GENIUS NORTH AMERICA

↘ INSTALLATION AND COMMISSIONING GUIDE

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Important: Read carefully before use. Keep for future reference.

→ 1.0 GETTING STARTED

IMPORTANT SAFETY INSTRUCTIONS

Read this manual thoroughly and make sure you understand the procedures before you attempt to install or operate this equipment.

+ This product is intended for charging vehicles only.
+ This product shall be installed, adjusted, and serviced by qualified electrical personnel.
+ Isolate the product from any electrical source before wiring or servicing it. Failure to follow this may lead to severe bodily injury or death.
+ This product shall be installed by a qualified electrician, and installation must be in accordance with all applicable local and national electrical codes and standards. Failure to observe this warning could result in death or severe injury.
+ Do not use extension cords for charging.

ELECTRIC SHOCK PREVENTION MEASURES

+ Do not expose the live part of this product and its cables.
+ This product must be grounded through a permanent wiring system or an equipment grounding conductor.
+ Install circuit breakers to reduce the severity of electric shock accidents.
+ Limit the authorized personnel responsible for handling switches on electrical appliances.
+ Do not touch this product with wet hands.
+ Be sure to use standard regulation fuses for switches and do not use copper/steel wire.
+ Do not use faulty or malfunctioning cables or breakers on this product.

ELECTRIC FIRE PREVENTION MEASURES

+ The cables and wires used to install this product must satisfy local laws and regulations.
+ Do not share the power source of this product with other appliances.
+ Keep combustible material away from the installation area of this product.
+ Keep sufficient distance from any other the heat source.
+ Take care not to damage or overheat the wire coating of this product and its connections.
+ Install an automatic power off device in case of abnormal rises in temperature within this product.

WARNINGS

+ The instructions and warnings contained in this manual must be followed when installing, using, and maintaining this product.
+ This device should be supervised when used around children.
+ Do not put fingers into the electric vehicle connector.
+ Do not use this product if the flexible power cord or EV cable are frayed, have broken insulation, or any other signs of damage.
+ Do not use this product if the enclosure or the EV connector is broken, cracked, open, or shows any other indication of damage.
+ Do not install or use the product in any environment full of flammable, explosive, harsh, or combustible materials, chemicals, or vapors.
+ Isolate the product from any power source before installing or servicing it.
+ Do not use the product if it is found defective, cracked, frayed, broken or otherwise damaged, or fails to operate.
+ Do not attempt to open, disassemble, repair, tamper with, or modify the product. The product is not user serviceable.
+ Do not use the product when either you, the vehicle, or the product is exposed to severe rain, snow, electrical storm, or other severe weather conditions.
+ When transporting the product, handle with care. Do not drag it or step on it or subject it to any strong force.
+ Do not touch the product's terminals with sharp metallic objects.
+ Do not forcefully pull the charge cable.
+ Do not insert foreign objects into any part of the product.

CAUTIONS

+ Incorrect installation of, and testing on, this product could potentially damage either the vehicle's battery and/or this product. Any resulting damage hereof invalidates the warranty for the product.
+ Operate the product in the temperature range specified in the specification.
+ Ensure that the charge cable is positioned so it will not be stepped on, tripped over, or subjected to damage or stress.
+ This product shall be connected to and form a dedicated circuit with a proper circuit breaker that satisfies the local electrical requirements.
+ Do not use this product if the EV cable shows any sign of damaged insulation.
+ Do not use this product if the enclosure or the EV connector shows any indication of damage.
+ The power wires connecting to this product from the circuit panel shall be routed through an approved conduit or jacket.

FCC DECLARATION OF CONFORMITY – CLASS B

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B 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 users will be required to correct the interference at their own expense.

Connections between the Harmonic equipment and other equipment must be made in a manner that is consistent with maintaining compliance with FCC radio frequency emission limits. Modifications to this equipment not expressly approved by Harmonic may void the authority granted to the user by the FCC to operate this equipment and you may be required to correct any interference to radio or television communications at your own expense.

RETURN FOR SERVICE

In the unlikely event you encounter operational problems with the charger that cannot easily be fixed, please refer to the EO Charging Product Warranty Guide for instructions related to the repair of the charger.

SAVE THESE INSTRUCTIONS

The purpose of this manual is to provide you with information necessary to safely install, operate and maintain this equipment. Keep this manual for future reference.

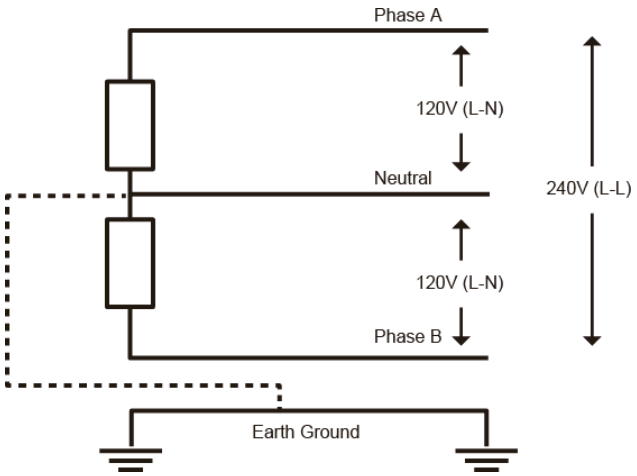
→ 2.0 INTRODUCTION

2.1 RESIDENTIAL INSTALLATIONS

2.1.1 SINGLE-PHASE 120V/240V INSTALLATIONS USING 240V (L-L)

The most common source of AC power for residential use is single-phase 120/240 (also referred to as Split Phase 240).

This configuration consists of 2 voltage legs that are 180 degrees apart. The voltage between the two legs (called phase to phase or line to line) is 240V and the phase to neutral voltage is 120V. Some list the phase-to-phase voltage in which case this is referred to as 240/120 single phase.

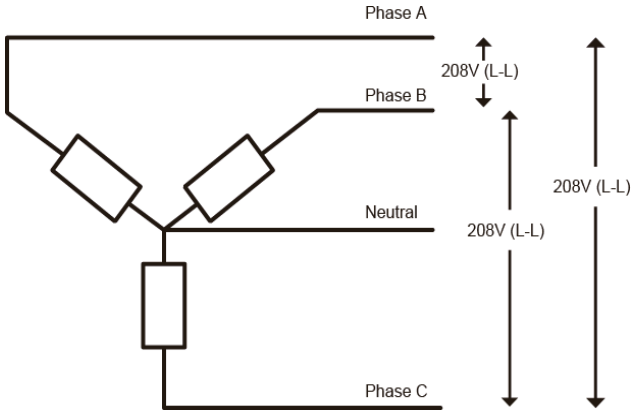


2.2 COMMERCIAL INSTALLATIONS

2.2.1 THREE-PHASE WYE INSTALLATIONS USING ANY L-L

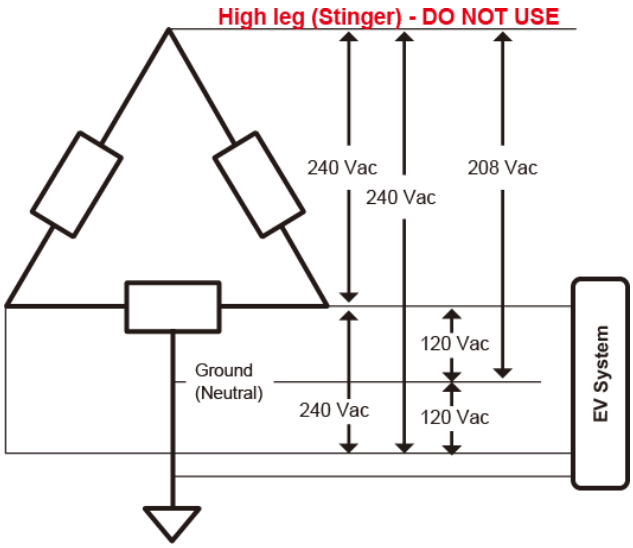
The most common source of AC power for light commercial environments is 208/120 WYE.

In this configuration, the line to line (L-L) voltage is 208VAC and the line to neutral (L-N) voltage is 120VAC. This may also be designated as 120/208VAC, 120/208 WYE, 208/120 WYE, 4-wire WYE or 120/208Y.



2.2.2 THREE-PHASE 240V HIGH LEG DELTA INSTALLATION

Three phase delta configuration is supported only with a grounded center-tapped leg, and only using the legs on each side of the center tap.



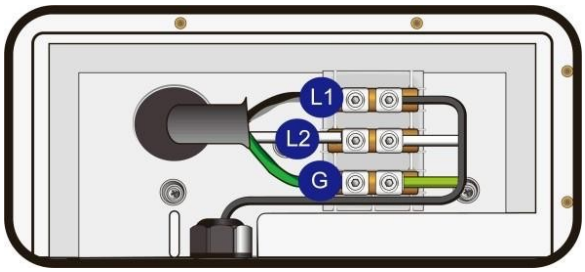
2.3 CONNECTING TO THE INPUT TERMINAL BLOCK

When connecting to the input terminal block, torque lugs (L1, L2, G) to 65 lb-in.

If the cable comes in from the back, the cable will enter straight into the cable terminal cabinet. Secure the three wires to the corresponding terminals as shown in the following figure.

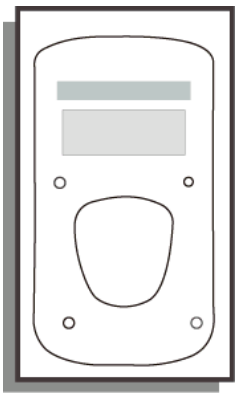
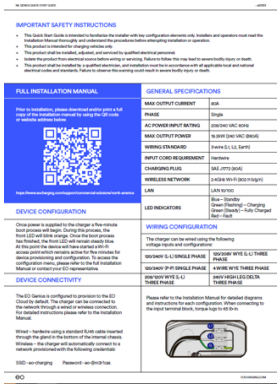
Note: The cable hole must be sealed properly to keep the terminal cabinet watertight.

CAUTION: To reduce the risk of fire, connect only to a circuit with appropriately sized conductors and branch circuit.



→ 3.0 UNPACKING

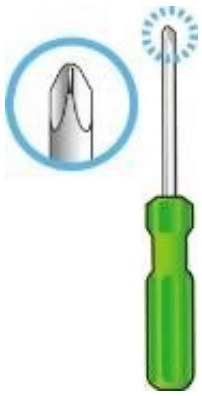
Verify you received the components in the table below:

EO Genius Charger (with the charging cable attached)	Mounting screws (with washer) x 4 (M8 × 1.25 × 40mm x D18 x H1 .2)	Mounting template	Quick Start Guide
			

Note: It is recommended to keep the packaging material for potential transportation or storage in the future.

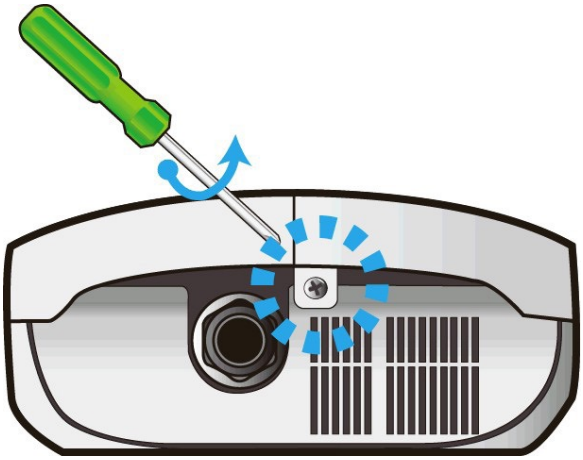
→ 4.0 PREPARATION

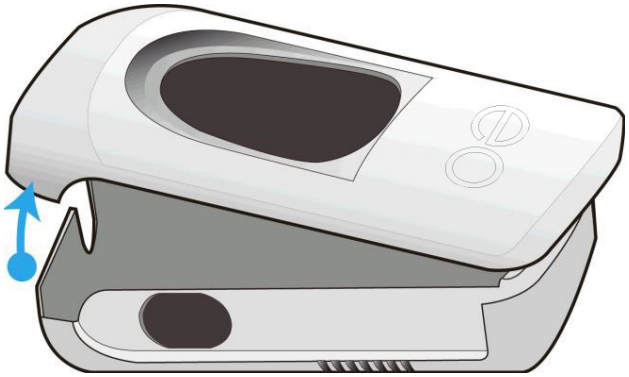
Installation often requires the following tools:

Philips Screwdriver (PH#4)	Torx Screwdriver x2 (T20 & T45)	Hole Saw (2”)	Allen Wrench (4mm)
			

4.1 OPENING THE FRONT COVER

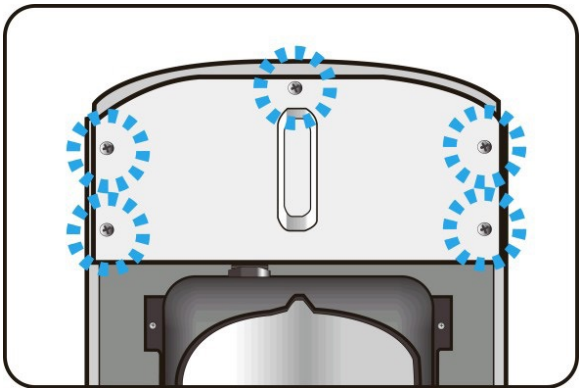
1. Locate the Torx screw on the bottom side of the cover. Using a T20 Torx screwdriver, remove the screw.
2. Hold and lift the cover from the bottom.
3. Keep the cover and screw in a safe place.

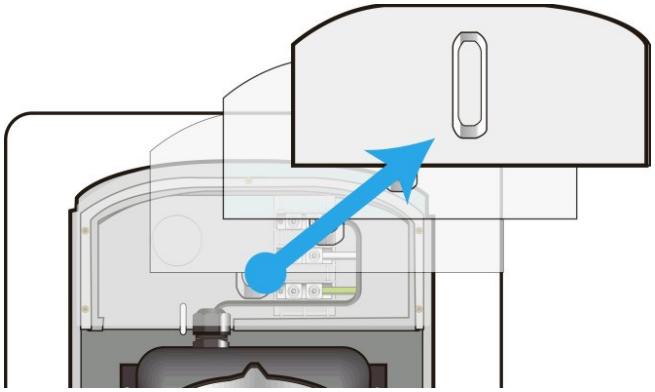




4.2 ACCESSING THE CABLE TERMINAL CABINET

1. Locate the five screws as shown below. Use a M4 Philips screwdriver to remove them.
2. Take the cabinet off.
3. Keep the cover and five screws together in a safe place.

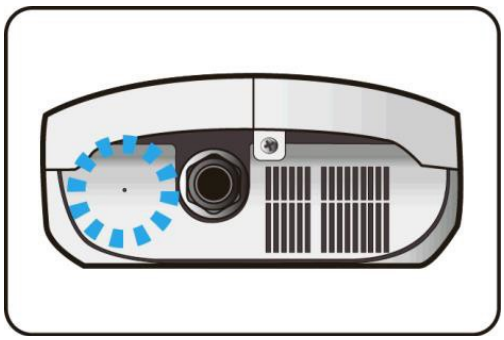
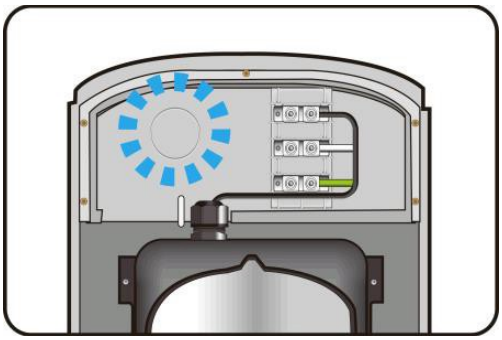




Note: The terminal cabinet cover contains a rubber gasket that may fall out during removal of the cover.

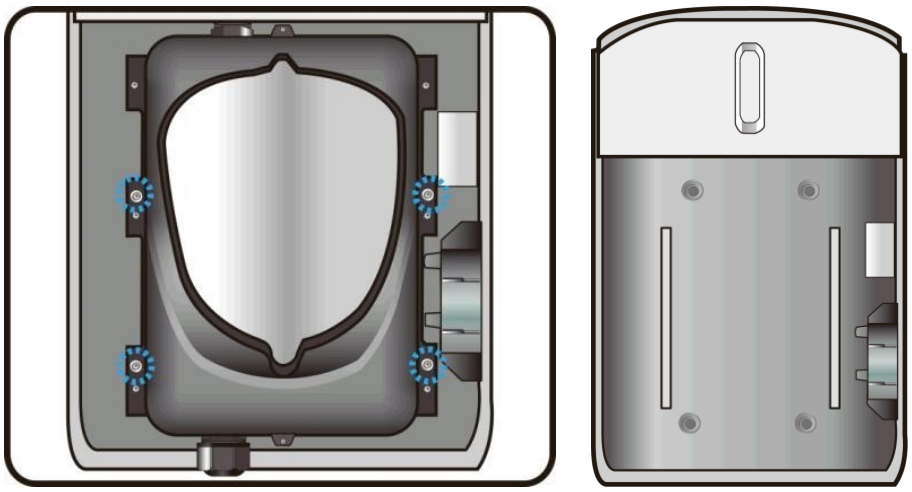
4.3 DRILLING ENCLOSURE FOR THE INPUT CABLE

There are two ways to insert the input cables: from the back and from the bottom. Choose either method and drill a 2” hole as shown below:

From the bottom	From the back
	

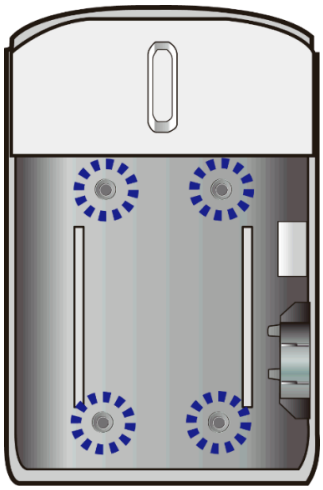
4.4 DRILLING THE MOUNTING HOLES

To access the back panel from the inside, use an M4 Philips screwdriver to remove the four Philips screws and release the inner electrical enclosure. Either remove the box by disconnecting the power leads from the terminal block inside the cable terminal cabinet or gently roll the inner box to the side of the enclosure to gain access to the back wall of the enclosure.



Drill four holes to mount the EO Genius to the wall (see the following figure):

+ Drill the holes to fit M8 mounting screws.
+ Drill the holes at corresponding locations on the wall or backplane.

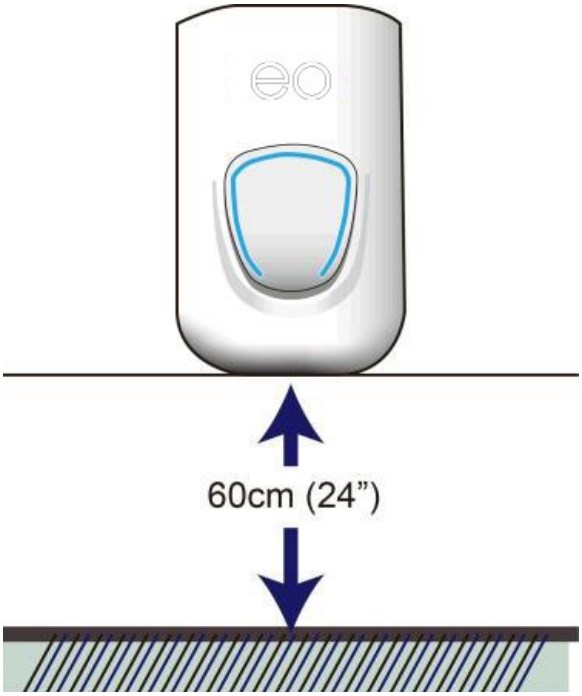


→ 5.0 INSTALLING THE CHARGING STATION

The following procedure may vary from the actual installation depending on the circumstances and is subject to proper adjustment, local building codes, or state regulations.

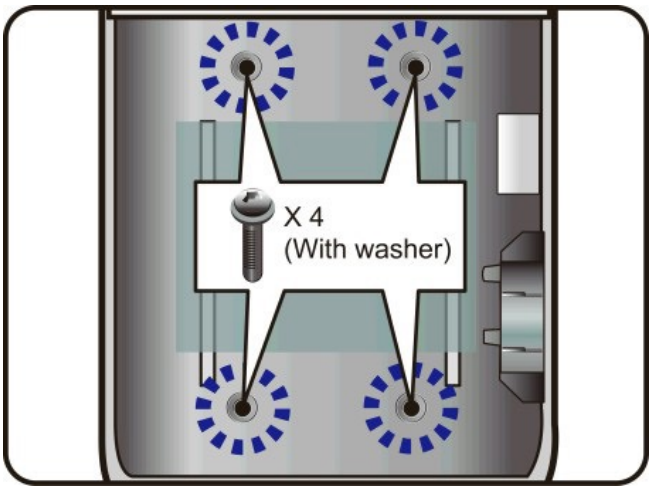
5.1 MOUNTING THE UNIT

1. Make sure the following are complete before mounting the unit
   I. Drill the input cable hole and the mounting holes on your charger as previously outlined.
   II. The installation height is at least 24” (60cm), as shown on the right.
2. Use the mounting layout template provided to drill holes on the wall.
   I. Tape the layout template on the wall in the position you plan to install the charger.
   II. Mark the mounting holes (which are marked as circles on the template) onto the wall.
   III. Remove the template.
   IV. Drill the 4 mounting holes (M8).



WARNING: If at any point you contact something metallic while drilling, stop immediately.

3. Mount and screw the charger to the wall, as shown in the following figure:



4. Seal the screws by applying a moisture resistance membrane.

5.2 CABLE CONNECTION AND WIRING

Input wiring should be sized according to all applicable local and national requirements and consider factors such as cable length and ambient temperature. Input wiring must be sized according to the required branch circuit rating. The table below shows the recommend minimum conductor sizes for connection from the main panel based on a 30° C ambient from NEC table 310.16.

Branch circuit and breaker rating	75°C copper types RHW, THHW, THW, THWN, XHHW, USE, ZW	90°C copper types TBS, SA, SIS, FEP, FEPB, MI, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE-2, XHH, XHHW, XHHW-2, ZW-2
15A	14 AWG	14 AWG
20A	12 AWG	12 AWG
25A	12 AWG	12 AWG
30A	10 AWG	10 AWG
40A	8 AWG	8 AWG
50A	8 AWG	8 AWG
60A	6 AWG	6 AWG
80A	4 AWG	4 AWG
100A	2 AWG	2 AWG

Additionally, the following guidelines must be observed:

+ Table 3-4 provides a reference for the minimum conductor size for the circuit from the panel. The required conductor size must also consider installation factors such as temperature correction and length of cable.
+ For connection to terminal block, a minimum wire size of 8AWG and maximum wire size of 1/0 are supported. This must be considered by the installer when selecting conductor size as the table above contains sizes below 8AWG.
+ Do not use GFCI breakers with this product. This product contains integrated Ground Fault protection.

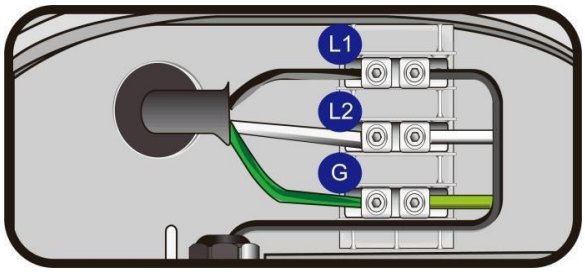
Use the following wire and torque force when connecting to the input terminal block, using conductor type other than RHH, RHW, and RHW-2 with outer covering.

Terminal	Conductor	Rating	Torque - LB-in (N-m)
L1, L2, G	1/0~8AWG	90C, copper wire	65 (8.5)

5.2.1 REAR CABLE INSTALLATION

If the cable comes in from the back, the following steps should be taken:

1. The cable will enter straight into the cable terminal cabinet. Secure the three wires to the corresponding terminals, as shown in the following figure.



Note: The cable hole must be sealed properly to keep the terminal cabinet watertight.

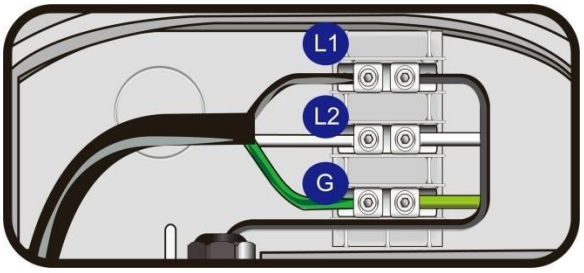
2. Replace the terminal cover and relevant screws.

5.2.2 BOTTOM CABLE INSTALLATION

If the cable comes in from the bottom, the following steps should be taken:

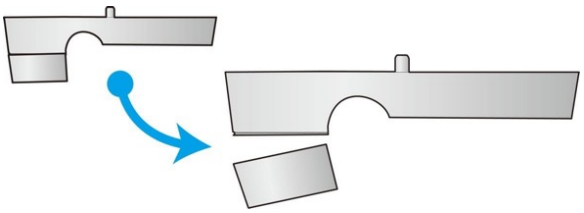
1. Insert the power cable from the hole drilled in the previous steps, and then pull the cable into the terminal cabinet.

2. Secure the three wires in the order shown below:



3. If necessary, apply proper cable ties or clamps to secure the cables and to relieve cable strain on the terminals.

4. Prior to replacing the terminal cover, cut the plate off the cover as showing in the following figure:



5. Replace the terminal cover and relevant screws.

WARNING: To reduce the risk of fire, connect only to a circuit provided with 100 amperes maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70, and the Canadian Electrical Code, Part 1, C22.2.

5.3 SELECTING THE OPERATING CURRENT

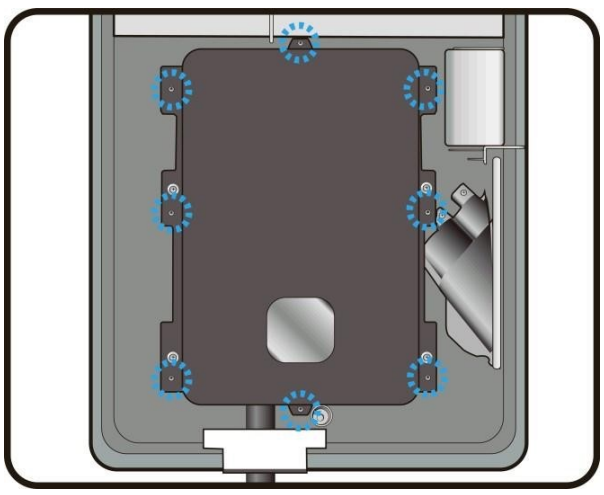
The charger contains a programmable maximum output current setting that allows the charger to operate as a 10A – 80A charger. The installer must determine the intended output power setting in the installation planning.

Note: This device is considered to be a “continuous load” device. As such, the branch circuit must be rated for 125% of the operating current.

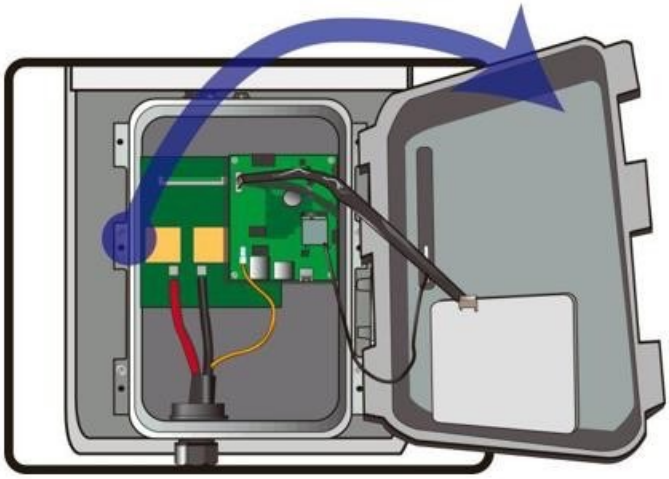
Current selection switch setting	Maximum output current	Required branch circuit and breaker rating
0	10A	15A
1	12A	15A
2	16A	20A
3	20A	25A
4	24A	30A
5	32A	40A
6	40A	50A
7	48A	60A
8	63A	80A
9	80A	100A

Current selection is performed by adjusting the rotary switch.

1. Open the inner electrical box by using a T20 Torx screwdriver to remove the eight screws as shown below.

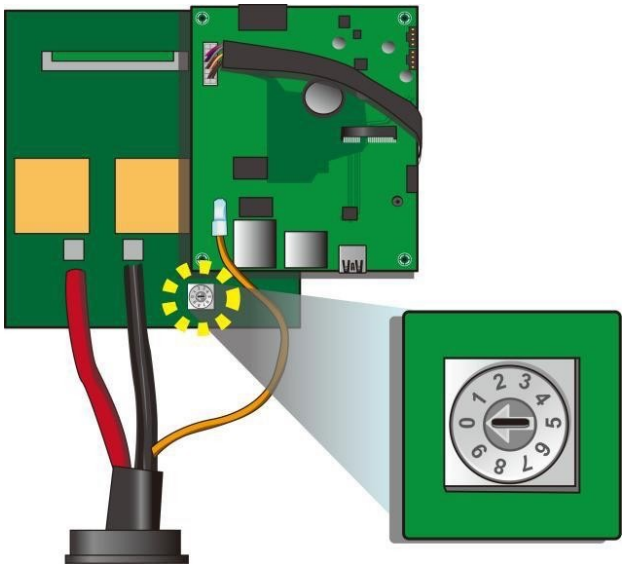


2. Open the box cover as shown.



Note: There are cables connected to the cover. Open the cover with care.

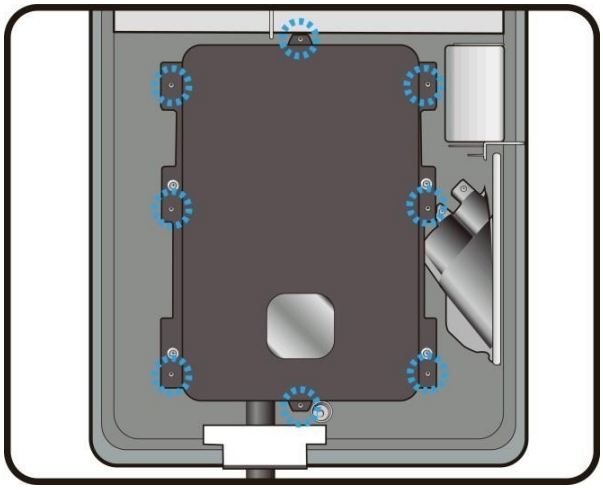
3. Select the relevant current setting from the rotary switch referring to the current selection table above.



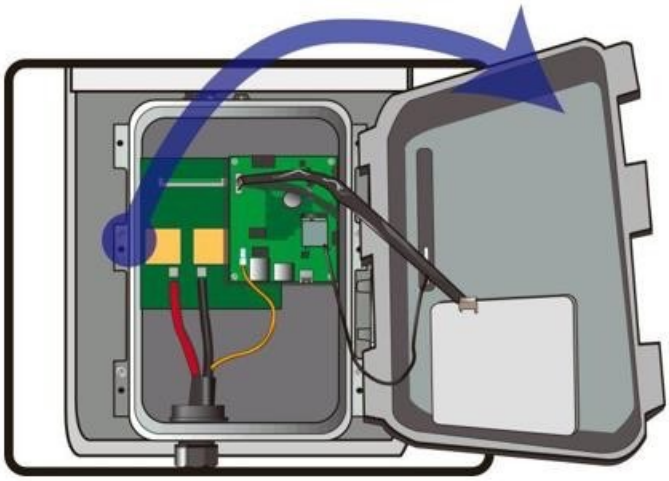
5.4 INSERTING AN RJ45 CABLE (OPTIONAL)

EO strongly recommends hardwiring the device to local infrastructure using an RJ-45 cable.

1. Open the inner electrical box by using a T20 Torx screwdriver to remove the eight screws as shown below.

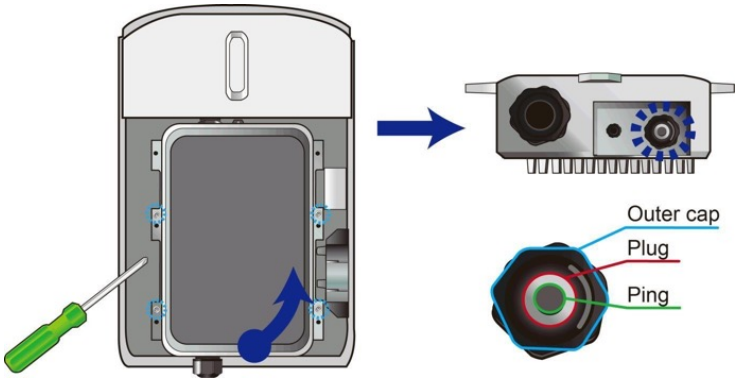


2. Open the box cover as shown.

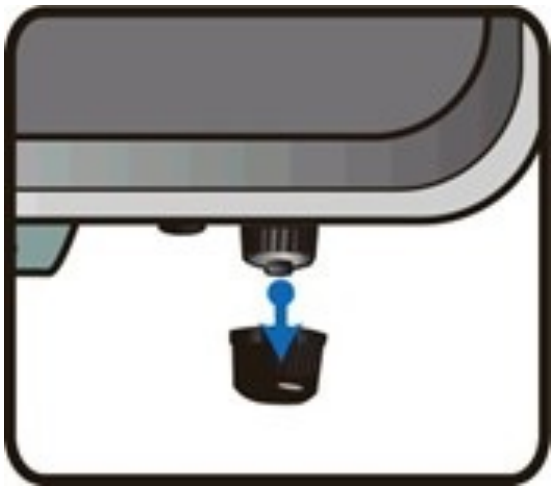


Note: There are cables connected to the cover. Open the cover with care.

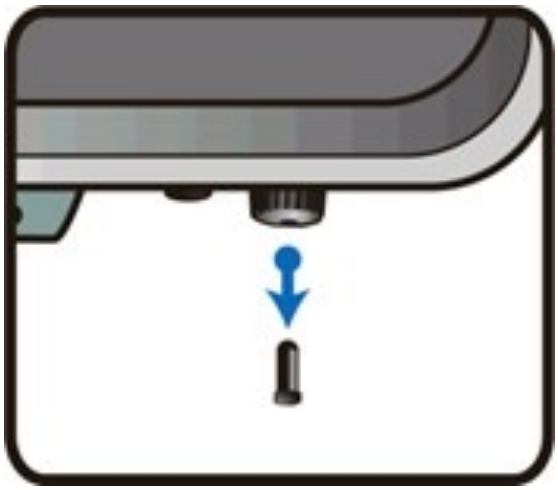
1. Using an M4 Philips screwdriver, unscrew the four Philips screws, as shown in the following figure, to release the electrical box. Raise the bottom side of the box and you can find the cable gland.



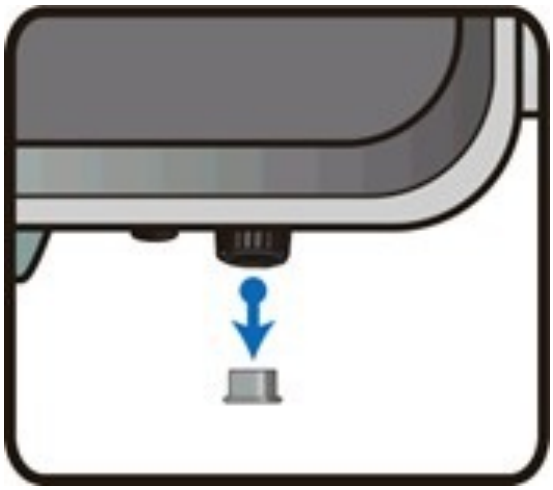
4. Unscrew the outer cap.



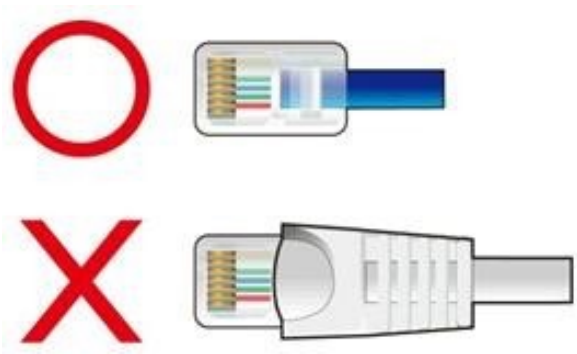
5. Pull out the pin.



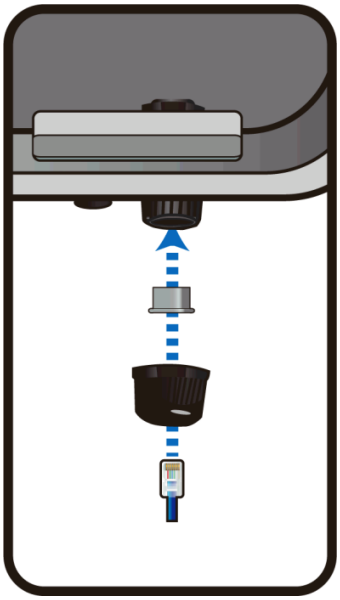
6. Pull out the plug.



7. Prepare the RJ45 cable so that at least one end (charger side) does not utilize a cable boot.



8. Thread the RJ45 head through the outer cap, plug, and gland.



9. Make sure the plug has been inserted firmly into the cable gland.
10. Screw the outer cap back into its place.
11. Plug the RJ45 head to the RJ45 port.
12. Re-install the electrical box and its cover back into their places.

Note: To exit the enclosure, you will need to drill a hole to allow the RJ45 cable to exit.

From the bottom	From the back
	

→ 6.0 PRODUCT SPECIFICATIONS

ELECTRICAL	EA000-LE-BLK
MAX OUTPUT CURRENT	80A
ADJUSTABLE CURRENT SETTINGS	80A | 63A | 48A | 40A | 32A | 24A | 20A | 16A | 12A | 10A
AC POWER INPUT RATING - STANDARD	208/230VAC 60Hz single-phase
VEHICLE-TO-GRID COMMUNICATIONS	IEC 15118
WIRING STANDARD	3-wire (L1, L2, Earth)
OUTPUT POWER	19.2kW (240VAC @ 80A)
INPUT CORD REQUIREMENT	Hardwire
CHARGING PLUG	SAE JI772 (80A)
CHARGING CABLE LENGTH EA000-LE-BLK	25 feet

MECHANICAL	
DIMENSIONS (H x W x D)	20.8in x 12.5in x 5.7in
WEIGHT	32lbs

COMMUNICATION OPTIONS	
WIRELESS NETWORK	2.4GHz Wi-Fi (802.11 b/g/n)
CELLULAR NETWORK	4G LTE (optional)
LAN	LAN 10/100
OPEN CHARGE POINT PROTOCOL (OCPP)	OCPP 1.6

USER INTERFACE & CONTROL	
LED INDICATOR	Standby (blue), Charging (flashing green), Full charge (steady green), Fault (red)
RFID READER	ISO 15693, 1443A/B

SAFETY	
CODES AND STANDARDS	SAE J1772
SAFETY COMPLIANCE	Compiles with UIL 2594, UL 2231, UL1998, UL991
EMC COMPLIANCE	FCC Part 15 Class B
SURGE PROTECTION	6kV @ 3000A
GROUND FAULT DETECTION	Yes
OPEN SAFETY GROUND DETECTION	Continuously monitors presence of safety ground connection
POWER RECOVERY INTERVAL	20 seconds for 1st recovery, latch off at 2nd fault

ENVIRONMENTAL	
NEMA/IP RATING	NEMA 3R
IK RATING	IK 10
ALTITUDE	Up to 10,000 feet
SOLAR RADIATION	1120 W/m2 (Class 2K4)
WIND RATING	12 Beaufort
OPERATING TEMPERATURE	-20°F to 130°F
STORAGE TEMPERATURE	-40°F to 140°F
OPERATING HUMIDITY	Up to 85% @ +122°F non-condensing
NON-OPERATING HUMIDITY	Up to 95% @ +122°F non-condensing
WARRANTY	5-year

→ 7.0 EO SUPPORT CENTER

All EO Charging technical documentation is published in the EO Resource Center, this is found at: **https://www.eocharging.com/support.**

The EO Support team can be reached at:

Email: **support@eocharging.com**

This document contains information that is subject to change without notice.

The latest version of this publication can be downloaded at:
https://www.eocharging.com/support/commercial-solutions/north-america