

TOPDON®

# PulseQ

## AC Mini



**AC EV Charger** User Manual



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# Section 1 - Precautions

## 1.1 IMPORTANT SAFETY PRECAUTIONS



**WARNING - When using electric products, the tool's safety precautions should always be followed. Follow the instructions below closely.**

1. Read all the instructions before using this product. This manual contains important instructions for the PulseQ AC Mini charger which shall be followed during the installation, operation, and maintenance of the charger.
2. Children should be supervised if they are in the vicinity of the PulseQ AC Mini while the product is in use. Children should not use this device.
3. Do not put any of your or another person's body, clothing, or accessories into the tool's Electric Vehicle (EV) connector.
4. Do not use this product if the charging cable is frayed, has broken insulation, or has any other signs of damage (applicable to models that come with a charging cable).
5. Do not use this product if the enclosure or the charging plug / socket is broken, cracked, open, or shows any other indication of damage.
6. Note the operating temperature rating (-30°C to +50°C).



## **WARNING**

A certified AC Surge Protection Device (SPD) is suggested to be installed upstream close to the charging station. SPDs shall comply with standard IEC / EN 61643-11, and the rated voltage against lightning overvoltage shall be up to 2.5kV.

A certified Type A or Type B Residual Current Device (RCD) must be installed upstream, close to the EV charger. The RCD shall have a 1-phase 40A rated current and comply with one of the following standards: IEC 61008-1, IEC 61009-1, IEC 60947-2 or IEC 62423.

All these protection devices shall be chosen based on the appropriate technical specifications, i.e., working voltage  $\geq$  charging station working voltage, working current  $\geq$  charging station working current, Ingress Protection (IP)  $\geq$  IP54 or installed inside IP54 protection box for outdoor use.

## 1.2 SAFETY NOTES

### 1.2.1 Safety Signs Used

The following types of signs are used in this manual and on the charger. They must be adhered to.



CAUTION: Electrical hazard.

This indicates severe personal injury or substantial property damage can result if the device is not operated as instructed.



ATTENTION:

This indicates minor personal injury or material damage can result if the device is not operated as instructed.



CAUTION: Do not touch in case of Electrostatic Discharge (ESD).

Indicates possible consequences of touching electrostatically sensitive components.



No access for unauthorized persons.



The user must wear safety gloves.



The user must wear protective footwear.



The user must wear a safety helmet.



Indicates important texts, notes, or tips.

## 1.2.2 Safety Precautions for Installation

The following types of signs are used in this manual and on the charger. They must be adhered to.



Safety gear (helmet, gloves & protective footwear) must be worn when installing the EV charger.

Installation of the product must be performed by a licensed professional.

The charger must be installed vertically to allow for ventilation. Do not install on surfaces that vibrate or where the device could be at risk of impact.



Must be installed away from combustible materials due to the risk of fire.

Do not drop any foreign objects (especially metal objects) inside the charger due to a risk of fire.

## 1.2.3 Safety Precautions for Operation



It is strictly forbidden for minors or persons of restricted capacity to be near the charger while in operation. This is to avoid injury.

Forced charging is strictly forbidden when the electric vehicle or charger fails.



Electric vehicles can only be charged when the engine is off and the vehicle is stationary. Do not charge in rainy and thunderous weather.

Do not use the charger if the charging plug / socket is defective, cracked, worn, or broken.

## 1.2.4 Safety Precautions for Maintenance



Personnel must always use protective footwear when performing maintenance work.

It is recommended that the charger is routinely inspected at least once a week.



Do not put flammable, explosive, or combustible materials, chemicals, combustible vapors, or other dangerous materials near the charger, due to the risk of fire.



Keep the charging plug / socket clean and dry. Disconnect the power to the charger and wipe with a clean, dry cloth if soiled.

# Section 2 - Standards Compliance

## 2.1 Safety Standard(s)

Conforms to IEC 61851-1: 2017, IEC 62196-2

## 2.2 Charging Mode and Connection

In accordance with IEC 61851-1, the charging mode of PulseQ AC Mini is classified as Mode 3, and the charging connection is a Case C (for models that come with a charging cable) / Case B (for models that come with a charging socket).



**Mode 3:**

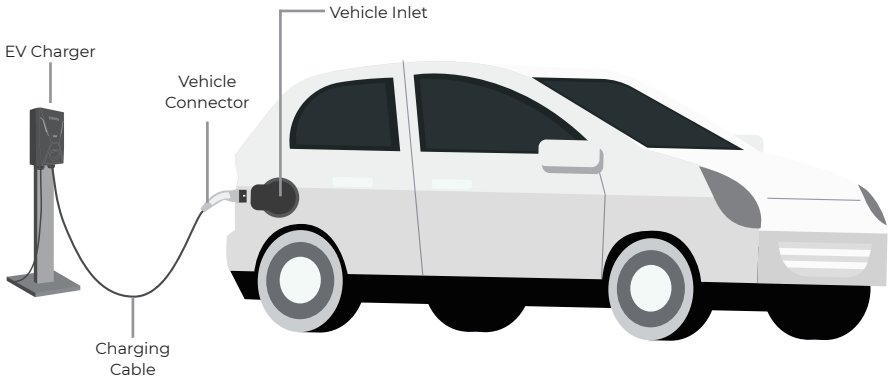
A method for the connection of an EV to an AC EV supply equipment permanently connected to an AC supply network, with a control pilot function that extends from the AC EV supply equipment to the Electric Vehicle.

**Case C:**

The connection of an EV to a supply network utilizing a cable and vehicle connector (charging plug) permanently attached to the EV charger.

**Case B:**

The connection of an EV to a supply network with a cable assemble detachable at both ends.



## 2.3 Charging Interface

### ***For models that come with a charging cable:***

The charging plug of PulseQ AC Mini meets IEC 62196-2, Type 2.

The PulseQ AC Mini provides a Type 2 female plug with a charging cable, which only charges EVs with a Type 2 charging socket (vehicle inlet).

### ***For models that come with a charging socket:***

The charging socket of the PulseQ AC Mini meets IEC 62196-2, Type 2.

To connect the PulseQ AC Mini charger with the vehicle inlet socket, a Type 2 male to Type 2 female cable (not included) is needed.

#### **Note:**



Ensure that the Type 2 male to Type 2 female cable you use conforms to IEC 62196-2, and matches the specifications of the PulseQ AC Mini charger (32A 1-Phase), with the minimum size of each wire of 6mm<sup>2</sup>.

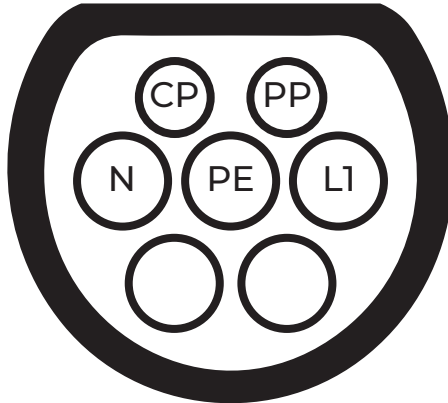
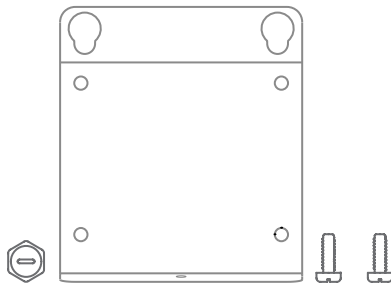


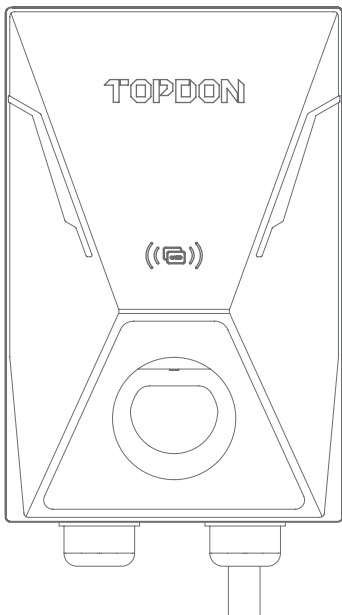
Fig. 2-2 Schematic Diagram of Type 2 Interface

# Section 3 - What's in the Box

- a. AC EV Charger 1
- b. Wall-Mounting Accessories 1
- c. User Manual 1
- d. Quick User Guide 1
- e. Quality Certificate 1
- f. Wall Installation Template 1
- g. M5×40mm Expansion Bolt 4
- h. Charging Card 2
- i. Hex Screwdriver 1



**b**



**a**



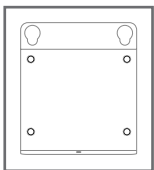
**c**



**d**



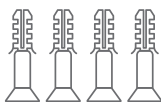
**e**



**f**



**i**



**g**



**h**

# Section 4 - Product Overview

## 4.1 Naming Conventions

### 4.1.1 Model Names

The PulseQ AC Mini is available in five models, each adhering to our standardized naming conventions. See below for more details.

PulseQ AC Mini	_	7K	_	C5S	_	EU
PulseQ AC Mini	_	7K	_	C7S	_	EU
PulseQ AC Mini	_	7K	_	C5	_	EU
PulseQ AC Mini	_	7K	_	C7	_	EU
PulseQ AC Mini	_	7K	_	S	_	EU
_____						
		I	II	III	IV	

**I** refers to the product family name.

**II** represents the rated power of the product.

**III** indicates the type of cable or socket. "C" stands for cable, and "S" stands for socket. The number 5 or 7 represents the length of the cable. For example, "C5S" indicates that the product includes a 5m charging cable and a charging plug holder (socket).

**IV** represents the standard that the charging plug of the product applies to.

## 4.1.2 Abbreviations

The five PulseQ AC Mini models are categorized into two groups: models that include a charging cable and models that include a charging socket. For ease of reference, the models with a charging cable will be referred to as "Cable Version" models, while the models with a charging socket will be referred to as "Socket Version" models.

### ***"Cable Version" models:***

PulseQ AC Mini\_7K\_C5S\_EU, PulseQ AC Mini\_7K\_C7S\_EU, PulseQ AC Mini\_7K\_C5\_EU, and PulseQ AC Mini\_7K\_C7\_EU

### ***"Socket Version" models:***

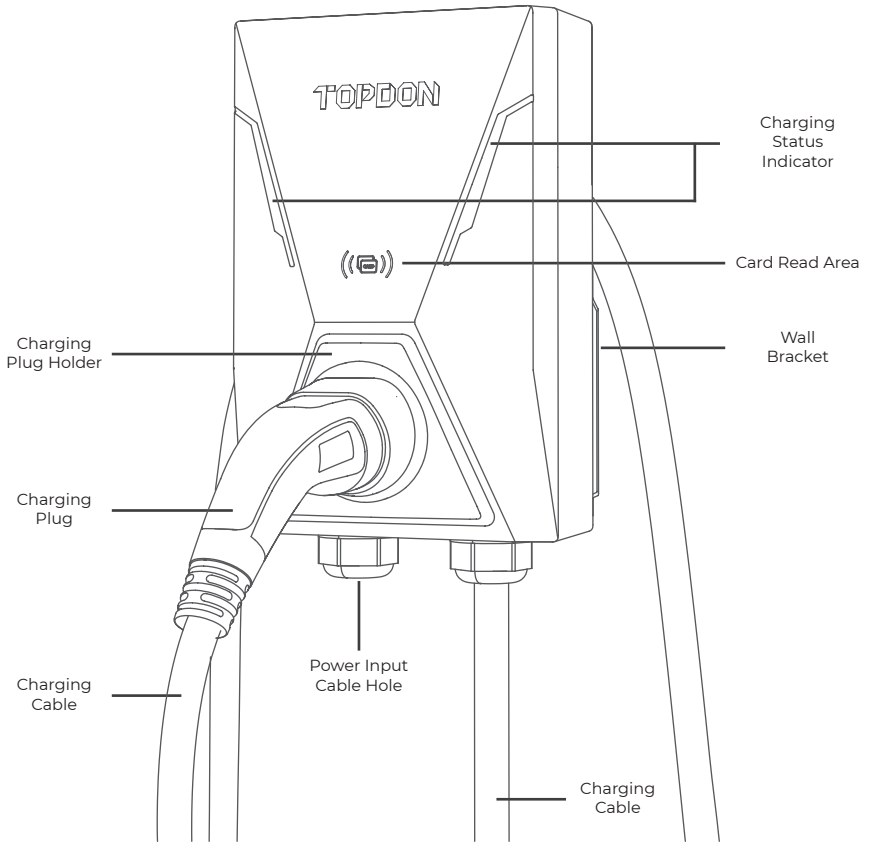
PulseQ AC Mini\_7K\_S\_EU

## 4.2 Physical Features

### 4.2.1 Cable Version Models

The physical appearance of the cable version models differs solely based on whether a charging plug holder is present or absent.

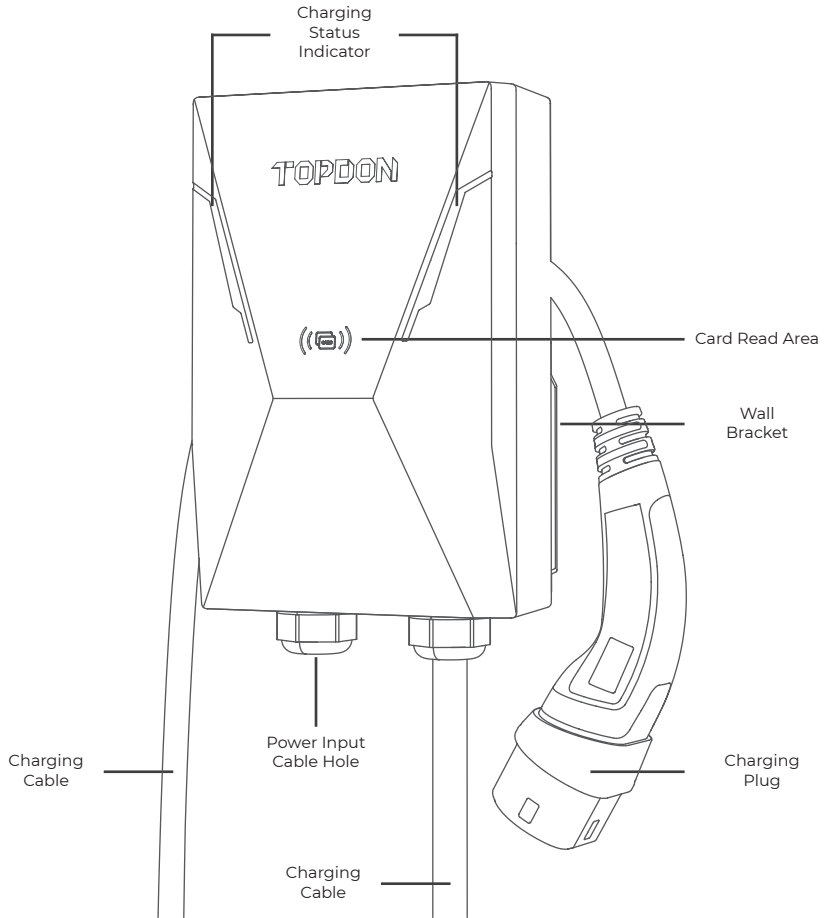
**For PulseQ AC Mini\_7K\_C5S\_EU and PulseQ AC Mini\_7K\_C7S\_EU:  
(With a charging plug holder)**



**Note:**

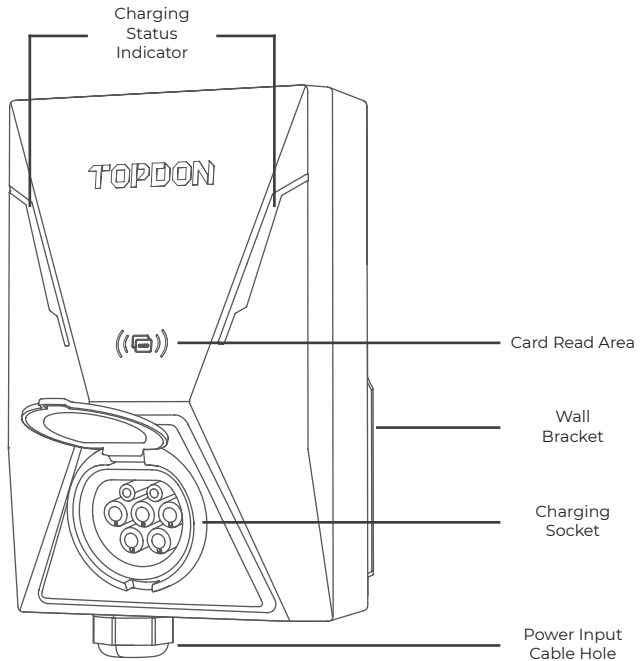
The illustrative images in this user manual all depict the cable version model that includes a charging plug holder.

**For Pulse Q AC Mini\_7K\_C5\_EU and Pulse Q AC Mini\_7K\_C7\_EU:  
(Without a charging plug holder)**



## 4.2.2 Socket Version Models

**For PulseQ AC Mini\_7K\_S\_EU:**





## Description of the Charging Status Indicator (Applicable to All Models)

Indicator Color	Indicator Status	Connotation
Green	On	Standby
Blue	On	Charging plug connected, ready to charge / Charging complete (plug still connected)
	Pulsing	Charging in progress
Green & Red	Alternatively Blinking (1 green blink, 1~11 red blinks)	Fault (for more details, please see Section 7 - Fault Handling)

## 4.2 Specifications

### 4.2.1 Electrical Specifications

Product Name	PulseQ AC Mini
Rated Voltage	230Vac±10%, 50Hz
Rated Current	32A 1-Phase
Rated Power	7kW
Charging Interface	IEC 62196-2, Type 2 plug

### Radio parameters

Item	Operating Frequency Range	Transmitting Field Strength	Antenna Gain
RFID	13.56MHz	< 15 dBµA/m @ 3m	+0dBi

## 4.2.2 Functional Descriptions

Charging Mode	Mode 3
Charging Control	Plug and play
	RFID reader mode
Indicator Lights	Charging status indicator
Safety Protection	Surge protection, over temperature, over / under voltage, over current, LN reverse polarity, leakage, ground protection
RCD Built-in	$I\Delta dc=6mA$
SCCR	1000A

## 4.2.3 Mechanical Parameters

Mounting Method	Wall-mounted	
IP Rating	Cable Version models	IP 65
	Socket Version models	IP 54
IK Rating	IK 8	
Dimensions (H×W×D)	275mm × 180mm × 127mm	
Net Weight	PulseQ AC Mini_7K_C5S_EU	3.29kg
	PulseQ AC Mini_7K_C7S_EU	4.16kg
	PulseQ AC Mini_7K_C5_EU	3.27kg
	PulseQ AC Mini_7K_C7_EU	4.15kg
	PulseQ AC Mini_7K_S_EU	1.76kg

## 4.2.4 Ambient Conditions

Working Altitude	≤ 2000m
Storage Temperature	-40°C ~ +80°C
Operating Temperature	-30°C ~ +50°C
Relative Humidity	≤ 95% RH, no water droplet condensation
Vibration	< 0.5 G, no acute vibration and impact
Installation Location	Can be installed indoor or outdoors. Should be installed in an area with good ventilation, and not near flammable or explosive gases.

# Section 5 - Installation

## 5.1 Pre-installation Inspection

When unpacking, please carefully check the following:

- Whether the accessories are missing according to the packing list.
- Whether there is any damage to the product that occurred during transportation.
- Whether the model and specification of the machine's nameplate are consistent with the order requirements.




- ▷ If any damage or missing parts are found, please do not start the installation, and contact your vendor as soon as possible.



- ▷ Please keep the packing box and packing materials for 1 month for future handling.
- ▷ The paper packaging is recyclable.

## 5.2 Pre-work Preparation

- When transporting or moving the EV charger, pay attention to the following points to ensure product safety:
  - ▷ This product is electrical equipment. It should be handled with care, avoiding violent vibration and impact.
-  The charger shall not be transported by dragging the charging cable. (Applicable to Cable Version models)

- In order to ensure the long-term stable operation of the product, it is recommended not to install the charger in extreme weather, as low or high ambient temperatures may affect the installation effect due to expansions and contractions from temperature changes.
- Space requirement: When the charger is fixed on the wall, the minimum space requirements are shown in Fig. 5-1.
- It is suggested that the charger should be installed in a place with good ventilation, no direct sunlight and sheltered from wind and rain. In order to ensure good ventilation, mount the charger vertically with at least the minimum space around all sides.

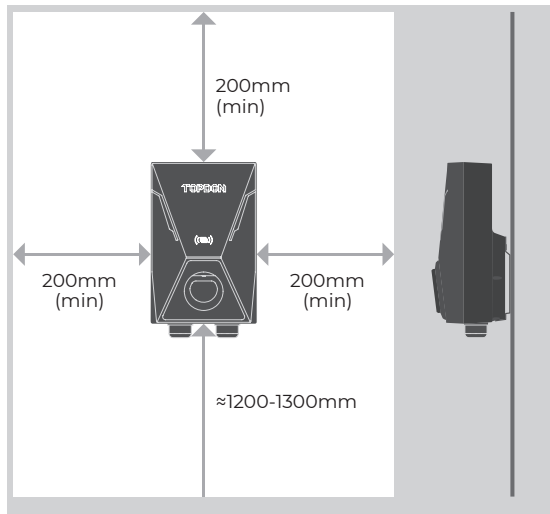

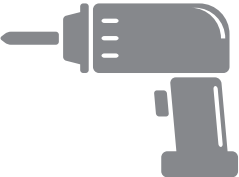

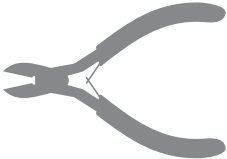


Fig. 5-1 Minimum Space Requirements for Wall Mounting

## 5.3 Tools for Installation

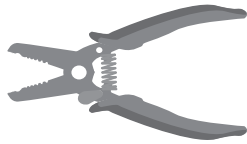
Please have the following tools prepared before installation.

No.	Tool Name	Schematic Picture	Main Uses
1	Multimeter		Checking the electrical connection and measuring the voltage
2	Electric impact drill		Drilling mounting holes in the wall
3	Wrench		Fastening bolts
4	Diagonal pliers		Cutting cables

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5

Wire stripper

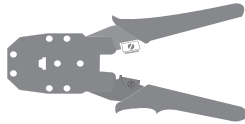


Peeling cables

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6

Crimping  
pliers



Pressing cable terminal

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7

Phillips  
screwdriver



Fastening screws

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8

Hex  
screwdriver  
(included)



Fastening screws

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9

Torque  
screwdriver



Fastening screws to a specified  
torque

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10

Level tool



Ensuring a level installation

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11

Tape measure



Measuring distance

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12

Pencil



Marking mounting holes

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13

Hammer



Driving expansion anchors into the mounting holes

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## 5.4 Hardware Installation

**WARNING:**



In areas with frequent thunderstorms, add surge protection at the service panel for all circuits. Ensure all power and ground connections, especially those at the breaker and bus bar, are clean and tight. Remove all oxide from all conductors and terminals before connecting any wiring.



▷ Hardwire installation needs to be done by professional electricians. Please adhere to all safety precautions.

1. Unscrew the hexagon socket head screw at the bottom of the back cover with the provided hex screwdriver, and remove the wall bracket from the charger. (See Fig. 5-2)

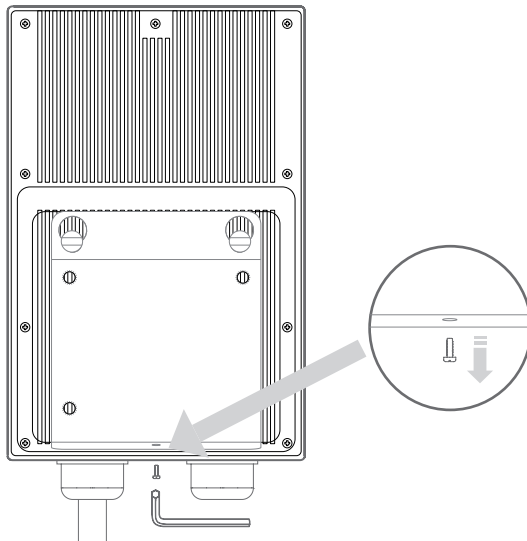


Fig. 5-2



**Note:**

The two thumb screws can remain attached to the charger while removing the wall bracket.

2. Use a Phillips screwdriver to unscrew all the 10 screws on the back cover, and then remove the front cover. (See Fig. 5-3)

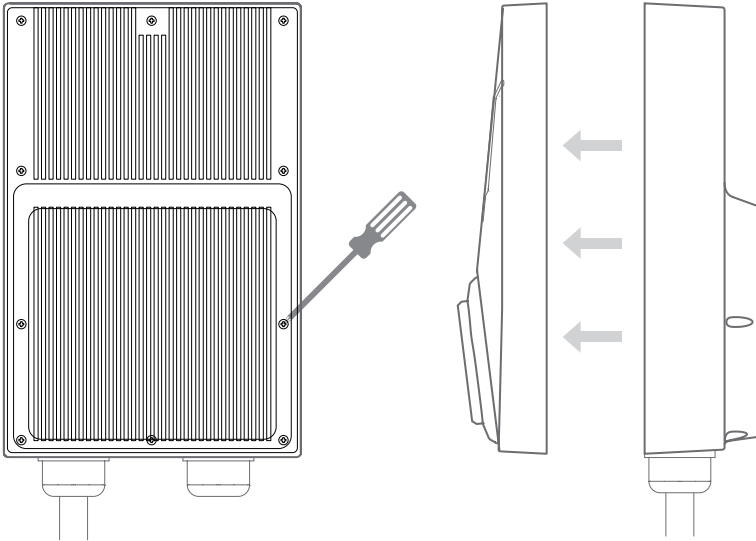


Fig. 5-3

3. Remove the gland at the bottom left of the charger. You can use a large wrench if needed. (See Fig. 5-4)

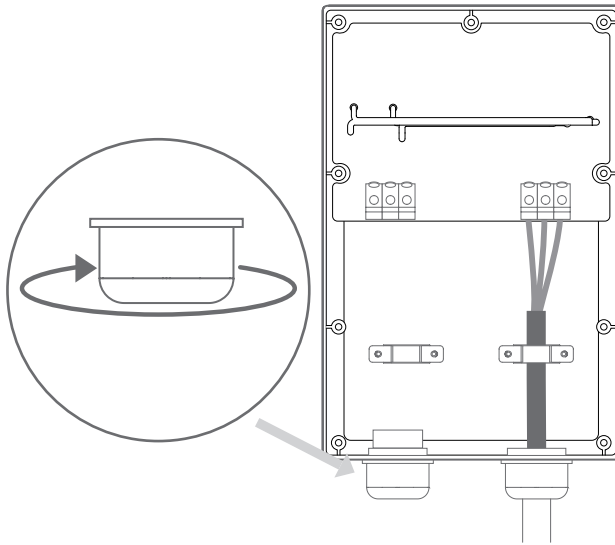


Fig. 5-4

4. Use a wire stripper to remove 10~12 mm of insulation from the prepared power wires, and crimp the exposed wire conductors with crimping pliers. (See Fig. 5-5)

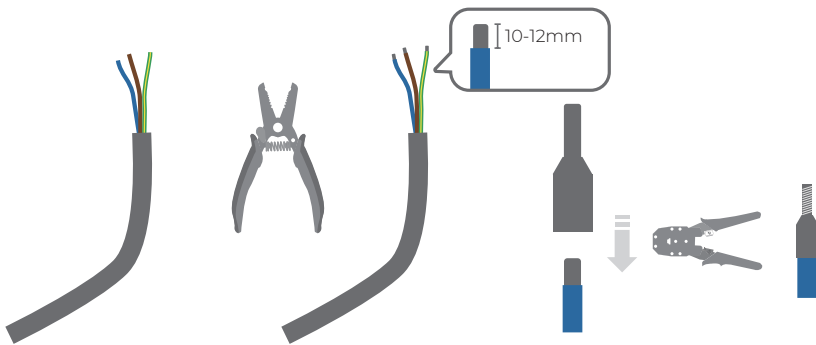


Fig. 5-5



**Note:**

Wire ferrules are needed (not included).

5. Remove the wire holding plate on the left. Pass the crimped power cable through the gland, and then thread it through the bottom left hole. (See Fig. 5-6)

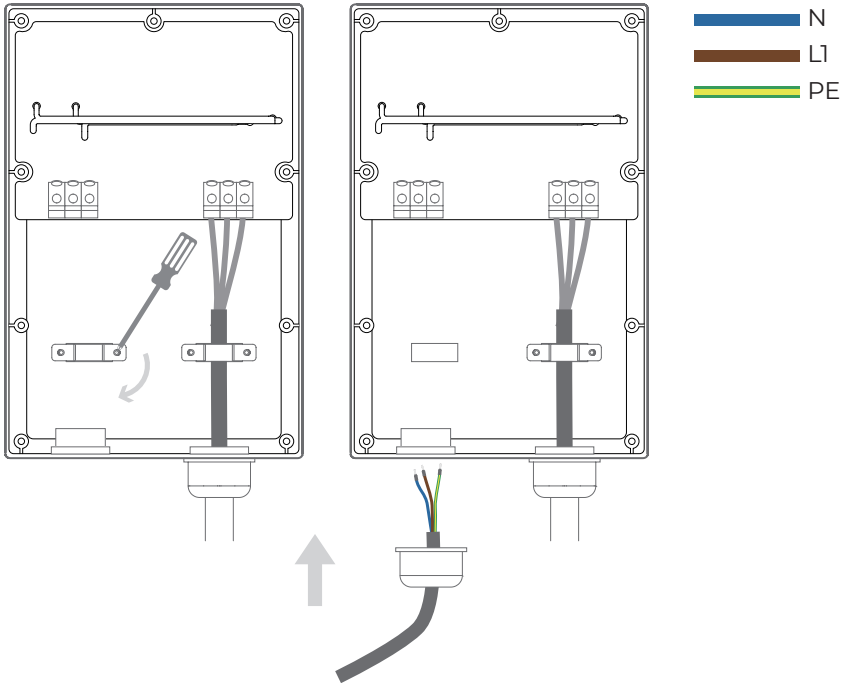


Fig. 5-6



The supported diameter of outer cable sheath ranges from 17 to 22 mm, and the minimum size of each wire is 6mm<sup>2</sup>.

6. Loosen the three terminal screws with a Phillips screwdriver and fully insert each wire connector into the correct terminal block. Use a torque screwdriver to tighten the terminal screws with a torque of 19.6 N.cm. Then reinstall the wire holding plate. (See Fig. 5-7)

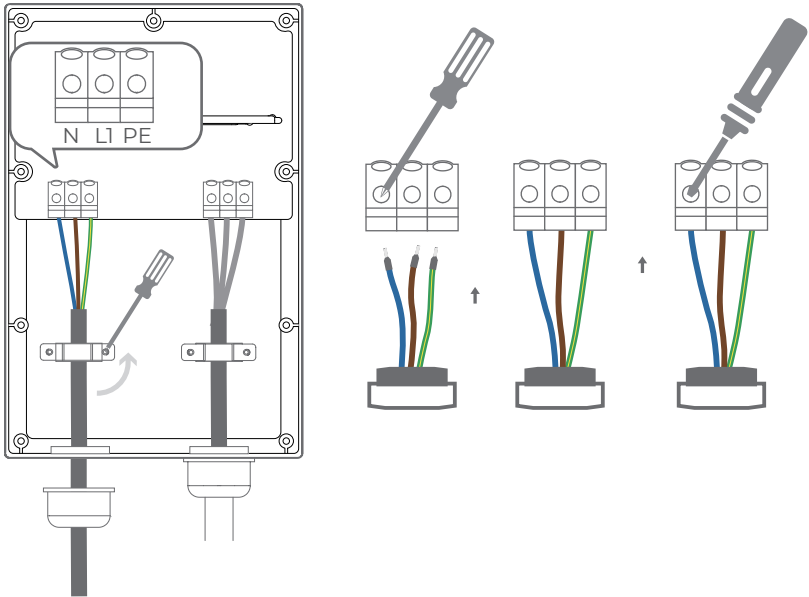


Fig. 5-7

7. Reinstall the gland and the front cover. (See Fig. 5-8)

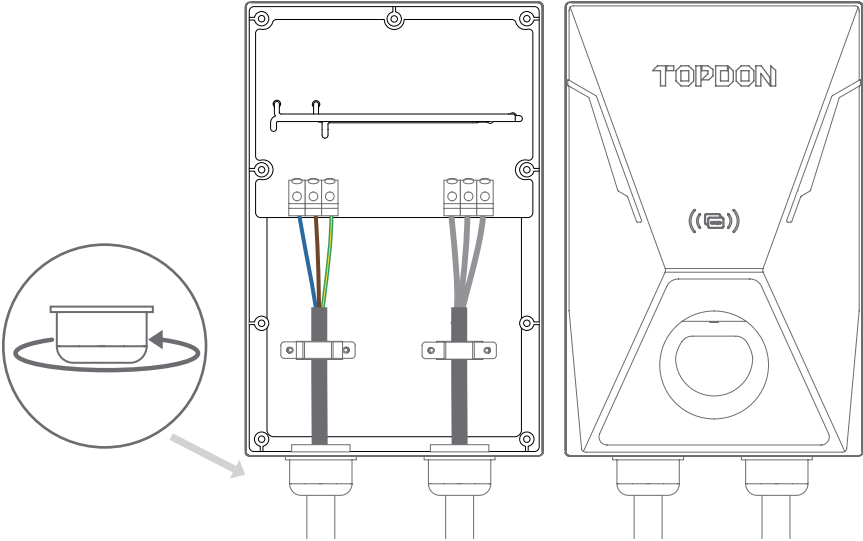


Fig. 5-8

## 5.5 Wall Bracket Installation

Before installation, ensure the homeowner has chosen an installation location that allows the charging cable to reach the car's inlet socket while still providing slack.

1. Refer to Fig. 5-9 to understand the dimensions of the wall bracket. Make sure the space on the wall is at least 3.90" x 2.87" (99mm x 73mm).

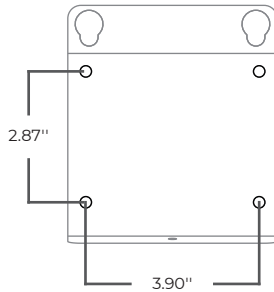


Fig. 5-9

2. Mark the mounting holes on the wall with the installation template. (See Fig. 5-10)

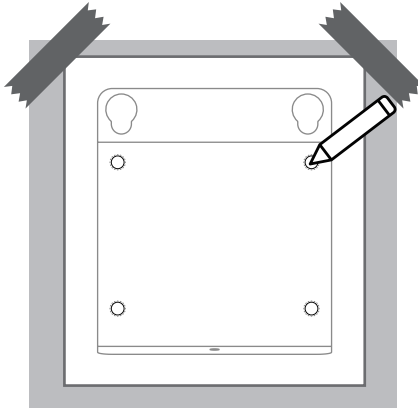


Fig. 5-10

3. Drill the mounting holes into the wall with an M6 ~ M10 drill bit at a depth of at least 1.57" (40 mm). (See Fig. 5-11)

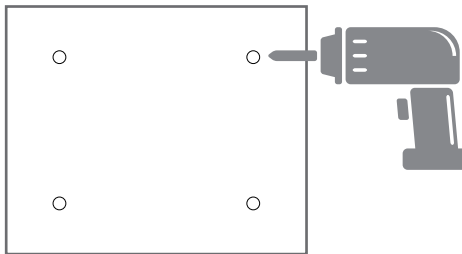


Fig. 5-11



4. Hammer the four plastic expansion anchors into the holes. (See Fig. 5-12)

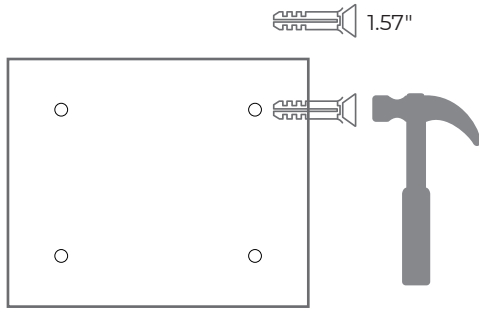


Fig. 5-12

5. Fix the bracket to the wall with the four expansion screws (see Fig. 5-13) included in the package.

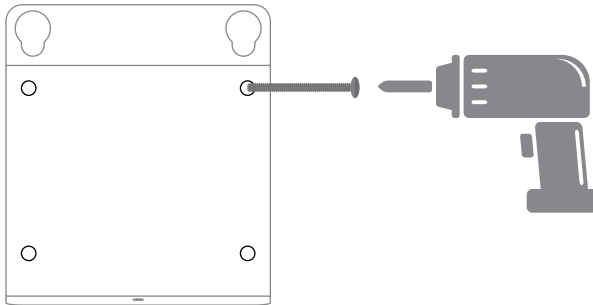


Fig. 5-13

6. Attach the charger to the wall bracket by passing the two thumb screws through the corresponding holes. (See Fig. 5-14)

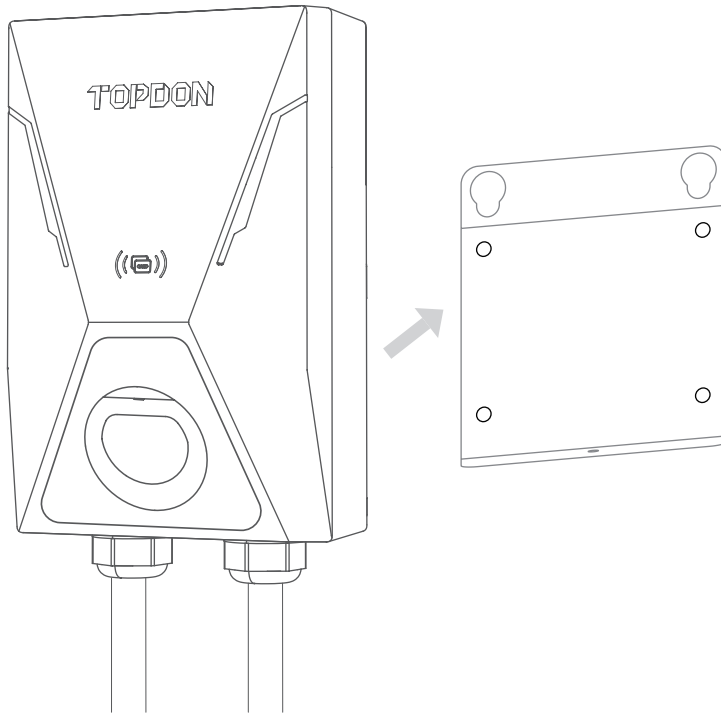


Fig. 5-14

7. Install back the hexagon socket head screw to fix the charger to the wall bracket. (See Fig. 5-15)

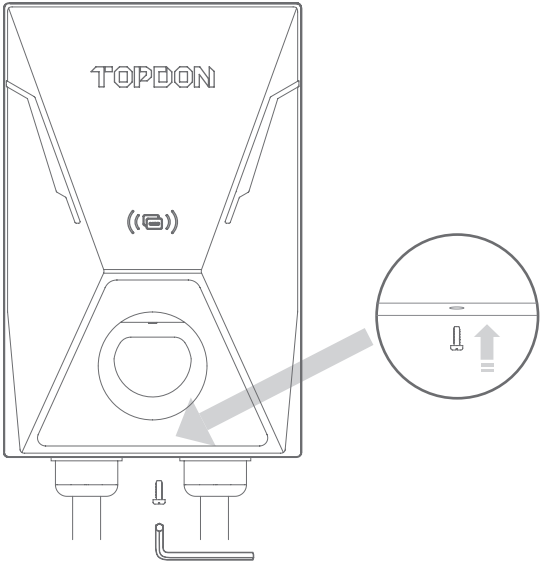


Fig. 5-15

# Section 6 - How to Charge an EV

## 6.1 Charging With a Cable Version Model

The PulseQ AC Mini EV charger provides two charging modes for Cable Version models: "Plug and Play" and "RFID Reader" modes.

### ***Plug and Play***

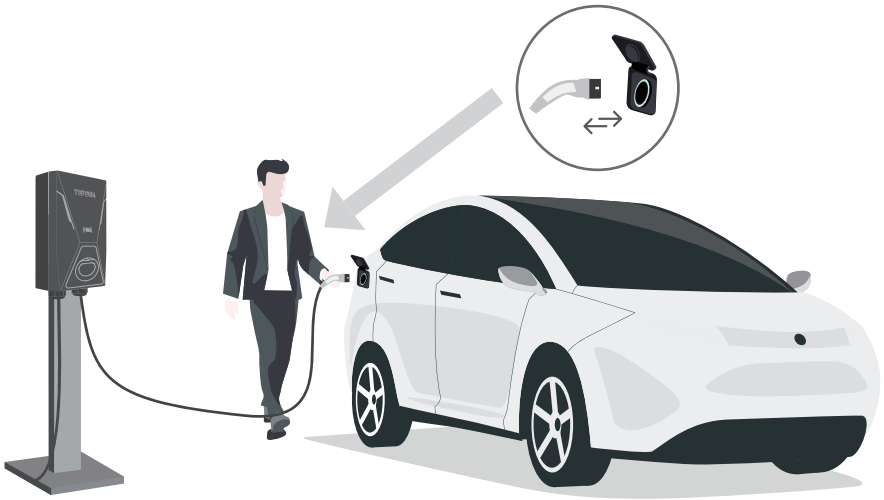
When in the Plug and Play mode, charging starts once the charging is connected.

#### **Step 1**

Insert the charging plug into the vehicle inlet. Then charging will start automatically.

#### **Step 2**

Unplug the charging plug when charging is finished.



### **RFID Reader Mode**

When in the RFID Reader mode, you need to use the supplied charging card to start and stop the charging process.

#### **Step 1**

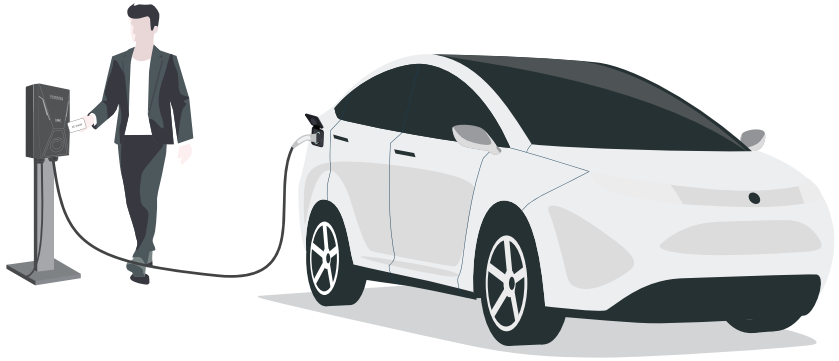
Insert the charging plug into the vehicle inlet.

#### **Step 2**

Touch the supplied card on the charger to start charging. You will hear a beep sound when charging starts.

#### **Step 3**

Unplug the charging plug when charging is finished.



#### **Note:**

1) During the charging process in both modes, the charging plug is locked to prevent unplugging. To stop charging prematurely, use the supplied card or stop charging at the vehicle end.



2) To toggle between the two charging modes, touch the supplied charging card on the charger for **more than 5 seconds** (until a beeping sound is heard).

## 6.2 Charging With a Socket Version Model

The PulseQ AC Mini EV charger provides two charging modes for Socket Version models: Plug and Play, and RFID Reader modes.

### ***Plug and Play***

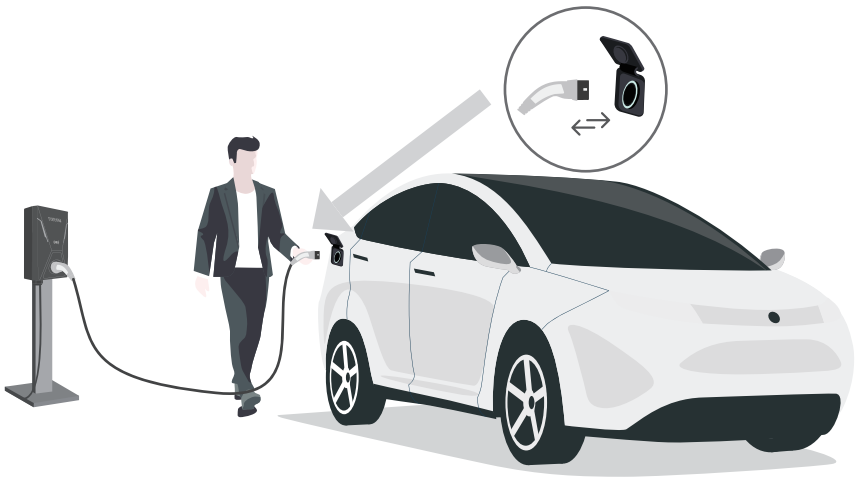
When in the Plug and Play mode, charging starts once the charging plug is connected.

#### ***Step 1***

Get a Type 2 male to Type 2 female cable (not included) designed for detachable connection (Case B). Insert the male end of the Type 2 cable into the charger's charging socket, then connect the female end to the vehicle's inlet. Then charging will start automatically.

#### ***Step 2***

Remove the female side of the cable from the vehicle inlet, then the male side from the charger when charging is finished.



### **RFID Reader Mode**

When in the RFID Reader mode, you need to use the supplied charging card to control the start / stop of charging.

#### **Step 1**

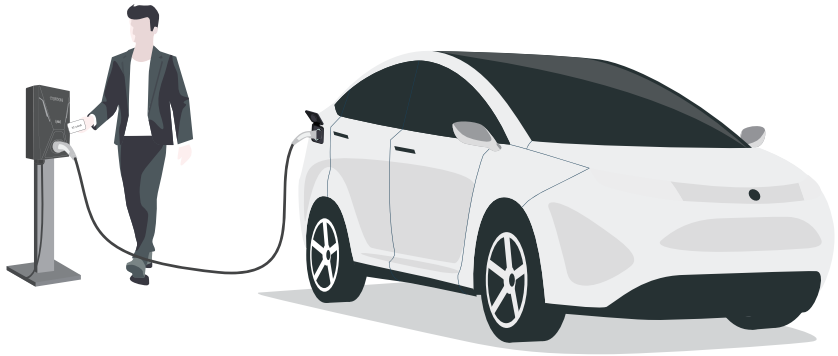
Get a Type 2 male to Type 2 female cable (not included) designed for detachable connection (Case B). Insert the male end of the Type 2 cable into the charger's charging socket, then connect the female end to the vehicle's inlet.

#### **Step 2**

Touch the supplied card on the charger to start charging. You will hear a beep sound when charging starts.

#### **Step 3**

Remove the female side from the vehicle inlet, then the male side from the charger when charging is finished.



#### **Note:**

- 1) During the charging process in both modes, the charging plug is locked to prevent unplugging. To stop charging prematurely, use the supplied card or stop charging at the vehicle end.
- 2) To toggle between the two charging modes, touch the supplied charging card on the charger for **more than 5 seconds** (until a beeping sound is heard).



# Section 7 - Fault Handling

When a fault occurs, the charging status indicator will alternatively blink green (once) and red (1~11 times), then repeat.

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Indicator Status	Fault Code	Fault Description	Suggestion
1 red blink	E001	LN reverse polarity or ground fault	Check if the input power cable is correctly connected or the ground wire is securely connected.
2 red blinks	E002	Relay sticking	Contact after-sales service. (Charger components may be damaged and need to be replaced.)
3 red blinks	E003	Relay rejection fault	Contact after-sales service. (Charger components may be damaged and need to be replaced.)
4 red blinks	E004	Input overvoltage	Power grid failure, wait until the input voltage is automatically recovered.
5 red blinks	E005	Output overcurrent	Contact after-sales service. (This may be caused by faulty charging cable or output short circuit.)
6 red blinks	E006	Overtemperature	Check if the temperature of the charger is too high. Stop charging and wait until the temperature is dropped.
7 red blinks	E007	Leakage	Contact after-sales service. (Charger components may be damaged and need to be replaced.)

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8 red blinks	E008	RCD fault	Contact after-sales service. (Charger components may be damaged and need to be replaced.)
9 red blinks	E009	CP signal fault	Contact after-sales service. (This may be caused by a faulty OBC or CP circuit fault.)
10 red blinks	E010	Metering unit fault	Contact after-sales service. (Charger components may be damaged and need to be replaced.)
11 red blinks	E011	Socket lock fault	Contact after-sales service. (Charger components may be damaged and need to be replaced.)

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# Section 8 - Warranty

## ***TOPDON's Limited Warranty***

TOPDON warrants to its original purchaser that the company's products will be free from defects in material and workmanship for 24 months for the charger (applicable to all models) and 12 months for the charging cable (only applicable to Cable Version models) from the date of purchase (Warranty Period).

For the defects reported during the Warranty Period, TOPDON will either repair or replace the defective part or product according to its technical support analysis and confirmation.

TOPDON shall not be liable for any incidental or consequential damages arising from the device's use, misuse, or mounting.

If there is any conflict between the TOPDON warranty policy and local laws, the local laws shall prevail.

This limited warranty is void under the following conditions:

- Misused, disassembled, altered or repaired by unauthorized stores or technicians.
- Careless handling and/or improper operation.

Notice: All information in this manual is based on the latest information available at the time of publication and no warranty can be made for its accuracy or completeness. TOPDON reserves the right to make changes at any time without notice.



**Manufacturer:**

TOPDON TECHNOLOGY Co., Ltd.

20/F & 32/F, Qianhai Shimao Tower, No. 3040, Xinghai Avenue, Qianhai Shenzhen-Hong Kong Cooperation Zone, Shenzhen, P.R. China

**Importer:**

TOPDON EUROPE SL

Regus World Trade Centre, Muelle de Barcelona, edif. Sur, 2ª Planta, Barcelona, Cataluña, 08039, Spain

**TEL**

**86-755-21612590**  
**1-833-629-4832 (NORTH AMERICA)**

**EMAIL****SUPPORT@TOPDON.COM****WEBSITE****WWW.TOPDON.COM****FACEBOOK****@TOPDONOFFICIAL****TWITTER****@TOPDONOFFICIAL****RoHS**