

PowerCharge™

Energy Series [32a]

User Manual

Revision 1.20



IMPORTANT SAFETY INSTRUCTIONS

This document contains instructions and warnings that must be followed when installing and using the Electric Vehicle Supply Equipment (EVSE). Before installing or using the EVSE, read this entire document as well as WARNING and CAUTION markings in this document.

Safety Instructions

The symbols used have the following meaning:



WARNING: RISK OF PERSONAL INJURY



WARNING: RISK OF ELECTRIC SHOCK



WARNING: RISK OF FIRE



CAUTION: RISK OF DAMAGE TO THE EQUIPMENT

- The charging station must be installed only by licensed electricians.
- Make sure that the materials used and the installation procedures follow local building codes and safety standards.
- The information provided in this manual in no way exempts the user of responsibility to follow all applicable codes or safety standards.
- This document provides instructions for the charging station and should not be used for any other product. Before installation or use of this product, review this manual carefully and consult with a licensed contractor, licensed electrician, or trained installation expert to make sure of compliance with local building codes and safety standards.

Repair and Maintenance Clause

- Only licensed electricians can repair or maintain the charging station. It is forbidden for general users to repair or maintain it.
- Turn off input power before repair or maintenance the charging station.

Federal Communication Commission Interference Statement

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

Industry Canada statement:

This device complies with ISED's licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

**WARNING: RISK OF ELECTRIC SHOCK**

When using electric products, basic precautions should always be followed, including the following. This manual contains important instructions that shall be followed during installation, operation and maintenance of the unit.

- Read all the instructions before using this product.
- This device should be supervised when used around children.
- Do not put fingers into the EV connector.
- Do not use this product if the flexible power cord or EV cable is frayed, has 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.
- To avoid a risk of fire or electric shock, do not use this unit with an extension cord.

**WARNING: RISK OF ELECTRIC SHOCK**

Improper connection of the equipment grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded.

Do not modify the plug provided with the product – if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

**WARNING: RISK OF ELECTRIC SHOCK**

Do not remove the cover or attempt to open the enclosure. No user serviceable parts inside. Refer servicing to qualified service personnel.

**WARNING: RISK OF ELECTRIC SHOCK**

- Do not touch live electrical parts.
- Incorrect connections may cause electric shock.
- Do not Disconnect Under Load.



WARNING: This equipment is intended only for charging vehicles that do not require ventilation during charging. Please refer to your vehicle's owner's manual to determine ventilation requirements.



WARNING: Do not use extender cables to increase the length of the charging cable. Maximum length is limited to 25 feet by the National Fire Protection Agency.



WARNING: Do not drag the charge point by input power cord.



CAUTION: Do not expose to liquid, vapor or rain.



CAUTION: If this unit is installed outdoors, the outlet must be rated for outdoor installation. The outlet must be installed properly to maintain the proper NEMA rating of the enclosure.

- Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
- Do not touch the terminals or other current-carrying parts.
- Take care not to drill into any pipes or power lines beneath the surface during mounting holes preparation. Use power line / metal detector.
- Do not trample or drive over the product's cables.
- Do not put any foreign objects into the enclosure.
- Do not start the engine when the charging connector is still connected.



CAUTION: Do not use this product if there is any damage to the unit. Send the unit back to PowerCharge™ in the event the unit is not operational.

SAVE THESE INSTRUCTIONS

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1 Introduction

This user manual applies to “PowerCharge™ Energy Series Level 2 AC Charger for Plug-in Electric Vehicles (PEVs) and Battery Electric Vehicles (BEVs)”.

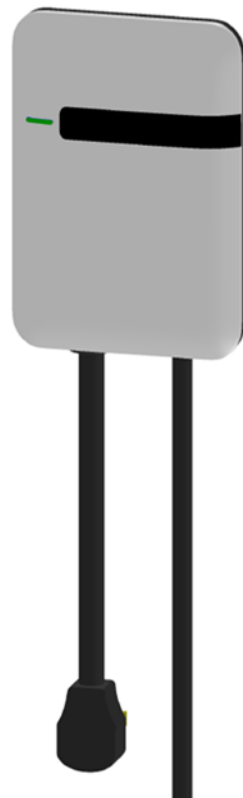
The Level 2 Electric Vehicle Supply Equipment (EVSE) with 32A capabilities will be used in North America. It can provide a shorter charging time than the traditional 16A EVSE.

!!! Any unauthorized modifications will void the manufacturer’s warranty !!!

1.1 Product view

Different models of charging stations:

Energy Residential



Energy Commercial



Figure 1-1 Front view

Box Contents

See the table for content differences of three models.

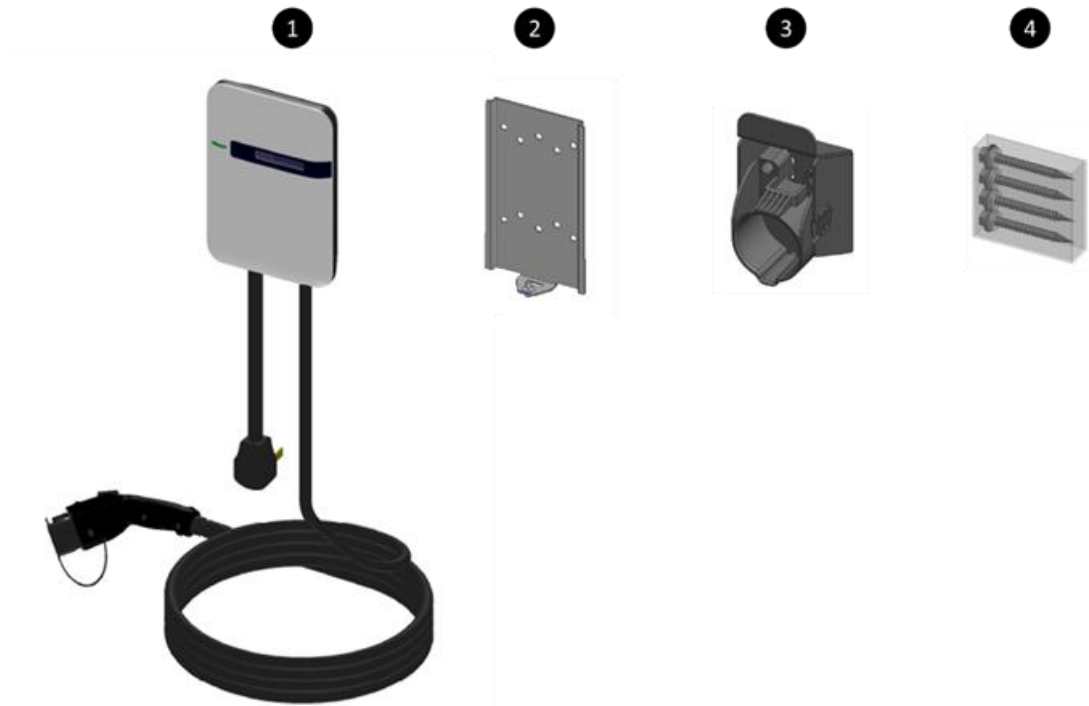


Figure 1-2 Box contents

Table 1-1 Accessories in the box

	Description	QTY	Remark	
1	Energy Residential - 32A	1	<ul style="list-style-type: none"> ■ Charging Plug □ OLED Display 	<ul style="list-style-type: none"> ■ Input Power Cord □ RFID Icon
	Energy Commercial - 32A		<ul style="list-style-type: none"> ■ Charging Plug ■ OLED Display 	<ul style="list-style-type: none"> ■ Input Power Cord □ RFID Icon
	Energy Commercial - 32A		<ul style="list-style-type: none"> ■ Charging Plug ■ OLED Display 	<ul style="list-style-type: none"> □ Input Power Cord ■ RFID Icon
2	Mounting Bracket	1	Attached to the back of the charging station	
3	Holster ASSY	1	With Hook x1, Holster x1 & M4xL15 tapping screw x2	
4	Screw Bag	1	With #12xL50 tapping screw x4	

Box Opening Process:

1. Open the carton and remove the upper partition.



Figure 1-3 Opening the carton



Figure 1-4 Charging Station Unit

2. Take out the charging station and upturn middle partition. The charging plug is in the bottom of the carton.



Figure 1-5 Take out the charging station



Figure 1-6 Charging plug

3. The hook and holster are placed inside the right of the middle partition.



Figure 1-7 Accessories inside the middle partition



Figure 1-8 Hook and holster

4. Release the bottom screw, then the wall mounting bracket can be removed.



Figure 1-9 Release the screw

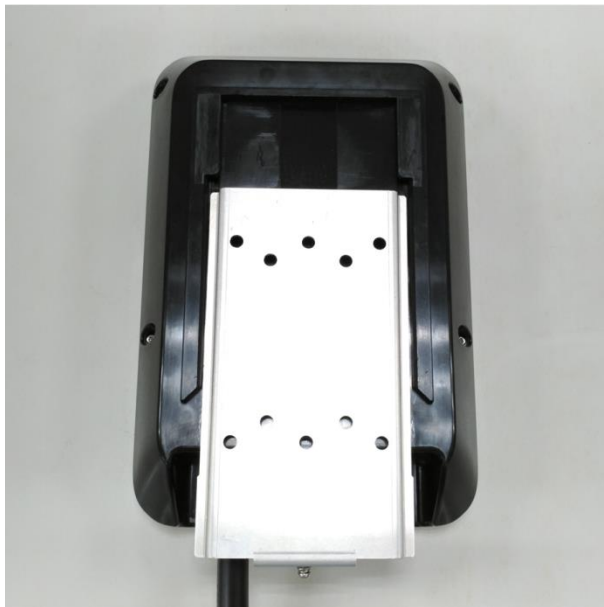


Figure 1-10 Remove the mounting bracket

2 Specifications

2.1 Product specifications

Table 2-1 Product specifications

Item	E20-SWE	E20-SWC	E20-SWP
Application	Residential/Light Commercial		Commercial
Voltage (Vac)	208/240VAC, Single Phase		
Frequency (Hz)	60 Hz		
Current (Rms)	32 A		
Charging Connector	SAE J1772 Type 1		
Charging Cable Length	25 ft. (18 ft. optional)		
Metering Accuracy	N/A	Embedded $\pm 1\%$	
Real Time Clock	N/A	Yes (7 days)	
Protection	Over Voltage, Under Voltage, Surge Protection, GM/I, CCID20, Over Current, Over Temperature, Under Temperature, Short Circuit, Relay Malfunction/Welding Protection		
Indication	<ul style="list-style-type: none"> • Green Steady: Ready • Green Flashing (Fast): Authorized, wait for EV Connect • Green Flashing (Slow): Suspend (Occupying) • Blue Flashing (Slow): Charging • Red Steady: Unrecoverable Fault • Red Flashing (Slow): Recoverable Fault • Yellow Steady: Out of Service • Yellow Flashing (Slow): Booting / Firmware Upgrading <p><u>Remark</u></p> <ul style="list-style-type: none"> • Fast Flash: On Time 300ms, Off Time 200ms, 2Hz • Slow Flash: On Time 1200ms, Off Time 800ms, 0.5Hz 		
Wi-Fi	N/A	802.11 b/g/n	
Cellular	N/A		LTE Cat. 1 (AT&T or Verizon)
RFID	N/A		ISO 14443 A/B, ISO 15693, NFC, NEMA interoperability protocol
Display	N/A	116(L)*8.5(W)*37(H)mm, 5.57mm CHARACTER HEIGHT, 5*8 DOT MATRIX, OLED 20x2	
Data Protocol	N/A	OCPP 1.6	
Operation Temp.	-30 ~ 50 °C / -22 ~ 122 °F		
Storage Temp.	-40 ~ 70°C / -40 ~ 158 °F		
Mounting Type	Wall mount / Pole mount (optional)		
Wiring Type	NEMA 6-50		Hard-wired

Item	E20-SWE	E20-SWC	E20-SWP
IP Performance	NEMA 4		
Impact Resistance	IK10		
Dimension (H x W x D, inch)	11.14" x 7.56" x 3.11"		
Web Portal Management	N/A	Yes	
Console Management	Yes		
Certification	UL 1998/2231/2594 FCC Part 15B		
	N/A	FCC Part 15.247 (WLAN 2.4GHz)	
	N/A		FCC Part 27 (AT&T) or FCC Part 27 (Verizon) FCC Part 15.225 (RFID 13.56MHz) Energy Star

3 Installation

3.1 Before installation

3.1.1 Safety check

- Check for transport damages.
- Before connecting the product to the power supply, check that the power supply voltage and current rating corresponds with the power supply details shown on the product rating label.



CAUTION: Disconnect the power supply before installing or repairing the charging station. Failure to do so may result in physical injury or damage to the power supply system and the charging station.



CAUTION: Avoid touching or pressing the OLED screen all times, as this may result in damage to the OLED screen.



DANGER: RISK OF SUFFOCATION

Keep any packing materials away from children – these materials are a potential source of danger, e.g. suffocation.

The charging station must be installed only by a licensed electrician in accordance with the provisions of the local electrical industry construction and should comply with national electrical codes and standards.

Before installing the charging station, make sure you have read all of these instructions in this manual and fully understand its contents.

Appropriate protection is required when connecting to a main switchboard. The tools and parts used as outlined in the section “Tools & parts required for installation”.

3.1.2 Grounding instructions

The charging station must be implemented equipment grounding through a permanent wiring system or an equipment grounding conductor. Use a wire with a dedicated grounding wire and a ring terminal and connected to the equipment ground terminal block for grounding.

3.2 Tools & parts required for installation

Table 3-1 Tools & parts required for installation

Tool	QTY	Model	Size	Supplier	Remark
Mounting Bracket	1	All	194x109x9 mm	Model Accessories	Fasten charge point to the wall
Holster ASSY	1	All	58x58x70 mm	Model Accessories	Hold EV charging plug
Screw	4	All	Tapping: #12	Model Accessories	Fasten Mounting Bracket & Hook
			Mechanical: M6	Commercially Available	
Wire, Copper	3	IC3	8 AWG	Commercially Available	UL1015 (recommended)
Heat Shrink Tube	3	IC3	For 8 AWG wire	Commercially Available	Protect wires & terminals
Terminal	3	IC3	For 8 AWG wire	Commercially Available	Connect input wires to the terminal block
Conduit	1	IC3	1 inch	Commercially Available	Protect power cable
Torx Screwdriver	1	All	T20	Commercially Available	
Philips Screwdriver	1	All	PH3	Commercially Available	
Hexagon Socket	1	All	5/16	Commercially Available	Tighten #12 Tapping screws
Torque Wrench	1	All	35 kgf-cm min	Commercially Available	

3.3 Install the SIM card (for Energy Commercial only)

1. Disassemble top cover

1-1 Loosen the star screws (x5).

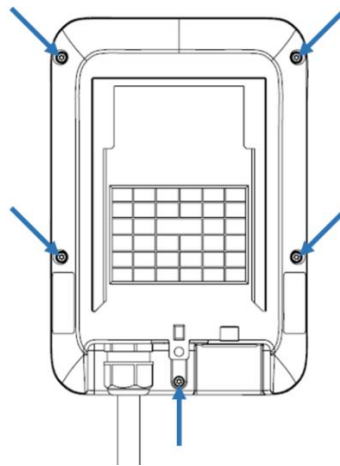


Figure 3-1 Five screws in the Base Cover position

2. Find SIM card socket

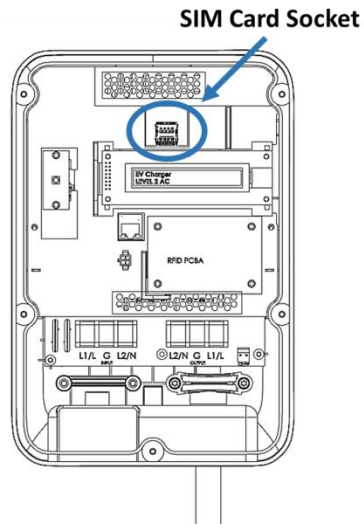


Figure 3-2 Position of SIM card socket

3. Insert SIM card

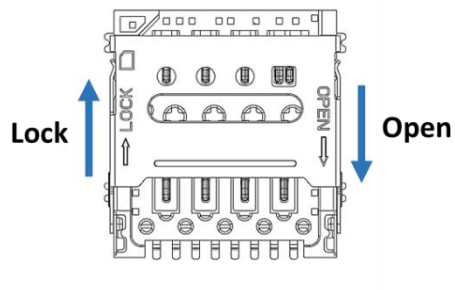


Figure 3-3 SIM card socket and cover Open/Close direction

3-1. Push down the cover to open SIM card socket.

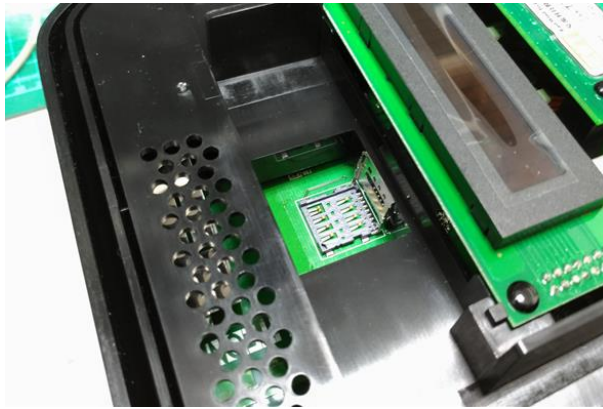


Figure 3-4 Open SIM card socket

3-2. Prepare the SIM card. (Use micro-SIM, 15mm x 12mm.)

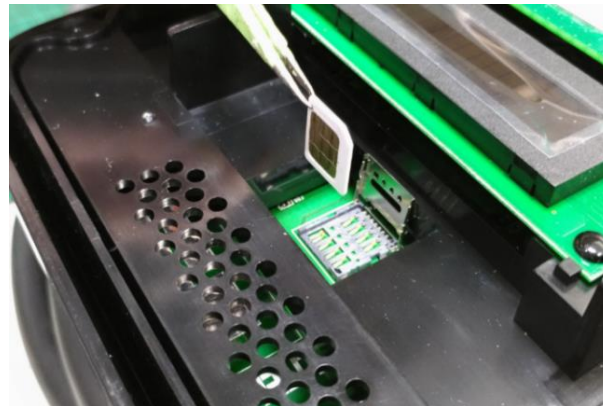


Figure 3-5 Prepare the SIM card

3-3. Insert the SIM card.

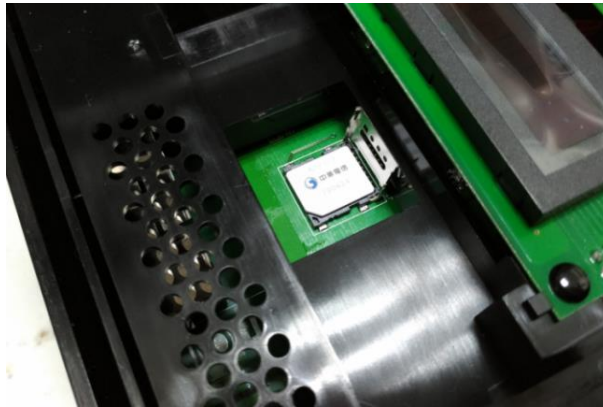


Figure 3-6 Insert the SIM card

3-4. Close the SIM card socket and push the cover toward lock direction to lock the cover.

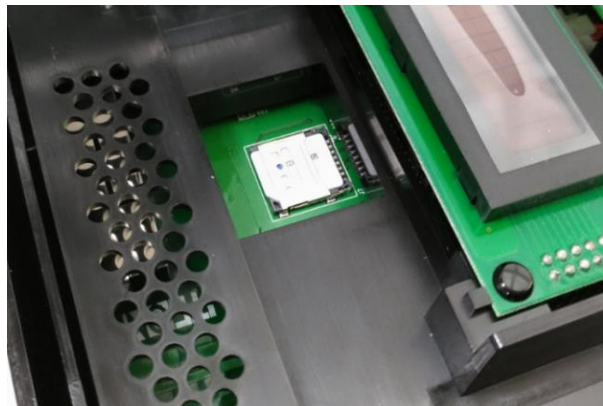


Figure 3-7 Lock SIM card socket cover

3-5. Reassemble the top cover. Please refer to the following torque. SIM card installation is completed.

Screw	Torque	
M4	16 kgf.cm	13.88 lb-in

3.4 Install the charging station

1. **Secure the main body mounting bracket to the wall with appropriate screw.**



DANGER: Disconnect power at the circuit breaker before installation.



CAUTION: Before mounting determine the suitable mounting location. The unit must be fixed to a wooden or masonry/concrete wall using hardware that is appropriate for the surface. Do not install on drywalls, wall boards or thin plywoods. The fixing point must be capable of supporting the weight of the unit.

Follow applicable accessibility requirements for the mounting position. The unit shall be stored or located at a sufficient height.

For indoor use: The unit shall be mounted at a sufficient height from the floor between 18 inches (450 mm) and 4 feet (1.2m).

For outdoor use: The unit shall be mounted at a sufficient height from the floor between 24 inches (600 mm) and 4 feet (1.2m).

The mounting bracket has ten screw holes. If only two screws be used to fasten the mounting bracket, the screws should pass through the middle two screw holes of the mounting bracket. The other screw holes are reserved for the user.

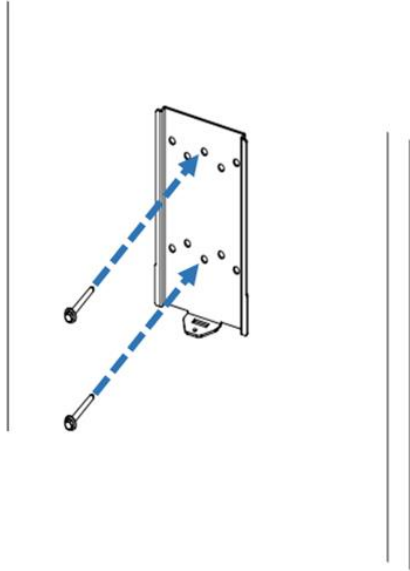


Figure 3-8 Fixing mounting bracket

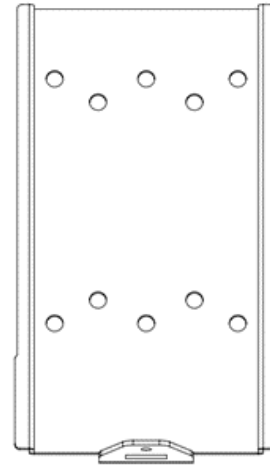


Figure 3-9 Screw holes of mounting bracket

Screw suggestion:

- a. For masonry walls, use M6 mechanical screws. (Commercially available)
- b. For finished walls supported by wood studs, use 1/4" or M6 tapping screws. (Commercially available)
- c. Please use following torque force.

Screw	Torque	
	M6	25 kgf.cm min
#12	25 kgf.cm min	21.7 lb-in min

2. Mount charging station onto mounting bracket and lock the screw.

2-1. Put the charging station on the mounting bracket.

2-2. Fix charging station on mounting bracket by M4 screw and screw washer. 2-3.

Please refer to the following torque.

Screw	Torque	
	M4	16 kgf.cm

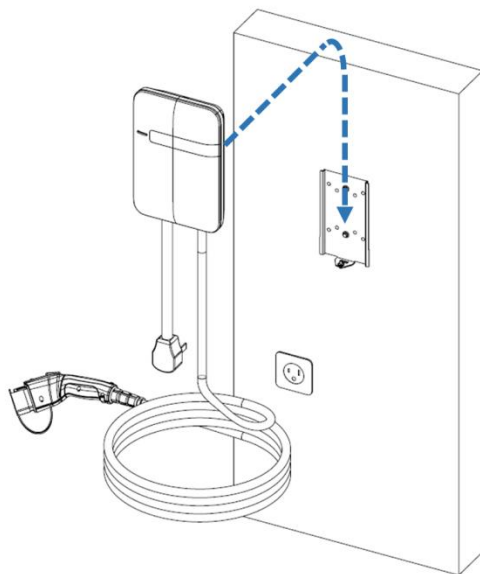


Figure 3-10 Charging Station and mounting bracket

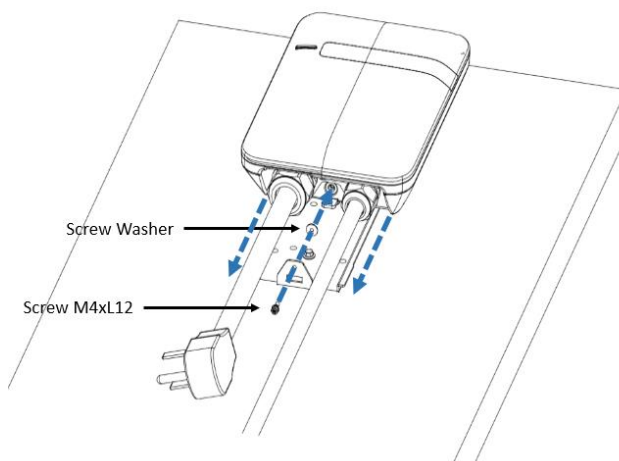


Figure 3-11 Screw locking position

3. Plug in the power cord (Residential Only).

The outlet should be located at 20-26 inch from the ground. Refer to the installation template to decide where to install the charging station.

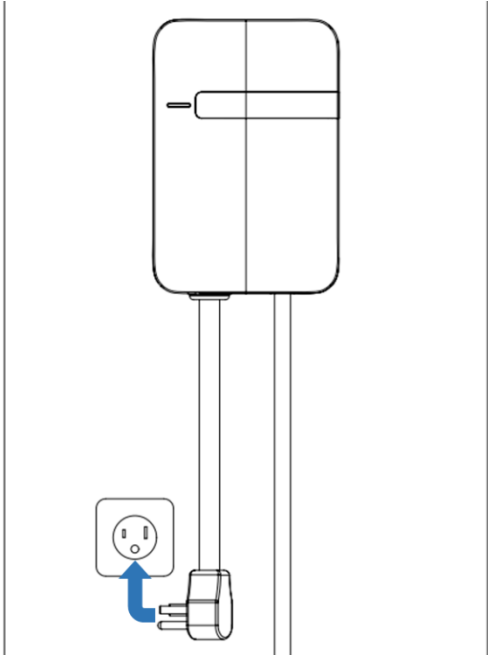


Figure 3-12 Plug in the power cord (Residential Only)

3.5 Input cord connection

1. Choose the appropriate conduit in accordance with all applicable state, local and national electrical codes and standards.

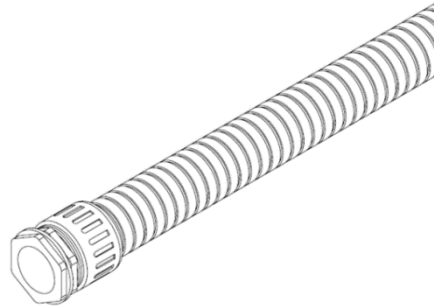


Figure 3-13 Conduit.

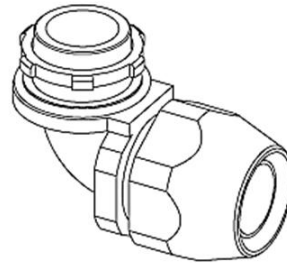


Figure 3-14 Right angle conduit

2. Clamp copper terminal to connect copper wire. The clamp point is covered by heat shrink tube for protecting.

2-1 Refer to the following wire specification. Use conductor type other than RHH, RHW and RHW-2 with outer covering.

Model	Terminal	Conductor	Rating
Intelligent Charger-32A	L1, L2, G	8 AWG	90C copper wire

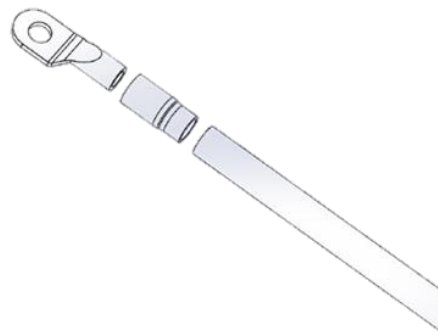


Figure 3-15 Copper terminal, heat shrink tube and copper wire.

3. Electrical wiring to the charging station.

3-1. Disassemble top cover.

3-2. Use Philips screwdriver to release terminal screws.

3-3. Fold the wire end to pass through the conduit and insert them into the input hole.

3-4. Fix the copper wire on the corresponding terminal block. The wiring instruction is printed in front of the terminal block (L1/L2/G).

3-5. Use the following torque to connect the wire terminal to the terminal block.

Screw	Torque	
M4	16 kgf.cm	13.88 lb-in

3-6. The recommended terminal specifications are as following.

Terminal	Dimension(mm)
W	≤ 9.5
d2	4-6.4

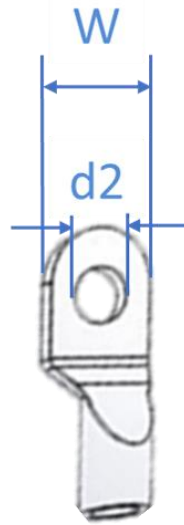


Figure 3-16 Dimension of terminal

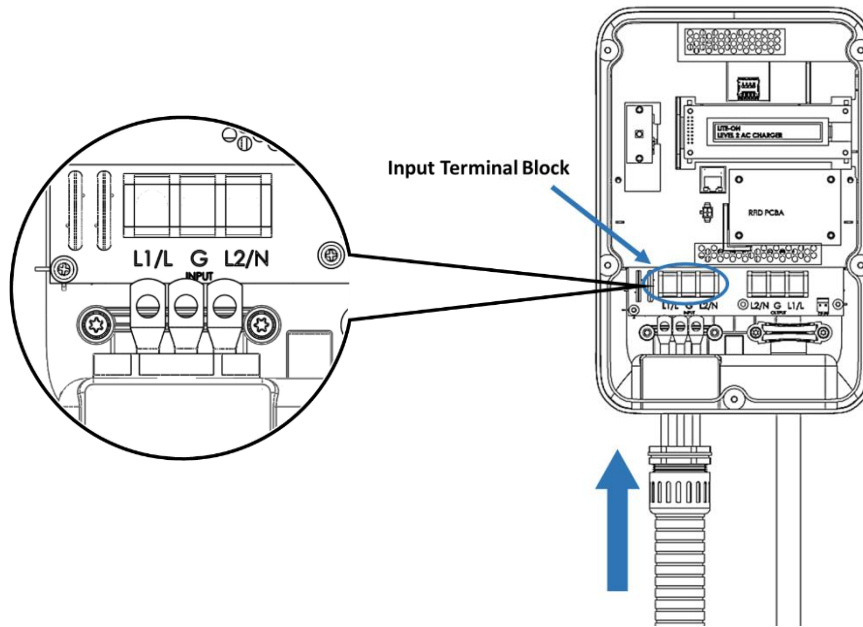


Figure 3-17 Input wiring



CAUTION: To reduce the risk of fire, connect only to a circuit provided with 40 amperes maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70, and the Canadian Electrical Code, Part I, C22.1.



CAUTION: If this unit is installed outdoors, the outlet must be rated for outdoor installation. The outlet must be installed properly to maintain the proper NEMA rating of the enclosure.

Model	Current Rating
Intelligent Charger-32A	32 A

3-7. Lock the conduit on the enclosure. Please refer to the following torque.

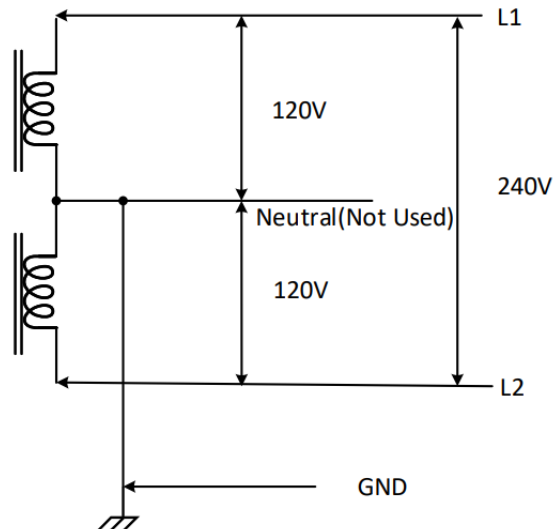
Conduit	Torque	
	1 "	35 kgf.cm

3-8. Reassemble top cover. Please refer to the following torque.

Screw	Torque	
	M4	16 kgf.cm

3.6 Service Wiring

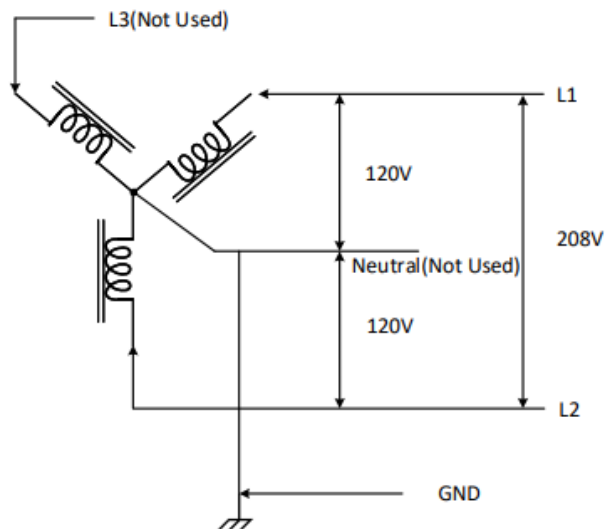
3.6.1. 240V Split-Phase



3.6.2. 208V 3-Phase Wye-Connected

With a Wye-connected secondary, any two of the legs can be used to provide 208V to the Wall Connector. For example, L1 and L2, or L1 and L3, or L2 and L3. The two used phases must each measure 120V to neutral.

Note: A current-carrying neutral is not required.



Caution: The unused leg (L3 in the illustration) must remain open. Do not connect to a neutral bar, or to earth ground.

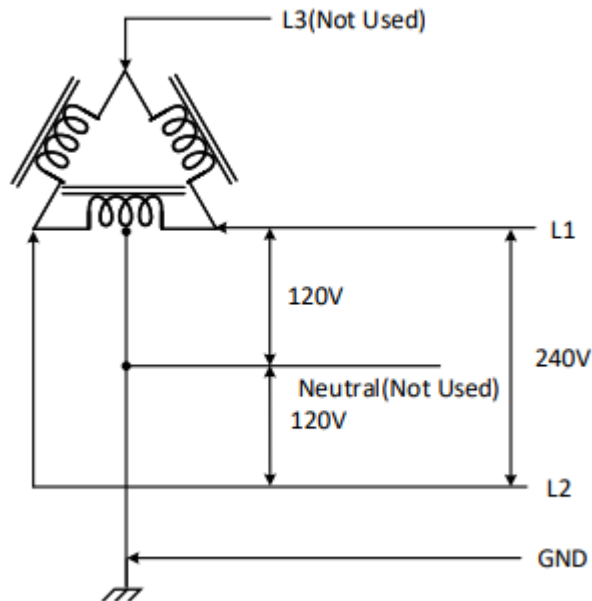
Caution: The center point of the three phases (normally used as neutral) must be grounded to earth at only one point. This is usually at the breaker panel.

3.6.3 240V Three-Phase Delta-Connected

With the delta connection, one leg must be center tapped, and only the two phases on either side of the center tap can be used. The two used phases must each measure 120V to neutral.

Consult the transformer manufacturer's literature to verify that the single leg can supply the required power.

Note: The Wall Connector's contactor closes only if it detects the presence of an earth ground wire connected to a neutral point on the transformer secondary.



Caution: The third line (L3 in the illustration) of the delta is 208V, with respect to neutral, and is sometimes referred to as a “stinger.” Do not use this third line.

Caution: Do not use a three-phase delta-connected transformer secondary without a center tap on one leg. No neutral point is available for the required earth ground connection.

3.7 Install the holster

1. Separate the holster from hook.

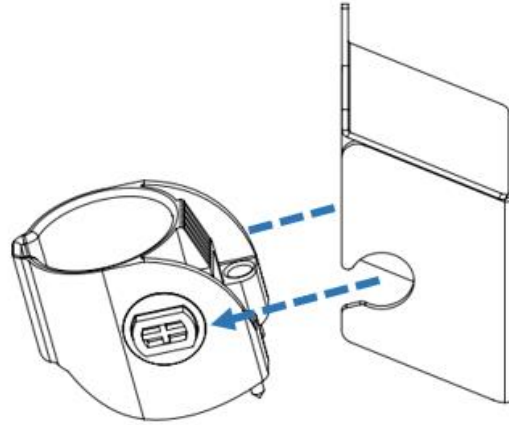


Figure 3-18 Separate the holster

2. Fasten the hook on the wall with appropriate screws.

2-1. For finished walls supported by wood studs, use #12 tapping screws (x2).

2-2. The recommend torque is 25 kgf.cm (21.7 lb-in).

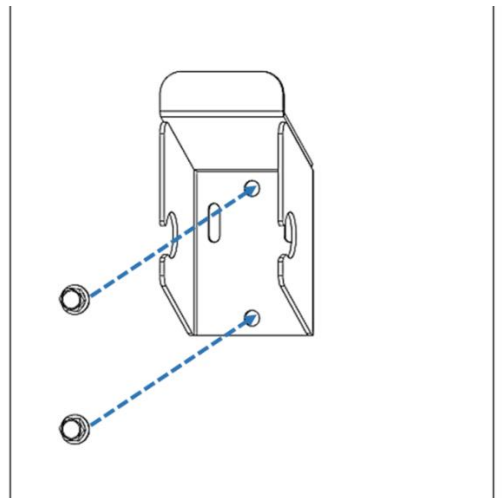


Figure 3-19 Secure the hook

3. Make the holster face up and combine with the hook.

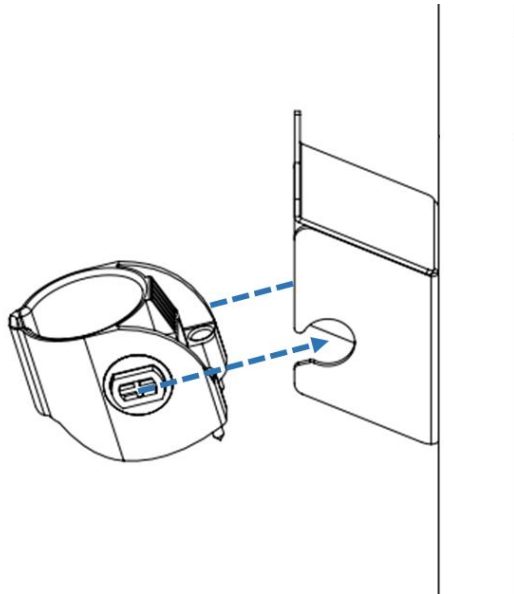


Figure 3-20 Secure the holster

4. Rotate the holster down completely.

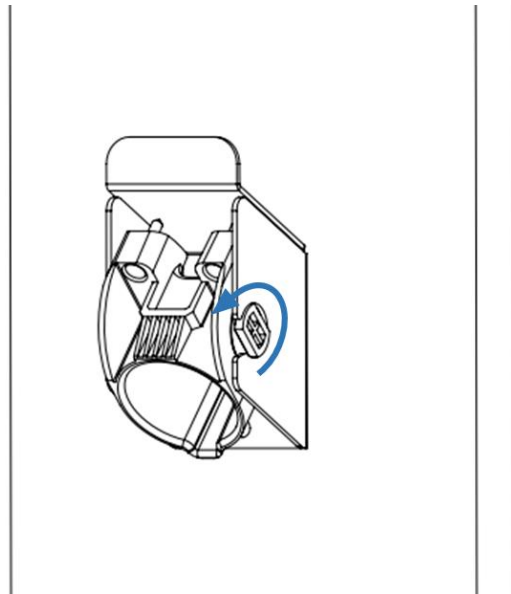


Figure 3-21 Rotate the holster

5. Keep the holster in this state and tighten screws completely.

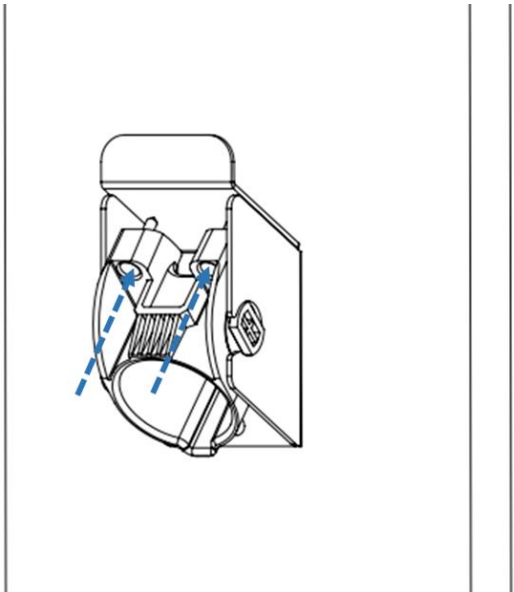


Figure 3-22 Lock screws

6. Place EV charging plug on the holster.

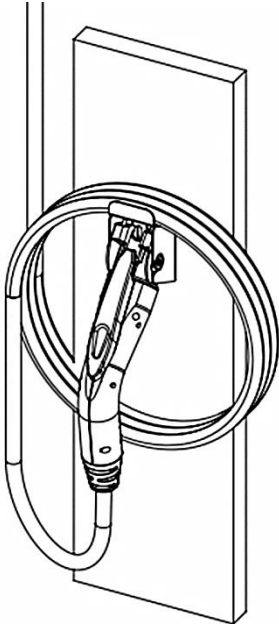


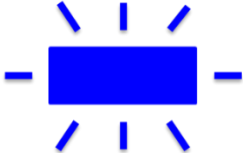





Figure 3-23 Place EV charging plug.

4 Operations

4.1 Charging status indicators

Table 4-1 Charging status indicators

LED Indicator	Description	Definition
	Not illuminated	Power Off
	Green Steady	Ready
	Green Flashing	Flashing green (Fast): Authorized, wait for EV Connect Flashing green (Slow): Suspend (Occupying)
	Blue Flashing	Flashing blue (Slow): Charging
	Red Steady	Unrecoverable Fault
	Red Flashing	Recoverable Fault
	Purple Steady	Reserved (from OCPP Service)
	Yellow Steady	Out of Service
	Yellow Flashing	Booting / Firmware Upgrading

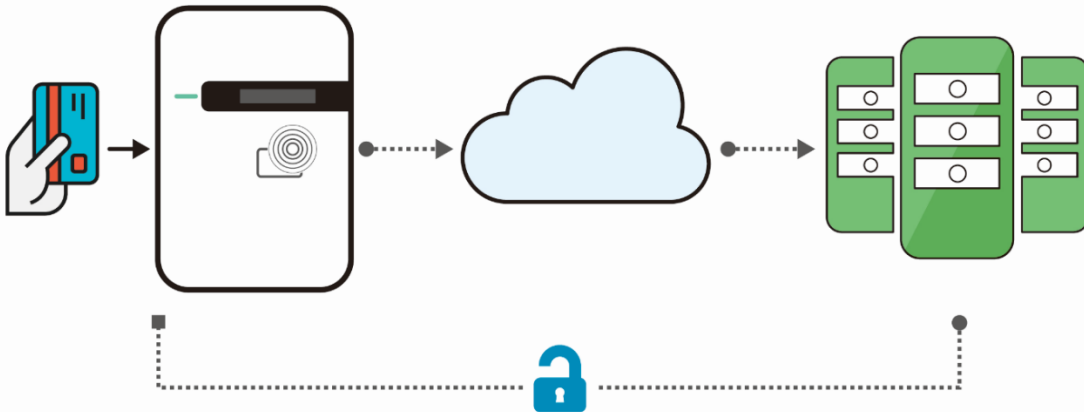
4.2 Authorization (for Commercial only)

Before the owner of an electric vehicle can start or stop charging, the charging station has to authorize the operation.

4.2.1 Online Authorization

Description:

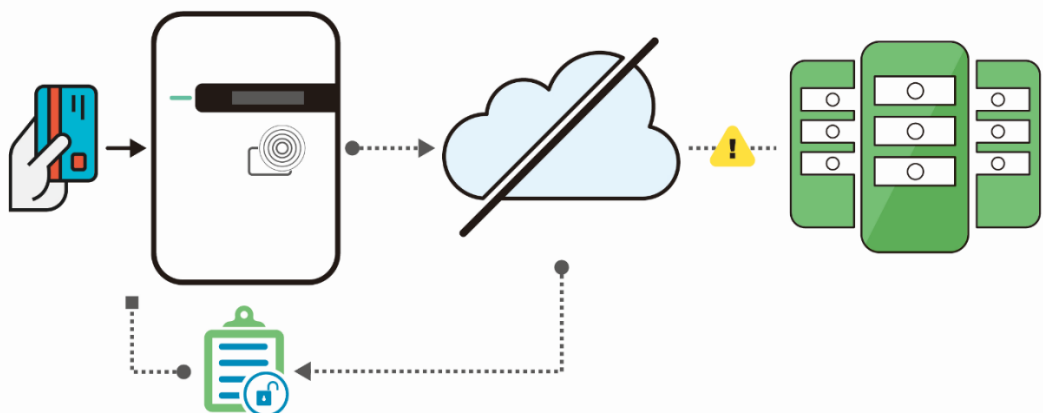
- Synchronized with the Central System when EVSE is Online.
- The EVSE SHALL only supply energy after authorization.



4.2.2 Local Authorization

Description:

- To improve the experience for users, the EVSE MAY support local authorization when EVSE is *offline*, and faster authorization response time when communication between charging station and network is slow.



4.3 Charging an Electric Vehicle (EV)

Choices of start charging are as below:

4.3.1 Plug and Charge

1. Insert the charging plug into the EV
2. Charging session started

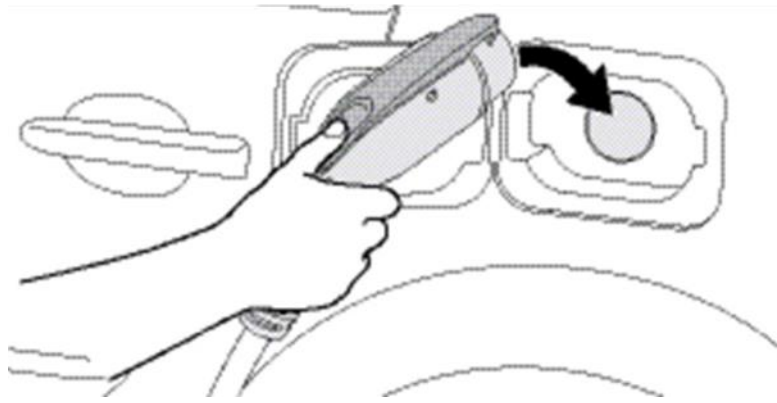


Figure 4-1 Connect the charging plug to the EV

4.3.2 RFID card (for RFID only)

1. Insert the charging plug into the EV
2. Swipe card
3. Wait for authorization
4. Charging session started

Stop charging

1. Unplug any time (disconnect the charging plug from EV to stop charging session)
2. Session ended (please return the connector to the holster)

4.4.1 Interrupt charging

Please refer to STOP CHARGING section for more information.

4.4.2 Auto restart

When a charging session is interrupted due to a temporary error condition, the charging station will automatically restart charging when the cause of the temporary error condition returns to normal. Status indicator lights remain flashing RED until the error condition is resolved.

- Temporary error conditions include: Over Current, Over Voltage, Under Voltage, and Over Temperature.
- For Over Current conditions: The charging session will be stop while OC occurs. After recovery from OC for 30 seconds, the charge point will automatically restart charging for three times.
- When charging session stopped due to CCID trip, the charging station will try to restart after 15 minutes for 3 times.

4.4.3 Power outage recovery

When power resumes after an outage, the charging station starts automatically with a delay ranging from 120 to 720 seconds. The delay is designed to avoid impacting the utility grid when multiple charge points are in the same area attempting to resume charging simultaneously.

4.5 General care

The exterior of the charging station is designed to be waterproof and dust proof. To ensure proper maintenance of the charging station, follow these guidelines:

- Despite the water resistance of the enclosure, when cleaning it is preferred to not direct streams of water at the unit. Clean with a soft, damp cloth.
- Make sure the charging plug is put back in the holster after charging to avoid damage.
- Ensure the power cable is stored on the charge point after use to avoid damage.
- If the power cable or the charging plug is damaged, please contact **PowerCharge™ Customer Support at (585) 533-4085**.

4.6 Customer support

Please contact PowerCharge™ directly for technical support.

PowerCharge™

500 Canal View Blvd • Suite 100

Rochester, NY 14623

(585) 533-4085 - M-F, 8am-5pm ET

PowerChargeEV.com