severe injury or death. Battery gases can cause an explosion. Do not smoke or permit flames or sparks to occur near a battery at any time, particularly when it is charging. To prevent burns and sparks that could cause an explosion, avoid touching the battery terminals with tools or other metal objects. Remove wristwatch, rings, and other jewelry before handling the battery. Never connect the negative (–) battery cable to the positive (+) connection terminal of the starter solenoid. Do not test the battery condition by shorting the terminals together. Sparks could ignite the battery gases or fuel vapors. Ventilate the compartments containing batteries to prevent accumulation of explosive gases. To avoid sparks, do not disturb the battery charger connections while the battery is charging. Always turn the battery charger off before disconnecting the battery connections. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Battery Charger Features

Ammeter. The ammeter displays the charge rate when the low charge rate is selected. The ammeter does not function in the high charge rate mode.

Rheostat. The rheostat allows adjustment of the low charge rate current.

Fuse. The fuse protects the battery charger internal components from excessive current overload.

High charge rate lamp. The lamp lights to indicate when the high charge rate is selected.

High/low switch. The switch allows selection of the high or low charge rates.

12/24-volt switch. The switch allows selection of the generator set engine starting battery voltage.

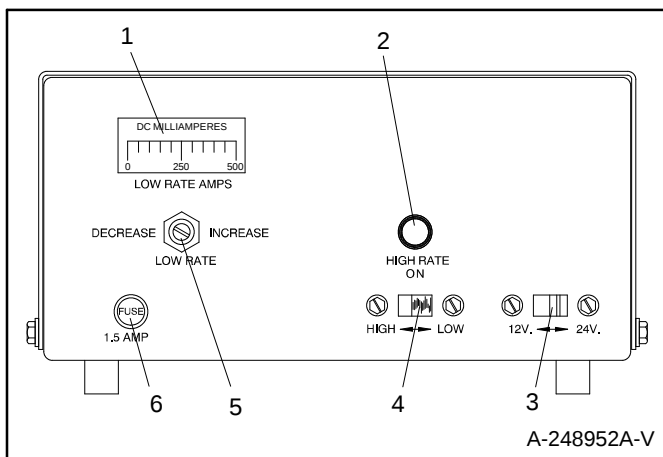


Figure 1. Battery Charger Features

Installation

1. Inspect the generator set engine starting battery(ies) for defective cables, loose posts, or loose terminals. The battery terminals and battery charger clips must be tight and clean of all corrosion for efficient battery charging.
2. Check the fluid level of each battery cell, if the battery is not a sealed maintenance-free battery. If the fluid level is low, add distilled water until the fluid level is at the bottom of the vent well (filler hole) or to the top of the plates.
3. The factory sets the battery charger for a 12-volt system. Set the 12/24-volt switch to the 24-volt position if using the battery charger on a generator set with a 24-volt engine electrical system.

4. Set the HIGH/LOW switch for the high or low charge rate as required. When selecting the low rate, adjust the rheostat to the desired rate of charge. See Operation following.

NOTE

The battery(ies) may be charged without disconnecting the battery(ies) from the generator set.

Connection

5. Connect the positive (+) charger terminal to the battery positive (+) post.
6. Connect the negative (-) charger terminal to the battery negative (-) post.
7. Connect the 120-volt AC power cord to a power source.

Disconnection

8. Disconnect the 120-volt AC power cord from the power source.
9. Disconnect the negative (-) charger terminal from the battery negative (-) post.
10. Disconnect the positive (+) charger terminal from the battery positive (+) post.

Operation

The trickle charger is equipped with an automatic reset thermal circuit breaker to protect the battery charger from overloads; in the event of an overload the circuit breaker trips. After a short cooling-off period, the circuit breaker automatically resets. The resetting process is referred to as cycling and can be determined by a clicking sound. During the generator cranking cycle this circuit breaker may operate.

A severely discharged battery can cause the thermal circuit breaker to cycle repeatedly. If the battery is otherwise in good condition, the cycling can continue until the battery has recovered enough to allow a normal charging rate.

A battery with a shorted cell(s) can cause the fuse to blow. Replace the battery.

The battery charger ammeter shows the battery charging rate. The initial charging rate may be higher or lower than the charger capacity depending on the internal condition of the battery. A supply voltage higher or lower than 120 volts AC causes a correspondingly higher or lower charging rate. The 5-amp maximum charging rate may be exceeded because of the battery condition or during the engine cranking period.

When a battery reaches 80–85% of full charge, bubbles appear on the surface of the fluid. Vigorous bubbling occurs when the battery nears full charge.

As the battery nears full charge, switch the charge rate to low and adjust the current control to maintain the battery in a charged condition at the desired voltage.

Voltage Control

If connecting the battery charger to a battery full time, adjust the battery charger low charge rate. Use a voltmeter with at least 20,000 ohms sensitivity. Check the battery voltage while the battery charger is connected and energized. See Figure 2 for battery voltages. If the battery voltage is below the specified readings, adjust the low rate rheostat to increase the current (amps). If the battery voltage is above the specified readings, adjust the low rate rheostat to decrease the current (amps). If the battery current rate drops below 250 mA during the initial battery charging process check the battery voltage. It may be

necessary to adjust the low rate current several times to obtain the correct battery voltage.

Generator Set Engine Starting Battery Voltage	Voltmeter Reading (volts)
12	13.2
24	26.4

Figure 2. Battery Voltage

Service

If the battery is not a sealed, maintenance-free battery, check and maintain the battery fluid level. If the fluid level is low, add distilled water until the fluid level is at the bottom of the vent well (filler hole) or to the top of the plates.

Check the battery terminals and cable connections for clean contact surfaces.

Figure 3 shows the battery charger wiring diagram.

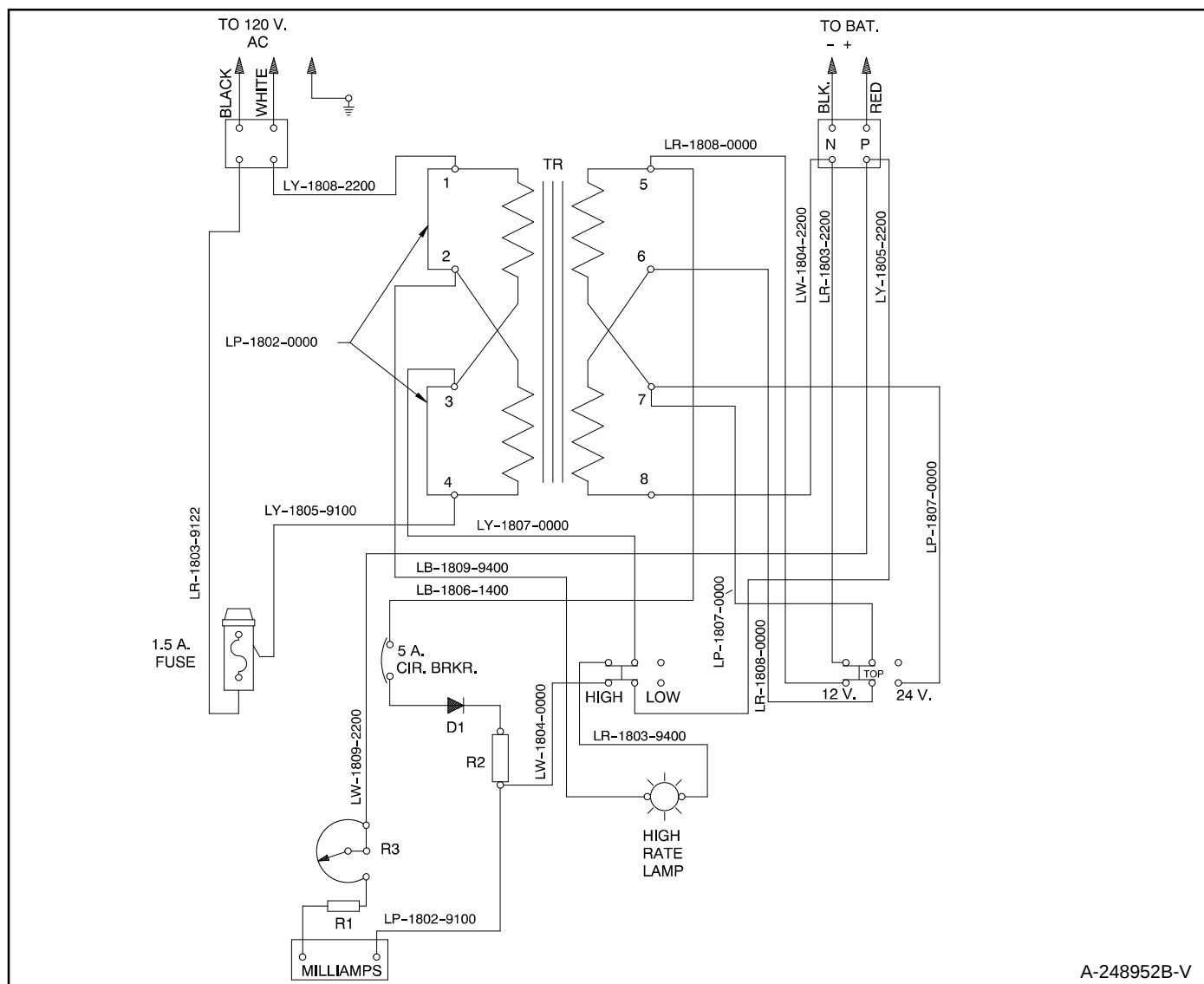


Figure 3. Battery Charger Wiring Diagram

Checking Specific Gravity (Lead-Acid Batteries)

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell. Draw the battery electrolyte from a battery cell into the hydrometer. While holding the hydrometer vertically, read the number on the glass bulb at the top of the electrolyte level. The battery is fully charged if the specific gravity is 1.260 at an electrolyte temperature of 80 °F (26.7 °C). The difference between specific gravities of each cell should not exceed 0.01. Charge the battery if the specific gravity is below 1.215 at an electrolyte temperature of 80 °F (26.7 °C).

The temperature of the battery electrolyte affects the specific gravity reading and must be taken into consideration when checking battery specific gravity. If the hydrometer used does not have a temperature correction table, use the one shown in Figure 4.

Charging Nickel-Cadmium Batteries

Because charging recommendations vary between manufacturers of nickel-cadmium batteries, specific nickel-cadmium battery charging instructions are not provided in this manual. Contact the manufacturer of the nickel-cadmium battery for specific charging and maintenance instructions.

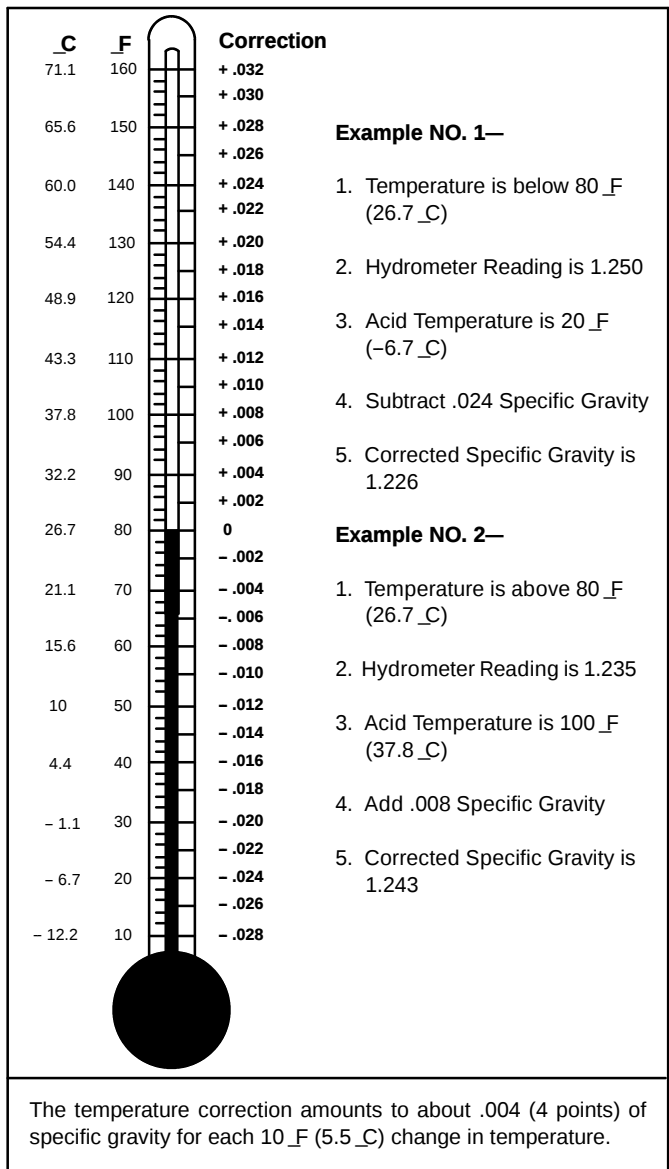


Figure 4. Specific Gravity Temperature Correction

Battery Trickle Charger Kits

Parts List				
Kits: PAA-248952, PAA-352344-SD			Unique Parts	
Qty.	Description	Common Parts	PAA-248952	PAA-352344-SD
1	Charger assembly, battery (includes *)		A-248952	A-325344
1	*Lead	LB-1806-1400		
1	*Lead	LB-1809-9400		
2	*Lead	LP-1802-0000		
1	*Lead	LP-1802-9100		
2	*Lead	LP-1807-0000		
1	*Lead	LR-1803-2200		
1	*Lead	LR-1803-9122		
1	*Lead	LR-1803-9400		
2	*Lead	LR-1808-0000		
1	*Lead	LR-1804-0000		
1	*Lead	LW-1804-2200		
1	*Lead	LW-1809-2200		
1	*Lead	LY-1805-2200		
1	*Lead	LY-1805-9100		
1	*Lead	LY-1807-0000		
1	*Lead	LY-1808-2200		
2	*Washer, lock, #6	X-22-25		
1	*Terminal	X-283-8		
2	*Block, terminal	X-405-2		
1	*Terminal	X-431-27		
9	*Terminal, fast-on, 7/64	X-431-28		
1	*Screw, p.h.m., 6-32 x 0.50 in.	X-49-26		
6	*Screw, p.h.m., 8-32 x 0.375 in.	X-51-12		
4	*Screw, r.h.m., 8-32 x 0.625 in.	X-51-9		
2	*Connector, nonmetallic	X-567-1		
4	*Screw, hex slotted	X-67-43		
4	*Screw, drill	X-794-2		
1	*Tab, identification, AC	201620-122		
1	*Tab, identification, GRD	201620-152		
1	*Tab, identification, P	201620-85		
1	*Tab, identification, N	201620-86		
1	*Holder, fuse	238426		
1	*Cord, power	246185		
1	*Cover, battery charger		246604-KCB	246604-SD
1	*Ammeter, DC	269202		
1	*Transformer	269204		
4	*Spacer, screen	270833		
1	*Fuse, 1.5-amp	291207		
1	*Lamp	291208		
1	*Resistor, 0.56 ohm	291209		
1	*Switch, slide, DPDT	291210		
1	*Switch, slide, DPDT	291211		
1	*Diode, 6 amp, 100 volt	291212		
1	*Resistor	291213		
1	*Cable, positive (+)	291215		
1	*Cable, negative (-)	291216		
1	*Nameplate		291221	325343
1	*Breaker, circuit	291265		
1	*Rheostat	291975		
1	*Decal, battery charger		325389	325397