40684

SLM 24-25

SWITCH MODE
INDUSTRIAL BATTERY CHARGER

USER'S MANUAL

Important Safety, Installation, Operation, and Maintenance Instructions

Lester ELECTRICAL

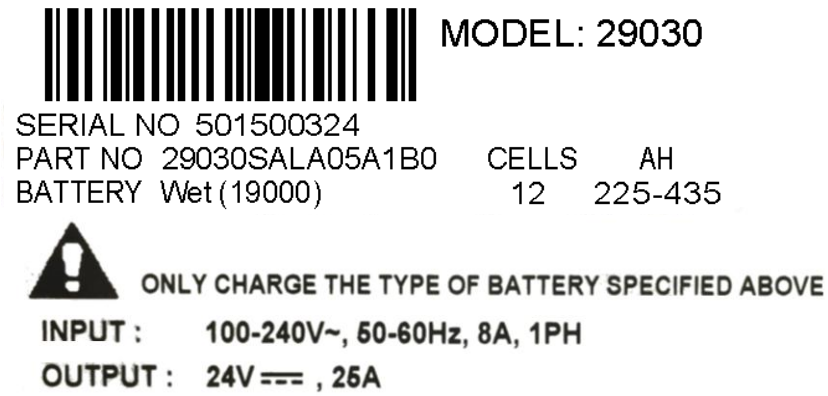
www.LesterElectrical.com

NOTES

CHARGER RATINGS LABEL

The ratings label is located on the back of the charger. The label provides the model (MODEL), part number (PART), serial number (SERIAL NO), AC input ratings (INPUT), and DC output ratings (OUTPUT, CELLS, and AH) of the charger. The amp-hour (AH) rating indicates the full range of battery capacities that are recommended for use with this charger. Different battery profiles may be required to optimize the charging of specific battery capacities within this range. The BATTERY field indicates the factory-configured battery profile.

An example charger ratings label is provided below.



Document any configuration or settings changes that are made by marking the ratings label on your charger or on an additional label or tag attached to your charger.

<u>SAVE THIS MANUAL</u>: Keep it in a location where it is available to anyone who may operate the charger.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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IMPORTANT SAFETY INSTRUCTIONS

1. **SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions.**

2. **Before using battery charger, read all instructions and cautionary markings on battery charger, battery, and product using battery.**

LOOK FOR THIS SYMBOL TO POINT OUT SAFETY PRECAUTIONS. IT MEANS: *BE ALERT—YOUR SAFETY IS INVOLVED.* IF YOU DO NOT FOLLOW THESE SAFETY INSTRUCTIONS, INJURY OR PROPERTY DAMAGE CAN OCCUR.

3. **DANGER: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, CAREFULLY READ AND FOLLOW THESE IMPORTANT SAFETY AND OPERATING INSTRUCTIONS BEFORE INSTALLING OR OPERATING THE CHARGER.**

4. **INSTRUCTIONS IMPORTANTES CONCERNANT LA SECURITÉ.**

5. **WARNING: TO REDUCE THE RISK OF FIRE, INSTALL THIS BATTERY CHARGER ON A SURFACE OF NON-COMBUSTIBLE MATERIAL SUCH AS BRICK, CONCRETE, OR METAL.**

6. **DANGER: RISK OF ELECTRIC SHOCK. DISCONNECT CHARGER FROM BATTERY AND AC POWER BEFORE SERVICING. TURNING OFF THE CHARGER DOES NOT REDUCE THIS RISK.**

7. **DANGER: RISK OF ELECTRIC SHOCK. DO NOT TOUCH UNINSULATED PORTION OF AC OR DC CONNECTORS OR UNINSULATED BATTERY TERMINAL.**

8. **DANGER: RISQUE DE CHOCKS ÉLECTRIQUES. NE PAS TOUCHER LES PARTIES NON ISOLÉES DU CONNECTEUR DE SORTI OU LES BORNES NON ISOLÉES DE L'ACCUMULATEUR.**

9. **CAUTION: CHARGE ONLY BATTERIES OF THE SAME TYPE, VOLTAGE, CELL NUMBER, AND AMP-HOUR CAPACITIES AS SHOWN ON THE LABEL. OTHER TYPES OF BATTERIES MAY BURST CAUSING PERSONAL INJURY AND DAMAGE. BEFORE CHARGING ANY OTHER TYPE OF RECHARGEABLE BATTERY, CHANGE THE CHARGER SETTINGS AS RECOMMENDED BY THAT BATTERY MANUFACTURER.**

10. **ATTENTION: UTILISER POUR CHARGER UNIQUEMENT LES ACCUMULATEURS AU PLOMB À ELECTROLYTE LIQUIDE. D'AUTRES TYPES D'ACCUMULATEURS POURRAIENT ÉCLATER ET CAUSER DES.**

11. **DANGER: TO PREVENT ELECTRICAL SHOCK, DO NOT TOUCH EITHER AC OR DC UNINSULATED PARTS. MAKE SURE ALL ELECTRICAL CONNECTORS ARE IN GOOD WORKING CONDITION. DO NOT USE CONNECTORS THAT ARE CRACKED, CORRODED OR DO NOT MAKE ADEQUATE ELECTRICAL CONTACT. USE OF A DAMAGED OR DEFECTIVE CONNECTOR MAY RESULT IN A RISK OF OVERHEATING OR ELECTRIC SHOCK.**

12. **WARNING: HAZARD OF ELECTRIC SHOCK.**

13. **⚠WARNING: LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES. TO PREVENT ARCING OR BURNING NEAR BATTERIES, DO NOT DISCONNECT DC CHARGING CORD FROM BATTERIES WHEN THE CHARGER IS OPERATING. KEEP SPARKS, FLAME, AND SMOKING MATERIALS AWAY FROM BATTERIES.**

14. **⚠WARNING: ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT.**

15. **⚠WARNING: BATTERIES PRODUCE HYDROGEN GAS, WHICH CAN EXPLODE IF IGNITED. NEVER SMOKE, USE AN OPEN FLAME, OR CREATE SPARKS NEAR THE BATTERY. VENTILATE THE AREA WHEN THE BATTERY IS CHARGING IN AN ENCLOSED PLACE.**

16. **⚠WARNING: LEAD-ACID BATTERIES CONTAIN SULFURIC ACID, WHICH MAY CAUSE BURNS. DO NOT GET ACID IN EYES, ON SKIN, OR CLOTHING. IF CONTACT WITH THE EYES OCCURS, FLUSH IMMEDIATELY WITH CLEAN WATER FOR 15 MINUTES AND OBTAIN MEDICAL ATTENTION.**

17. **⚠WARNING: ONLY A QUALIFIED SERVICE TECHNICIAN SHOULD PROGRAM OR SERVICE THIS EQUIPMENT.**

18. **⚠CAUTION: DO NOT OPERATE THE CHARGER IF IT HAS RECEIVED A SHARP BLOW, BEEN DROPPED, OR OTHERWISE DAMAGED. HAVE A QUALIFIED SERVICE TECHNICIAN EXAMINE AND REPAIR AS NEEDED.**

19. **⚠WARNING: DO NOT DISASSEMBLE THE CHARGER. HAVE THE CHARGER EXAMINED BY A QUALIFIED SERVICE TECHNICIAN. INCORRECT RE-ASSEMBLY OF THE CHARGER MAY RESULT IN AN EXPLOSION, ELECTRIC SHOCK, OR FIRE.**

20. **⚠CAUTION: MAKE SURE THE BATTERY SYSTEM HAS THE PROPERLY RATED VOLTAGE, AMP-HOURS, AND TYPE ("WET", "AGM", "GEL", ETC.) FOR THIS CHARGING SYSTEM.**

SAVE THESE INSTRUCTIONS

1. INTRODUCTION

This switch mode (high frequency) industrial battery charger features advanced charge and termination algorithms designed to optimize both daily battery capacity and overall battery life. The charger is convection cooled with no moving parts, sealed, and designed to provide maximum reliability. The universal AC input enables the charger to be used with a wide range of AC voltages and frequencies, and the charger includes high efficiency and power factor. The charger is designed for on-board use.

The charger was factory-configured with a selected charge profile intended for use with batteries of the same type, voltage, and number of cells as is listed on the ratings label (see the Charger Ratings Label section for additional details). See the Charge Profile section if you require a different charge profile.

2. RECEIVING AND INSTALLING THE CHARGER

⚠WARNING: DO NOT INSTALL THE CHARGER ON OR NEAR FLAMMABLE MATERIALS.

⚠WARNING: CHARGERS CAN IGNITE FLAMMABLE MATERIALS AND VAPORS. DO NOT USE NEAR FUELS, GRAIN DUST, SOLVENTS, THINNERS, OR OTHER FLAMMABLES.

⚠WARNING: REPLACE WORN, DAMAGED, OR CUT ELECTRICAL CORDS AND TERMINALS/CONNECTOR IMMEDIATELY.

Unpack the charger and examine it for shipping damage. In the event that shipping damage is found, report it as a claim with the freight company.

Do not operate the charger with a damaged AC or DC cable or connector. Do not operate the charger if it has received a sharp blow, was dropped, or was otherwise damaged in any way. Contact your dealer.

Proper installation is important to achieve optimum performance and life from the charger and batteries. Allow as much free air space around the charger as possible. Refer to the SLM 24-25 sales/datasheet for specific storage and operating environmental specifications.

The charger is designed for mounting on-board a battery-powered vehicle/machine. The most favorable mounting orientation for the charger is with the enclosure/heatsink fins vertical. The most favorable way to mount the charger is with the charger base bolted to a metal plate (0.1 inch minimum). This provides both a strong structural mounting and good thermal conductive cooling. A poor thermal conductive mounting material such as plastic would be less favorable for cooling.

The charger dimensions and mounting slot locations are shown in Figure 2-1.

The remote rear panel mount LED assembly is to be installed on your vehicle/machine where it can be easily viewed by the operator. The LED mounts in a 5/16 inch diameter hole, on a panel thickness between 0.031" [0.8mm] and 0.125" [3.18mm]. Drill and deburr this hole where you want the LED to be located. To install the LED, remove the front lens with rubber o-ring and place into hole on outside of panel. Install LED housing inside machine and screw lens into LED housing. Lock washer should be between panel and LED housing on inside of panel. Attach three pin connector on LED assembly to connector on charger and route and wire tie LED wires as necessary to prevent accidental disconnection. Attach LED decal next to LED for user reference. Refer to Figure 2-2 for remote LED installation.

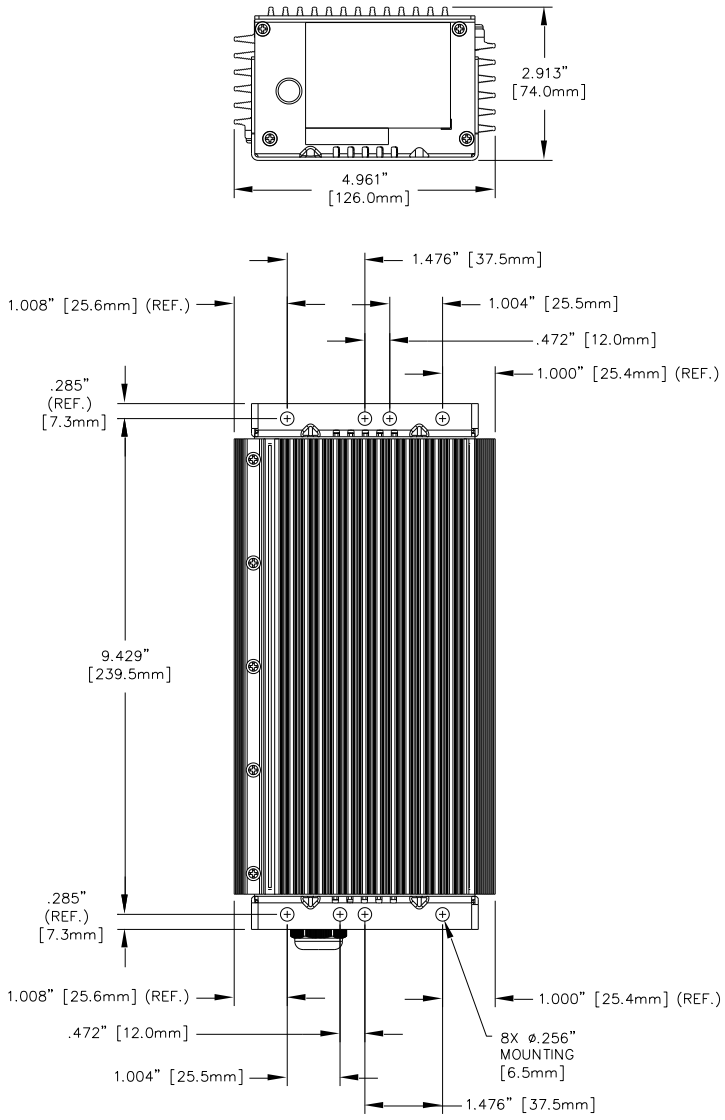


Figure 2-1: Charger Dimensions and Mounting Slot Locations

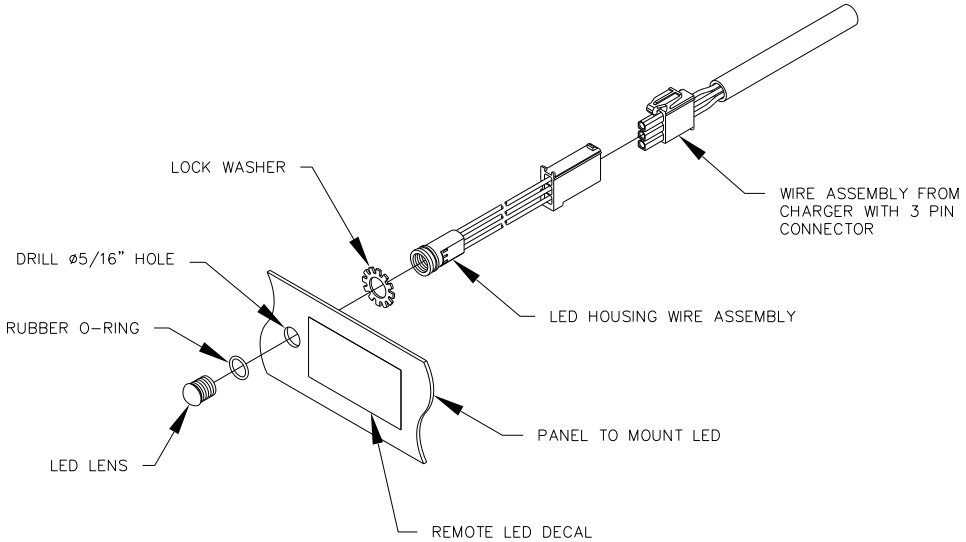


Figure 2-2: Remote LED Installation

3. CHARGE PROFILE

This charger includes up to 10 charge profiles that are selected using the Active Charge Profile DIP switch that is located behind the rubber access plug on the back of the charger. See Figure 3-1 for assistance locating the access plug. If you have a charger that includes the standard 10 charge profiles, the 14th character in the charger part number, available in the PART field on the charger ratings label, will be a "B" (for example, 29030SALA05A1B0). Figure 3-2 illustrates which standard charge profiles correspond to the Active Charge Profile DIP switch positions. If the 14th character in the part number for your charger is not a "B", please contact your dealer for charge profile information.

The 15th character in the charger part number provides the code for the Active Charge Profile DIP switch positions that were set in the factory. For example, charger part number 29030SALA05A1B0 has a code of "0".

If the 14th character in the part number for your charger is a "B", Figure 3-2 can be used to change the active charge profile for this charger. If the active charge profile is changed, mark the charger ratings label and/or add an additional label or tag.

Please be aware it is very important that the operator removes the AC supply from the charger for at least 20 seconds or until the LED light has gone out. If this operation is not performed the previous profile will remain active even though the switch settings reflect a different profile setting.

CAUTION: THIS CHARGER IS FOR USE ONLY WITH BATTERY SYSTEMS OF THE SAME TYPE AS THE ACTIVE CHARGE PROFILE. BATTERIES IMPROPERLY MATCHED WITH THE CHARGER MAY BURST CAUSING PERSONAL INJURY AND DAMAGE TO THE BATTERIES OR CHARGER.

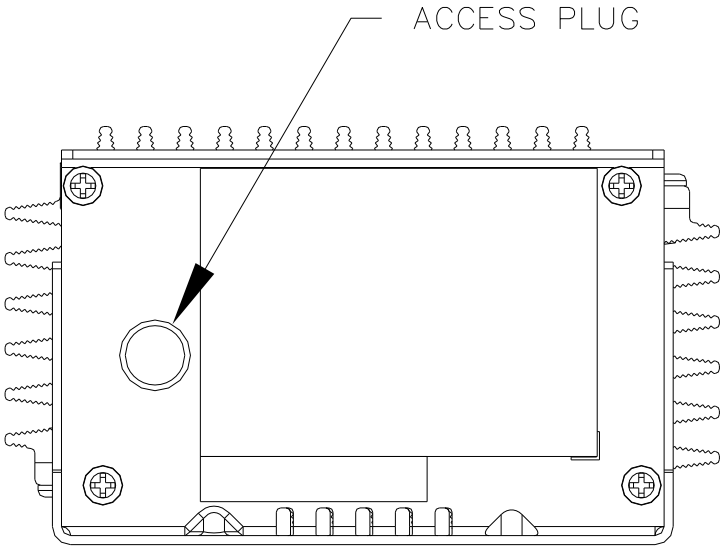


Figure 3-1: Location of the Access Plug for the Active Charge Profile DIP Switch

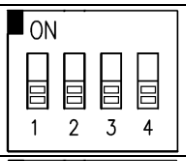
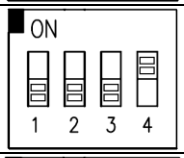
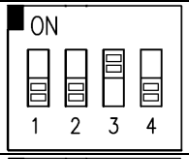
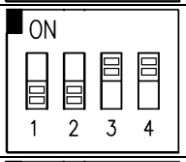
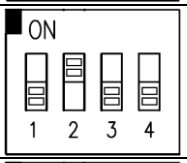
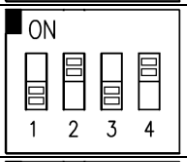
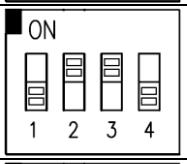
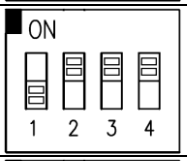
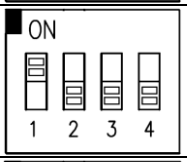
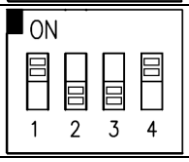
Active Charge Profile DIP Switch Positions	Charge Profile	Part Number Code
	Wet/flooded, IEI, 25A start/bulk, 7A finish	0
	Wet/flooded, IEI, 25A start/bulk, 9A finish	1
	Wet/flooded, IEI, 25A start/bulk, 11A finish	2
	Wet/flooded, IEI, 20A start/bulk, 6A finish	3
	Wet/flooded, IEI, 15A start/bulk, 4.5A finish	4
	AGM, IEI, 25A start/bulk, 2A finish, delayed float	5
	AGM, IE, 25A start/bulk, delayed float	6
	AGM, IE, 20A start/bulk, delayed float	7
	AGM, IE, 15A start/bulk, delayed float	8
	Gel, IE, 25A start/bulk, delayed float	9

Figure 3-2: Active Charge Profile DIP Switch Positions and Their Corresponding <u>Standard</u> Charge Profiles (This Table Only Applies if the 14th Character in the Part Number for Your Charger Is a "B")

Battery manufacturers frequently use the same battery cases for different battery types. Wet/flooded batteries have removable cell caps. Water electrolyzed by discharging and charging the battery is replaced through these openings. Sealed batteries are generally distinguished by non-removable cell caps. The physical appearance of the battery case is frequently the same as a wet battery, though the cell caps are generally not removable. Refer to the battery manufacturer's information panel on the battery case to determine the type battery you have. If the information panel is missing or not legible, do not use the battery.

4. ON-BOARD (BUILT-IN) OPERATION

On-board chargers are designed to be mounted on electric vehicles/equipment. If the charger DC output is connected to a battery pack of the proper voltage, a charge cycle automatically starts when the charger AC input plug is connected to AC power. Disconnecting and reconnecting the charger DC output from the battery pack is not required to start a new charge cycle.

5. AC INPUT

The charger has an AC input rating of 100-240 volts, 50-60 hertz, single-phase. The charger has an AC operating range of 85-265 volts, 45-65 hertz. Below 100 volts, the charger may reduce output power.

The charger is equipped with an IEC inlet for the AC input power. This allows the AC power cord to be selected with a proper plug to be compatible with the local wall outlets. An AC cord clamp is included to retain the AC power cord.

The charger must be grounded to reduce the risk of electric shock and is equipped with an IEC inlet having an equipment-grounding conductor and a grounding socket. The installed AC power cord must be plugged into an outlet that is properly installed and grounded in accordance with all applicable electrical codes and ordinances.

⚠CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK OR FIRE, DISCONNECT AC POWER FROM THE CHARGER BEFORE INSTALLING OR REMOVING UNIT.

⚠DANGER: NEVER ALTER THE AC POWER CORD OR PLUG PROVIDED. IF IT WILL NOT FIT AN OUTLET, OBTAIN THE CORRECT CHARGER IEC AC CORDSET FOR THE OUTLET, OR HAVE A PROPER OUTLET INSTALLED BY A QUALIFIED ELECTRICIAN. IMPROPER CONNECTION CAN RESULT IN A RISK OF ELECTRIC SHOCK.

If an extension cord is necessary, it must be a 3-conductor, No. 12 AWG minimum, heavy-duty cord with ground. It must also be in good electrical condition and as short as possible, 50 ft (15m) maximum. Make sure that the pins on the plug of the extension cord are the same number, size, and shape as the AC power cord plug on the charger. The use of an improper extension cord could result in a risk of fire or electrical shock.

Locate all cords so that they will not be stepped on, tripped over, or otherwise subjected to damage, stress, or accidentally disconnected.

⚠CAUTION: VERIFY THAT THE AC POWER CORD IS FULLY ENGAGED IN THE IEC INLET AND CANNOT BE PULLED LOOSE BEFORE USING THE CHARGER.

⚠DANGER: RISK OF ELECTRIC SHOCK! CONNECT THE AC SUPPLY CORD DIRECTLY TO A GROUNDED, 3-WIRE OUTLET. DO NOT TOUCH UNINSULATED PORTION OF DC OUTPUT TERMINALS OR BATTERY TERMINALS. REPLACE DEFECTIVE CORDS, WIRES, OR CONNECTORS IMMEDIATELY.

6. DC OUTPUT

⚠WARNING: LEAD-ACID BATTERIES GENERATE EXPLOSIVE GAS. CHARGE ONLY IN WELL VENTILATED AREAS. TO PREVENT ARCING OR BURNING NEAR BATTERIES, DO NOT DISCONNECT THE DC CHARGING TERMINALS/CONNECTOR FROM THE BATTERIES WHEN THE CHARGER IS OPERATING. IF THE CHARGE CYCLE MUST BE INTERRUPTED, UNPLUG THE AC POWER CORD BEFORE DISCONNECTING THE DC OUTPUT CONNECTOR(S) FROM THE BATTERIES. KEEP SPARKS, FLAME, AND SMOKING MATERIALS AWAY FROM BATTERIES. TO REDUCE THE RISK OF FIRE, DO NOT USE THE CHARGER NEAR FLAMMABLE MATERIALS OR VAPORS.

Only charge batteries of the same type, voltage, number of cells, and amp-hour capacities listed on the charger ratings label.

The DC output cordset includes a commonly-used terminal/connector. The polarity of the charger DC terminals/connector must be the same as the battery connector. The BLACK DC cable must be connected to the battery negative (-), and the RED DC cable must be connected to the battery positive (+). The charger will not operate if the polarity is reversed.

7. VEHICLE LOCKOUT

The charger includes a lockout/interlock circuit to prevent vehicle/equipment operation while the charger is in use. The lockout circuit consists of a switch with a maximum continuous DC current rating of 5A and an over-current protection trip point of 6A. The over-current protection is non-latching. The RED, 18 Awg, lockout wire should be connected to battery positive (+) and the WHITE, 18 Awg, lockout wire should be connected to the vehicle's lockout circuit that is referenced to battery negative (-) (Ref. Wiring Diagram, Pg. 17). When AC power is not applied to the charger, the charger lockout switch is closed, providing continuity between the RED wire and the WHITE wire. When AC power is applied to the charger, the charger lockout switch is open with no continuity between the RED wire and the WHITE wire.

8. PROPER CARE OF DEEP-CYCLE LEAD-ACID MOTIVE POWER BATTERIES

Motive power battery packs are subjected to severe deep-cycle duty on a daily basis. Although these batteries are designed to withstand such duty, the following precautions must be observed to obtain good performance and maximum cycle life.

⚠CAUTION: ALWAYS WEAR PROTECTIVE EYE SHIELDS AND CLOTHING WHEN WORKING WITH BATTERIES. BATTERIES CONTAIN ACIDS WHICH CAN CAUSE BODILY HARM. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS THE BATTERY TERMINAL OR BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT.

1. When installing new batteries, be sure the polarity of each battery and the overall battery pack is correct. Otherwise, battery and/or charger damage can result.
2. New batteries should be given a full charge before their first use because it is difficult to know how long the batteries have been stored.
3. New batteries and older batteries that have been in storage are not capable of their rated output until they have been discharged and charged a number of times. Consult the manufacturer of your batteries for more information.
4. DO NOT EXCESSIVELY DISCHARGE THE BATTERIES. Excessive discharge can cause polarity reversal of individual cells resulting in complete failure shortly thereafter.
5. Maintain the proper electrolyte level of wet (flooded) batteries by adding water when necessary. Distilled or deionized water is best for battery life. Never allow the electrolyte level to fall below the top of the battery plates. Electrolyte levels lower during discharge and rise during charge. Therefore, to prevent the overflow of electrolyte when charging, it is mandatory that water be added to cells AFTER they have been fully charged – do not overfill. Old batteries require more frequent additions of water than new batteries.
6. Hard crystalline sulfates form when batteries in storage are not maintained in a charged active state. Internal self discharge can bring about the start of this condition in as little as three days in warm temperatures. Batteries not maintained and allowed to sit in storage will self discharge, sulfate and lose

capacity. Repeated charging without using the batteries between charges can recover some of the lost power, range, and life, but some permanent loss should be expected.
7. Cold batteries require more time to fully charge. When the temperature falls below 65°F, the batteries should be placed on charge as soon after use as possible.
8. The tops of batteries and battery hold downs must be kept clean and dry at all times to prevent excessive self discharge and the flow of current between the battery posts and frame. Electrolyte spilled on batteries never dries or evaporates.
9. All connections to batteries must be maintained clean and tight. Due to heating and discharge rates, bolted connections loosen over time. Re-tighten the connections twice yearly to the torques specified by the battery manufacturers.
10. Follow all operating instructions, cautions, and warnings as specified in this manual, on the charger, in the battery manuals, and in the vehicle manuals.

8.1 Personal Safety Precautions

1. Have someone within the range of your voice and close enough to quickly come to your aid when you work near a lead-acid battery.
2. Ensure that ample fresh water and soap are nearby in case battery acid contacts your skin, clothing, or eyes.
3. Wear complete eye and clothing protection. Avoid touching your eyes while working near a battery.
4. If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flush your eye with running cold water for at least 10 minutes, and get medical attention immediately.
5. NEVER smoke or allow a spark or flame to be in the vicinity of a battery.
6. Be extra cautious to reduce the risk of dropping a metal tool onto a battery. It could spark or short circuit the battery or other electrical components that could cause an explosion.
7. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery can produce a short-circuit current that is high enough to cause a severe burn.
8. NEVER charge a frozen battery.

9. CHARGER OPERATION

⚠WARNING: TO REDUCE THE RISK OF AN ELECTRIC SHOCK, CONNECT ONLY TO A SINGLE-PHASE, PROPERLY GROUNDED (3-WIRE) OUTLET. REFER TO GROUNDING INSTRUCTIONS.

⚠CAUTION: MAKE SURE THE BATTERY IS A RECHARGEABLE DEEP-CYCLE BATTERY WITH THE PROPER RATED VOLTAGE FOR THIS CHARGER.

⚠DANGER: TO PREVENT ELECTRICAL SHOCK, DO NOT TOUCH UNINSULATED PARTS OF THE CHARGER DC OUTPUT CONNECTOR, BATTERY CONNECTOR, OR BATTERY TERMINALS. MAKE SURE ALL ELECTRICAL CONNECTORS ARE IN GOOD WORKING CONDITION. DO NOT USE CONNECTORS THAT ARE CRACKED, CORRODED, OR DO NOT MAKE ADEQUATE ELECTRICAL CONTACT. USE OF A DAMAGED OR DEFECTIVE CONNECTOR MAY RESULT IN A RISK OF OVERHEATING OR ELECTRIC SHOCK.

⚠WARNING: CHARGER IS NOT TO BE USED WHILE THE BATTERY POWERED EQUIPMENT IS OPERATING.

⚠ATTENTION: NE PAS UTILISER LE CHARGER PENDANT QUE L'EQUIPMENT EST EN MARCHE.

⚠WARNING: LEAD-ACID BATTERIES GENERATE GASES WHICH CAN BE EXPLOSIVE. TO PREVENT ARCING OR BURNING NEAR BATTERIES, DO NOT DISCONNECT THE CHARGER DC OUTPUT FROM THE BATTERIES WHEN THE CHARGER IS OPERATING. KEEP SPARKS, FLAME, AND SMOKING MATERIALS AWAY FROM BATTERIES.

⚠WARNING: ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES. DO NOT PUT WRENCHES OR OTHER METAL OBJECTS ACROSS BATTERY TERMINALS OR THE BATTERY TOP. ARCING OR EXPLOSION OF THE BATTERY CAN RESULT!

⚠WARNING: DO NOT DISCONNECT THE CHARGER DC OUTPUT CONNECTOR FROM THE BATTERY CONNECTOR WHILE A CHARGE CYCLE IS IN PROGRESS. THE RESULTING ARCING AND BURNING OF THE CONNECTORS COULD CAUSE THE BATTERIES TO EXPLODE.

⚠CAUTION: TO AVOID DAMAGE TO THE CHARGER DC CABLE AND CONNECTOR AND BATTERY CONNECTOR, DISCONNECT BY GRASPING THE CHARGER CONNECTOR HANDLE OR BODY AND PULLING IT STRAIGHT OUT OF THE BATTERY CONNECTOR. DO NOT PULL ON THE CHARGER CABLE. DO NOT TWIST, ROCK, OR PULL THE CONNECTOR SIDEWAYS.

Please follow these operating instructions:

1. Ensure that the vehicle/equipment that the charger is mounted on is turned off.
2. With the charger AC power cord disconnected from the AC outlet, connect the charger DC output terminals/connector to the battery pack terminals/connector (most likely already connected or hard wired).
3. Connect the charger AC power cord to an appropriate AC outlet. The charger will start automatically, which is indicated by the remote LED beginning to blink slowly green. The remote LED will continue to blink slowly green through the Bulk/Start (constant current or constant power) and Absorption/Plateau (constant voltage) charge cycle phases.
4. If the charger must be disconnected from the battery while a charge cycle is in progress, disconnect the AC power cord from the AC outlet. Do not disconnect the charger DC output terminals/connector from the battery while a charge cycle is in progress.
5. A Finish charge cycle phase (constant current) is indicated by the remote LED beginning to blink quickly green. Not all charge profiles include a Finish phase.
6. The remote LED will continue to blink quickly green during an Equalize/Balance charge cycle phase (constant current), which occurs when a trigger condition has been met (cycle count, etc). Not all charge profiles include an Equalize/Balance phase.
7. The charger automatically terminates the charge cycle when a battery reaches full charge, which is indicated by the solid green illumination of the remote LED. The required charge time is affected by numerous factors, including battery amp-hour capacity, depth of discharge, battery temperature, and battery age/usage.
8. A Post Charge (constant-voltage float) charge cycle phase is indicated by the remote LED beginning to blink quickly green. Not all charge profiles include a Post Charge phase.
9. Leave the charger connected to AC power until the vehicle/equipment will be used.
10. Disconnect the charger AC power cord from the outlet before operating the vehicle/equipment.

9.1 Storage Mode

1. Storage mode is designed to periodically charge your batteries during storage periods that last a few weeks to several months at a time.
2. Do not disconnect the charger from AC power or the batteries while your vehicle/equipment is not being used. Disconnecting and reconnecting the charger from the AC power or the batteries will start a new charge cycle, but disconnection disrupts the storage mode so optimum battery maintenance is not achieved.
3. There are multiple triggers which can start a storage charge, but a storage charge will take place at least every 15 days.
4. After several months of storage, your batteries should be serviced and the charger reset by disconnecting and reconnecting AC power before continuing another storage session.

10. LED INDICATOR

The charger includes a single remote bi-color LED to indicate charger status and fault information. During charge initialization, the LED check displays a amber/orange color when both green and red LEDs are on at same time. The functionality of the LED is outlined below in Figure 10-1.

Charge Status (Green)	Fault (Red)	Description
Off	Off	Charger is off and disconnected from live AC voltage.
Solid On	Solid On	LED check during charge initialization which occurs for the first few seconds.
Slow Blink	Off	The remote LED blinks slowly green during the Start/Bulk charge cycle phase (constant power or constant current) and the Plateau/Absorption charge cycle phase (constant voltage).
Fast Blink	Off	The remote LED blinks quickly green during a Finish charge cycle phase (constant current). Not all charge profiles include a Finish phase. The remote LED also blinks quickly green during an Equalize/Balance charge cycle phase (constant current), which occurs when a trigger condition has been met (cycle count, etc). Not all charge profiles include an Equalize/Balance phase. The remote LED also blinks quickly green during a Post Charge phase (constant-voltage float). Not all charge profiles include a Post charge phase.
Solid On	Off	The remote LED is solid green when the charge cycle has completed.
Off	Slow Blink	The remote LED blinks slowly red when a charger-related fault has occurred that causes the unit to terminate the charge cycle and stop charging.
Off	Fast Blink	The remote LED blinks quickly red when a charger-related fault has occurred that does not cause the unit to terminate the charge cycle. Charging will continue but performance will be reduced.
Off	Solid On	The remote LED is solid red when a battery-related fault has occurred. Battery-related faults include the following. • MIN VOLTAGE – Minimum voltage was not met after a specified time from the start of the charge cycle. • MAX VOLTAGE – Maximum voltage was met. • PHASE – Maximum time for a particular charge cycle phase (start/bulk, plateau/absorption, finish) was met. • MAX TIME – Maximum time for the overall charge cycle was met.
Alternating	Alternating	The remote LED alternates green and red when the Active Charge Profile DIP switch positions are invalid. See the CHARGE PROFILE section for more information.

Figure 10-1: Charger Remote Bi-Color LED States

Removing AC power from the charger for a minimum of 20 seconds will clear a fault. See the TROUBLESHOOTING section for guidance with troubleshooting and corrective action.

If the charger continues to indicate a fault after you have taken appropriate corrective action, contact your dealer for troubleshooting and/or service.

11. TROUBLESHOOTING

The charger was fully tested and calibrated before leaving the factory. It was delivered ready to charge. If properly installed, the charger should require very little attention. If improper charger operation occurs, it will require repair by a qualified service technician.

⚠CAUTION: DO NOT OPERATE THE CHARGER IF IT IS DAMAGED OR APPEARS TO BE MALFUNCTIONING. PERSONAL INJURY OR DAMAGE TO THE CHARGER OR BATTERIES MAY RESULT. DO NOT DISASSEMBLE THE CHARGER. CONTACT YOUR DEALER. INCORRECT REASSEMBLY MAY RESULT IN RISK OF ELECTRIC SHOCK OR FIRE.

See the LED INDICATOR section for information regarding the Fault LED.

1. If the charger does not turn on, check for one of the following conditions.
   a. The charger AC power cord is not plugged into a live and/or appropriate AC outlet.
   b. The battery connections are incorrect – battery not connected, reverse polarity, or short circuit.
   c. The battery voltage is too high.
   d. The battery voltage is too low (below 4 volts).

2. If the charger turns off before a battery is fully charged, and a fault condition is not indicated by the remote LED, this indicates one of the following conditions.
   a. The AC power was interrupted during the charge cycle.
   b. The charger DC output connector was disconnected from the battery during the charge cycle.
   c. The battery has been allowed to sulfate. Charge the battery at least once every three (3) days when the equipment is lightly used. Once sulfation is allowed to take place, it may be partially reduced by returning, temporarily, to daily charging.

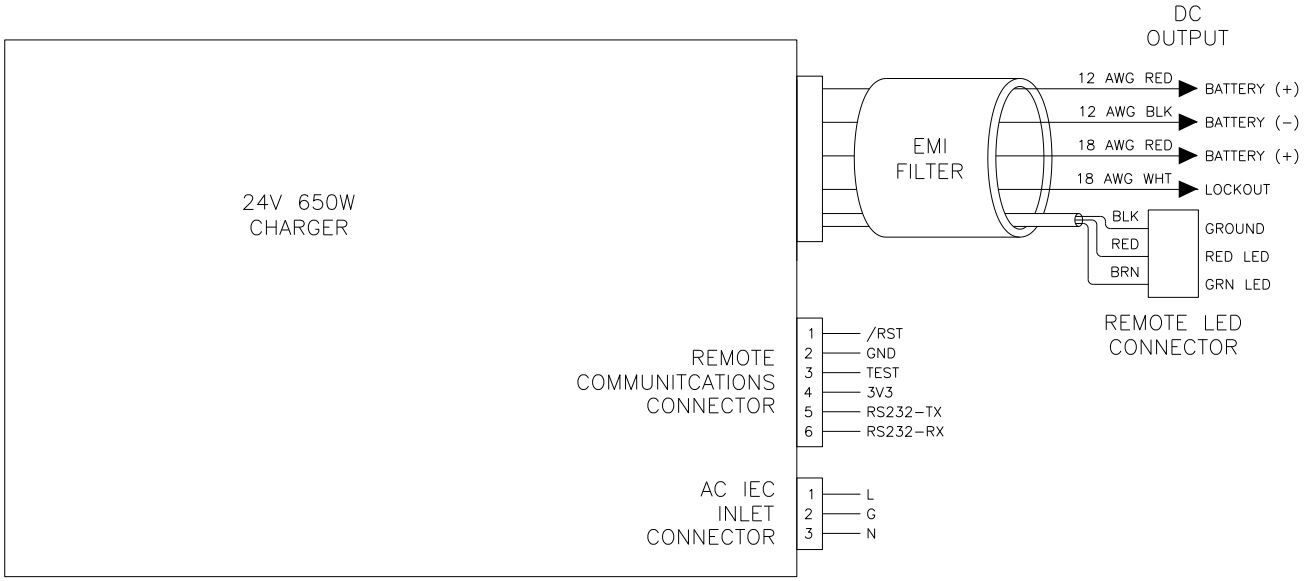
3. A decrease in vehicle/equipment range where the battery loses power faster indicates one of the following conditions.
   a. The electrolyte level in a wet lead-acid battery was allowed to drop below the top of the battery plates. If so, add distilled water to <u>just cover the top of the plates</u> immediately upon discovery, and then fill to the proper level with distilled water at the completion of the very next charge cycle.
   b. Use of the vehicle/equipment before the battery has been fully charged and the charger automatically terminates the charge cycle. This shortens battery life and accelerates the onset of reduced daily range.
   c. The normal wear-out pattern for the battery.

4. A charge cycle running longer than anticipated before terminating indicates one of the following conditions.
   a. An overly-discharged battery.
   b. The charger output may have been reduced due to low AC input voltage, high ambient temperature, or obstructions to cooling airflow.
   c. The amp-hour capacity of the battery is greater than the charger can fully charge in the anticipated amount of time.

12. SPECIFICATIONS

See the SLM 24-25 sales/datasheet for complete product specifications.

WIRE DIAGRAM



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