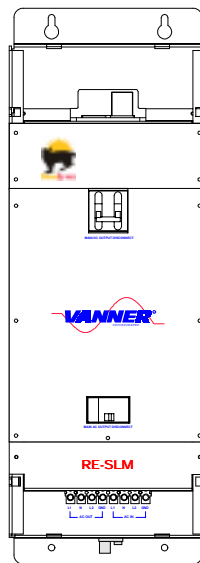




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SunLynx Module Owner's/Installation Manual



**Model
RE48-SLM**

**Owner's Manual #D910770
Revision 0.0d**

08/03/01 10:10 AM

Notes:



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1 INTRODUCTION

Thank you for purchasing a Vanner SunLynx Grid Tie Module. We are confident that you will be satisfied with its performance and its many features. With proper installation and care, you can look forward to years of service from this high performance product.

“**RE-SLM**” stands for **R**enewable **E**nergy **S**unLynx **M**odule.

The *RE Series* SunLynx Module is a control system designed to incorporate the DC breaker, wiring, and switching needs for applying the RE-4500 in a Grid Interactive Mode. This is to say that the SunLynx module enables the RE-4500 in a Solar system to be tied directly to the grid. It also contains a charge controller for regulation of DC Voltage from the Solar Array. In addition, it contains an optional AC breaker for tying the system to the grid.

This document will describe the operation, technical specifications and installation procedures of the RE-SLM and accessories offered in this product family. We suggest that you acquaint yourself with the RE-4500 inverter/charger and other optional accessories before proceeding with this manual. If you require additional information please contact your dealer, or contact us directly at 1-800-227-6937 (800 AC POWER).

WARNING: Before you install and use your *RE-SLM*, be sure to read and save these safety instructions.

WARNING: The RE-SLM is not designed to be a part of Life Supporting or Life Sustaining Equipment. If the Unit is to be used in such an application, please contact Vanner Inc. at 1-800-ACPOWER.

The *RE SERIES* product line is designed to meet the requirements of a variety of applications.



SAVE THESE INSTRUCTIONS!



Please note your model and serial number here for future reference.

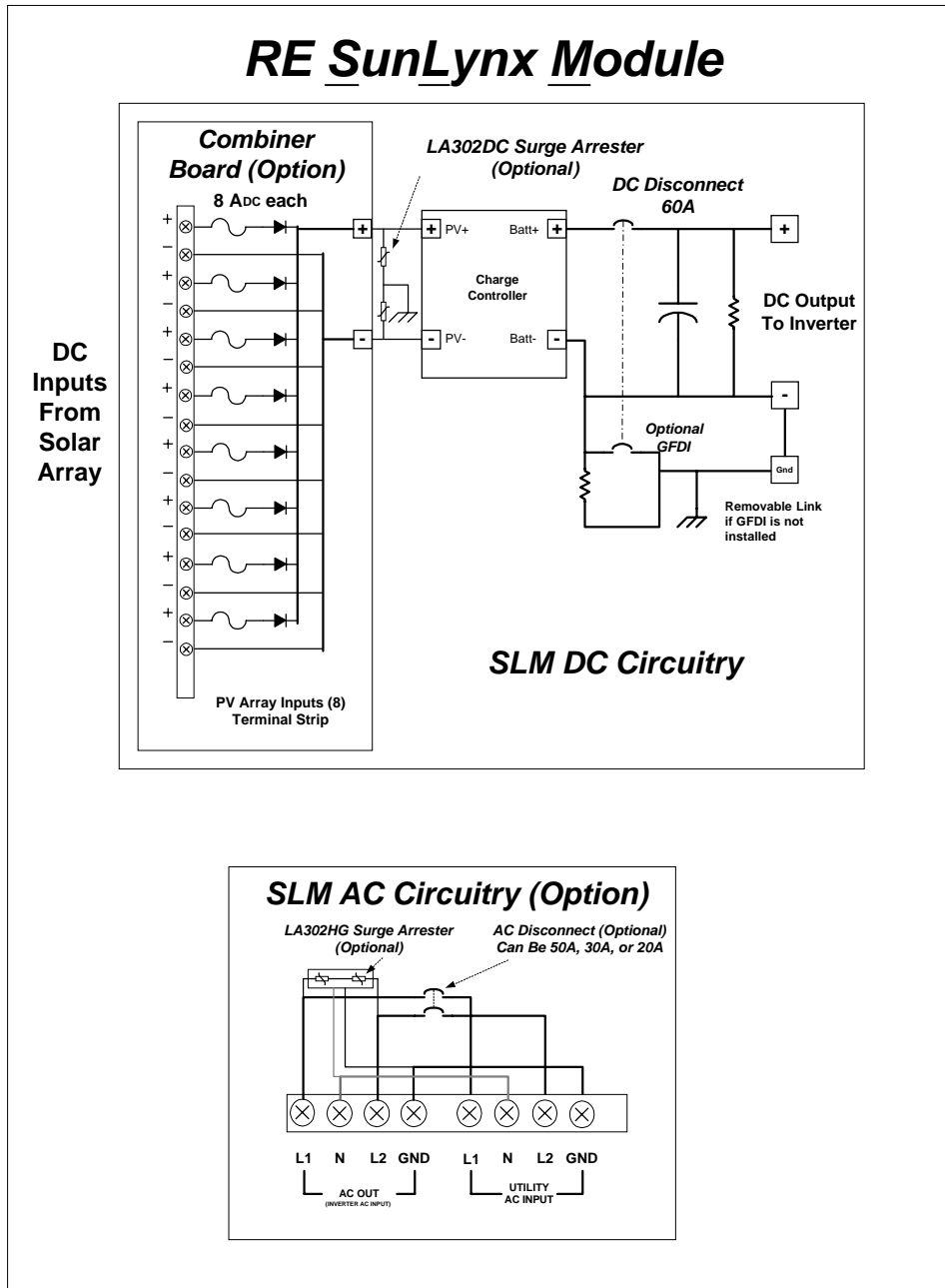
Model No. _____ Serial No. _____ Date of Installation _____

This document describes the operation, technical specifications and installation procedures for the RE-SLM SunLynx Module System. If you require additional information please contact your dealer or contact Vanner at 1-800-AC POWER (1-800-227-6937).

2 Specifications and Features

The block diagram shows the components of the RE-SLM system.

F 1 Figure 2.0-1 SunLynx Module





Specifications and Features

T 1 Table 2.0-1 RE-SunLynx Module Specifications

DC Power Ratings	
Rated Output Watts (0°C to +25°C)	2160 Watts
DC Sources Eight (8) 8 amp sources – (48 VDC) PV Arrays	60 Amps @25C (60V Max)
DC Output	54.4 Vdc
AC Source One (1) 60 amp source	50, 30, or 20 Amps AC (dependent on option)
Charge Controller	
AC Input/Output Frequency	60 Hz
DC Input Wiring Method	Hardwire Terminal Strip
AC Input/Output Wiring Method	Hardwire Terminal Strip
System	
Ambient Operating Temperature	-0° to +40°C (32 to +104°F)
Enclosure	Painted Aluminum for Wall Mounting
Dimensions	29½ H x 10 ½ W x 9¼ D
Unit Weight	28 pounds

2.1 Standard Features

1. Includes most requirements for Solar Arrays, Charge Controller, a DC disconnect, and fusing in a convenient assembly.
2. Allows the use of the RE-4500 in a battery-less Grid-Tied system configuration.
3. Slotted mounting holes allow easy mechanical integration.
4. Entry/exit knockouts allow easy integration (no conduit required) to interface to RE-4500.

2.2 Parts and Accessories

Part Number	Name	Description
RE48-SLM-A	AC Breaker	AC Breaker for overcurrent interruption and AC Disconnect of the Utility from the RE-4500. Also provides Lightning and Surge suppression/protection for the AC portion of the system
RE48-SLM-C	Solar Combiner Module	Contains a termination strip for wires from Solar Array, and fuses for connecting up to 8 strings of 48 VDC Solar Arrays .
RE48-SLM-D	DC Surge Suppression	Provides Lightning and Surge suppression/protection for the DC portion of the system.
RE48-SLM-G	DC Breaker GFD	DC Breaker with Ground Fault Detection and Interruption for protection against ground faults, over current, and output disconnect of the SLM.

It should be noted that the RE48-SLM can be populated with a combination of any of the above options, from a single option RE48-SLM-A through RE48-SLM-G, to a fully populated option of RE48-SLM-ACDG

3 SAFETY INSTRUCTIONS

 **Warning Labels Please READ ME** 

 **SAVE THESE SAFETY INSTRUCTIONS!** 

This manual contains important instructions for the Vanner RE-SLM that shall be followed during installation and maintenance of the RE-SLM.

It should be noted that hazardous voltages are associated with this product. This unit has connections to AC at lethal amperages and voltages.

Installation should only be done by qualified personnel and in compliance with local regulations and codes.

Special care must be taken in working around the RE-SLM System in order to avoid hazardous voltages and currents.

Note: In order to reduce the risk of damage to personnel or equipment, please read all instructions in this manual, particularly warnings noted by the following symbols.

These symbols are used to note procedures that if not closely followed could lead to loss of life or damage to equipment or property due to electrocution.



Electrocution Hazard Exists



Fire Hazard Exists



A Potential Dangerous Condition

3.1 SAFETY INSTRUCTIONS



**Before you install and use your RE-SLM,
Read and save these safety instructions!**



This manual contains important safety and operating instructions for the Vanner Incorporated RE SunLynx as prescribed by Underwriters Laboratories (UL). The RE system is listed as compliant with UL 1741 Power Conditioning Units for use in Residential Photovoltaic Power Systems.



1. Read owners manual BEFORE wiring or powering up.


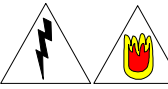









2. This equipment employs components that tend to produce arcs and sparks. To prevent fire or explosion, DO NOT install in confined areas or compartments that contain batteries or flammable gases and materials.




3. Improper use of this product may result in risk of electrical shock.

3.2 General Precautions



1.  Do not expose the SunLynx Module to direct water spray, rain, or snow.
2. Do not install the RE-SLM in a zero clearance compartment. This may result in overheating or diminished performance.
3.  To avoid the risk of fire, electrical shock, or injury to persons, do not use attachments not recommended or sold by Vanner Incorporated.
4.  Vanner recommends that all DC electrical wiring be performed by a licensed electrician or a qualified technician to ensure compliance with all applicable national and local wiring regulations.

5.  To avoid a risk of fire and/or electrical shock, always verify wiring connections are in good electrical condition. All external conductors must use proper wire size to avoid dangerous overheating or diminished performance.
6.  If the SunLynx Module has been dropped or damaged in any way, do not operate the SLM until it has been verified to be safe by a qualified technician.
7.  To reduce the risk of electrical shock, always disconnect the DC connections using the code required DC disconnects.
8.  The SunLynx must be properly grounded in accordance with local and national codes and ordinances before operation. For most installations, the negative (ground) conductor should be bonded to the grounding system at one and only one point in the system.
9.  It should be noted that only qualified service personnel should attempt to wire the SLM to the Inverter, to the AC Utility and to the Solar Panel DC Sources.
10.  Always use service disconnects to break the circuit before attempting any kind of servicing of the RE-SLM. DO NOT attempt to service the unit while still actively connected to a power source of any kind.

3.3 Explosive Gas Precautions

1.  This equipment contains components, which tend to produce arcs or sparks. To prevent fire or explosion, do not install in compartments containing batteries or flammable materials, or in locations that require ignition protected equipment. This includes any space containing batteries or gasoline-powered machinery, fuel tanks, or joints, fittings, or other connections between components of the fuel system.

3.4 DC and AC Sources

1.  Before attempting any sort of wiring for the Solar Array to the SLM, insure that voltage does not exist on the wires going to the Solar array. Ideally, if this is a new installation, make the connections at the Optional RE-SLM Combiner Module prior to connecting in the junction boxes associated with the solar array. If this is a previous installation, disconnect the solar array at the junction box associated with each solar array. Failure to do so could result in death.
2.  The solar panel will generate lethal currents even if not exposed to bright sunlight. It is important to make certain that the service disconnect is utilized to remove the lethal potential from the terminals.



3. Before attempting any sort of wiring for the AC supply to the RE-SLM, turnoff the AC service disconnect associated with the AC Mains. For Safety, ALWAYS check the operation of the disconnect with a voltmeter!!.

3.5 Code Compliance

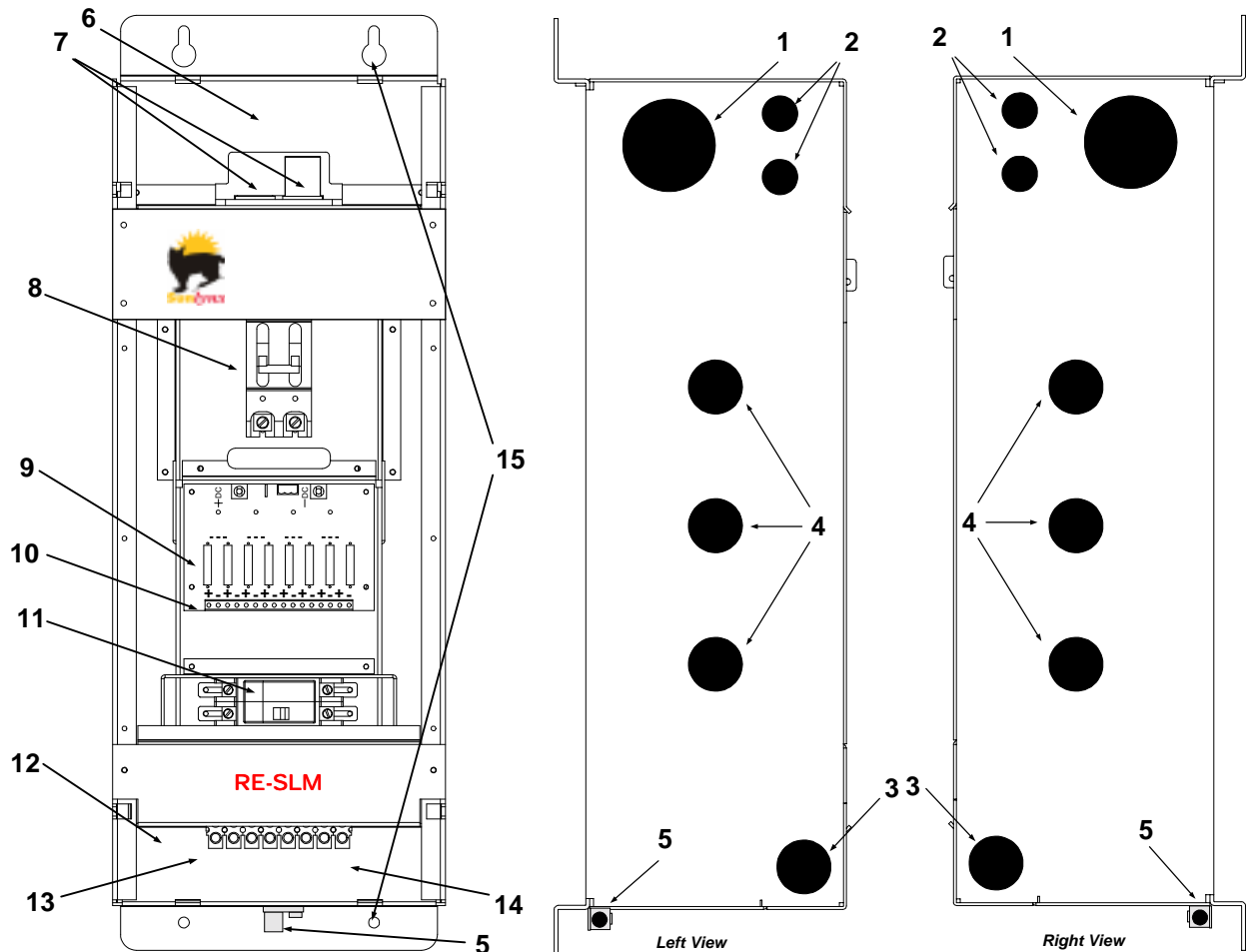
Vanner Model RE-SLM is listed by Underwriters Laboratories Inc. to UL 1741 for Photovoltaic Systems, and complies with IEEE 929 and the National Electric Code Article 690, Solar Photovoltaic Systems.

4 COMPONENT IDENTIFICATION

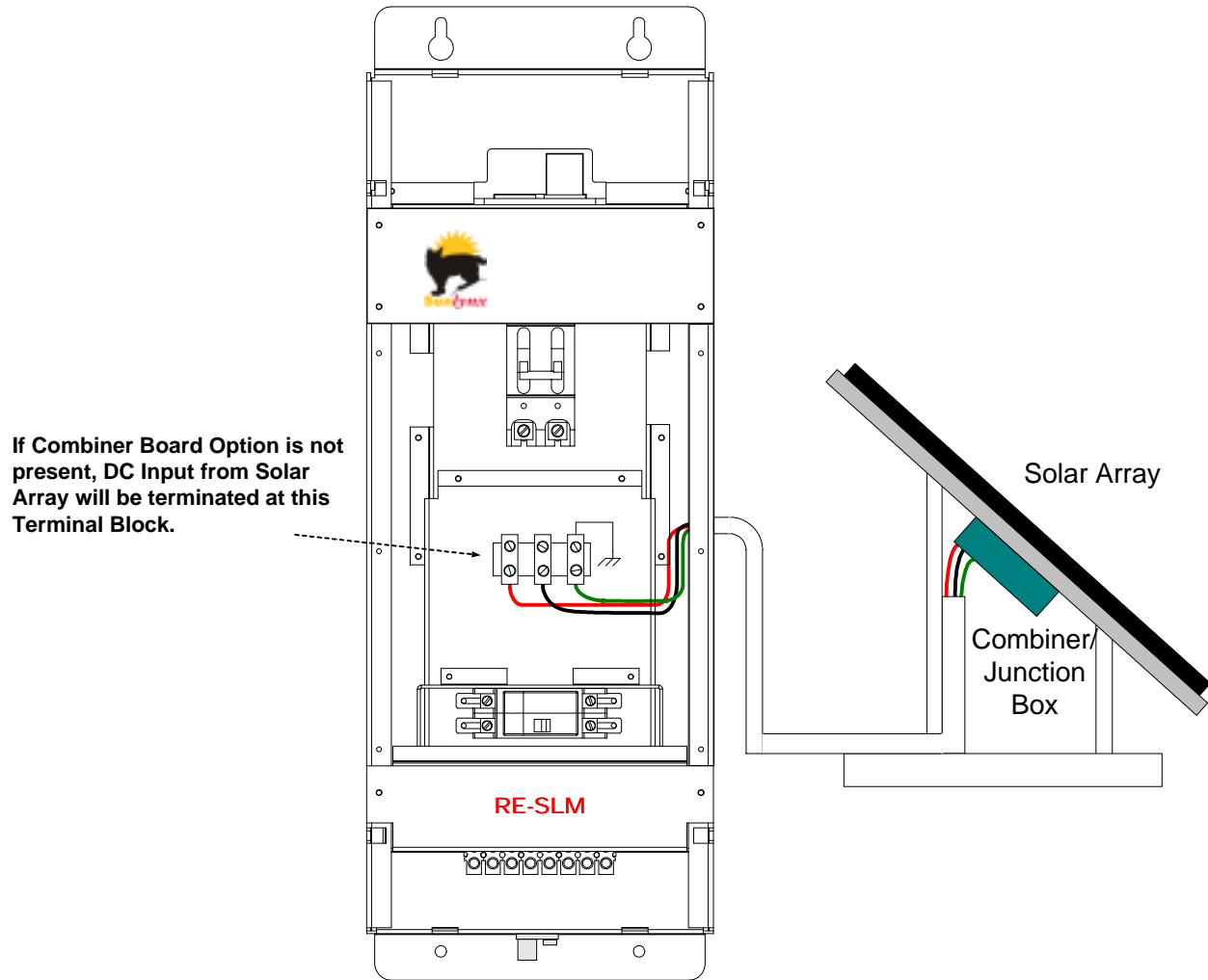
This section will give the reader an idea as to location and description of various features of the RE-SLM.

Note that at the top of the unit is a raceway with terminations for connecting DC, and at the bottom of the unit is a raceway for the routing and termination of AC power lines.

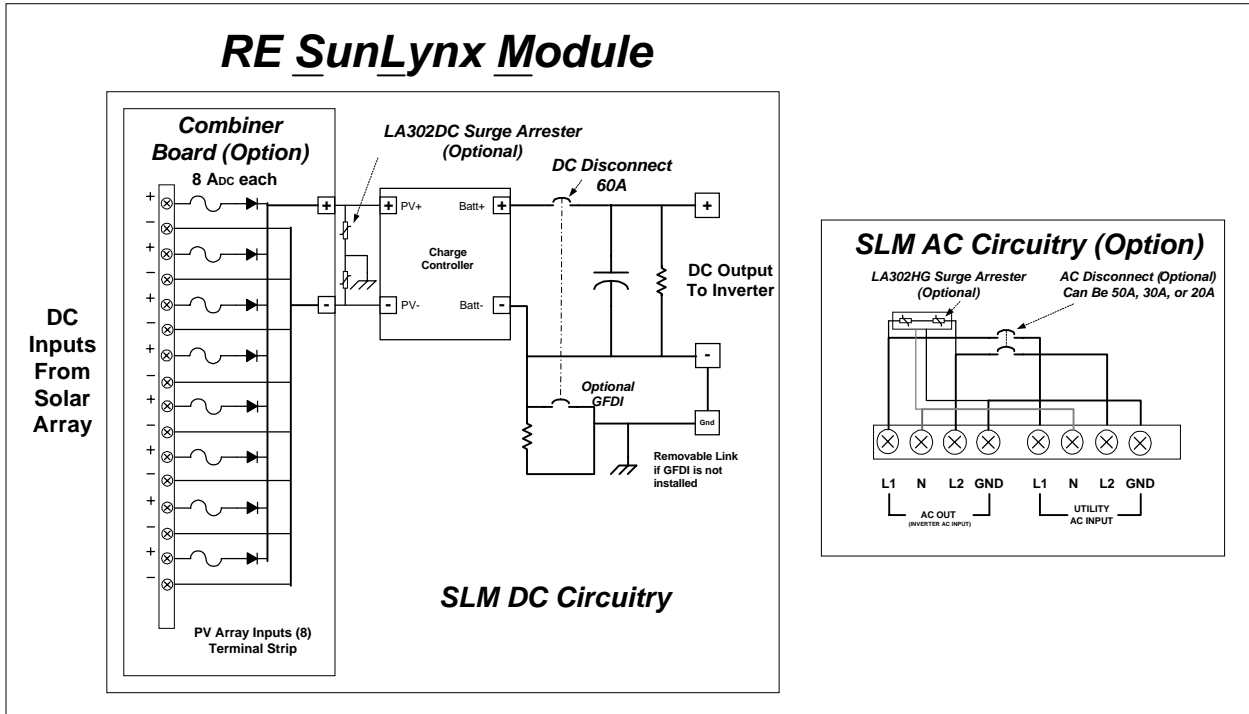
F 2 Figure 4.0-1 SunLynx Module Front and Side View



F 3 Figure 4.0-2 DC Options



F 4 Figure 4.0-3 SLM Schematic



(1) Knockout Entry/Exit for High Current DC Wiring

These knockouts provide for the routing and termination of high capacity DC cables from the RE-SLM to the RE-4500 Inverter. This knockout is a standard size 2.914" to accommodate 2 1/2" conduit or chase nipple.

(2) Knockout Entry/Exit for Low Current DC Wiring and Control Wiring

These knockouts provide for the routing and termination of low capacity DC wiring and Control Wiring. These knockouts also provide access (from either the right side or left side of the unit) to the DC Wiring Raceway. This knockout is a standard size 1.115" to accommodate 3/4" conduit or chase nipple.

(3) Knockout Entry/Exit for AC Wiring and Raceway

This knockout provides for the routing and termination of AC Wiring from the Grid and to the RE-4500 Inverter.

This knockout also matches up with the AC knockout on Vanner systems such as the RE-4500. This knockout is a standard size 1.701" to accommodate 1 1/4 " conduit or chase nipple.

(4) Knockout Entry/Exit for DC Wiring from Solar Array

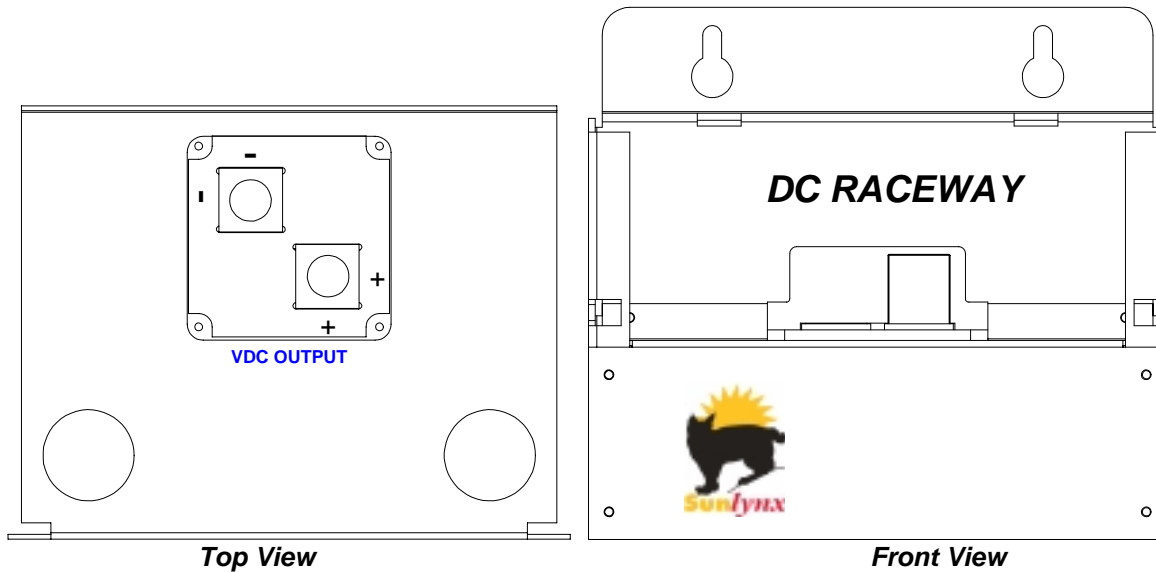
This knockout provides for the routing and termination of AC Wiring from the Solar Array to the RE-SLM. This knockout is a standard size 1.701" to accommodate 1 1/4 " conduit or chase nipple.

(5) Chassis Ground Tie Point

(6) DC Raceway

This raceway provides a method of routing DC cables from the SLM to connect to the RE-4500 Inverter.

F 5 Figure 4.0-4 DC Raceway



(7) DC Voltage Out Terminals

These two terminals provide the DC output voltage from the SunLynx Module to the RE-4500 Inverter.

(8) PV Array Circuit Breaker (Ground Fault Detector is an Option)

This Circuit Breaker selects whether the SLM is connected to the RE-4500 Inverter. There is one (1) 60 amp circuit breaker for the entire array. There is an optional GFDI available for this breaker.

(9) Solar Panel Fuses (Part of Optional Combiner Module)

These fuses are 8 Amp fuses designed to protect in case of a fault either with the Solar Array or with the RE system. There are eight of these fuses (1 for each Solar Array).



For Continued Protection Against Risk Of Fire, Replace The Combiner Module Fuses With Only With Same Type And Ratings Of Fuse (Maximum 8 Amp).

(10) Solar Panel Termination Strip (Part of Optional Combiner Module)

This terminal strip provides termination points for 8 strings of 48VDC Solar Arrays. Contains + and – DC input connections from the Solar Array.

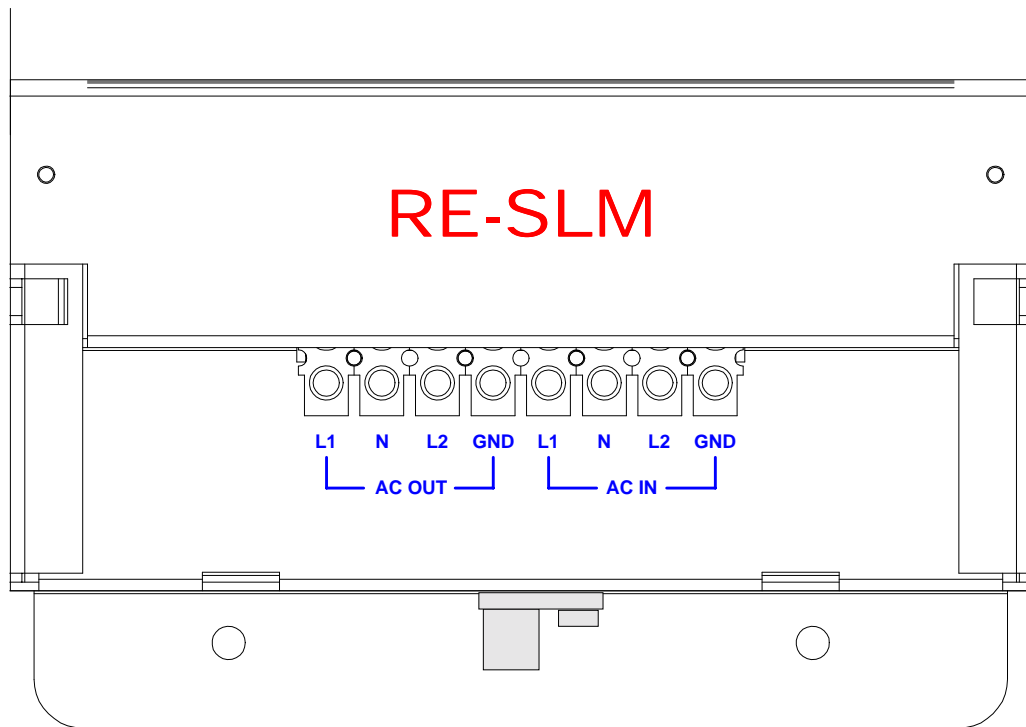
(11) AC Breaker (Optional)

This 50 Amp (maximum) 240 VAC breaker provides a convenient disconnect and acts as a protection element for the RE48-4500 system. There are also optional configurations for a 20 amp and 30 amp AC Breaker.

(12) AC Raceway

This raceway provides a method of routing AC cables to connect to the RE-SLM to the RE-4500 Inverter/Charger, and to the utility.

F 6 Figure 4.0-5 AC Raceway (AC Option Installed)



(13) AC Output to Inverter Terminals

These terminals are used to connect the output wires from the RE-SLM to the RE-4500 system if the AC breaker and Surge Arrester options are installed.

(14) AC Input from Utility Terminals

These terminals are used to connect the input wires from the Utility to the RE-SLM if the AC breaker and Surge Arrester options are installed..

(15) Mounting Bolt Slots

5 INSTALLATION and START-UP

This section will provide the user with information to install the RE-SLM into a power system.

5.1 Installation and Start-up

This installation procedure is to provide a method for installation of the RE-SLM. Please refer also to the RE-4500 Owners Manual for information on installing the Inverter.

Unpacking the SLM

1. Inspect the shipping container and equipment for loose or damaged parts. If any damage is found, immediately notify the freight carrier.

Inverter and SLM Installation Considerations

1. Mounting: Locate a secure, dry, flat vertical surface large enough to mount the SLM (and Inverter). The location should provide adequate ventilation while the SLM and inverter are operating. The location must be clean, dry and free of dripping water, or other moisture contamination.
2. The RE-4500 weighs approximately 28 pounds and is designed for vertical mounting. Mounting bolt pattern is 6" horizontal x approximately 30" vertical.
3. Take into account Cooling Fan Clearance for the RE-4500 (if the RE-SLM is to be installed with the RE-4500): If the RE-SLM is to be installed with the RE-4500, the mounting location must allow unobstructed airflow for cooling the RE-4500. Remember to take this into account when mounting the SLM. Allow a minimum clearance of 12 inches (30.48 cm) on bottom of the RE-4500. The Cooling Fan is a thermostatically controlled exhaust fan. Air is drawn into the inverter from the intake vents and exhausted by the fan. Obstruction of the fan exhaust or the intake vents will diminish the inverter output capacity due to overheating.
4. The wiring of your inverter and SLM installation should conform to the National Electric Code (NEC), ANSI/NFPA 70 and any other state or local codes in effect at the time of installation. These codes have been written for your protection and their requirements should be followed.
5. Remove the top cover (for the DC Raceway) to expose the DC wiring compartment and the DC Utility Terminal Block.
6. Route the AC output wiring with as much physical separation as possible from low voltage wiring such as audio and video signal wires, and the Input DC wiring. This is accommodated in the system through the physical separation of the AC and DC wiring raceways.
7. To conform to local and national electrical codes, proper installation of strain reliefs and/or conduit is important. If strain reliefs are used, tighten the strain relief cable clamps to keep the wire from moving around in the entry/exit port.



WARNING

All diagrams in this document are for informational purposes ONLY!!!
Please refer to National, State, and Local Electrical Wiring codes to insure compliance and safety!



WARNING

It is important to disconnect ALL AC and DC sources to avoid electric shock!

If possible, disconnect the Solar Array at the junction box prior to wiring between the Solar Junction Boxes and the RE-SLM.

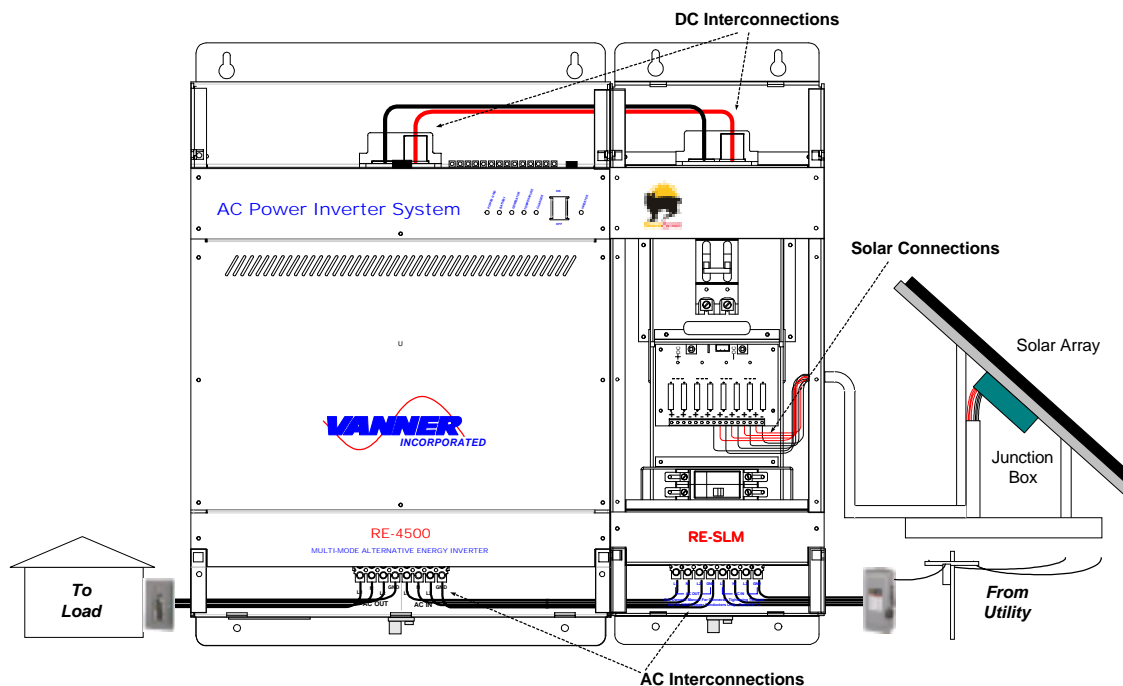
DC Voltage is extremely dangerous and contact with DC Currents can lead to injury, damage to property, and death!

Use the DC disconnect to insure that ALL potentials are disabled.



WARNING

F 7 Figure 5.1-1 RE-SLM System Interconnection Diagram (Shown with Combiner Option)



5.1.1 DC Wiring Considerations

1. The wiring of your RE-SLM installation should conform to the National Electric Code (NEC) and any other state or local codes in effect at the time of installation. These codes have been written for your protection and their requirements should be followed. Article 690 of the NEC requires any DC cable from a solar panel, be protected by a fuse. This consideration is taken care of in the SunLynx Module through the optional combiner module fuses. It should be noted that if the combiner board option is not installed, this overcurrent protection must be provided by some other approved device so that NEC Article 690 can be met.



It is important to disconnect ALL AC and DC sources to avoid electric shock!

If possible, disconnect the Solar Array at the junction box prior to wiring between the Solar Junction Boxes and the RE-SLM.

DC Voltage is extremely dangerous and contact with DC Currents can lead to injury, damage to property, and death!

Use the DC disconnect to insure that ALL potentials are disabled.



2. Route the DC power wiring and AC output wiring with as much physical separation as possible from low voltage wiring such as audio and video signal wires.
3. Route the DC positive and negative cables as close together as possible and use cable ties to keep them together. This reduces electromagnetic radiation that could interfere with sensitive electronics.
4. If passing through steel or other ferrous metal walls, the DC input cables need to pass through the same hole to prevent causing a transformer effect. If two holes are required, cut a slot to connect the two holes to prevent heating of the ferrous metal.
5. If passing through any sort of holes, make certain that strain reliefs are used to avoid cutting or abrasion of insulation over time.
6. **Proper DC cable size is critical** for the performance and safe operation of the RE-SLM system. It is recommended by Vanner that the installer use 4/0 AWG wire to minimize losses to less than ½ volt over the length of the cable between the RE-SLM and the Inverter. This wire needs to be rated for 90°C.
7. **DC cables should be as short as possible to minimize losses.**

5.1.2 DC Wiring Installation Procedure

1. The DC wiring raceway is located on the top of the RE-SLM. The DC cables may exit the RE-SLM through left or right side openings to the raceway. Bolts are provided for connecting 5/16 diameter ring terminals to the DC Input Contacts. Optional compression lugs (Vanner part no. D08241) are available for cables sizes up to 250 MCM.
2. Route the DC power wiring and AC output wiring with as much physical separation as possible from low voltage wiring such as audio and video signal wires.
3. Route the DC positive and negative cables as close together as possible and use cable ties to keep them together. This reduces electromagnetic radiation that could interfere with sensitive electronics.
4. If passing through steel or other ferrous metal walls, the DC input cables need to pass through the same hole to prevent causing a transformer effect. If two holes are required, cut a slot to connect the two holes to prevent heating of the ferrous metal.
5. If passing through any sort of holes, make certain that strain reliefs are used to avoid cutting or abrasion of insulation over time.
6. Proper DC cable size is critical for the performance and safe operation of the inverter system. It is required by Vanner that the installer use 4/0 AWG wire to minimize losses to less than 1/2 volt over the length of the cable. This wire needs to be rated for 90°C.
7. DC cables should be as short as possible to minimize losses.
8. The DC power connections to the inverter require that 5/16" Dia. ring terminals be used for connection to the inverter unless the optional mechanical compression blocks (Vanner P/N D08421) are used. A list of suitable terminals, as well as the tools required to crimp them, are shown in Table 5-1.

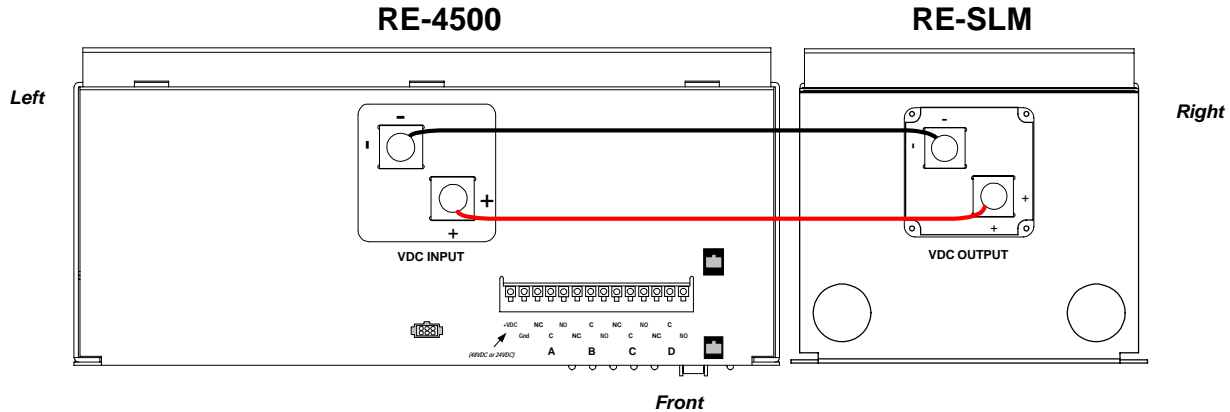
T 2 Table 5.1.2-1 Ring Terminals for 4/0 DC Cables

UL Listed Ring Terminals for 4/0 DC Cables

Molex Part Number	Size	Model	Crimping Tool Part Numbers
L-395-56	5/16" DIA.	Versacrimp	DLHH, PDDLH, SKT-840*
L-995-56		Nylacrimp	

*This tool is for crimping Versacrimp style terminals only.

F 8 Figure 5.1.2-1 DC Raceway Terminations



9. Select a location for the RE-SLM. An ideal location is close to the solar array; protected from weather and moisture; and well ventilated.



It is important to disconnect ALL DC sources to avoid electric shock!

DC Voltage is extremely dangerous and contact with DC Currents can lead to injury, damage to property, and death!

Use the DC disconnect to insure that ALL potentials are disabled.



10. Remove the cover plate on the DC cable raceway to expose the positive and negative DC connections.
11. Prepare DC cable ends for interconnection to the RE-4500. Use ring terminals or, if using the optional D08241 Compression Lugs, leave the cable ends bare.
12. Conduit knockouts are provided. Bolts and spring washers are provided for connecting 5/16" diameter ring terminals to the DC Input Contacts. Optional compression lugs (Vanner part no. D08241) are available for cables sizes up to 250 MCM.
13. Verify that the DC cables are still disconnected from the Solar Array (or other DC Source). Insert DC cables through the entry/exit port and into the DC wiring raceway. Torque DC cable mounting bolts to 180 inch pounds. Re-torque after 30 days. (If using the optional D08421 Compression Lugs, torque the Allen mounting screw to 180 inch pounds and the Allen compression screw to 105 inch pounds. Re-torque after 30 days.
14. Inspect the DC cable compartment to be sure no copper wire fragments are present after tightening cables.
15. Route the negative DC cable to the Inverter. Verify cable polarity before proceeding.



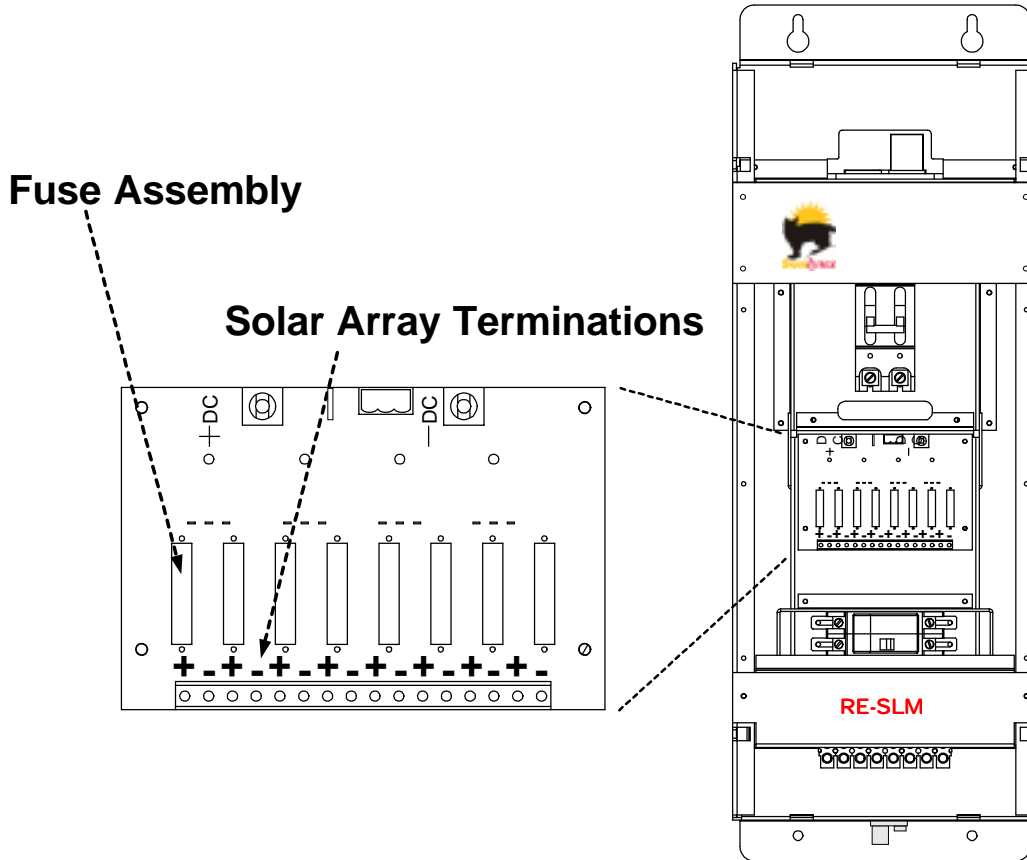
If the cables are reversed, the RE-4500 fuse will be blown and inverter can be damaged.



16. Route the positive DC output cable to the RE-4500. Protect cables with loom and use grommets or other appropriate means where cables may contact hard, sharp edges.
17. Verify DC wiring installation. Verify that all connections are tight. Secure all wiring and replace the DC Raceway cover.

5.2 Solar Array Connection Procedure

F 9 Figure 5.2-1 Solar Terminations (Optional Combiner Board Shown)

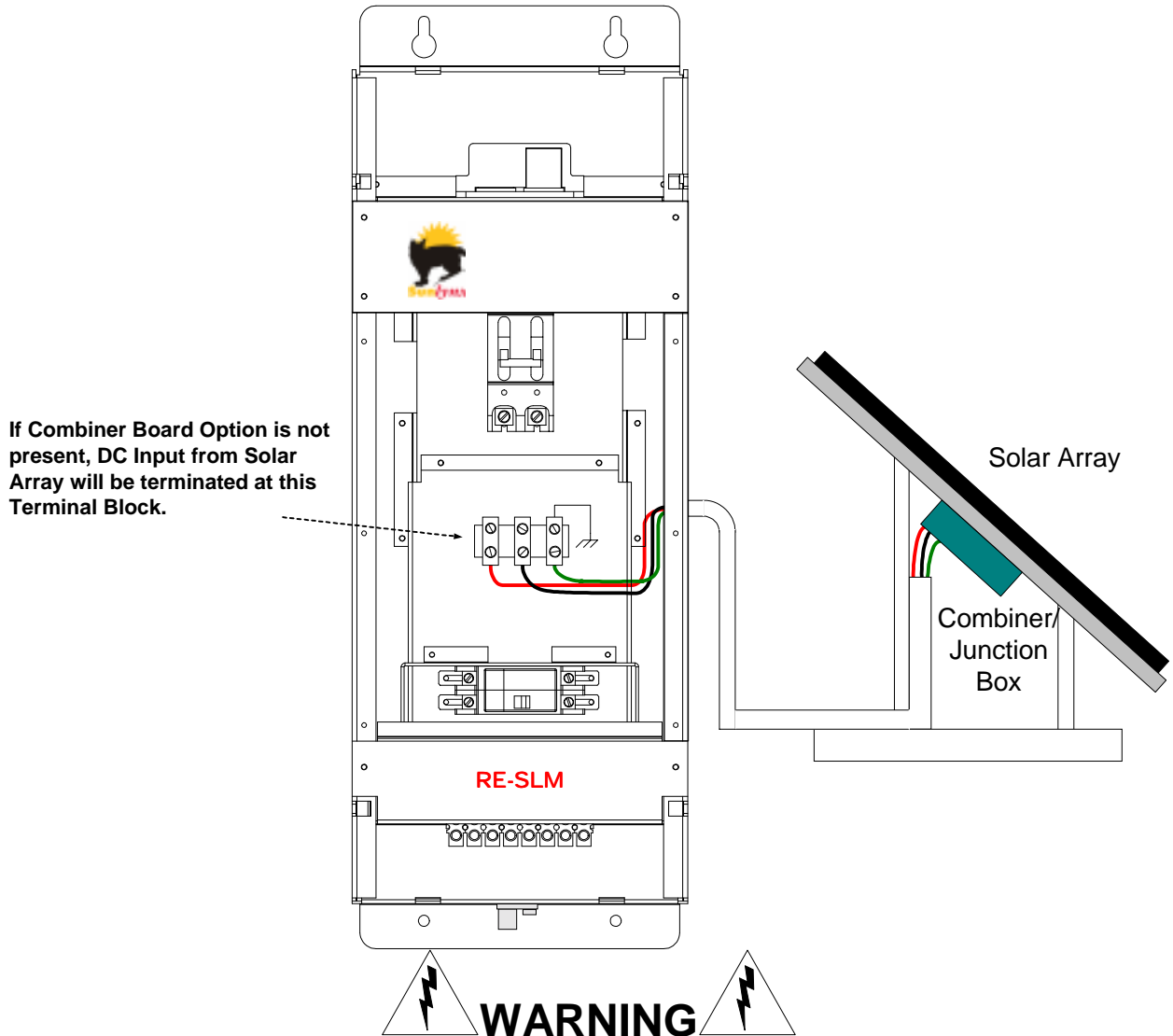


 **WARNING** 

Before proceeding with the DC wiring, verify that the inverter is OFF. Serious or fatal electrical shock may occur.

Note: It is recommended that all DC wiring to the Solar Array be done with 10 AWG 90°C wire (12 AWG minimum). Keep wires as short as possible to minimize losses over the wire and to minimize hazard of fire. Make certain that the wiring conforms to National and Local Electric Codes.

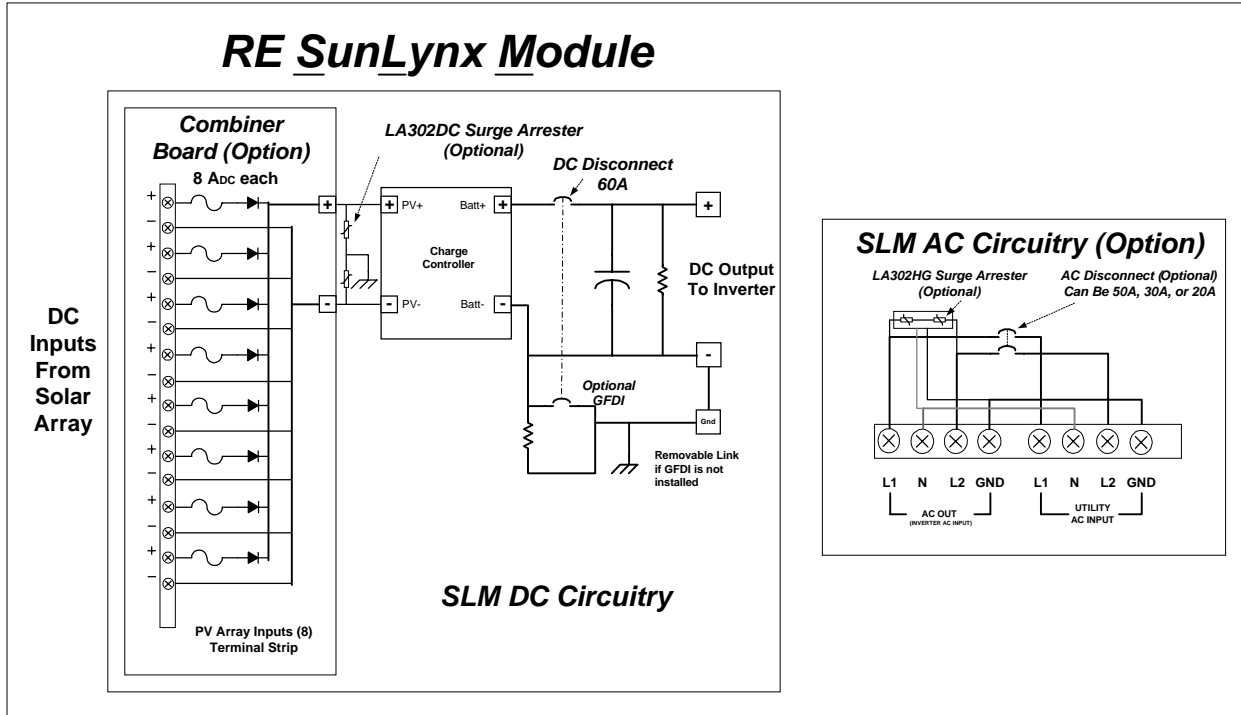
F 10 Figure 5.2-2 Solar Terminations (without Combiner Board Option)



Before proceeding with the DC wiring, verify that the inverter is OFF. Serious or fatal electrical shock may occur.

Note: It is recommended that all DC wiring from the terminal block (no Combiner Board Option) to the Solar Array be done with 8 AWG 90°C wire (10 AWG minimum). This is to insure maximum system efficiency, minimal losses over the copper, and reduce the possibility of Fire. Make certain that the wiring conforms to National and Local Electric Codes.

F 11 Figure 5.2-3 SLM Schematic



! Note !

The Output Neutral is Not Bonded to Ground internally.

! Note !

It should be noted that the RE-SLM enclosure is not grounded and should be when required by Section 690-41, 690-42, and 690-43 of NEC/NFPA 70-1999.

! Note !

It should be noted that if the Optional DC Ground Fault Detector is installed, that the Solar Array Chassis Ground must be tied to the RE-SLM Chassis Ground Point, and then tied to the Residential Earth Ground Rod in accordance with Code.

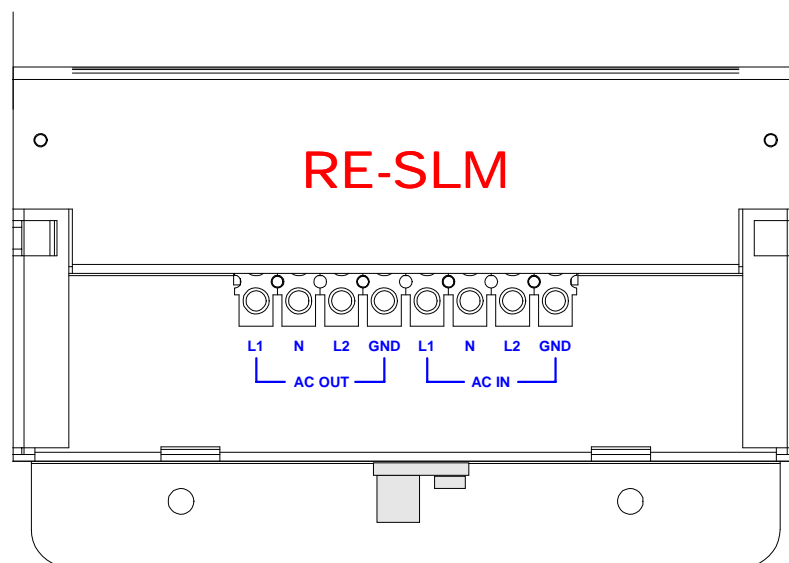
All of the SLM's electrical connections are labeled.

1. Place ALL Disconnects on the SLM and Service Disconnects in the OFF position to avoid electrical shock.
2. Remove the Front Panel from the SLM to expose the Solar Array Terminations on the Optional Combiner Module.
3. Solar Connection: Connect to the DC Solar Termination terminals of the optional Combiner Module, while observing polarity using 10 AWG 90°C wire recommended for best performance (12 AWG 90°C minimum). If the Optional Combiner Module is not present, the provided terminal strip are available for connecting the Solar Array to the RE-SLM using 8 AWG 90°C wire (10 AWG minimum for best performance).
4. Verify that the Solar Panel cables are disconnected from the DC Source. Insert DC source cables through the entry/exit ports and into the Optional Solar Combiner Terminal strip (or appropriate terminal of the DC Input Terminal Strip if the Combiner Board is not used). Connect the positive and ground to the appropriate terminals on the terminals and torque each of the DC terminal screws to 15 inch pounds. Re-torque after 30 days.
5. Inspect the DC cable compartment to be sure no copper wire fragments are present after tightening cables.
6. Route the positive DC input wires to the Solar Panel junction boxes. Protect cables with loom and use grommets or other appropriate means where cables may contact hard, sharp edges.
7. Verify DC wiring installation. Verify that all connections are tight. Secure all wiring and replace the RE-SLM cover.
8. RE-connect any disconnections made at the Solar Array Junction Boxes.

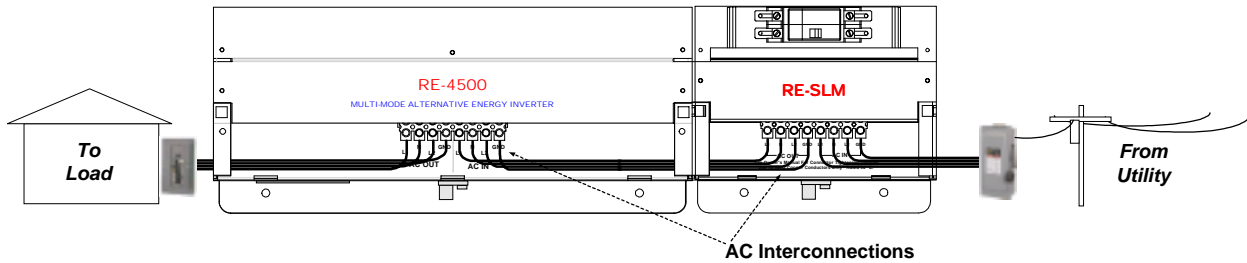
5.3 AC Raceway Wiring Installation Procedure

This section covers the interconnection and wiring of the RE-SLM AC Raceway (shown below in Figure 5.3-1.

F 12 Figure 5.3-1 SLM AC Raceway Connections



F 13 Figure 5.3-2 RE-SLM to RE-4500 AC Connections



1. All of the ACM's electrical connections are labeled.
2. Place ALL Disconnects on the SLM and Service Disconnects in the OFF position to avoid electrical shock.
3. Remove the access covers to the AC raceways.
4. Verify that there are no voltages present on the output of the AC Service Disconnect and that the disconnect is operating properly
5. Utility Connection: Connect 240 Volt Vrms Three wire Utility L1, L2, N, and GND to the AC Utility terminals using 10 gauge wire minimum (8 gauge recommended for best performance).

Note: The size gauge of this wire will be dictated by the size of the AC Breaker (recommendations in this section are based on a 50A breaker).

6. Verify that the AC utility cables are still disconnected from the AC Utility. Insert AC utility cables through the entry/exit port and into the AC wiring raceway. Connect L1, N, L2 and ground to the appropriate terminals in the terminal strip and torque each of the AC terminal screws to 15 inch pounds. Re-torque after 30 days.
7. AC Output Connection (Inverter In): Connect 240 Volt Vrms Three wire AC Output L1, L2, N, and GND to the Inverter AC Input on the RE-4500 using 10 gauge wire minimum (8 gauge recommended for best performance based on the Optional 50A breaker).
8. Verify that the RE-4500 is off and that the AC utility cables are still disconnected from the AC Utility. Insert AC Output (to Inverter) cables through the entry/exit port and into the AC wiring raceway. Connect L1, N, L2 and ground to the appropriate terminals in the terminal strip and torque each of the AC terminal screws to 15 inch pounds. Re-torque after 30 days.
9. Chassis Ground (28): Connect to compression fitting terminal using 10 AWG 90°C wire minimum (8 AWG recommended for best performance).
10. Use the Chassis Ground compression fitting (28) to ground the chassis using 10 AWG 90°C wire. Connect the chassis ground wire to the compression fitting and torque the bolt to 75 inch pounds. Re-torque after 30 days.

5.4 Final Inspection

1. Inspect AC and DC raceways to verify that no scrap or loose wire is present before securing the AC Raceway cover.
2. Verify AC and DC wiring installations. Verify that all connections are tight. Secure all wiring and replace the AC Raceway cover.

3. Secure AC and DC raceway and front panel covers.

5.5 Startup

This section covers the start up of the RE-SLM. It is assumed that the RE-4500 Inverter has been fully installed at this time. If it has not, please complete the installation of the RE-4500 by following the instructions in your RE-4500 Installation Manual.

1. Make certain that the RE-4500 power switch is in the "Off" position.
2. Place Service disconnects external to the RE-SLM in the "On" position.
3. Verify that 240 VAC is present on the AC Input terminals to the RE-SLM
4. Remove the Front Panel of the RE-SLM, along with the AC Raceway and DC Raceway covers.
5. If the solar array is providing power, verify that a DC voltage is present on the Solar Terminations of the Optional Combiner module.
6. Check to see that the output DC Voltage (approx. 54 volts) is present on the Input to the DC Breaker (bottom terminals).
7. Turn the DC Disconnect to the "On" position and verify that the output DC voltage is present on the Input terminals to the RE-4500 Inverter.
8. Verify that 240 VAC is present on the input to the Optional AC Breaker (right hand terminals).
9. Turn the Optional AC Breaker to the "On" position and verify that 240 VAC is present on the AC Input terminals to the RE-4500 Inverter.
10. Re-install the Front Panel of the RE-SLM, along with the AC Raceway and DC Raceway covers.
11. Proceed to the check out of the RE-4500 following the checkout in the RE-4500 Owners Manual.



6 Preventive Maintenance and Trouble Shooting Procedures

Preventive Maintenance

For continued reliability and safety, a monthly maintenance program should be implemented to include the following:

1. Check to insure that all wiring connections are tight, secure and corrosion free.
2. Examine connectors, indicators and switches for cracks and breaks.
3. Examine any surfaces that are discolored or deformed due to excessive heat.

Trouble Shooting Procedures

The following are the most common questions heard by Vanner service professionals. If your situation does not apply to the following categories, please contact your local Vanner Inc. Service Center or the Vanner Inc. Customer Service Department: 1-800-AC-POWER (1-800-227-6937). Please have your model and serial number available when consulting customer service.

7 APPENDIX

7.1 Warranty

NORTH AMERICAN LIMITED WARRANTY

Vanner Inc., doing business as The Vanner Inc., referred to herein as Vanner, warrants that this product is free from defects in materials and workmanship for a period of two (2) years from date of installation or two and one half (2 1/2) years from date of manufacture, whichever is less if and only if the following requirements are complied with:

1. The product is installed and checked out properly according to all guidelines, instructions, and checkout procedures set forth in the product Installation and Operating Manual.
2. The installer records all checkout data required and completes, signs, and returns the warranty registration card to Vanner within ten (10) days after installation.
3. The product was purchased after January 1, 2000.

Vanner does not warrant its products against any and all defects when: defect is a result of material or workmanship not provided by Vanner; normal wear and tear, or defects caused by misuse or use in contrary to instructions supplied, neglect, accident, reversed polarity, unauthorized repairs and/or replacements.

Vanner does not manufacture this product for use in a life supporting or life sustaining role. Please contact Vanner if you have any questions along this line.

All warranties of merchantability and fitness for a particular purpose: written or oral, expressed or implied, shall extend only for a period of two (2) years from date of installation or two and one half (2 1/2) years from date of manufacture, whichever is first. There are no other warranties that extend beyond those described on the face of this warranty. Some states do not allow limitation on how long an implied warranty lasts, so the above limitations may not apply to you.

Vanner does not undertake responsibility to any purchaser of its product for any undertaking, representation, or warranty made by any dealers or distributors selling its products beyond those herein expressed unless expressed in writing by an officer of Vanner.

Vanner does not assume responsibility for incidental or consequential damages, including, but not limited to, responsibility for loss of use of this product, removal or replacement labor, loss of time, inconvenience, expense for telephone calls, shipping expense, loss or damage to property, or loss of revenue. Some states do not allow the exclusion or limitation of incidental or consequential damages, so these limitations may not apply to you.

Vanner reserves the right to repair, replace, or allow credit for any material returned under this warranty. Any damage caused by the customer will be charged or deducted from the allowance.

All warranty work will be performed at Vanner's factory, by authorized Vanner distributors, by Vanner installers/technicians, or a Vanner authorized repair facility utilizing a valid Warranty Authorization Number (WAN) prior to repair. Products shall be delivered to Vanner's facility, freight prepaid and fully insured. Products repaired under warranty, or replacement parts or products will be returned to North American location prepaid via same transportation means and level of service as received, unless directed otherwise. Prepaid freight policy does not apply to locations outside North America.

7.2 Application Notes

Please refer to the Vanner Incorporated Web site for Application notes at:

<http://www.vanner.com>

7.3 Applicable Documents

National Electric Code 1999

NEC Article 690

UL-1741

IEEE-929



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**Manual Part Number D910770
Printed in USA**