

Noah Energy Solutions

NA AC CHARGER

Installation and Operation Manual



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A. Conventions

General Conventions

The following conventions are used in this manual:



Note:

Indicates additional information that is relevant to the current process or procedure.



WARNING!

Warning information appears before the text it references to emphasize that the content may prevent damage to the device or equipment.



CAUTION!

CAUTIONS APPEAR BEFORE THE TEXT IT REFERENCES. CAUTIONS APPEAR IN CAPITAL LETTERS TO EMPHASIZE THAT THE MESSAGE CONTAINS VITAL HEALTH AND SAFETY INFORMATION.

The content of this manual is for reference only and does not constitute any form of commitment. The product (including but not limited to color, size, function, etc.) shall prevail.

B. Copyright

The ownership and all intellectual property rights of this Installation and Operation Manual (the "Manual"), including but not limited to the content, data and figures contained herein, are vested by Noah Energy Solutions, Inc. ("Noah Energy"). The Manual can only be applied to the operation or use of the product. Any disposition, duplication, dissemination, reproduction, modification, translation, extraction, or any other usage to the Manual is prohibited without obtaining Noah Energy's prior written permission. As the product will be developed and improved continuously, Noah Energy may modify or update the Manual from time to time without any notice. Noah Energy will keep the Manual updated and maintain the accuracy of the Manual. Noah Energy disclaims any kinds or forms of warranty, guarantee or undertaking, either expressly or implicitly, including but not limited to the completeness, accuracy, non-infringement, merchantability or fitness for particular purpose or usage.

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C. Warranty

Noah Energy Solutions Inc., products are covered by a limited warranty against defects in materials and workmanship.

The standard warranty period is three (3) years from date of shipment (commercial use) unless otherwise stated in the Sales Quote. Extended warranty options are available and must be purchased in advance. Full warranty terms, conditions, limitations, exclusions, and extended warranty details are provided in the Noah Energy Solutions Terms and Conditions of Sale, supplied with your purchase and available at www.noahenergy.com/terms. Proof of purchase and serial number are required for all warranty claims. For warranty service, contact Noah Energy Solutions at info@noahenergy.com or 1-877-401-NOAH.

D. Abbreviations

Abbreviation	Definition
AC	Alternating current
BESS	Battery energy storage system
CAN	Controller area network
CPU	Central processing unit
DC	Direct current
EMC	Electromagnetic compatibility
EV	Electric vehicle
MID	Measuring instruments Directive
NFC	Near field communication
OCPP	Open charge point protocol
PE	Protective earth
RFID	Radio-frequency identification
RCD	Residual current device
MCB	Miniature circuit breaker
HPC	High Power Charger
CCU	Charge Control Unit
CU	Cooling Unit
IMD	Insulation Monitor Device
SECC	Supply Equipment Communication Controller



Note:

It is possible that not all abbreviations are present in this document.

E. Safety Caution

- Before using and operating your Noah AC charger, read this manual and follow the label on the device and all safety precautions in the manual.
- The safety precautions are intended to supplement, not replace, general safety practices.
- The device must be used in a working environment that complies with the provisions of this manual. Otherwise, the device may be faulty, and the resulting abnormal functions of the device, component damage, personal safety accidents, and property damage are not covered by the quality guarantee.
- The use and operation of the equipment shall not only comply with the standards of this manual but also comply with the provisions of relevant current national standards.



If the AC charger is found to be damaged, do not install it.



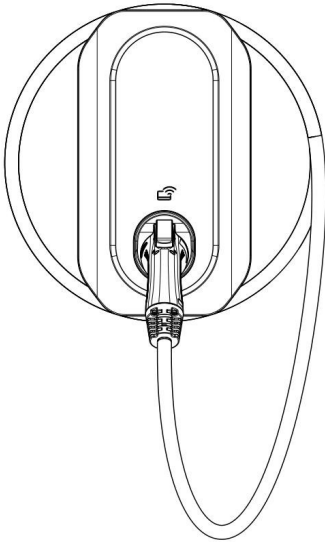
Do not install the cable if it is defective, cracked, or otherwise damaged.



Do not repair the AC charger without authorization.

- The radio waves generated by the AC charger may affect the normal work of implantable medical devices or personal medical devices, such as pacemakers, cochlear implants, hearing AIDS, etc. If you are using or considering any of these medical devices, consult their manufacturers about restrictions on the use of this device.
- Before installing or cleaning the AC charger, be sure to turn **OFF** the front RCBO (front-end power supply).
- Do not install AC charger in strong magnetic fields or near wireless transmitting devices. Do not install or use in or near flammable, explosive, chemical or steam environments.
- Do not install or use in a direct sunlight position. Do not install or use in bad weather.
- When charging an electric vehicle, read the vehicle's instructions carefully.
- Do not remove the safety symbol, warning, nameplate, or pipeline mark of the device.
- Do not spray water or other liquids onto the device, and do not immerse the charging connector in water or other liquids.
- Turn **OFF** the electric vehicle before using the charging station. Hybrid, turn **OFF** the engine. Do not allow children to approach, touch, or use the equipment.
- Do not disassemble, repair, or modify the AC charger by yourself.
- Do not use external wires, or adapters.
- Do not insert fingers or sharp objects into any part of the AC charger.
- Do not drop, squeeze, or puncture the home filling pile to avoid equipment failure. Do not fold, crush, or destroy any parts of the AC charger with sharp objects.
- Do not use the AC charger if it has defects, cracks, or other damage or does not work properly.
- Do not use a private generator as a power source for the charging pile. Do not connect the charging gun to devices other than the car.

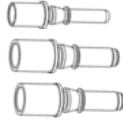
F. Packing List



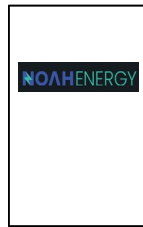
AC Charger



RJ45 x 1



Wire Terminals
1 x Ground (PE)
2 x Power Terminals



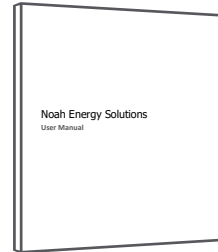
RFID x 2



Expansion Anchor x 4



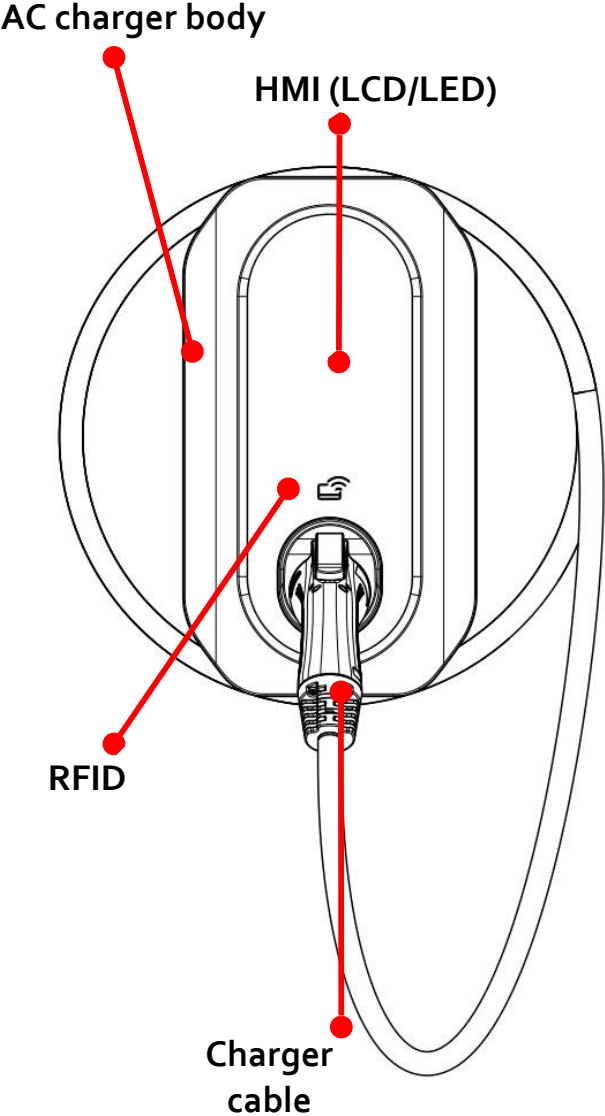
Fasten Screw
x 4



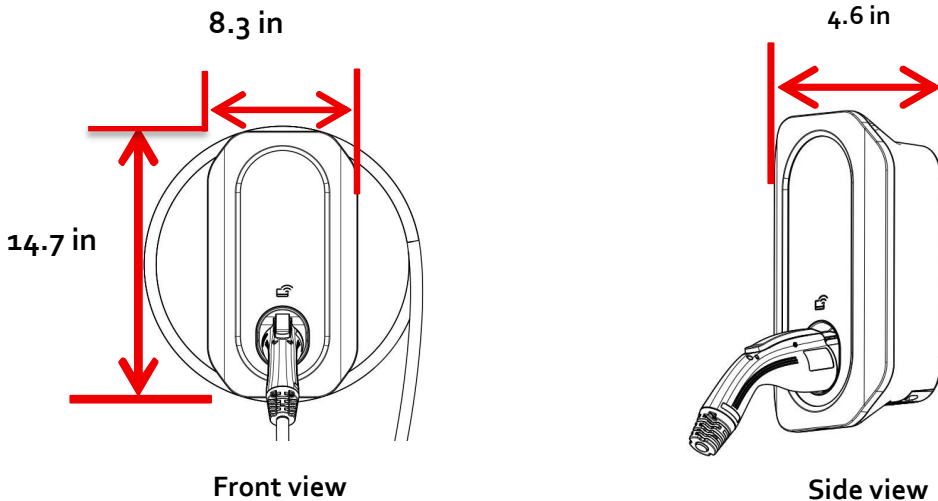
Manual

G. Introduction

Diagram of AC charger:



H. Specifications



Technical Characteristics	
Parameter	Specification
Type of connector	1 × 7m SAE J1772, NACS (with cable management)
Output design power	12.0kW (240V AC @ 50A) / 19.2kW (240V AC @ 80A)
Status indication	7-inch LCD with auto-brightness (LED optional)
Authentication methods	NFC Card, App, Credit Card (optional)
Internet/networking	4G, Ethernet, Wi-Fi, Bluetooth
Protocol	OCPP 1.6J (OTA upgradeable to OCPP 2.0.1); ISO 15118
SIM card	Nano SIM
Load and Phase balance	Supported locally
Ground Fault Detection	20mA CCID with auto-retry
Open Safety Ground Detection	Continuously monitored
Plug-Out Detection	Power terminated per SAE J1772™ specs
Energy meter	Meter accuracy 1%, Class 2.0, Tolerance 1.0%
Material	Polycarbonate, UV-resistant and flame retardant
Operating temperature	-35°C to +50°C
Storage temperature	-40°C to +85°C
Operating humidity	5% to 95%, no condensation
Operating altitude	≤2000m (7875ft)
Degree of protection (casing)	NEMA Type 3R (UL 50E), IK10 (HMI IK08), IP55
Dimensions: Charger (H × W × D)	14.69 in × 8.26 in × 4.56 in
AC Pedestal (H × W × D)	94.5 in × 20 in × 10.24 in
Weight: Charger	13.2 lbs
AC Pedestal	165.3 lbs, with two chargers 191.8 lbs
Mounting options	Wall or Post mounting (accessory)
Certification	UL and cUL listed; complies with UL 2594, UL 2231-1, UL 2231-2, and NEC Article 625, Energy Star, CTEP, FCC Part 15 Class B

I. Installation Precaution



WARNING!

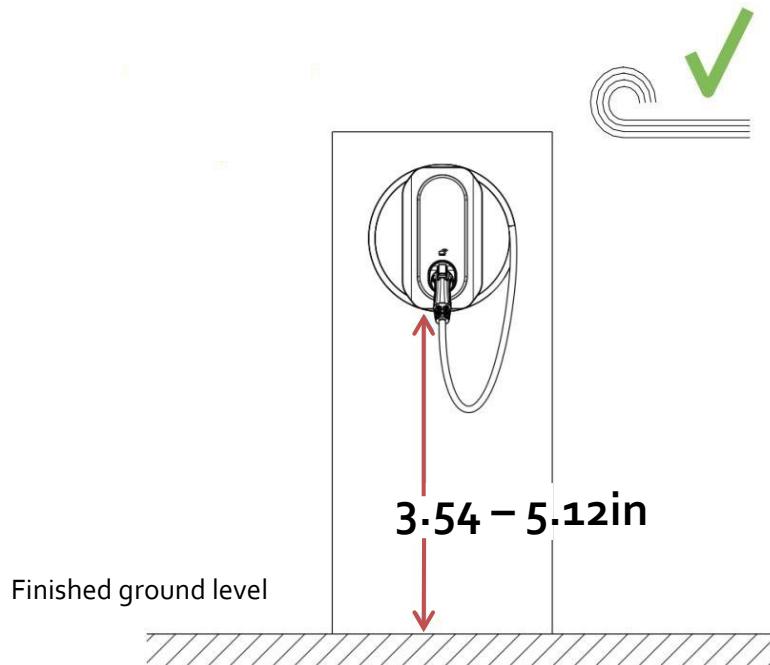
Before installation, carefully read and follow the installation precautions, and prepare for installation.

- Only certified and trained personnel are recommended to install and remove the charger.
- Follow the installation instructions to ensure the correctness and standardization of installation operations to avoid damage, accidents, or electric shock.
- When installing wiring, be sure to install PE cables first; when dismantling equipment, be sure to remove the PE cable last. Do not operate the equipment without installing PE cables.
- Do not install or dismantle equipment with electricity **ON**, ensure the circuit breakers are **OFF**.
- During the process of laying power wires, do not have any loops or winding.
- Ensure that the electrical cables are connected correctly before connecting the Residual Current Breaker with Over-Current (RCBO).
- After connecting the RCBO, do not directly touch or use conductors to contact the circuit terminals.
- Use cables that meet the local, state, federal, and standards to ensure that the insulation layer of the cable is not damaged.
- Ensure that the installation surface is sturdy and flat, meeting the load-bearing requirements for installation. It is recommended that the wall load bearing capacity be $\geq 100\text{kg}$ (220 lbs) and reserve sufficient space with good ventilation.

J. Installation Preparation

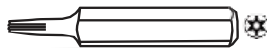
Confirm the following information before installation:

- The surplus electricity load can meet the usage of the equipment.
- Ready to meet the installation scenario, required cables, and RCBO.

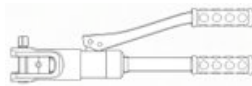


- It is recommended to install the product in a covered area. Direct sunlight may cause the charger to derate the current output when internal temperatures rise above +122F (+50°C).
- Install in a well-ventilated area. Avoid installation near heat sources or in enclosed environments.
- Ensure that the installation surface is sturdy and flat, meeting the load-bearing requirements for installation. It is recommended that the wall load bearing capacity be $\geq 100\text{kg}$ (220 lbs).
- When the wiring of the communication input cable is exposed outdoors for 9.84ft or more, consult the local installer. It is recommended to install a lightning arrester before the RCBO in front of the charging pile, with specifications meeting $U_c=385\text{V AC}$, $I_n \geq 10\text{kA}$, $U_p \leq 2\text{kV}$; there should be at least 9.84ft of cable length between the lightning arrester and the charging station.
- If the AC charger is connected to the internet using a wired connection, a sufficiently long network cable is prepared.
- If using Wi-Fi connection for networking, ensure that the installation area has wireless network coverage.
- If using green power mode and dynamic charging power control, it is necessary to select a distribution meter and use it in conjunction with the equipment.

K. Preparation of Tools



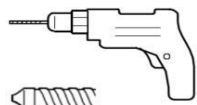
T20 internal screwdriver



Crimping pliers



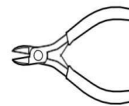
Cross screwdriver



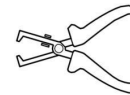
Drill and bit tool (1/4")



Pencil



Wire cutter



Wire stripper

Protective equipment	Safety helmet	Protective gloves	Insulating shoes
Installation tools	Cross shaped insulation torque screwdriver (M4)	Plum blossom insulation torque screwdriver (T10)	Impact drill and drill bit ($\phi 6$)
	Marking pen	Rubber hammer	Heat gun
Cable tools	Wire cutter	Crimping pliers	Scissors
Measuring instruments	Clamp flow meter	Tape measure	
Others	Insulating tape	Heat shrinkable sleeve	Cold-pressed Terminal

Prepare cable:

Cable Type	3-wire (L1, L2, Earth)	5-wire (L1, L1, L2, L2, Earth)
Current	32A/50A/80A	32A/50A/80A

Note: Cables must comply with electrical standards

Prepare RCBO:

Cable Type	3-wire (L1, L2, Earth)
Require	Select the appropriate RCBO based on the input line current. For example: 2P/4P RCBO, 40A; When the ambient temperature exceeds 45°C (113°F), 50A, Type A or B are recommended to meet local regulatory requirements.

L. Installation (Wall)

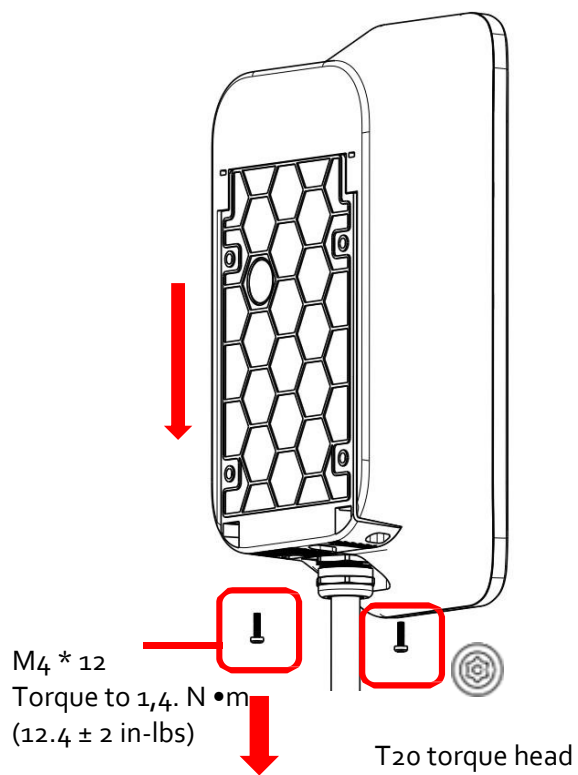
Open the unit



Note:

Read the installation precautions before installation.

1. Remove the two M4 * 10 screws at the bottom of the enclosure.
2. Separate the AC Charger from the mounting plate.

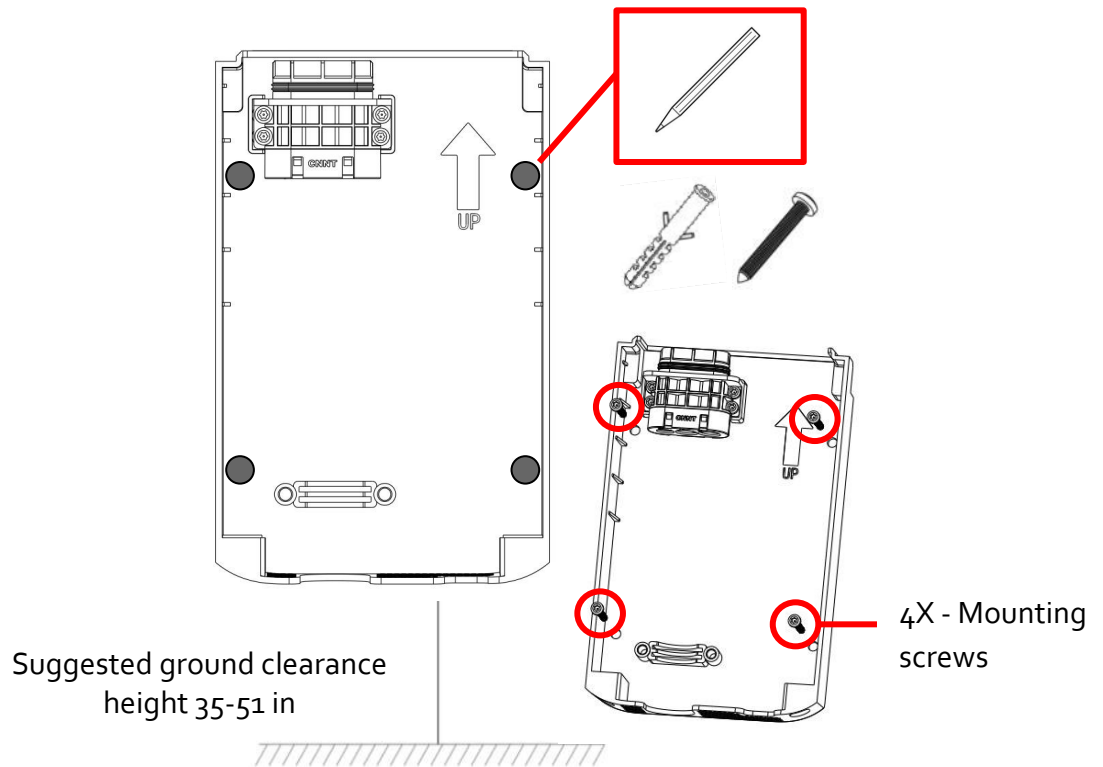


Fixed mounting plate



Note:

Install the AC charger on a wall with sufficient load-bearing capacity (≥ 220 lbs). Do not directly drill holes through the installation plate, as it may cause damage.



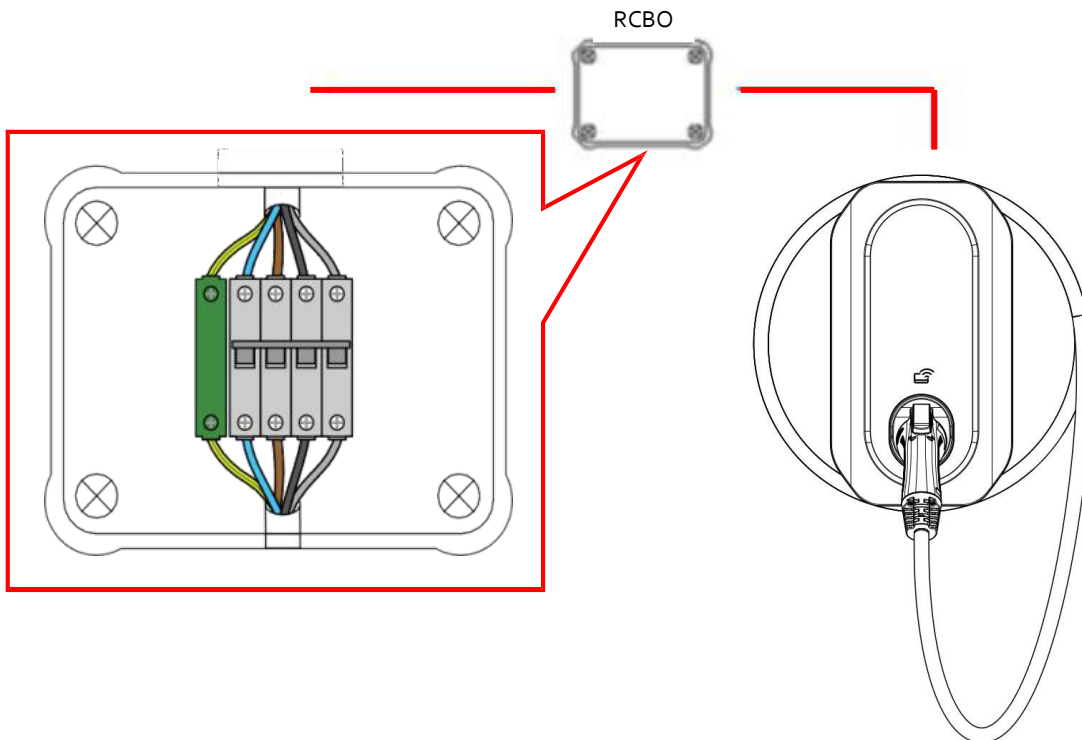
Wiring of incoming power supply



Note:

RCBO Note: A residual-current device (RCD), residual-current circuit breaker (RCCB), or ground fault circuit interrupter (GFCI) is an electrical safety device.

1. Purchase a suitable RCBO (to prevent risks such as leakage and overload) before installation.



2. Before installation, turn **OFF** the power switch of the front stage to ensure that the circuit is powered **OFF**.




WARNING!

Ensure that there is no power source in the cable during installation.

3. Choose conductor and cable types suitable for the installation based on local safety codes.
4. Select the incoming wire method based on the on-site installation situation; the stripping length depends on the incoming wire method.

Wiring of incoming power supply (continued)

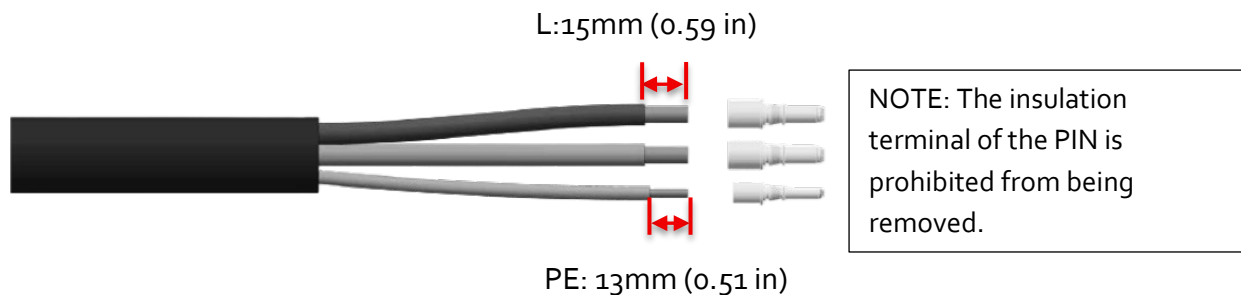
- Select the appropriate cable according to the installation requirements. Strip the cable ends as shown in the figure below and use suitable wire terminals for connection with the AC Charger.

Charger Current	32A/40A	50A	80A	Crimping Tool (Recommended)
L1	6 AWG	6 AWG	3 AWG	 Crimping Pliers
L2	6 AWG	6 AWG	3 AWG	
PE(THHN)	8 AWG	8 AWG	6 AWG	



Note:

Reserve sufficient cable length to ensure proper connection and avoid strain on the terminals. The cable must comply with UL 62 standards to ensure safety and reliability during operation.

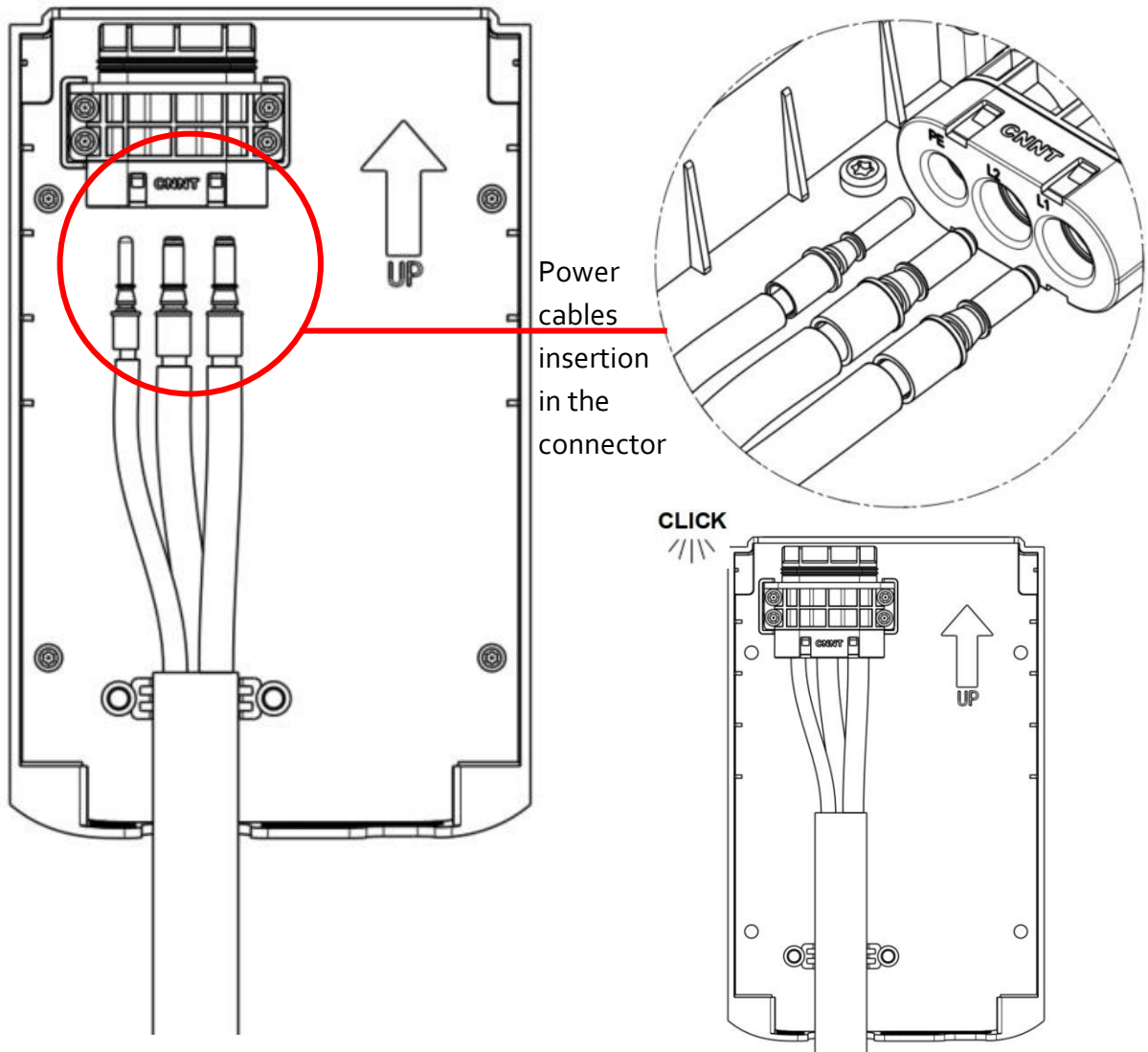


WARNING!

The on-site installation personnel are responsible for ensuring that the installation and wiring of the AC Charger complies with all applicable local regulations and electrical standards.

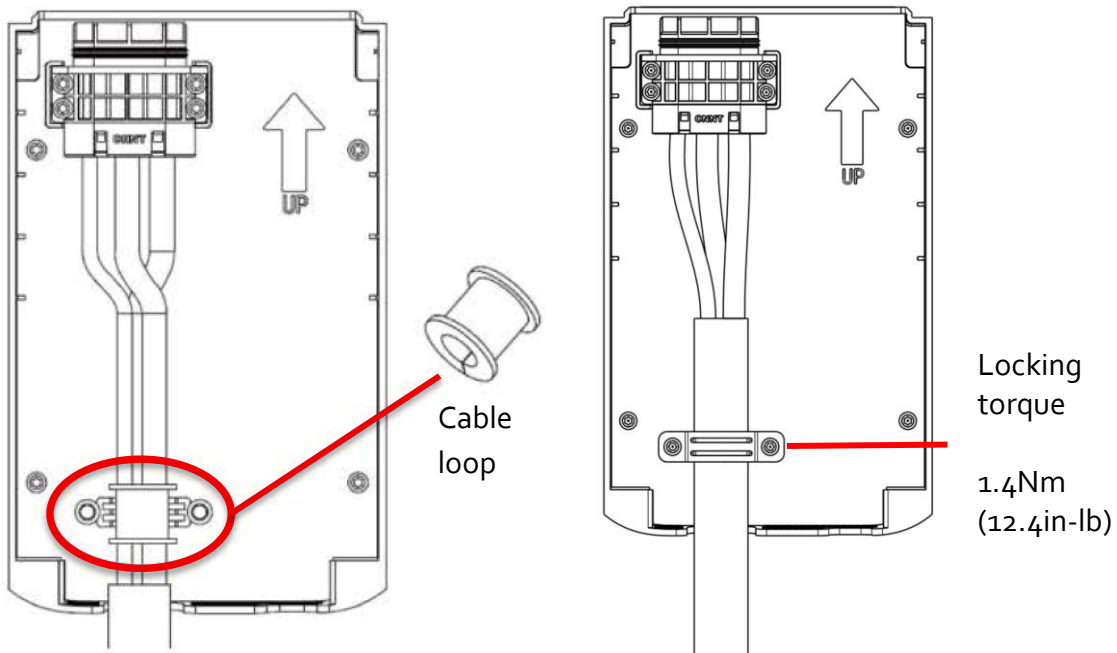
Wiring of incoming power supply (continued)

6. Insert the cable into the corresponding hole on the connector (marked on the connector) until you hear a clicking sound.
7. After it is in place, gently pull it outward to verify if it is in place and securely inserted.



Wiring of incoming power supply (continued)

8. Pass the cable through the cable loop and place it in the designated area.
9. Use the pressure plate to secure the cable.



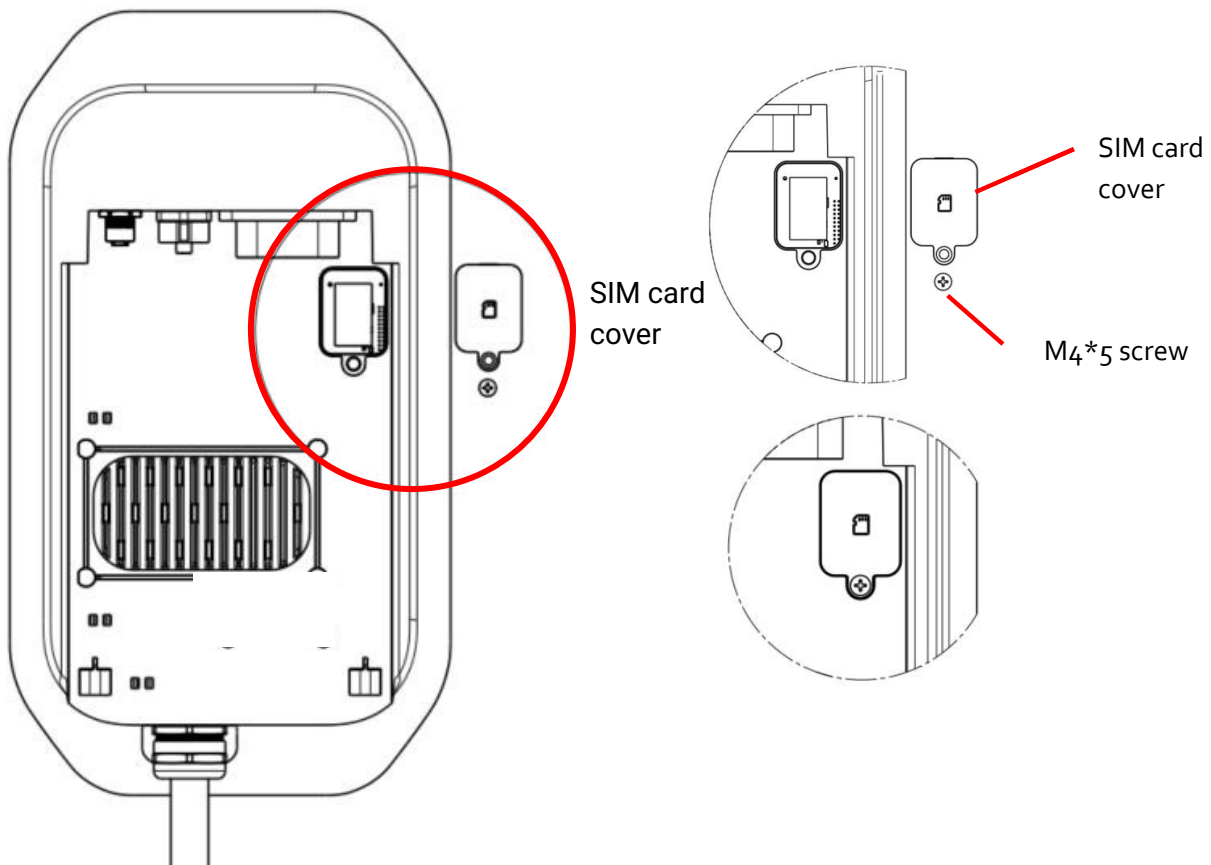
Install SIM card



Note:

If choosing 4G networking, ensure that the installation area has network coverage.

1. Remove the screws from the back of the AC charger and remove the cover plate.
2. Remove SIM card cover.
3. Insert SIM card into the designated slot with the contacts facing the correct direction and should be inserted into the socket with the connection points aligned properly.
4. Ensure the SIM card is fully seated and secured in the slot.
5. Replace the cover and torque the screw to 1.2Nm (10.6in-lb).
6. Replace the cover plate and tighten the screws.



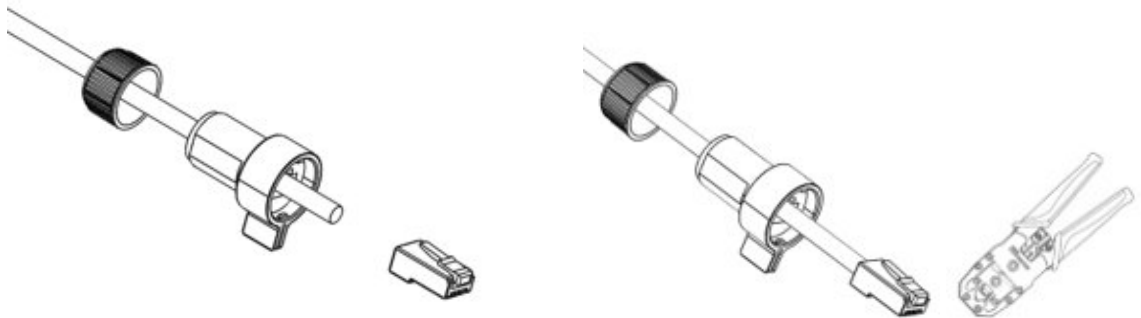
Connect network cables



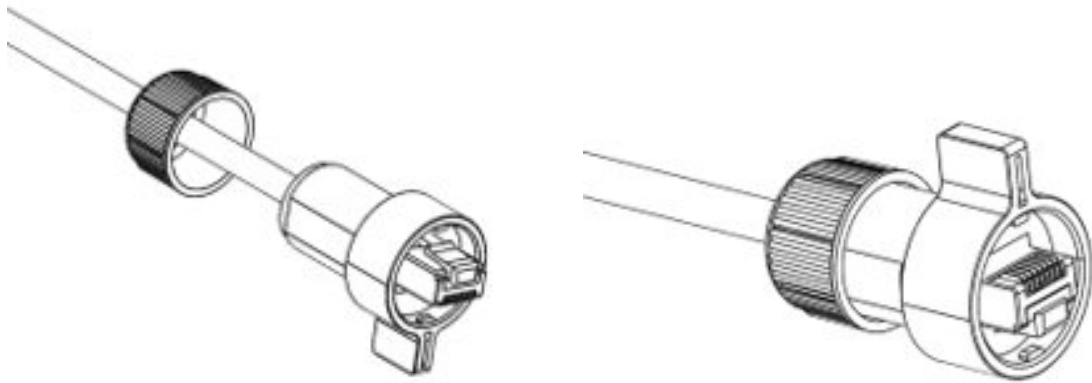
Note:

If wired networking is selected, follow the steps below to connect the communication cables.

1. Choose a network cable of appropriate length.
2. Use the network cable connector that comes with the package.



3. Pass the network cable through the connector.
4. Use a crimping tool to secure the connection.



5. Pull the network cable back into place and rotate it counterclockwise until it locks securely.

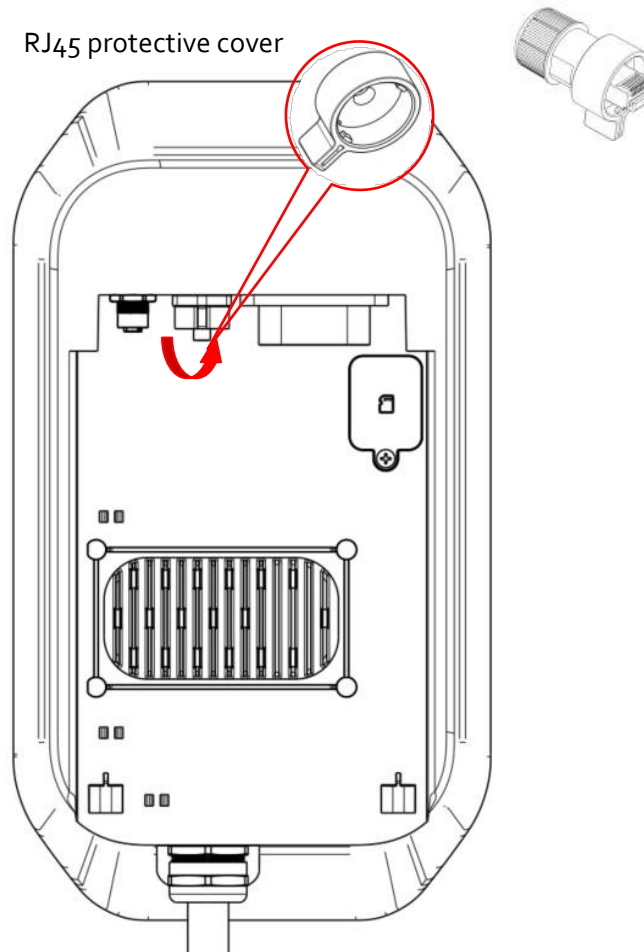
Connect network cables (continued)



Note:

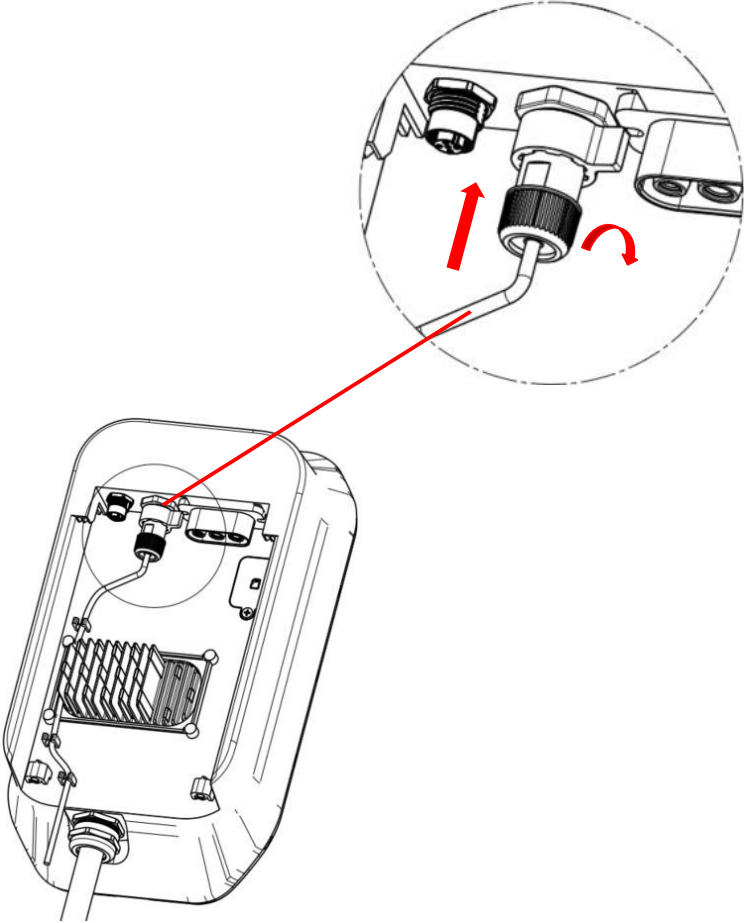
If you choose Wi-Fi networking, ensure that the installation area has wireless network coverage. If you choose wired networking, refer to the following content to connect communication cables.

1. Select the appropriate length of network cable based on the on-site situation.
2. Secure the Ethernet cable to the RJ45 connector provided with the device.
3. Rotate counterclockwise to remove the Ethernet cable protection cover of AC charger.

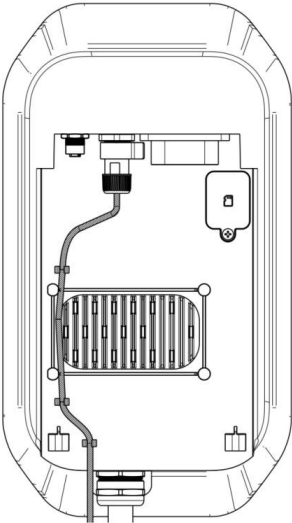


Connect network cables (continued)

- 4. Insert the made network cable connector and rotate it clockwise to lock it.

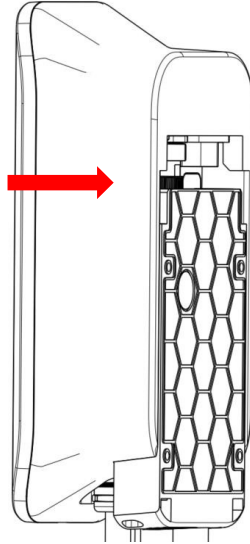


- 5. Insert the cable into the wiring buckle, fixing it into position.

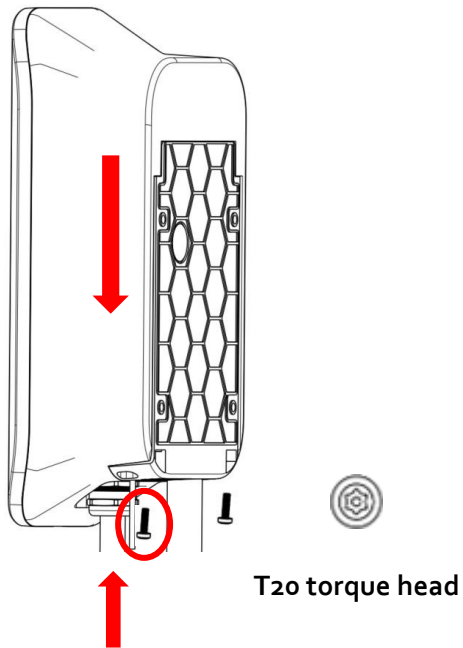


Complete the installation

1. Align the AC charger enclosure body on to the back plate.
2. Push the main body into the back panel.



3. Push the main body down until it is in place and then lock the two screws at the bottom.



4. Tighten the screws at the top and bottom. Torque the T20 screws using a Torx security driver to 1.4Nm (12.4in-lb)

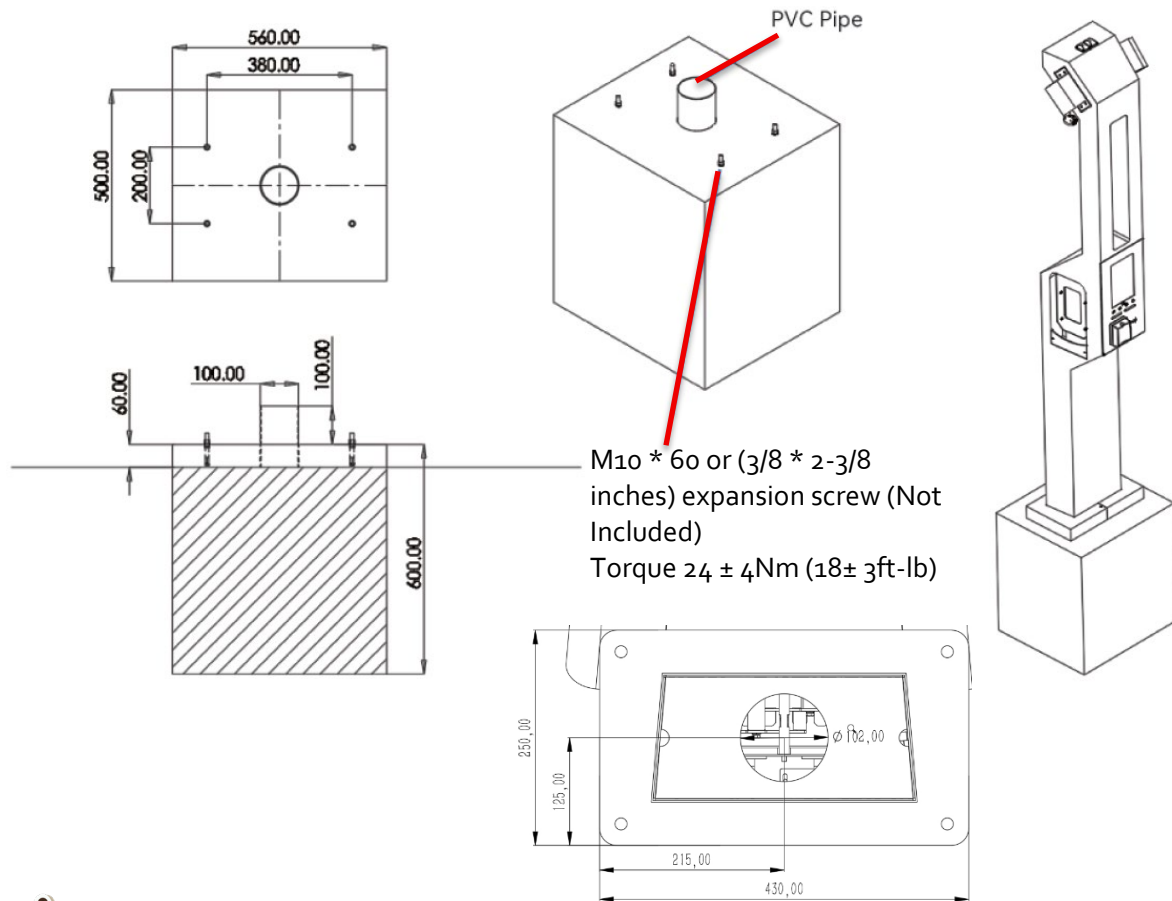
M. Installation (Pedestal)

Cement pedestal

Excavate a foundation area (22 in * 19-11/16 in * 23-5/8 in) at the installation location, pour concrete to form a base, and use a level to ensure that the bottom surface of the base is flat and level.

After solidification (usually taking 24-48 hours), use an electric drill to drill holes with a depth of 2-9/16 in and a diameter of .47in or specified by the expansion bolt manufacturer.

Insert the expansion bolt into the hole, tighten it, and ensure it is firmly fixed on the base.

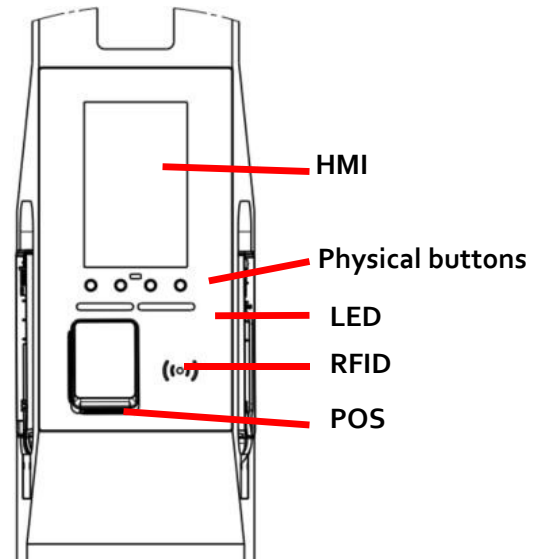
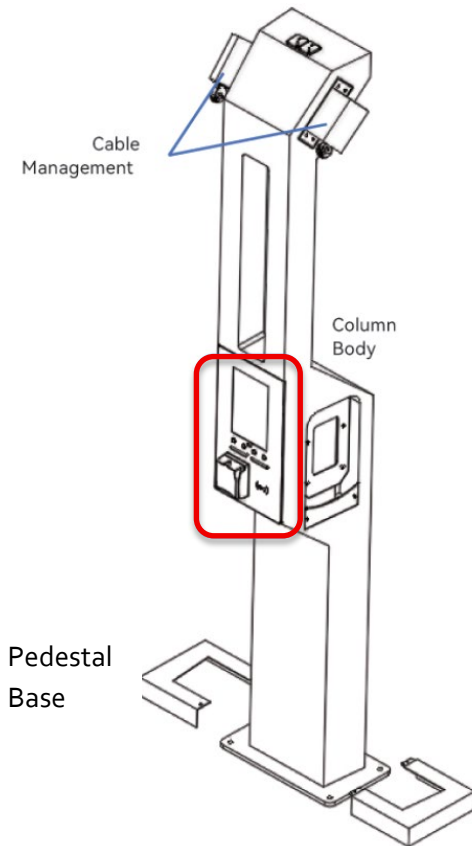


Note:

Requirements for reinforcing the concrete with rebar must comply with all applicable local, state, and federal regulations.

Open the unit

1. Open the pedestal packaging and check if it is deformed or damaged, and verify the accessories are complete.



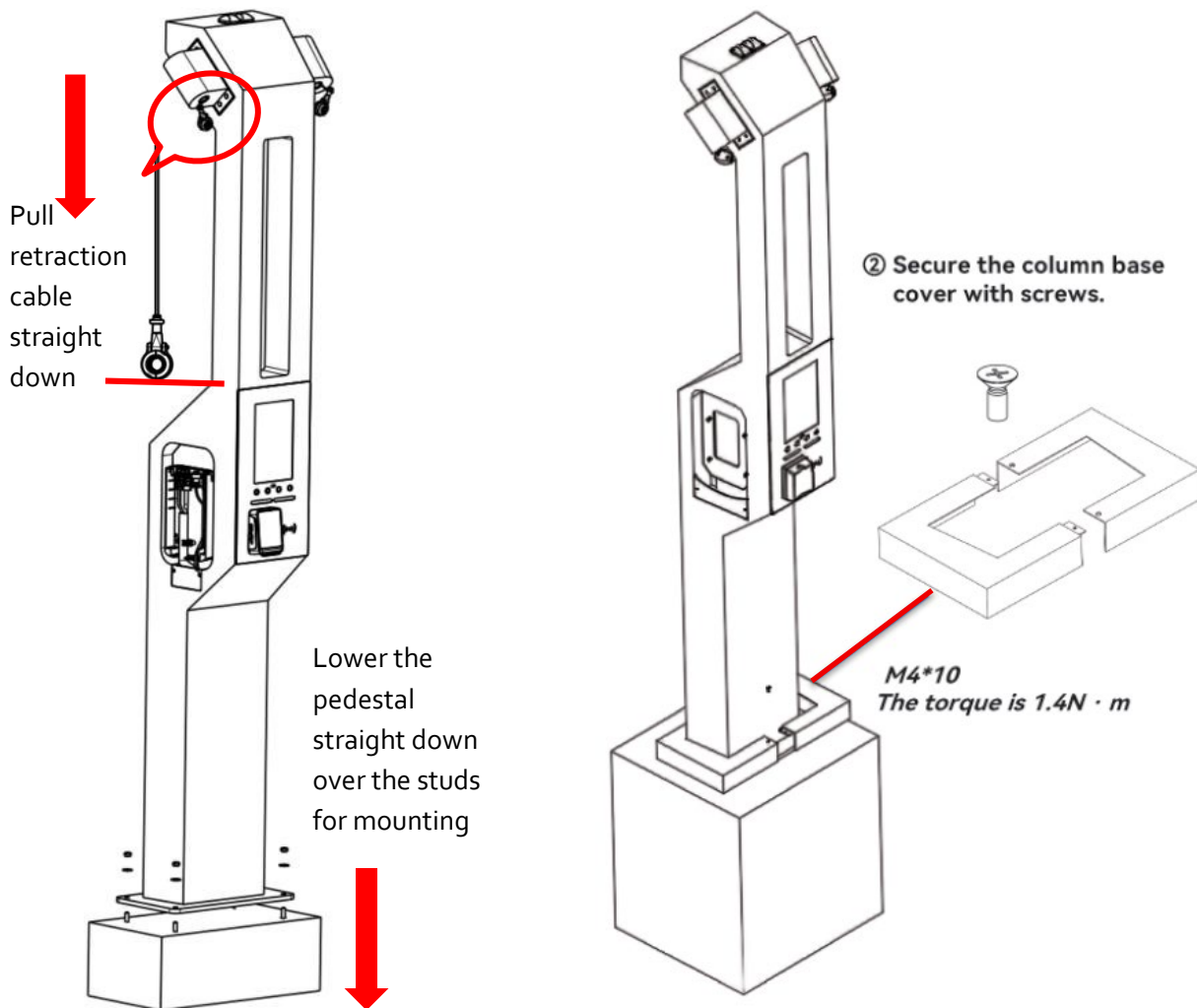
Installing the pedestal



Note:

Use a wrench to remove the nut and washer from the expansion screw, install the pedestal onto the base, then install the washer and nut and tighten them.

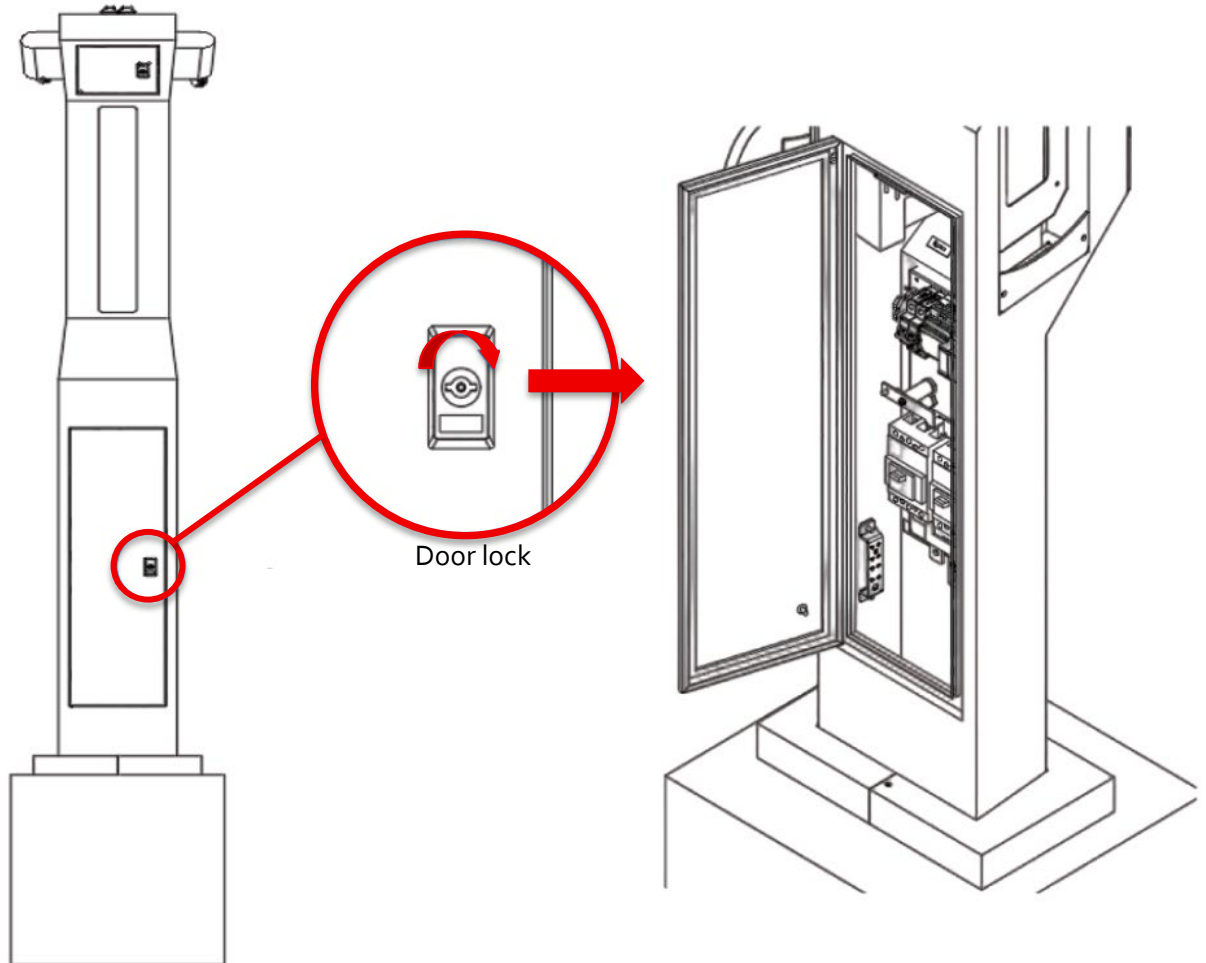
1. Pull down the cables on both sides to the position shown in the diagram.
2. Torque the nuts to the manufacturer's specification for M10 * 60 torque to $24 \pm 4\text{Nm}$ ($18 \pm 3\text{ft-lb}$).



Access and connect the wiring


1. Turn the lock clockwise to open.

Open the rear door and continue with the AC charger power cable installation and subsequent procedures.



Access and connect the wiring (continued)

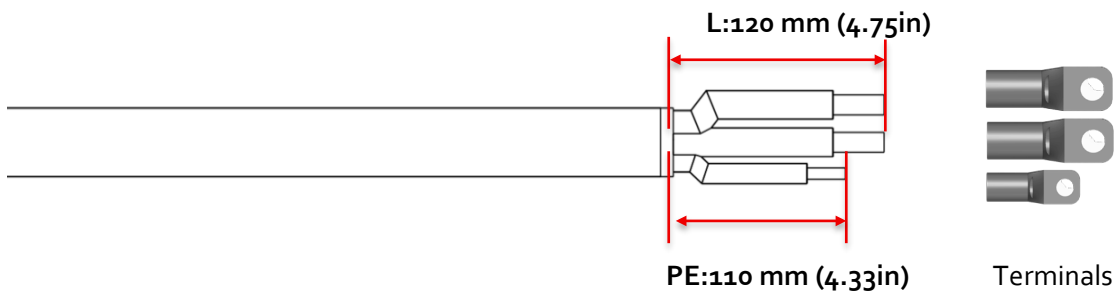
- Select the appropriate cable according to the installation requirements. Strip the cable ends as shown in the figure below and use suitable wire terminals for connection with the AC Charger.

Charger Current	50A	80A	Crimping Tool (Recommended)
L1	1 AWG	4/0 AWG	 <p>Crimping Pliers</p>
L2	1 AWG	4/0 AWG	
PE(THHN)	4 AWG	1 AWG	
Terminal Model	L: TL 50-10 PE: TL 25-8	L: TL 120-10 PE: TL 50-8	



Note:

Reserve sufficient cable length to ensure proper connection and avoid strain on the terminals. The cable must comply with UL 62 standards to ensure safety and reliability during operation.

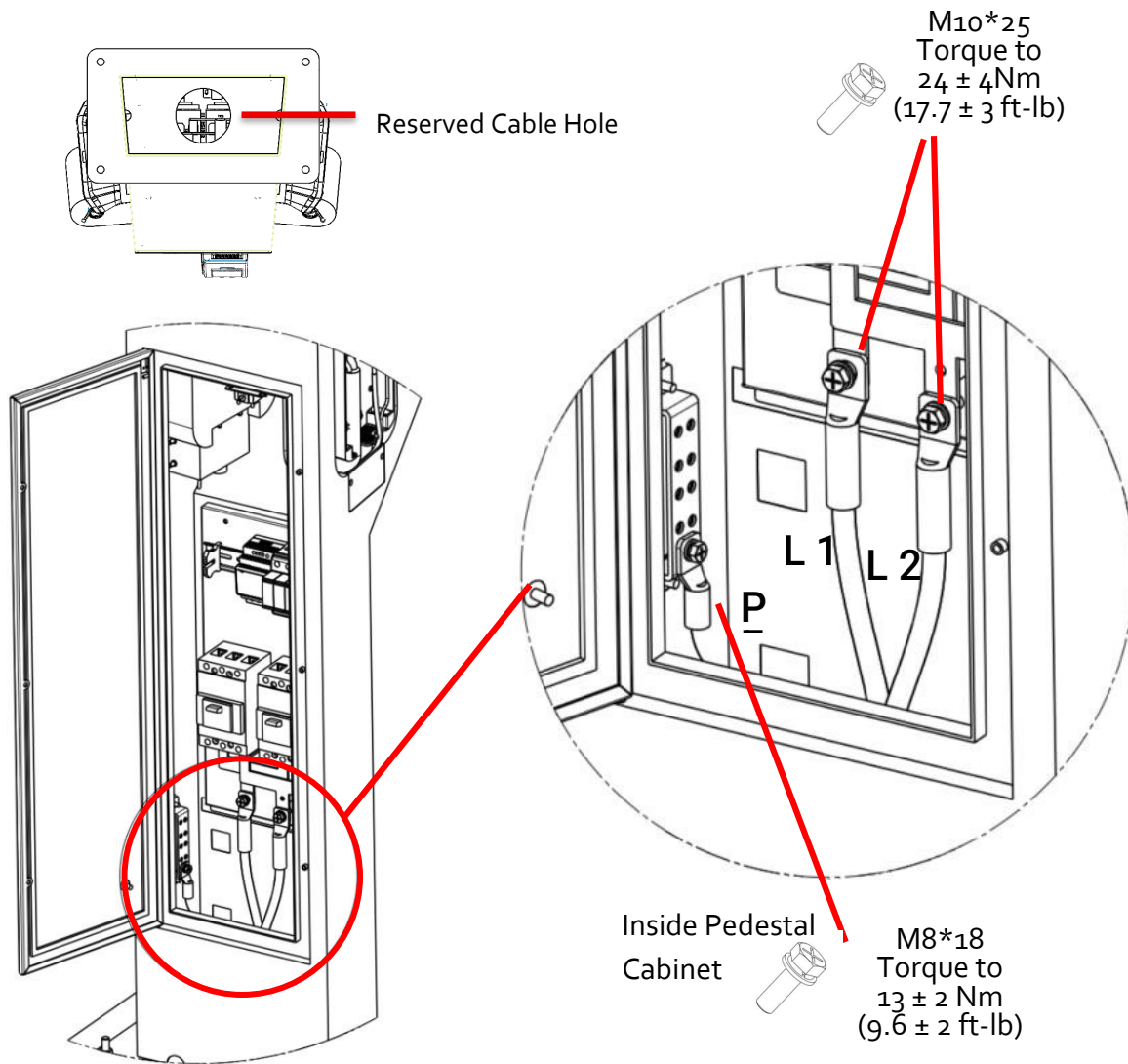


WARNING!

The on-site installation personnel are responsible for ensuring that the installation and wiring of the AC Charger complies with all applicable local regulations and electrical standards.

Access and connect the wiring (continued)

3. Pass the power cable through the reserved hole at the bottom of the column.
4. Open the cabinet door and connect L1, L2, and PE according to the diagram.



Installing the AC charger on the pedestal

1. Remove the two Phillips screws holding the small cover plate.



Remove the small cover plate.

M4 *10 Torque to 1,4. N •m (12.4 ± 2 in-lbs)

2. Install the AC charger back plate and mounting screws.



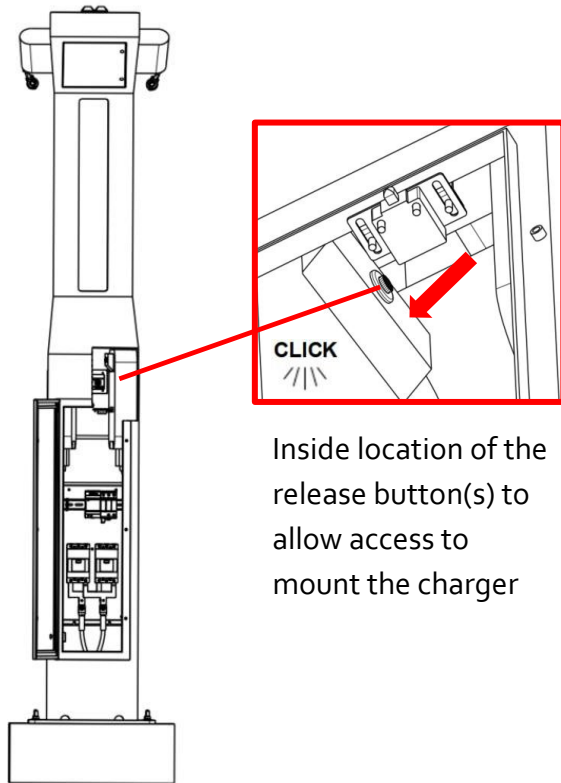
Install back plate and mounting screws.

M5 *12 Torque to 1,4. N •m (26.5 ± 4 in-lbs)

3. Follow the instructions in the "Wiring of incoming power supply" section of this manual for the following:
 - a. Wire size (Follow all local, state and federal regulations).
 - b. Terminal to wire preparation and crimping.
 - c. Cable and terminal installation in the connector.
 - d. Mounting the cable through the cable loop and pressure plate to the back plate.

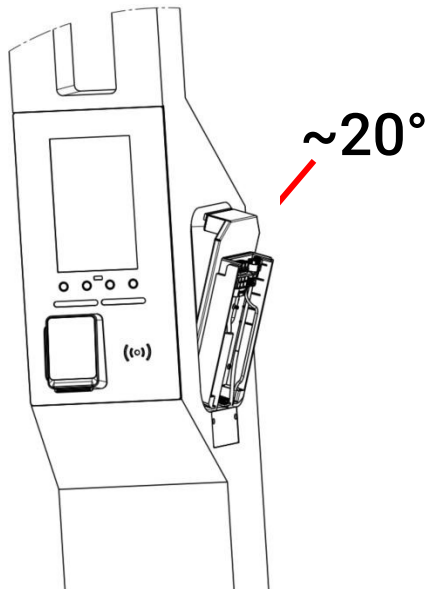
Installing the AC charger on the pedestal (continued)

4. Locate the buttons on each side within the pedestal. Press them until you hear a clicking sound.



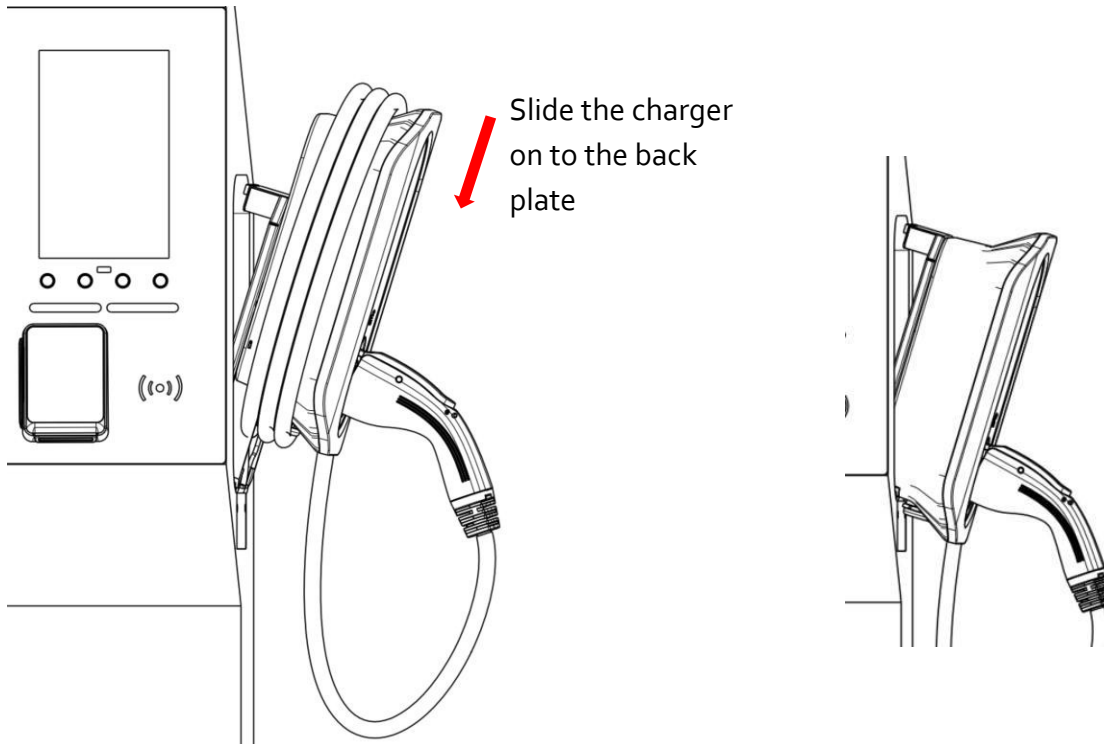
Inside location of the release button(s) to allow access to mount the charger

5. Flip the mounting plate downwards approximately 20 degrees until it is fully opened.

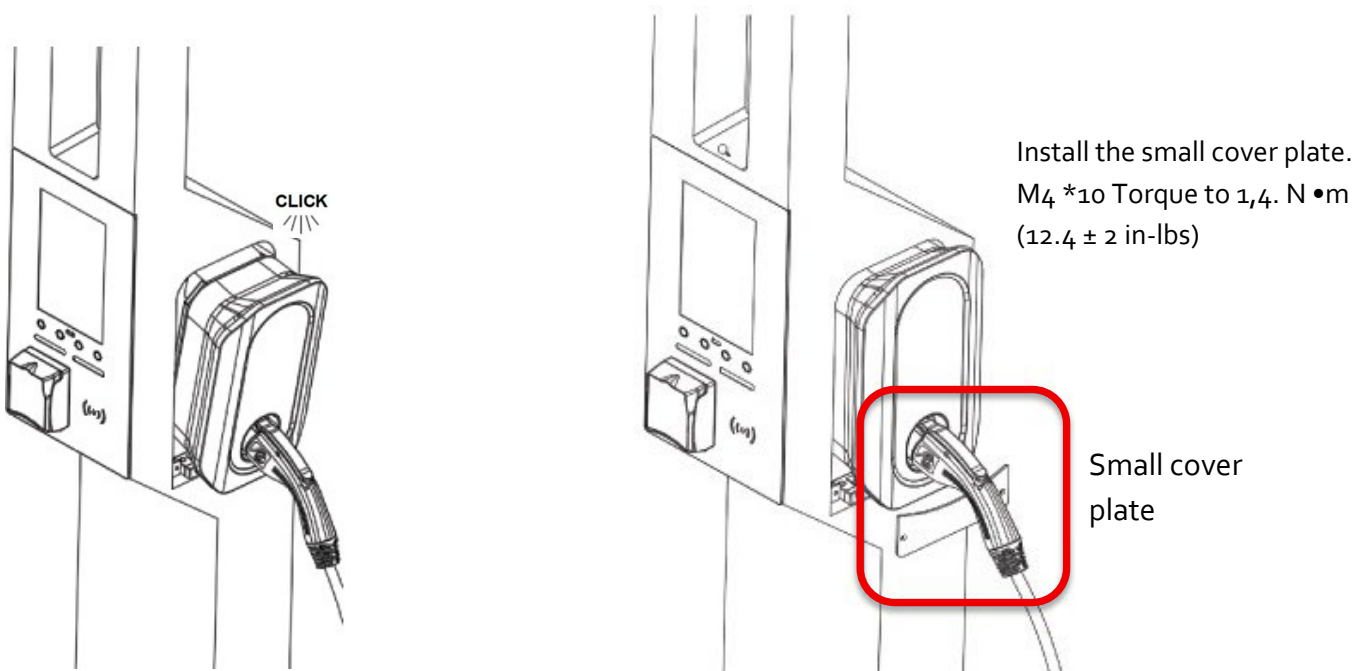


Installing the AC charger on the pedestal (continued)

- Slide the AC charger downwards along the direction of the mounting plate until it is fully installed.

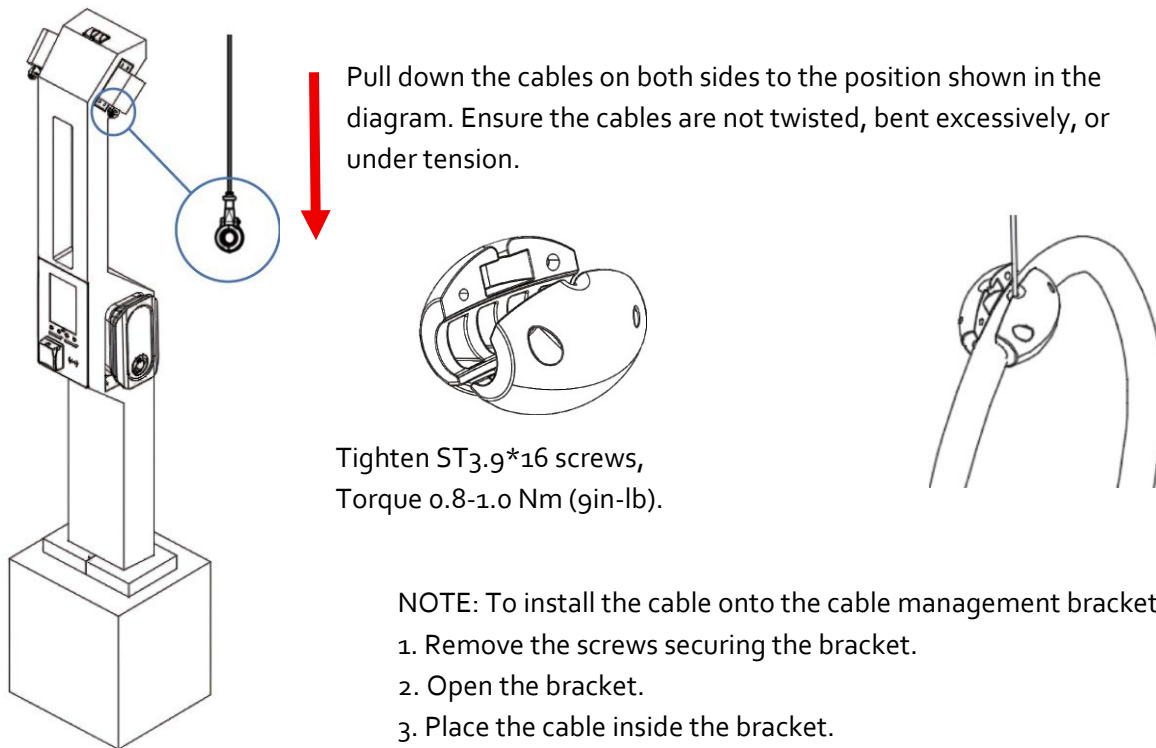
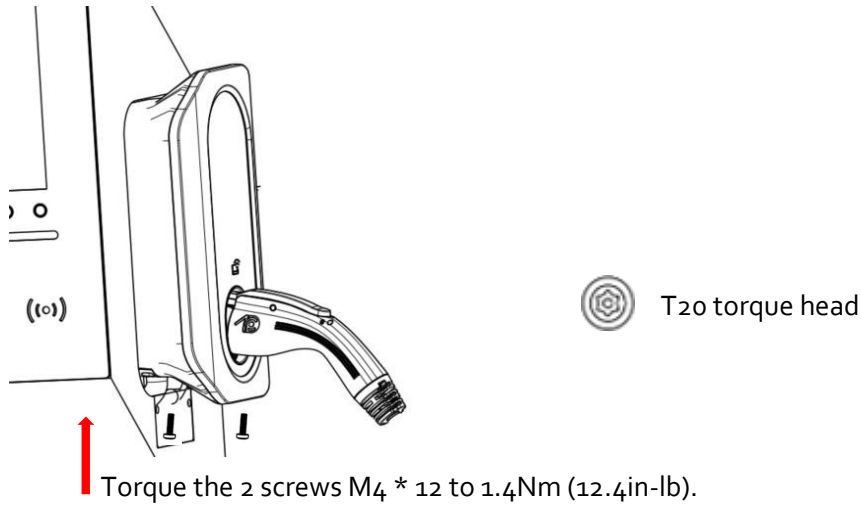


- Push the installation plate and press down firmly on the bottom until you hear a clicking sound.



Installing the AC charger on the pedestal

8. Tighten the two screws to complete the installation.



N. Instructions

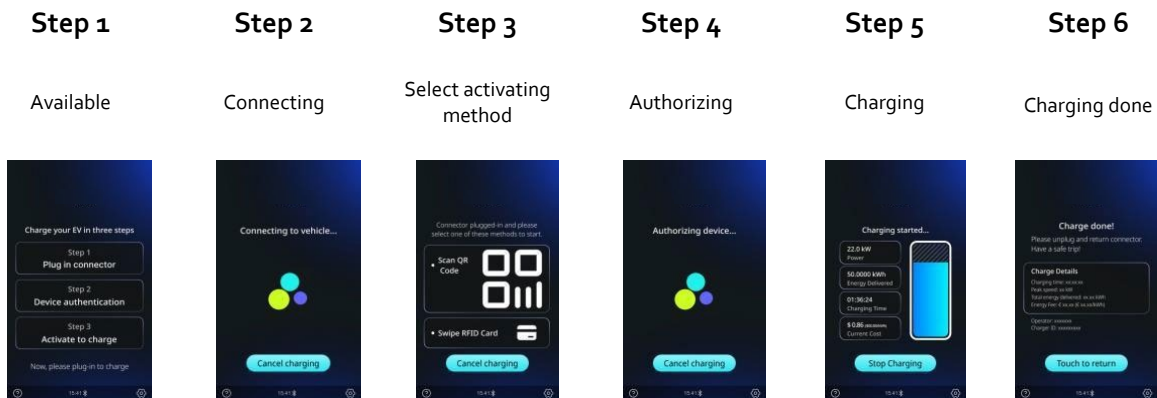


Note:

Please read the safety precautions carefully before use.

- Ensure that there are no abnormal conditions such as breakage or damage.
- Ensure that there is no liquid or other foreign matter inside the charging connector and vehicle charging port.
- This section reviews the RFID card activation as an example, refer to the user manual for other methods.
 - 1) Turn **ON** the circuit breaker, power up process initiated.
 - 2) Open the vehicle charging interface.
 - 3) Open the charge port cover of the EV and insert the charging gun into the car socket, ensuring complete connection.
 - 4) Place the card in the RFID card swipe area of the station (please make sure it is within the swipe area) for charging. The blue light flashes three times, indicating successful card swiping.
 - 5) Stop charging, use the RFID card to stop charging.
 - 6) Remove the connector from the vehicle.
- Do not unplug the charging gun during the charging process.
- Automatically stop charging when fully charged.
- If the red-light flashes three times when swiping the card, refer to the "Common Troubleshooting" in the user manual for detailed guidance.

NFC and Mobile App Mode Process of HMI



After connecting the charge cable, with the help of four physical buttons, follow the process on the HMI interface and choose startup modes to start the AC charger. When "Charging done" appears, remove the connector from the vehicle.

O. Software Security and Mechanism

The AC charger’s architecture ensures that security is applied consistently, whether the product is installed in a single home or as part of a larger commercial deployment.

Whether you connect via Wi-Fi, Ethernet over PLC (Power Line Communication), or 4G LTE-M, the same security model applies.

- End-to-end encryption.
- Role-based access control.
- Digitally signed firmware.
- Secure device authentication.

Software updates are required for compliance and handled via the app or remote updates. Testing follows the agile methods of continuous integration and continuous delivery.

Fully automated testing is done at the end of each sprint.

The supplier is always delivering a single software package, containing

For the Standard version:

- Board software version a.b.c encrypted and signed.

Manufacturer/Platform	Security Update Policy	Vulnerability Submission Channel
Noah Energy Solutions, Inc.	See the Noah Energy Solutions Security Update Policy Document for resolving security vulnerabilities.	infosec@noahenergy.com

The AC charger supports controlled software and firmware updates. All updates are authenticated, version-controlled, and validated to ensure that safety functions, metering accuracy, and regulatory compliance are not adversely affected. Updates that impact certified functions are subject to re-evaluation in accordance with applicable CSA, CTEP, and NEVI requirements.

P. Routine Maintenance

- AC charger does not require special maintenance; it is recommended to inspect and clean the charging station casing and accessories every 6 months.
- Check for any damage to the appearance of the charging station and cable.
- Use a cloth to clean the surface, do not spray water directly onto the equipment.



Note:

Do not use corrosive chemical cleaners, glass cleaners, or organic solvents to clean equipment.

Q. COM parameters

	Working frequency range	Maximum transmission power	Antenna gain capability
Wi-Fi	2412MHz~2472MHz	18.31dBm	2dBi
BT	2402-2480MHz	9.9dBm	2dBi
RFID	13.56MHz	/	0dBi

R. Product Handling, Storage, and End-of-Life Controls

Transportation/Storage

- Always transport in its original packaging and be careful not to place other items on top of the packaging.
- It should be stored in a clean, dry, well-ventilated place with no corrosive effects and relative humidity not exceeding 80%.
- The transportation and storage environment shall not exceed the limit values specified in the technical specifications.

Disassembly

- This device is only allowed to be disassembled by professional personnel.
- Before disassembly, turn **OFF** the front-end power supply of the circuit and then refer to the installation process to disassemble the equipment in reverse order.

Disposal/scraping

- Comply with local laws and regulations to dispose of equipment correctly and environmentally friendly and dispose of it at designated waste electronic equipment collection points.
- Do not dispose of electronic devices as regular household waste.

Troubleshooting and Handling

- Refer to the user manual for troubleshooting and handling related content.