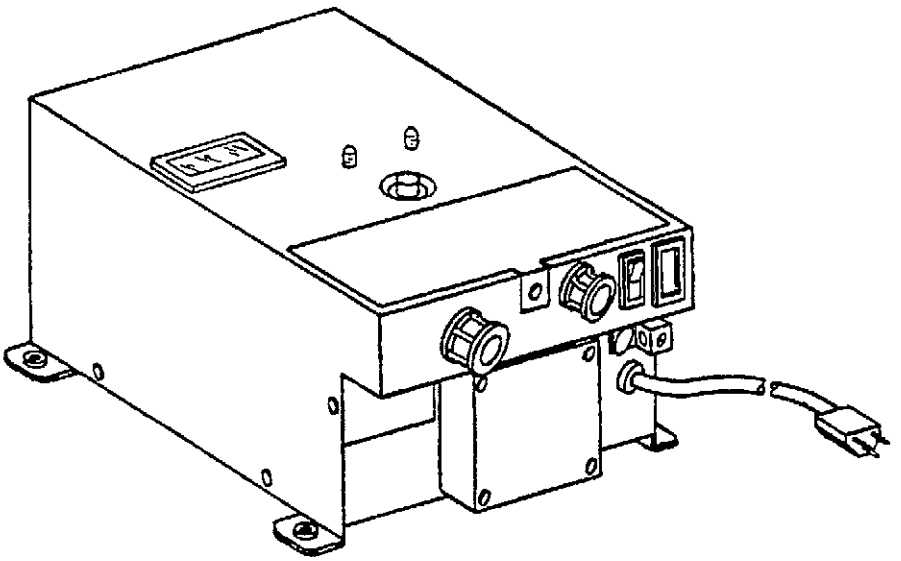
Onan

**Model**
Onan Number
305-0856

# Installation Manual



## 12 and 24 Volt
# Battery Charger

**901-0604**
9-90
Printed in U.S.A.

# Safety Precautions

This manual includes the following symbols to indicate potentially dangerous conditions to the operator or equipment. Read the manual carefully and know when these conditions exist. Then take the necessary steps to protect personnel and the equipment.

**⚠ DANGER** ***This symbol warns of immediate hazards that will result in severe personal injury or death.***

**⚠ WARNING** ***This symbol refers to a hazard or unsafe practice that can result in severe personal injury or death.***

**⚠ CAUTION** ***This symbol refers to a hazard or unsafe practice that can result in personal injury or product or property damage.***

## IMPORTANT SAFETY INSTRUCTIONS

1. Save these instructions. This manual contains important safety instructions.
2. Working in the vicinity of a battery is dangerous. Batteries generate explosive gasses during normal battery operation. For this reason, it is of utmost importance that you read all instructions and cautionary markings on the battery charger, the battery, and the generator set.
3. To reduce the risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment that is used in the vicinity of the battery. Review and follow all cautionary markings on these products.
4. To reduce risk of injury, only use the battery charger to charge lead-acid batteries. Other types of batteries (such as dry cell batteries) can burst, causing personal injury and property damage.
5. Never smoke or allow an open spark, arcing equipment or flame in the vicinity of the battery or generator set.
6. Do not expose the battery charger to rain, snow, or other precipitation.
7. Never charge a frozen battery.
8. Use of an attachment not recommended or sold by the battery charger manufacturer can result in a risk of fire, electric shock, or personal injury.
9. Do not operate the battery charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified service technician.
10. Do not disassemble the battery charger; take it to a qualified service technician when service or repair is required. Incorrect reassembly can result in a risk of electric shock or fire.
11. To reduce the risk of electrical shock, disconnect the battery charger from AC power before performing any maintenance or cleaning. Turning off controls does NOT reduce this risk.
12. If it is necessary to remove the battery from the generator set battery tray to charge, always remove the grounded (–) terminal from the battery first and replace it last. Make sure that all switches on the generator set control panel are off in order to prevent an arc.
13. Study all battery manufacturer's specific precautions, such as removing or not removing cell caps while charging, and recommended rates of charge.
14. Do not use the battery charger unless the battery voltage matches the output voltage rating of the charger. Refer to the generator set operator's manual to determine the battery voltage.
15. Never place the charger directly above or below the battery; gases or fluids from the battery can corrode and damage the charger. Locate the charger as far away from the battery as practical.
16. Do not operate the battery charger in a closed–in area or restrict ventilation in any way.
17. Grounding Instructions: This battery charger should be connected to a grounded, metal, permanent wiring system. An equipment-grounding conductor should connected to the equipment-grounding terminal on the battery charger. Wiring and connections to the battery charger must comply with the National Electrical Code, and all local codes and ordinances.

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**⚠WARNING**

***INCORRECT SERVICE OR PARTS REPLACEMENT CAN RESULT IN SEVERE PERSONAL INJURY, DEATH, AND/OR EQUIPMENT DAMAGE. SERVICE PERSONNEL MUST BE QUALIFIED TO PERFORM ELECTRICAL AND/OR MECHANICAL SERVICE.***

# Installation

## GENERAL

These instructions provide information necessary for installation of the battery charger. The charger is intended for use in a permanently wired, industrial application. Installation and service are to be performed only by technically qualified personnel.

This battery charger is fully automatic, and has a constant voltage, current limiting output. A manually-operated override switch (Override Reset) provides about one hour of straight-current-limit charging for deeply-discharged batteries. This operation mode is automatic when power is first applied to the charger.

During normal float-charge operation, as the battery approaches the preset voltage, charging current automatically tapers to a low value.

If there is a problem with operation, consult the Operator's Manual, or contact the local authorized distributor and give the complete model and serial number of the charger.

## LOCATION

The battery charger can be mounted vertically on a wall, or on a horizontal surface. The charger specifications are listed in Table 1.

Choose a vibration-free mounting surface that will support the weight of the charger. Avoid locations that are near flammable liquids or gases, are moist or near a condensation source, are hot (140° F [60° C] or above), or are dusty.

### TABLE 1. CHARGER SPECIFICATIONS

| | |
|---|---|
| VAC Input | 120 VAC |
| Nominal VDC Output (Refer to Nameplate) | 13.2 or 26.4 VDC |
| Output, Continuous rating | 35 or 17 Amps |
| Weight, Max. | 10 lbs (4.5 kg) |
| Height | 6.2 in. (157 mm) |
| Width | 9.0 in. (229 mm) |
| Depth | 10.6 in. (269 mm) |

⚠CAUTION ***To avoid damage to the charger and/or the battery, do not mount the charger directly above or below the battery. Keep the charger as far away as practical from the explosive gases and corrosive fluids given off by the battery.***

Do not mount the battery charger in a closed-in area, or restrict the ventilation in any way. Allow a minimum space of 6 inches (152 mm) above and below the charger for ventilation.

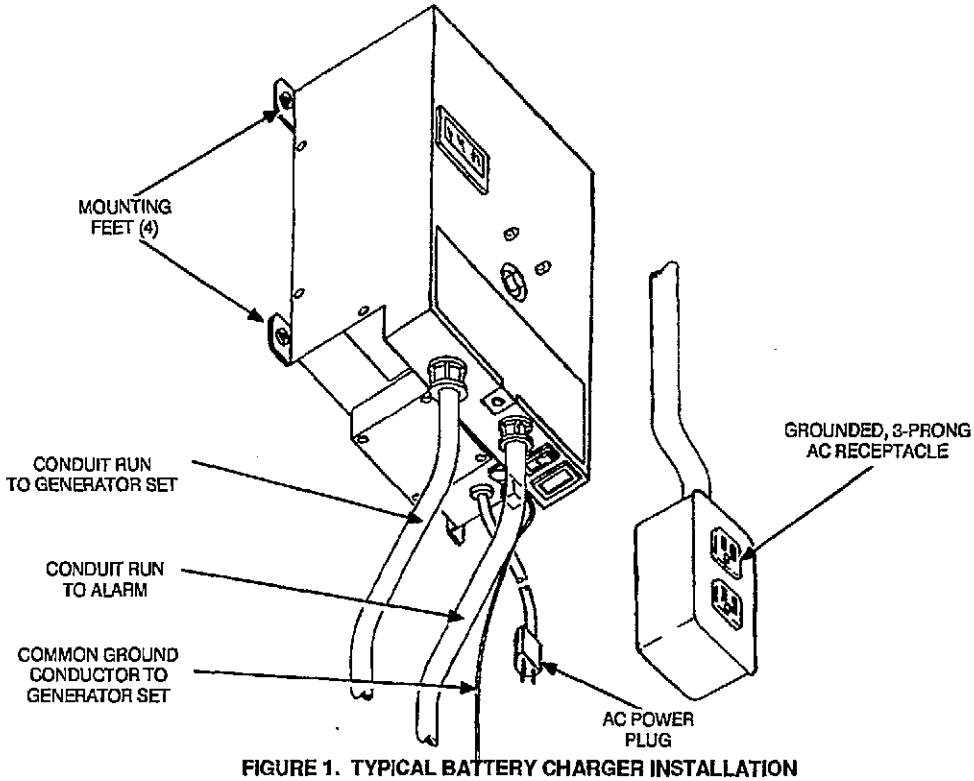


**FIGURE 1. TYPICAL BATTERY CHARGER INSTALLATION**

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## MOUNTING

The battery charger has a mounting foot on each corner. Vertical mounting on a wall with the connections down is preferred for most efficient air flow as shown in Figure 1. Placement should be considered for efficient conduit runs to the generator set and the alarm to eliminate unnecessary bends. A grounded 3-prong, 120-volt, 15-ampere AC receptacle must also be available near the charger for the power cord. All wiring must comply with the National Electrical code, local codes and ordinances.

1. Check the mounting location to be sure that no wiring, plumbing, gas or exhaust lines are located behind the wall. The charger ammeter should preferably be at about eye level.
2. Hold the charger in the mounting position and scribe the mounting hole locations on the wall.
3. Drill pilot holes if needed and secure the charger with #10 mounting screws.

## WIRING

1. Connect 3/4-inch thin wall conduit between the charger DC Output connector and the generator battery case. See Figure 1.
2. If an alarm is used, connect 1/2-inch thin wall conduit between the charger Alarm Output connector and the alarm.
3. Connect a #12 AWG or larger ground wire between the grounding stud on the charger and the generator set frame (common ground). The stud will accept #8 AWG gauge wire maximum.
4. Remove the access cover from the battery charger. Pull battery leads (positive [+] and negative [–]) through the 3/4 inch thin wall conduit. Use a wire size that will offer low resistance for the wire length required (refer to the National Electrical Code Handbook). The charger output lugs will accept #6 gauge wire maximum.
5. Pull alarm leads through the 1/2-inch thin wall conduit. Use 16 AWG or larger wire. The relay contacts are rated 5 amperes at 240 VAC.
6. Connect the battery positive (+) and negative (–) leads to the charger output terminals observing correct polarity (see Figure 2). Tighten the lug screws securely.
7. Connect the alarm leads to the terminal board TB1. Select either the normally-open (NO) or normally-closed (NC) terminals depending on the alarm system requirements. The designations shown below are for the relay not energized (power off or charger malfunction).

   TB1-1 . . . . NO Contact
   TB1-2 . . . . Common
   TB1-3 . . . . NC Contact

8. Connect the DC output wires to the battery, the (negative [–] lead last).

   ⚠WARNING ***Ignition of explosive battery gases can cause severe personal injury. Do not smoke or cause any spark, arc, or flame while servicing batteries.***

9. Replace the access cover on the battery charger. Plug the power cord into the AC receptacle and place the on/off switch in the On position. Observe charger operation. The DC ammeter should show a charge condition depending upon the battery state-of-charge.

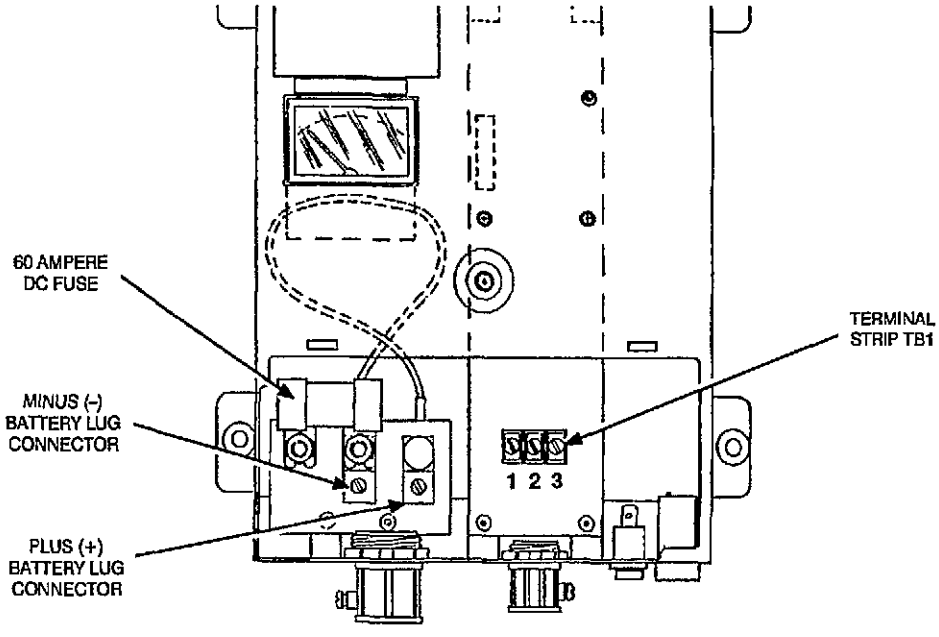


FIGURE 2. BATTERY CHARGER WIRING CONNECTIONS

## FLOAT VOLTAGE ADJUSTMENT

The float voltage is factory-set at the correct value and should not require adjustment. However, it is good practice to check the voltage output after completing the installation, and make adjustment for ambient temperature if necessary. It can be changed if needed with the Output Adjust potentiometer accessible through a hole in the top panel.

The adjustment procedure in the Operator's Manual is for voltage settings other than the nominal value that may be needed to keep the battery fully charged. This adjustment accounts for factors of battery age, circuit resistance, and temperature.

To adjust the float voltage, the charger must not be in current-limit mode of operation (Foldback Override indicator light on) while adjusting the output voltage, otherwise erroneous voltages will result under normal conditions. Some tools required are a small screwdriver, an accurate voltmeter (0.5% accuracy), and a hydrometer for checking specific gravity (if the battery is not a sealed, self-maintenance type). A fully-charged lead-acid battery will have a specific gravity of 1.260 at 77° F (25° C). Use the following procedure:

⚠WARNING ***Battery electrolyte can cause severe eye damage and burns to the skin. Wear goggles, rubber gloves and a protective apron when working with batteries.***

1. Remove all load from the battery. If connected to a standby generator set, disconnect the genset battery leads, the negative (–) lead first.

⚠WARNING ***Ignition of explosive hydrogen gas given off by the battery can cause severe personal injury. Do not smoke or cause any spark, arc, or flame while servicing batteries. Always disconnect the negative (–) lead first, and reconnect it last to prevent arcing if a tool accidentally touches the frame or other grounded metal parts of the equipment while disconnecting or connecting the positive (+) cable.***

2. Connect the voltmeter directly to the battery terminals. The charger must not be in current-limit mode of operation (Foldback Override indicator light on) while adjusting the output voltage, or erroneous voltages will result under normal conditions.

3. Compare the battery voltage reading with the recommended nominal float value—13.2 for a 12-volt charger, 26.4 for a 24-volt charger. These float voltages are referenced at 77° F (25° C). If the voltage is above or below, adjust per Step 4.

4. Use a small flat-blade screwdriver to turn the float adjustment potentiometer counterclockwise to decrease the float voltage, or clockwise to increase the float voltage. Adjust in small increments (0.1 VDC max), and allow battery charge level to stabilize before making further adjustment.

   Reduce the voltage by 0.8% for every 10° F (5.5° C) above 77° F (25° C) ambient. Increase the voltage by 0.8% for every 10° F (5.5° C) below 77° F (25° C) ambient.

5. If the battery is connected to a generator set, reconnect the battery leads. Connect the positive (+) lead first, and the negative (–) lead last (see Warning in Step 1).

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Power Generation