

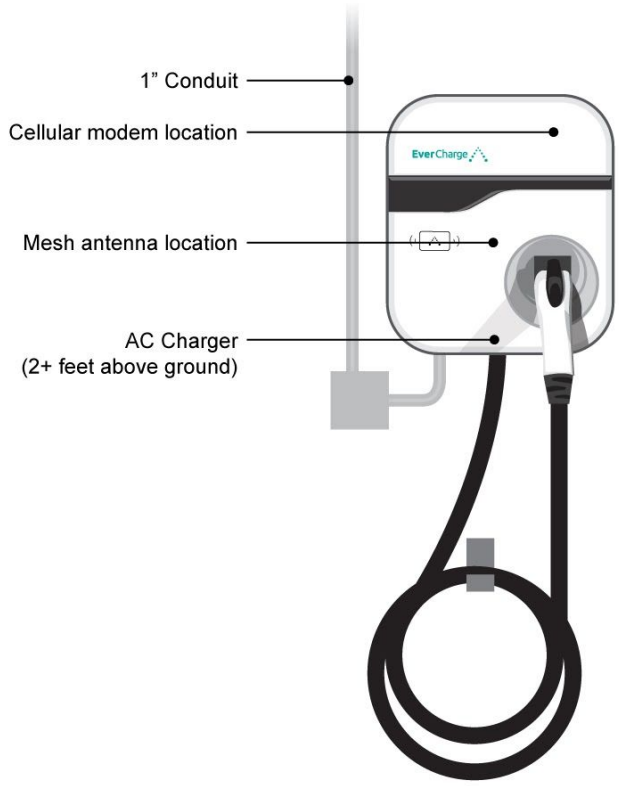
EV001 Level 2 Design and Install Specifications
North America - January 2020

install@EverCharge.net
415.429.2971

Single-page Install Guidelines

This page is designed to serve as a quick overview of the full EverCharge system install specifications. Do not solely use this page for installation, as required system testing and reporting is not covered on this page.

Contact EverCharge at install@EverCharge.net or 415.429.2971 if you have any questions. This document was **last updated January 8, 2019**.



Example installation image

AC Charger requirements

- 208-240V @ 40 amps (110-120V NOT OK)
- Cellular signal required for Primary only
- 50A-rated copper conductors
- Individual 40A OCPD for each AC Charger
- 1" trade size conduit
- Mount at least 18 inches (450 mm) above floor inside, 24 inches (600 mm) outdoors. **Suggested mounting height is 38.5 inches from bottom.**
- Included charge cable (18 feet / 5.5 m) reaches vehicle plug and does not block walkway

Shopping list / required tools

- ▢ 1" trade size (27 mm) conduit and fittings
- ▢ 50A-rated (e.g #6 THHN 75℃ or #8 THHN 90℃) copper conductors
- ▢ Torx T30 and T20 bits
- ▢ 40A 2-pole breaker / local disconnect

Minimum 50A-rated Wire Gauge Requirements	
< 250 Feet. (1 or multiple EVSE installations)	#6 THHN 75℃
> 250+ Feet	#4 THHN 75℃

After the install (including configuration and testing) is complete, before leaving the site, **make sure to contact EverCharge at install@EverCharge.net or 415.429.2971** so we can update our records and check on the unit. Please email/text a photo of the install too.

CONTENT

1. EverCharge System Overview
- 1.1. Power Management
- 1.2. Wireless Communication
- 1.3. Cloud-Based System Management

2. Making A Site Plan
- 2.1. Determine The Recommended Capacity For The System
- 2.2. Determine The Available Capacity
- 2.3. Typical System Layout Examples
- 2.4. Charge Groups
- 2.5. Confirm Cellular Service
- 2.6. Best Practices To Support Future Expansion
  - 2.6.1. Consolidate and Upsize Wiring
  - 2.6.2. Subpanels in Large Garages
  - 2.6.3. Install Junction Boxes
- 2.7. Electrical Layout Reporting

3. Installing the EverCharge Charge Station
- 3.1. Choose an Appropriate Mounting Location
  - 3.1.1. Power and Grounding Requirements
  - 3.1.2. Mounting and Installation Parts
- 3.2. Step-by-Step EverCharge Charge Station Installation Instructions

4. System Configuration and Testing
- 4.1. Testing Instructions
- 4.2. Installation Summary Checklist

Appendix A: Code Authority

Appendix B: Indicator LEDs and Troubleshooting

Appendix C: Charge Station Electrical Specifications

1. EverCharge System Overview

1.1. Power Management

The EverCharge system is a network of Electric Vehicle Supply Equipment (EVSE), also referred to as a charge station, that intelligently regulates allocated power delivered to vehicles based on need allowing more charge stations to be installed at a given site. **The EverCharge solution allows up to 10x as many vehicles to charge at any site,** reducing installation costs and the need for expensive electrical upgrades.

The EverCharge system is listed for and complies with:

- UL 916 Energy Management Equipment
- NEC Article 625 Electric Vehicle Charging System

1.2. Wireless Communication

The EverCharge system communicates via an internal wireless mesh network to regulate power. This wireless network, generated by EverCharge charge stations, does not require WiFi or other network resources from the installation site.

1.3. Cloud-Based System Management

EverCharge is managed through a cloud-based system management portal, allowing secure remote configuration of the system, management of users, as well as access to system status and usage information.

Cloud connectivity is facilitated by one or more primary charge station(s), installed in locations with cellular network connectivity. The primary charge station(s) will be marked on the shipping box and have a cellular modem installed.

Note: Brief cellular system outages will not affect the charging functionality of the system

2. Making A Site Plan

2.1. Determine The Recommended Capacity For The System

The chart in this section shows power needed to supply a Charge Group. A Charge Group (Section 2.4) is a group of stations that draw power from the same panel or breaker.

> ⚠ The following represent general guidelines. To ensure proper functionality contact an EverCharge installation expert for approval on all infrastructure designs at 415.429.2971 or **install@EverCharge.net**

AC Charge Group Size (+/- 5 EVSE)	**Recommended*** Service Rating / Capacity	**Voltage**
1-2	50A	208V
5	80A	208V
10	125A	208V
15	150A	208V
20	200A	208V
30	250A	208V
50	400A	208V
100	600A	208V

2.2. Determine The Available Capacity

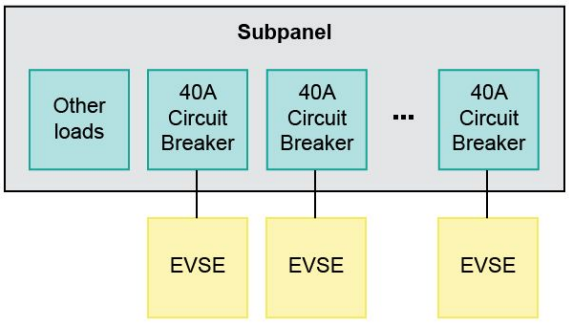
Use this checklist to note the nominal ratings for the building, starting at the main feeder and switchgear:

- ❏ Main Feeder: _____ amps
- ❏ Switchgear: _____ amps
- ❏ Panel Board: _____ amps
- ❏ Meter Demand Reading: _____ amps (observed at time of visit)
- ❏ Main Breaker: _____ amps (at the meter)
- ❏ 480 / 208V Transformer: _____ (if applicable)
- ❏ Panel Breaker Rating: _____ amps
- ❏ # of Phases on the Panel: _____
- ❏ Line Voltage: _____ Volts
- ❏ Panel Rating: _____ amps
  - ❏ Existing Loads on the Panel: _____ amps
  - ❏ Estimated Available Panel Capacity: _____ amps
- ❏ Subpanel Rating: _____ amps (if applicable)
  - ❏ Existing Loads on the Subpanel:_____ amps
  - ❏ Estimated Available Subpanel Capacity: _____ amps

Connect an EverCharge charge station to an existing 208V or 240V panel if electrical capacity and physical space is available. If there is capacity but no available space, the installation will require a new subpanel. Sites without sufficient 208V-240V capacity may require installation of a new transformer to leverage 277V/480V capacity if available or new service.

2.3. Typical System Layout Examples

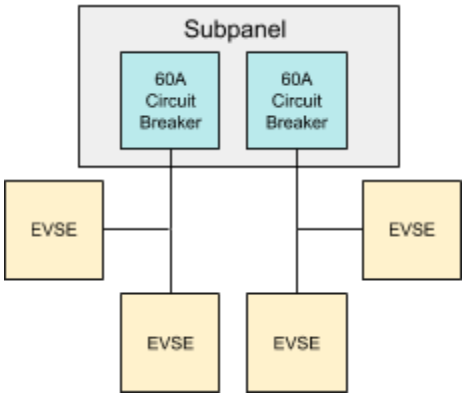
Two common configurations for the EverCharge system are shown in Figures 2.3.1 and 2.3.2. Charger stations MUST be protected with an overcurrent protective device. Contact EverCharge for site-specific layout assistance and approval at 415.429.2971 or install@EverCharge.net.



System configured to draw no more than 80% of the available capacity in the Subpanel after other loads taken into account

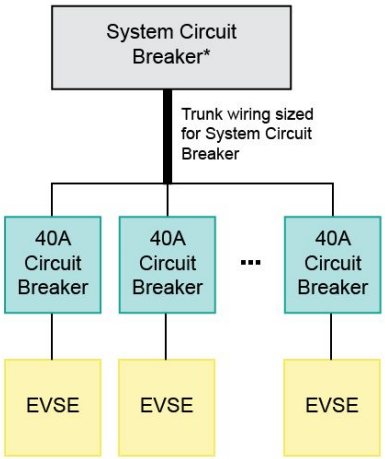
Case 1 - Figure 2.3.1

All AC charge stations are connected to individual circuit breakers in a panel that is shared with other non-EverCharge loads. Refer to Section 2.1 to suggest a possible panel size for available capacity on the subpanel. The EverCharge system will be configured in Section 4 to not exceed 80% of this available capacity regardless of the number of EverCharge 40A circuit breakers in the panel.



Case 2 - Figure 2.3.2

All AC charge stations are connected to a larger circuit breaker. Each has a 40A breaker box installed adjacent to the AC charge station. In this configuration the larger circuit breaker should be rated to meet the recommended available capacity from Section 2.1. The EverCharge system will be configured in Section 4 to not exceed 80% of the rating of the larger circuit breaker.



2.4. Charge Groups

Groups of charge stations may draw power from independent power sources at a site. Sets of charge stations drawing from the same power source belong to a Charge Group. While some smaller installations require only one Charge Group, the system supports any number. The amount of power that the EverCharge system will draw is set at the Charge Group level, which is then shared by individual charger stations.

In Case 1, the available power for the Charge Group is **80% of the available capacity on the subpanel,** after other loads on the subpanel have been taken into account.
In Case 2, the available power for the Charge Group is **80% of the rating of the larger circuit breaker**.

2.4.1 Charge Group Circuit Sharing

AC Chargers per single circuit	**Minimum** Breaker Rating	**Recommended** Breaker Rating	**Voltage**
1	40 A	**60 A**	208V
2	40 A	**60 A**	208V
3	50 A	**60 A**	208V
4	50 A	**80 A**	208V
5	60 A	**80 A**	208V
6	60 A	**80 A**	208V
7	70 A	**100 A**	208V
8	80 A	**100 A**	208V
9	80 A	**100 A**	208V
10	100 A	**125 A**	208V

2.5. Confirm Cellular Service

A simple test is to check for data on a mobile phone at the parking area. If no cellular service exists, alternative data connection options are available. Contact EverCharge for more information.

2.6. Best Practices To Support Future Expansion

2.6.1. Consolidate and Upsize Wiring

Consolidate feeders that supply the charge station installations by placing multiple circuits within a single conduit. Use higher-gauge wire when possible to make future expandability easier. As an example, 6 AWG wire enables the use of a 50-Amp breaker, quickly converting wiring for a single charge station into the ability to support 2-3 vehicles.

2.6.2. Subpanels in Large Garages

In multi-level and large parking areas, EverCharge recommends installing centrally-located subpanels to distribute power. This will provide greater coverage for expansion while reducing future conduit runs and installation costs.

2.6.3. Install Junction Boxes

Junction boxes should be installed roughly every 50 feet (15 meters) on each conduit run to provide easy expandability for future vehicles.

2.7. Electrical Layout Reporting

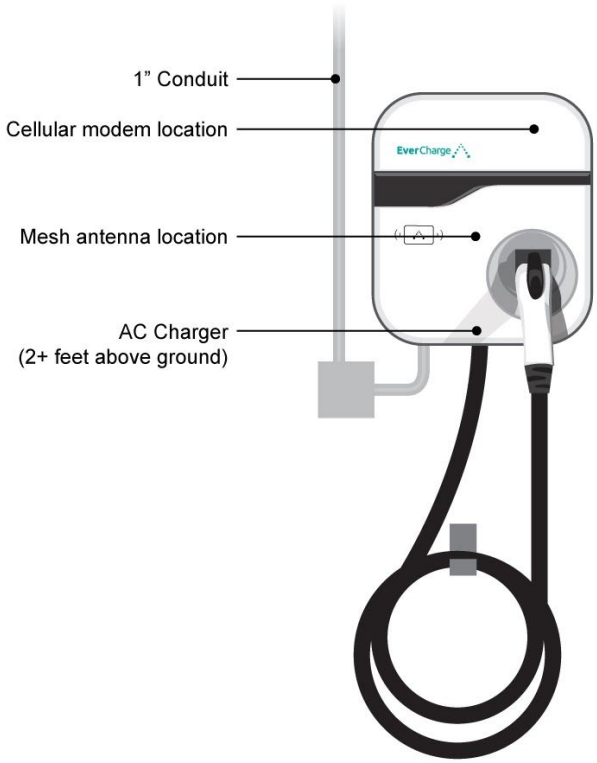
Please report how much power is available to the system **before** taking the 80% rule into account. EverCharge will apply the 80% rule during our configuration. For instance, if the panel powering chargers is being fed with a 125 Amp three-phase breaker, report 125 Amps of three-phase; EverCharge will limit total system draw to 100 Amps. Or, if EverCharge is sharing a panel with other loads (as in Case 1, shown in Figure 2.3.1), report the total capacity available and we will limit draw to 80% of that capacity.

When installing more than one charger, please report to EverCharge how you plan to feed chargers their power, specifically noting what parking space the charger is located at, what phase the charger is on, and what chargers share circuit breakers. For instance, something similar to a panel schedule would be useful:

Spot #	Charger serial	Brk	Circuit	Circuit	Brk	Charger serial	Spot #
11	HWT1701-EXAMPLE	40/2	1,3	2,4	40/2	HWT1701-EXAMPLE	12

During the initial site visit, you will not know the charger serial numbers, but that information will be supplied when we ship chargers to you. If parking spaces are not numbered, please use some unambiguous means of identifying locations. Ensure that chargers will be installed in their assigned location.

3. Installing the EverCharge Charge Station



3.1. Choose an Appropriate Mounting Location

The EverCharge charge station should be mounted on a wall or column adjacent to the electric vehicle parking space. If wall or column is not available, alternative options are available from EverCharge.

Verify the following before mounting:

➔ Chargers are installed in their assigned locations as shown on the shipping box
➔ Distance to the vehicle charge port is not longer than included charge cord length of 18 feet (5.5 meters)
➔ Charge cord does not obstruct a walkway
➔ The charge station is protected from a vehicle collision
➔ The charge station is at least 18-24 inches (450-600mm) above the ground [NEC Article 625.50]
➔ Access to all three mounting screw-holes is not blocked by conduit or other materials
➔ If more than one charge station is shipped, the charge station marked "Primary" has cell service
➔ Charge station has near line of sight view to at least one other charge station in Charge Group

3.1.1. Power and Grounding Requirements

⚠ **Attach the provided "Power Managed" warning sticker to the panel the charge station is supplied from!**

The charge station requires 208-240V across two legs. The charge station must be connected to a grounded, metal, permanent wiring system via the equipment grounding terminal on the charger.

3.1.2. Mounting and Installation Parts

EverCharge recommends the following parts for an AC Charger installation:

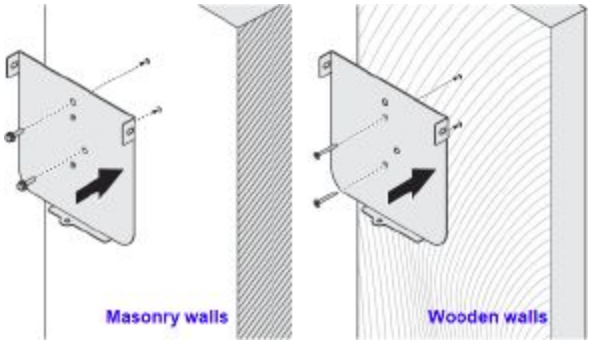
EverCharge-supplied hardware:
- Mounting bracket
- Torx T30 bolts (x3)
- Cable hanger bracket (optional)

Installer-supplied hardware:
- Trade size 1" (27mm) conduit and fittings
- Copper THHN #6 75℃ or #8 90℃ conductors
- 40 Amp 2-pole circuit breaker

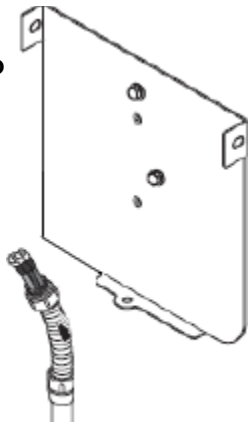
3.2. Step-by-Step EverCharge Charge Station Installation Instructions

> **Disconnect electrical power prior to installing the EverCharge Charge Station. Failure to do so may cause physical injury or damage to the electrical system and charging unit.**

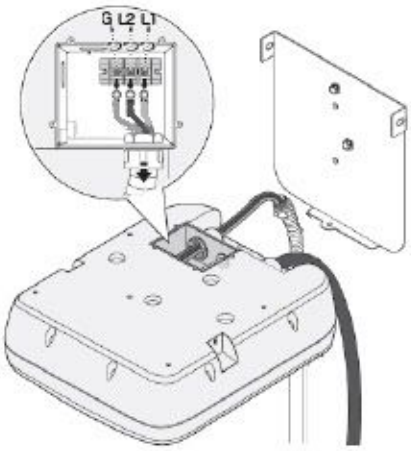
1. **Drill bolt holes** in the wall for the mounting bracket and optional cable hanger.



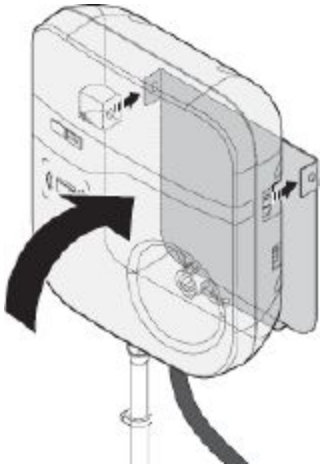
2. **Secure mounting bracket and optional cable hanger to wall** using appropriate bolts. For masonry, use ¼" expansion bolts. For wood studs, use #8 wood screws at least 2 inches in length.



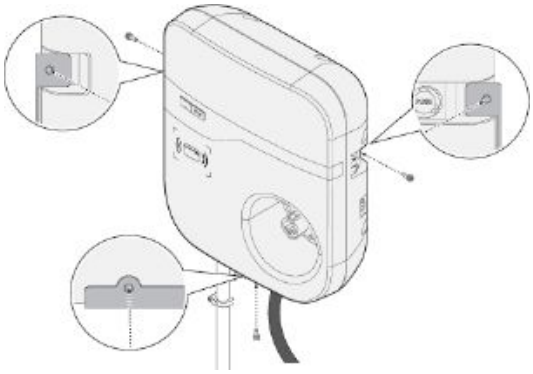
3. **Connect wiring to charger** in accordance with local codes. Use 50A-rated copper conductors. The charger requires 208-240V.



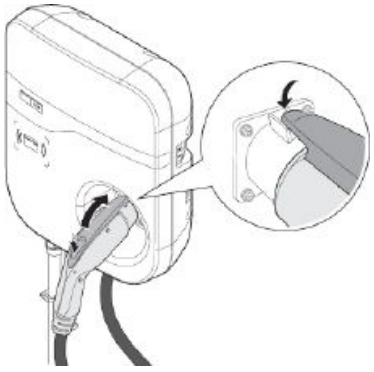
4. **Align screw holes** of the mounting bracket with the AC Charger holes.



5. **Install and secure** with three screws to the support bracket.



6. **Attach charge cable to plug** and hang the rest of the cable on the cable hanger if installed.



With the charger powered on, after initialization (which can take up to a minute), the charger should display a solid green LED. If it keeps flashing red for more than two minutes, contact EverCharge.

4. System Configuration and Testing



After installing all of the AC Chargers, before users can charge their cars, the system must be configured so that at no point does the system ever try to draw more power than is allocated.

Please reach out to EverCharge at 415.429.2971 or install@EverCharge.net so we can configure the chargers based on the site configuration worksheet and supply instructions.

4.1. Testing Instructions

Make sure that each charger is displaying a solid green LED before starting testing. Chargers require roughly a minute to initialize after getting power. If a charger blinks red for more than a minute, contact EverCharge.

Test an assigned card by tapping it to the charger. The charger should beep twice, then within 10 seconds, it should beep twice again and the LED should cycle between green/orange for two minutes, indicating the card was authorized and the system is ready to charge.

If the charge station flashes red or takes longer than 10 seconds to respond after tapping a card, it does not have a good wireless connection with the Primary Charger or the card was not assigned to the tested charger. Make there is no conduit/metal pipe near the antenna side of any Charger. EverCharge can provide relay Network Boxes if necessary to help connect chargers to each other.

4.2. Installation Summary Checklist

Use the following checklist to make sure that everything has been installed and configured correctly:

- ❏ Transformer, Main Breaker, Panel, subpanel have available capacity
- ❏ Junction Boxes along the entire electrical run for future expandability
- ❏ If applicable, trunk infrastructure wiring sized for the system breaker size
- ❏ Electrical layout (section 2.7) reported to EverCharge
- ❏ AC Chargers are securely and safely mounted on the wall, column, or pedestal adjacent to the electric vehicle parking space **in their assigned location**
- ❏ AC Chargers are connected to 208V-240V via an OCPD with 50A-rated conductors
- ❏ Charger marked “Primary” is installed in a location with cellular reception
- ❏ Power Managed warning stickers applied on panel feeding chargers (not to the chargers!)
- ❏ Access cards tested with assigned chargers, in envelopes for customers
- ❏ **Call 415.429.2971 before you leave**. Send EverCharge the site configuration worksheet including locations of each charger, it’s phase, and it’s serial number (see section 2.7) to install@EverCharge.net. Be sure to include photos of the install!

Appendix A: Code Authority

In electrical codes prior to NEC 2014, intermittent EVSE charging loads were considered to be continuous, requiring overcurrent protection at 125% of the combined max load of each charger unit, whether or not any load management system was operating. In NEC 2014, a provision was added that specifically allows for the EverCharge system of power management:

NEC 2014 625.41 Rating
Electric vehicle supply equipment shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Where an automatic load management system is used, the maximum electric vehicle supply equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.

This language was also adopted in TIA 11-3, which took effect in all NEC 2011 territories on November 8, 2011, and a California supplement that went into effect on July 1, 2015. The EverCharge system is designed to operate in accordance with the above code requirement, and presence of language substantially similar to the above in code requirements is assumed throughout.

Appendix B: Indicator LEDs and Troubleshooting

AC Charge Station Indicator Light	Status	Troubleshooting Instructions
SOLID GREEN	OK: Ready / Idle	N/A
FLASHING GREEN / YELLOW	OK: Card authenticated / In queue to charge	Plug in vehicle, wait for charging to begin.
FLASHING GREEN	OK: Charging	This is the appropriate indication that the vehicle is plugged in and charging properly
SOLID RED	ERROR: Wiring / ground fault	Check wiring. Charger needs 208V-240V. If problem persists contact EverCharge
FLASHING RED	ERROR: Booting up	The charger will flash red for up to 60 seconds while the charger self-configures. If light continues to flash red after 60 seconds, contact EverCharge.
SINGLE RED FLASH (within 10 seconds of tapping card)	ERROR: Card not authenticated	Assign card to charger via configuration interface
SINGLE RED FLASH (more than 10 seconds after tapping card)	ERROR: Network timeout	Charger does not have good connection with Primary charger. Relay network boxes may be required to resolve

Appendix C: Charge Station Electrical Specifications

Charging Interface	SAE J1772 compliant charging plug
Input Rating	208-240 Vac, single phase, 40 A, 60 Hz
Connections and Wiring	L1, L2, and grounded, hardwired with terminal block
Standby Power	< 5 W
Output Rating	208-240 Vac, single phase, 30 A maximum, 60 Hz, 7.2 kW max.
Internal Residual Current Detection	20 mA CCID per UL 2231
Upstream Breaker	2-pole breaker, non-GFCI type
Electrical Protection	over current, short circuit, over voltage, under voltage, ground fault, surge protection, over temperature
Status Indicators	standby, charging, fault, warning
Buttons/Switches	charger on/off, stop charging
Operating Temp.	-22 F to +122 F (-30 C to +50 C)
Humidity	95% relative humidity, non-condensing
Charging Cable Length	18ft (5.5 m) straight cable
Ingress Protection	NEMA 3R
Cooling	Natural cooling
Dimensions (W x H x D)	13.8 x 15.7 x 5.0 inches (350 x 400 x 126 mm)
Net Weight	15.4 lbs (7kg)
Certificate	UL, cUL