User manual

IQ-home 11 kW AC charger.

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IQ-home

11 kW EV charger.

About

Specifications updates

The specifications in this manual is verified at the time of printing. At IQ-plug we continues improve our product, which can cause to misalignment between the manual and the actual product.

Trademarks and copyright

Safety instructions

The wallbox is connected to the grid power. It can be dangerous to tamper with the installation or the wallbox. If the wallbox is not used properly it can result in hazards as electrical shock and fire. Please follow the instructions below:

- Read this manual before using the product.
- The wallbox shall be grounded to earth through wiring.
- Do not install the IQ-plug charger near flammable and explosive materials.
- Use an authorized electrician for the installation of the IQ-plug charger.
- Do not touch the plug's end terminals with fingers or sharp metallic objects, such as wire, tools, or needles.
- Do not apply sharp bends to the cable.
- If any part of the IQ-plug charger, cable and plug is damaged, turn off the power and do not used it before it has been repaired.
- To use any kind of extension sets is not allowed.

Installation

These guidelines ensure the proper installation and operation of the IQ-home charger, maintaining safety and compliance with relevant standards.

> ⚠ The IQ-home charger must be installed by an authorized electrician in accordance with national regulations.

Electrical Supply Requirements:

- The grid must supply 230/400 VAC across three phases.
- An RCD Type A and a fuse must be installed between the grid and the IQ-home charger.
- A protective earth wire is required.

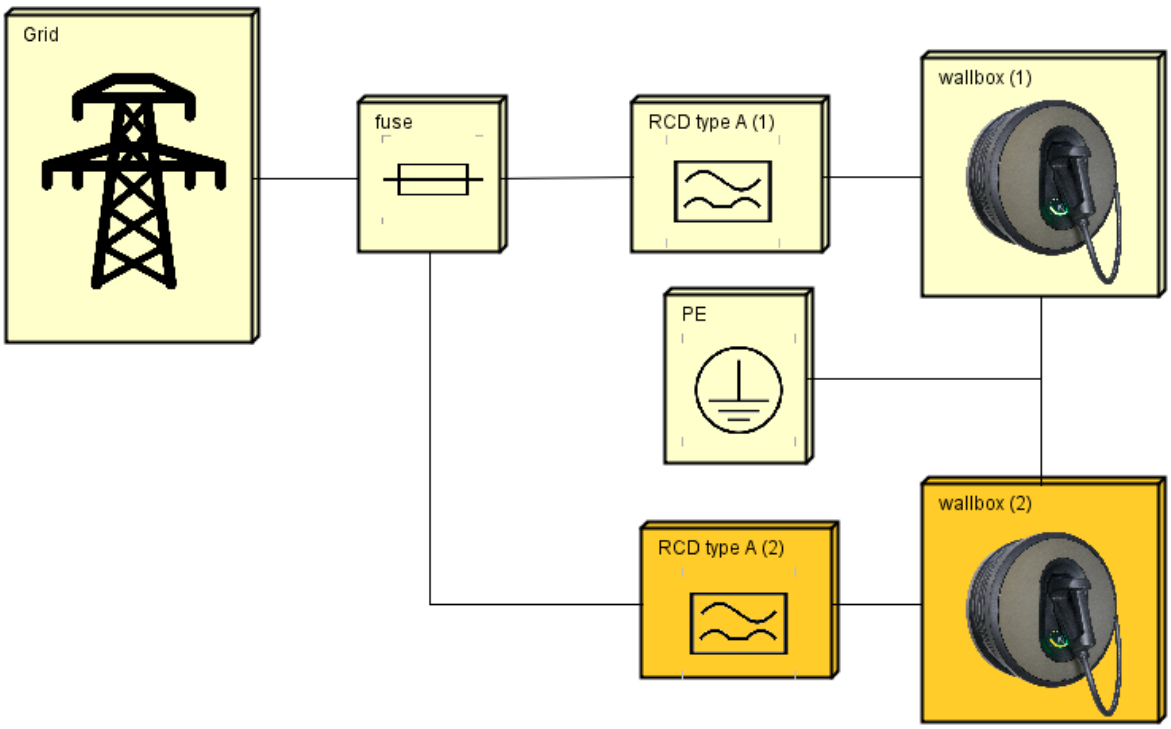
RCD and Fuse Specifications:

- Each EV charger requires an RCD Type A with a rated residual operating current not exceeding 30 mA AC, compliant with IEC 61008-1, IEC 61009-1, IEC 60947-2, or IEC 62423.
- The IQ-home charger includes an internal DC protection unit with a rated residual operating current not exceeding 6 mA DC, eliminating the need for external DC protection.
- A fuse to protect the wiring must be installed, with the size determined by the grid connection and wiring sizes. Recommended fuse sizes are 16, 20, or 32 A, as determined by the electrician. The short-circuit current at the IQ-plug charger should not exceed 80,000 A^2s.

> ⓘ When using a 16 A fuse with an 11 kW charger, please note that the fuse will be operating at its maximum capacity for extended periods. High ambient temperatures may cause the fuse to blow unexpectedly.

Mounting Instructions:

- Mount the IQ-home charger using the provided brackets on a wall or pole. The wallbox should be mounted between 50 cm and 150 cm above the floor or ground.
- If possible, keep the IQ-home charger out of direct sunlight to prevent temperature increases that could reduce charging power for safety reasons.



1 Installation according to IEC 60364-7-722 and the EN/IEC 60851-1. Darker colors shows a installation of two IQ-home chargers, that shares the same circuit to the grid.

Installation:

- Installation must comply with IEC 60364-7-722 and EN/IEC 60851-1.
- When installing multiple IQ-home chargers on the same circuit, each charger must have its own RCD Type A for protection, or use the IQ-plug for built-in AC protection.
- If the fuse rating is less than the combined maximum current of all chargers on the same circuit, load balancing must be configured.

Classification

Wallbox

Power supply input, supply network.	AC.
Power supply input, connection.	Permanently.
Power supply output.	AC EV supply equipment.
Normal environmental conditions.	Indoor and outdoor use.
Access.	Equipment for location with restricted access.
Mounting method.	Stationary equipment, mounted on walls, poles or equivalent positions (surface mount).
Protection against electrical shock.	Class I equipment
Charging mode.	Mode 3.

Plug.

Purpose.	Vehicle connector.
Method of connecting the conductors.	Non-rewireable accessories.
Serviceability.	Field serviceable accessories.
Electrical operation.	Accessories not suitable for making and breaking an electrical circuit under load.
Interface.	Basic interface.
Locking facilities.	Non-lockable accessories.

Interlocking facilities.	Accessories with an interlock, without latching device (electrical interlock).
Presence of shutter(s).	Accessories without shutter(s).

Installation guide.

This guide helps the installer during the installation. Each step must be carefully be filled, to make the installation a success.

> ⚠ Before starting the installation. Make sure the supply cable is disconnected from the power source.

Mounting plate.

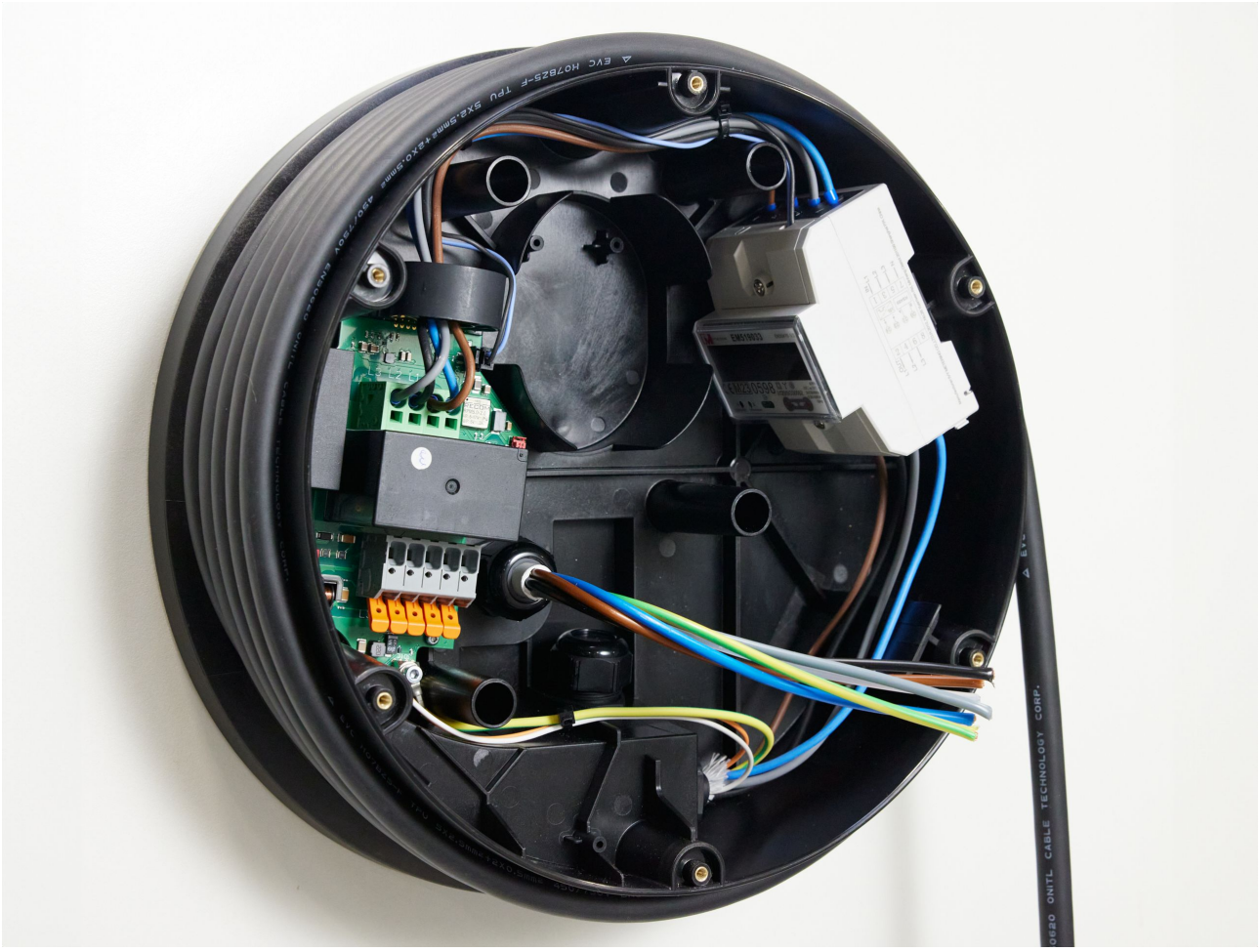
The mounting plate must be placed on a solid surface. It can be mounted directly onto the surface, but the method may vary depending on the insertion point of the supply cable. If the supply cable comes from the roof, the mounting plate can be elevated using spacers to allow the cable to pass between the mounting plate and the wall.

2 Mounting plate installed with cable from behind.

Wallbox installation.

When the mounting plate is installed, the wallbox can be mounted at it. Before installation, adjust the gasket in the two PG glands. This gasket, must be placed in the PG gland that are not in use.

The secure the wallbox, by mounting the four screes to the mounting plate.



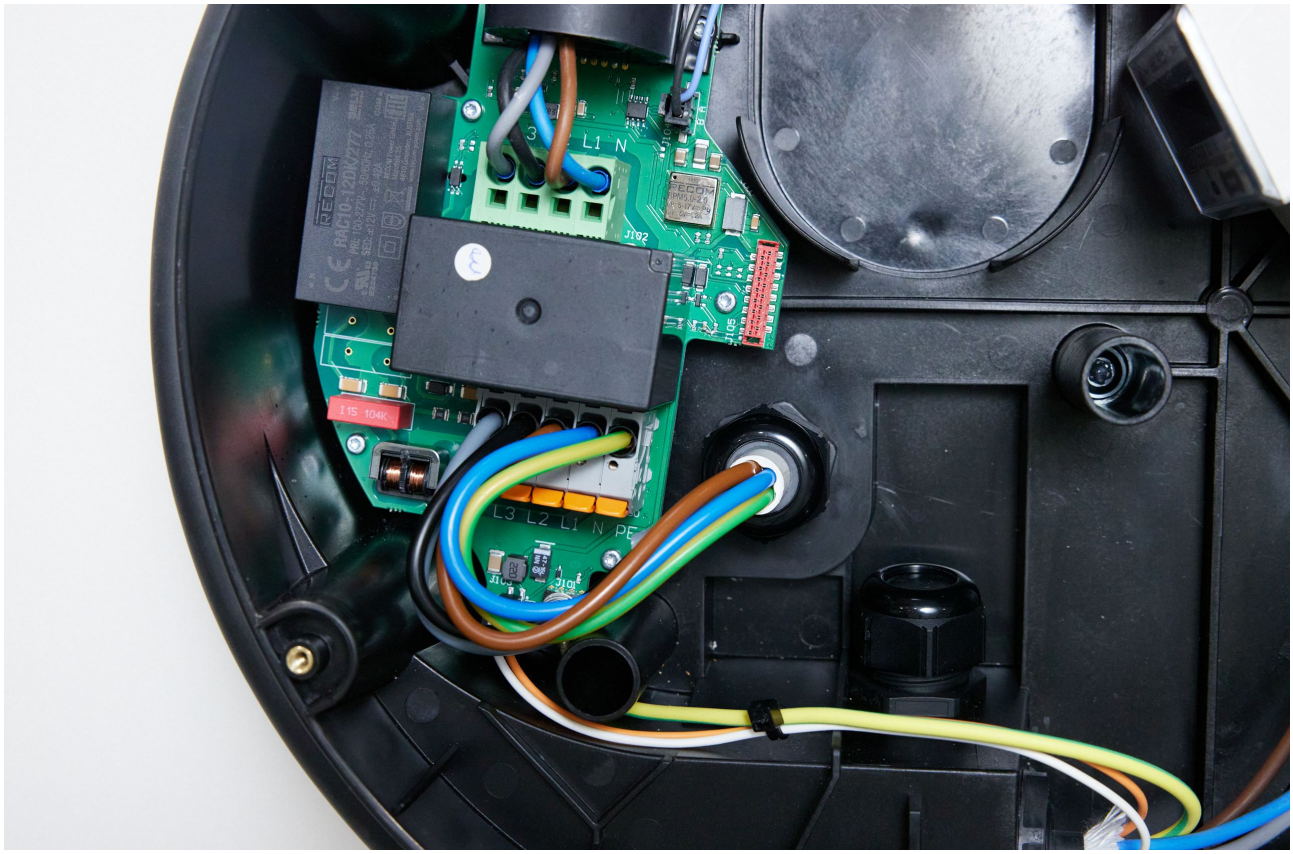
3 Wallbox installed on the mounting plate.

Now finger tight the PG glands, to make sure the IP classification is held.

Wallbox grid connection.

Now strip the cables 12mm, and mount them into connector in the wallbox as shown below.

L3	L2	L1	N	PE



4 Installing of the wires, please note the markings on the PCBA below the connector.
Make sure the wires do not reach higher than the screw towers to the mounting plate. If so bend the wires carefully down or adjust the length.

If wires are multi threaded, use a proper Wire-end sleeves to protect the cores.

Front gasket inspection

Before the front panel can be installed, inspect the gasket on the back. The gasket must be properly installed before mounting the front panel.

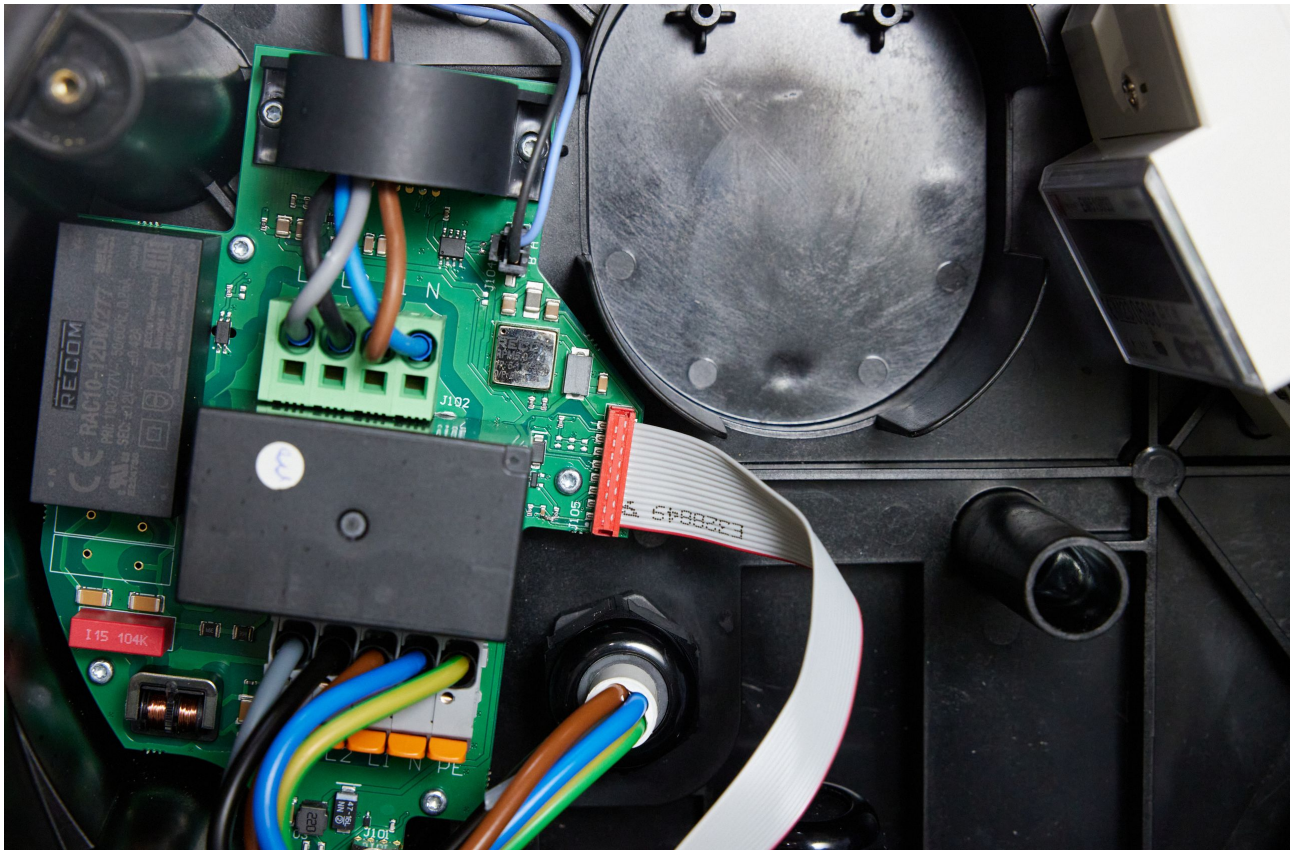
5 Inspect the gasket on the back of the front.

Installing the front cable

When the gasket are in place, connect the flat cable from the front to the wallbox PCBA.

> Not much force is needed to install the wire. Proper alignment is important.

> Please note the location of the red side of the cable



6 Flat cable installed in the walbox PCBA.

Mounting the front.

When the flat wire in place, mount the front of the wallbox with the 6 bolts.

7 The front is now mounted with the 6 x bolts

Finally, mount the aluminum plate and proceed to the "deployment" phase, where certain parameters in the IQ-home charger need to be set before it can operate.

Deployment guide

This guide will walk you through the steps after the IQ-home charger has been installed and the power is ready to be connected.

Before you start, you will need to install the IQ-plug APP. Mobile APP (see page 29)

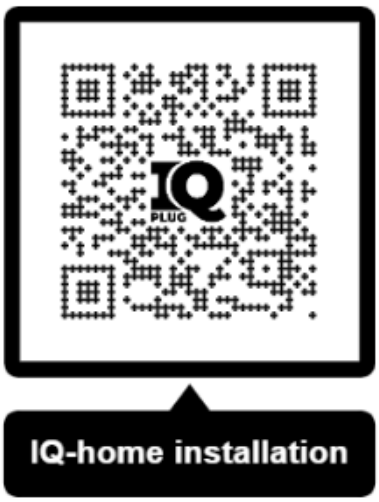
Power up.

When the IQ-home powers up, it light orange.

> If it change color to green, then please see the reset guide.
> Reset guide. (see page 19)

Connect to wifi

The IQ-home charger, has created an wifi access point. Please connect to it manually or scan this QR code.

SSID: IQ-home password: password	

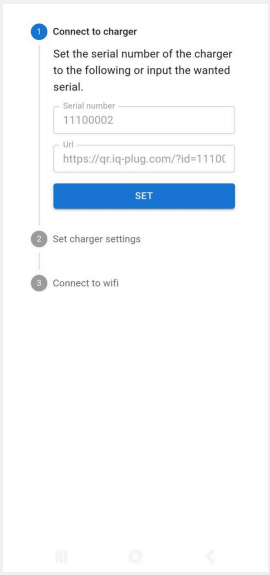
Open the IQ-plug APP.

> The app may ask for some permissions to use the camera, which are needed. Please accept.

Scan QR code

The first screen, appearing is the camera view. Please hold it over the QR code on the front of the wallbox, to be able to scan the code. When the code is scanned you can see the result on this screen

8 Scan QR code with the APP.



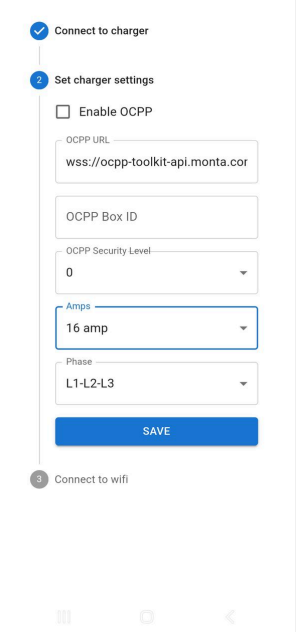
Set installation parameters.

On the next screen you configure the OCPP setting. (if not sure what to set, leave it as default).

The installation shall be specified to match the actual installation.

- **Amps. The maximum of maps in the installation.**
- **Phase order, is important when using load balancing.**

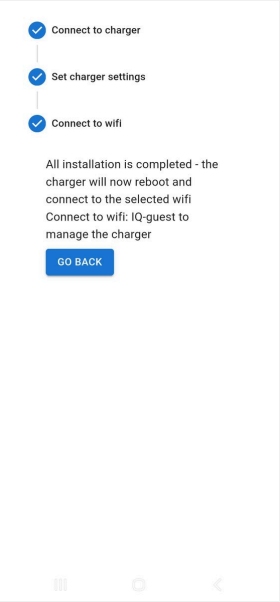
After pressing save the installing is completed, and the status light is changing the color to green.



Set up wifi

The last step, is to set up the connection to the local wifi network.

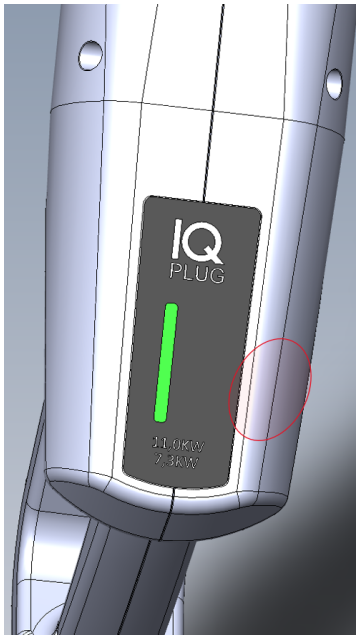
After adding SSID and password, this screen appears. The wifi AP IQ-home is now gone, and the wallbox is now working via the users wifi.



Reset guide.

If the wallbox status light is green, you can change the deployment parameters, but first, you need to factory reset the IQ-home charger. Follow these steps:

1. Reset or power up the IQ-home charger. You can reset the charger via OCPP or by cycling the supply power off and on.
2. Within a short period after restarting and when the status light is green, activate the factory reset by touching the handle on top with one finger.
3. Find the right spot; the status light will start flashing orange.
4. Remove your finger; the status light will continue flashing orange.
5. Wait until the light is steadily orange.
6. Grab the handle; the status light will start flashing fast orange again.
7. Keep holding the handle until the status light turns off or stays steadily orange.
8. When the status light is steadily orange, the IQ-home charger is reset. Please refer to the Deployment Guide for further instructions. Deployment guide (see page 16) .



9 Area to find the reset button.

Function description

Status colors

color walbox	color plug	connected to EV	action	description
green	Off	no	constant.	Ready to be plugged in and charge.
yellow	Off	no	constant.	Ready to be plugged in and charge. Charging is limited to reservation holders only.
yellow	yellow	yes	constant.	Authorization with the OCPP backend server is needed before charging can start.
white	white	no	constant	Plug detect touch.
white	white	yes	flashing	Plug detect touch.. Stopping charging.
white	white	yes	constant	Plug detect touch. Plug can safely be unplugged.
blue	blue	yes	constant	Plug is correctly plugged into the EV. Waiting for the charging to start.
blue	blue	yes	pulsing	Charging is ongoing.
blue or cyan	blue or cyan	yes	constant	Charing session completed.
red	red	yes	constant	Some error occured while charging. Unplug to reset.
red	red	-	flashing	Some internal failure is detected, please turn off power to the charger and contact support.
orange	orange	-	constant	booting after a reset or power loss. Performing internal validation on data and electronics. If the orange color stays on for more than one minute, contact support.
orange	orange	no	flashing	Deployment data reset in process.
orange	orange	-	pulsing	App is connected to charger, deployment can start.

color walbox	color plug	connected to EV	action	description
TBD	TBD			Firmware update is ongoing

Charging

To start a charging session can vary by how the IQ-plug charger is configured.

Here is the steps to start and stop charging. Some steps can be avoided depending on the configuration.

1. Grap the handle, status light changes to white.
2. After a short time, the light guide turns on
3. Radio signals are send to a Tesla, to open the charge port.
4. Plug-in the connector to your EV. Status light will change:
5. if status light is yellow, start charging by you OCPP app.
6. if status light is purple, the EV is suspending the charging. (you need to fix this from you car or car app).
7. if status light is blue or blue pulsing everything is fine.

> Steady blue can appear shortly, or if OCPP server is blocking the charging at the moment.

Stop charging

To stop charging depending on how you EV is handling the standard procedure.

1. Grab the handle. The IQ-plug charger, try to stop the charging by setting the allowed current draw to 0 A, and then signal to the EV, that charging is stopped.
2. When the charge port unlocks and the status light is steady white, you can safely remove the handle.
3. Park the connector in the wallbox dock.

> For some EV's, you may need to unlock the charge port manually, before you can remove the connector.

Power limits

The IQ-home AC charger can deliver up to 16A on 3 phase, which are equal to 11kW.

This maximum power can be limited by some factors. Such as:

- Installation, can limit the power output, due to number of phases and maximum current draw set by the installer.
- The EV/car, can limit the power.
- High ambient temperatures or direct sunlight, can decrease the power to protect the surrounding for increasing temperatures.
- If the charger is controlled via OCPP or an App, it can limit the power due to load balancing, energy prices or CO2 emission etc.

Light guide

The plug is equipped with a light guide in the tip of the plug. This help you to find the way from the Charger to your car and back, when the light condition is not very good. The light is on when you grab the handle of the plug.

Tesla opener

The plug has build in a radio device, that will open your Tesla charge port, when you grab the plug from the charger dock. The signal is send once, to repeat it, you need to release the handle, and grab it again. The radio power is very limited, so you need to be close to you Tesla before it works.

> If you Tesla is in deep sleep, it may take a while before it response to the signal.

Cable management

The IQ-plug charger is designed to be able to hold both the cable and the plug while it is not in use. This makes it look nice, and also prevent trip accident.

The cable management can hold the almost 6 meter cable, that comes with the charger. When the charger is used, the cable shall be released from the charger, and placed on the ground in the best way, so no one can trip over it, or placed where no damage will be added to the cable. When the charger is not used, make sure to wrap the cable back on to the charger.

The plug is release from the dock of the charger, by lifting it up a little, then it can be drawn back. When the charging session is done, the plug can placed again in the dock, simple just to push it in, and it will automatically lock.

One hand operation

The IQ-home charger support auto release. When you need to remove the plug from you EV, you simple grab the handle of the plug, and wait a few seconds, then the handle will be unlocked, and you can remove the plug.

> One hand operation is not possible on all EV's, since it is not implemented on all.

OCPP

The de facto standard OCCP ver. 1.6 is supported by the charger. You can freely choose which provider you will use. In the IQ-plug APP you can setup the OCPP parameters.

OCPP is used to manage you charger, you can do a lot, some are:

- access control.
- payment.
- tax refund (for some countries).
- load balancing.
- smart charging.
- remote control.
- firmware upgrade.

Mobile APP

The IQ-plug mobile app, is available in Google play and in Apple store, find links below.

The app will be self explained, unless otherwise noted in this manual.

Specifications

General	
Dimensions (H x W x D with plug / without plug)	345 x 345 x 230/130 mm
Operation temperature	-20 °C to +50 °C
Weight	5.2 kg
Maximum operational altitude	2000 meters
Degree of protection wallbox/plug	IP65 / IP65

Feuture	
Guide light	Color white
Cable management	Integrated
Cable length	5,5 m
RCD-DD (DC protection acc to EN IEC 61851-1:2019)	6mA DC
One hand operation	Depending on the EV
Energy meter	MID class B 1%
Load balancing	Via OCPP
Temperature supervision for protection	In both wallbox and plug

Charging	
Maximum charging power	11 kW
Connection	Type-2
Cable length	5,5 m

Input power	
Rated input voltage	230/400 VAC
Rated current (at 25°C)	16 A
Number of phase	3
Frequency	50 Hz

Connectivity	
OCPP	Version 1.6
WIFI	2,4 GHz IEEE 802.11 b/g/n/ax GCMP, CCMP, TKIP, WAPI, WEP, BIP, WPA2-PSK/WPA2-Enterprise, and WPA3-PSK/WPA3-Enterprise
Tesla	Tesla charge port 433 Mhz.
IQ-plug APP	IOS and Android

Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Declaration number	IQ-PLUG_01
The manufacturer	IQ-Plug Aps Bøgelunden 13 9560 Hadsund Denmark
Product type number	IQ-home
Product	1 / 3 phase EV charging station for 230/400 VAC. Type-2 connector 

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Directive		Standard
LV 2014/35/EU	: : : :	EN/IEC 61851-1:2019 (harmonised) EN/IEC 62196-1:2014 (harmonised) EN/IEC 62196-2:2012 (harmonised) EN 50620:2017 (harmonised)
EMC 2014/30/EU	:	EN/IEC 61851-21-2:2021
RED 2014/53/EU (Article 3.2)	:	EN300 328 V2.2.2 (harmonised)
MID 2014/32/EU	:	

Additional information

Apply to standards above with the following exceptions:

IEC 62196-2:2012 standard sheet 2-IIe. Surface roughness in sealing are: Ra=0,7uM is not meet. This have no practical impact.

Signed for and on behalf of

Signature:	Date:
	06 JUL 2024
Kasper Hauge CEO	