

4. CHARGER

ELECTRIC BY SCT
CHARGING REQUIREMENTS

The ELECTRIC BY SCT is equipped with an on-board charger and two 15 foot portable power cords. One is for use on 208/230 VAC (user specified), and the other is for use on 115 VAC.

The primary power source for charging is 208/230 VAC. Operation from 115 VAC should be limited to emergency, equalizing, or occasional off-site charging where 208/230 VAC is not available.

Table 1. Charger Input Power-Source Specifications

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<u>Outlet Rating</u>	<u>Maximum Continuous Load</u>	<u>SCT Supplied Portable Cord Specifications</u>			<u>User Supplied Outlet Specifications (1)</u>		<u>Minimum Overcurrent Protective Device Rating</u>
		<u>Length</u>	<u>Vehicle End</u>	<u>User End</u>	<u>Receptacle Type (2)</u>		
15 Amp 125 VAC	12 Amp	15 ft.	“Twist Lock” 30A/250 VAC	NEMA 5-15P	NEMA 5-15R	15 or 20 amps	
30 Amp 250 VAC	28 Amp	15 ft	“Twist Lock” 30A/250 VAC	NEMA 6-50P	NEMA 6-50R	40 amps	

(1) The user is responsible for providing the proper outlet receptacle, wiring, and overcurrent protective device.

(2) Grounding type required.

CHARGER OPERATING INSTRUCTIONS

Make certain that air flow to the charger fan is not restricted. Also, keep area around charger clean so that no debris can be pulled into the charger.

Electrical Installation

This charger is normally operated on one of the following 60 HZ single phase input voltages: 200-220 V or 220-240 V.

CAUTION: It is imperative that the internal charger taps be set to the proper voltage range on which it will be operated. Severe damage to the charger and/or batteries may occur if the charger is operated on an improper voltage setting.

DANGER: Due to the high voltages involved, the initial setup and servicing of the charger should be performed only by qualified personnel and then only with AC power turned off and, if possible, with the DC cord disconnected from the batteries.

Input Voltage Settings

The charger is shipped from the factory with the internal charger tap set for 220-240 V operation. If the charger is to be operated from a 200-220 VAC source, then change the tap as follows:

Remove the top cover from the charger. The internal charger taps are on a two connection cinch barrier strip, located above the blower inlet near the fuse assembly. Remove the screw retaining tap lead and place the tap lead on the upper (208 V) connection.

115 Volt AC 60 HZ Single Phase Operation

This charger may be operated from a 115 VAC source without any change required in the internal charger tap connections.

NOTE: The use of 115 volt AC input should be limited to emergency situations and occasional charging when vehicle is not in use and 208/230 volt inputs are not available. It may also be used for equalization charging as described in Section 3, Batteries.

CAUTION: The automatic shutoff of the charger will not occur on 115 volt operation and the charger will continue to operate at an output charging rate of approximately 6 amps until disconnected from the 115 volt source. The charger should not be allowed to operate under this condition for more than 24 hours at a time in order to prevent possible damage to the batteries. Also, continual use of the 115 volt input will lead to undercharging of the batteries, thus reducing performance and battery life.

CAUTION: To protect against shock hazards, connect AC cord only to properly grounded outlets.

CAUTION: When inserting the plug into the receptacle on the vehicle, be sure to twist the plug clockwise until it is firmly locked in place. If not, the elements of the connector may overheat, causing permanent damage to the plug and receptacle.

Push “START” button and hold until the ammeter shows a charging current.

NOTE: Charger will not continue to operate when the “START” button is released if the battery compartment ventilation fan is not working.

Monitor ammeter for correct charge rate. When operating from a 208 V or a 230 V input, the initial charge rate should be approximately 32 amps. After the batteries reach a near-charged condition, the charge rate will gradually drop to a finish rate of approximately 8 amps. When operating from a 115 V input, the initial charge rate will be from 6 to 7 amps and will remain in this range until charger is disconnected.

Monitor fans: Both the charger mounted fan and the battery compartment ventilation fan should be operating while the charger is operating and the fans should continue to operate for a period of approximately one hour after the normal shutoff time of the charger.

Charger turns completely off automatically and the ammeter goes to zero when operating from a 208/230 V AC source.

CAUTION: When operating from a 115 V AC source, the charger must be manually shut off by disconnecting from AC source.

CAUTION: Do not remove DC cord from batteries when charger is on. If charge cycle must be interrupted, disconnect AC cord before removing DC cord.

Charge time:

When operating from a 208/230 V AC input, the charger requires 8 to 10 hours of charging time under normal conditions to properly recharge the batteries. Cold batteries (below 50°F) or new batteries will require more time to achieve full charge.

CAUTION: When operating from a 115 V AC source, do not allow the charge time to exceed 24 hours.

Full charge test: (208/230 V input operation) To test for full charge on batteries, push “START” button. Charge rate should drop to the finish rate and shut off within 45 to 90 minutes (New or cold batteries will require a longer period of time.)

Over temperature shutdown: If the internal ambient temperature of the charger becomes too great during operation, the charger will automatically shut off and the red light on the front panel will glow. The fans will continue operate for approximately one hour after shutdown. In order to resume charger operation, the temperature “reset” button must be depressed.

Fuse replacement: When replacing a fuse in the charger, always use the same type of fuse specified. Otherwise, the charger or other wiring could be extensively damaged.

A sensor at the battery compartment ventilation fan will prevent the charger from operating if the fan is not functional. This is to prevent an accumulation of gasses within the battery compartment during recharging.

An interlock switch mounted in the vehicle charging cord socket prevents the motor from being started when the cord is plugged in.

Any charger that cannot be repaired by following the problem diagnosis procedures must be returned to the manufacturer for servicing. However, in order to expedite repairs and to prevent unnecessary shipment of chargers, contact Lester Electrical (402/477—8988) before removing a malfunctioning charger.

Charger Problem Diagnosis

1. Verify the AC input to the charger.
2. Install the diagnostic aid between the wiring harness connectors and the charger. (See Section 13 for diagnostic aid information).
3. Unplug the battery pack leads (grey connector at the bottom of the charger front panel). With a digital multimeter set to the DC volts function, perform the following test:

<u>+ Red Probe</u>	<u>- Black Probe</u>	<u>Meter Reading</u>	<u>Conclusion</u>
+ Socket of the of the battery pack connector	- Socket of the of the battery pack connector	80 volts or more	OK. Proceed to test #4
		Less than 80 volts	Check connections at main battery pack terminals. Check main battery pack fuse. Check all battery pack interconnecting cables

Reconnect the battery pack connector to the charger be before proceeding with testing.

4. Press the thermal reset button, then press the start button and hold. Observe the amp meter on the front panel of the charger:

<u>Meter Reading</u>	<u>Conclusion</u>
6 amps or above	Charger is functioning. Proceed to test #5.
Zero (0) amps	Charger is not operational. Disconnect AC power cord. Disconnect plug from main battery pack. Check all the fuses, both on the front panel and inside the charger. (Remove top cover for access.) Replace as necessary. Reconnect main battery pack plug and AC power cord, and repeat test #4. If the amp meter reading is still 0, the charger must be replaced.

5. Verify that the charger cooling fan (far right side of charger) is operating and that the inlet and outlet (beneath the vehicle) are not restricted. Check the fuse on the charger front panel. Repair/ replace the fan and clear any obstructions to the free flow of air as necessary. Proceed to test #6.

6. If the charge rate drops to zero as soon as the “START” button is released, check to see that the battery compartment ventilation blower is working. If the blower is working, proceed to test #8. If not, proceed to test #7.
7. With a digital multimeter set to the AC volts function, perform the following test:

<u>+ Red Probe</u>	<u>- Black Probe</u>		<u>Meter Reading</u>	<u>Conclusion</u>
Test socket J18-3	Test socket J18-4	(Charger start button depressed)	110 volts or more	Check the wiring to the ventilation blower. If the wiring is OK, replace the Blower. Proceed to #8.
			Less than 110 volts	Check the charger fuses as outlined in test #4. If all the fuses are OK, replace the charger.

8. With a digital multimeter set to the DC volts function, perform the following tests:

<u>+ Red Probe</u>	<u>- Black Probe</u>		<u>Meter Reading</u>	<u>Conclusion</u>
Test socket J18-1	Test socket J18-2	(Charger off, cord plugged in)	Same as battery pack (within 3 volts)	OK. Proceed to Test #9.
			Less than main battery pack (by more than 3 volts)	Check the 1 amp (vane switch) fuse on the charger front panel. If the fuse is OK, the charger is faulty.

9. With a digital multimeter set to the DC volts function, perform the following tests:

<u>+ Red Probe</u>	<u>- Black Probe</u>		<u>Meter Reading</u>	<u>Conclusion</u>
Test socket J18-1	Test socket J18-2	(Charger start button depressed)	Less than 1 volt	OK.
			More than 1 volt	Check the wiring to the volt sensor relay at the ventilation blower. If the wiring is OK, replace the sensor relay.

10. To verify the charger output to the DC/DC converter, use a digital multimeter set to the DC volts function and perform the following test:

<u>+ Red Probe</u>	<u>- Black Probe</u>		<u>Meter Reading</u>	<u>Conclusion</u>
Test socket J17-1	Negative terminal of main battery pack	(Charger operating)	Same as main battery pack.	OK.
			Less than main battery pack.	Check 10 amp fuse on charger front panel (aux. 108 VDC). If fuse is OK, replace the charger

Charger Removal/Installation

1. Disconnect the AC power supply cord.
2. Disconnect the AC Input to the charger (red, blue, black and green connectors at bottom of charger front panel).
3. Disconnect main battery pack leads (grey connector at bottom of charger front panel).
4. Disconnect 4 and 6 pin molex connectors (white connectors on charger front panel).
5. Remove four bolts holding charger to floor of vehicle and lift out charger assembly.
6. To reinstall charger, reverse the above procedure.

Charger Specifications

Make:	Lestronic
Manufacturer:	Lester Electrical of Nebraska, Inc. 625W. "A" St. Lincoln, Nebraska 68522
Model:	No. 9865
Type:	108EL35—8ET
Input :	115/208/230 Volt AC 60 HZ
Output:	108 volt DC 35 Amp (Max.)
Additional Features:	DC/DC Converter Power and Control 115 Volt AC Fan Output and Interlock Input Cord Interlock in Vehicle Socket