Ensto One Home

ENG Installation Manual

RAK131B_ENG
2022-10-14

Contents

Installation Manual

1. Safety instructions

Electrically skilled person

- **The installation must only be done by a qualified professional.**
- **Read this Installation Manual carefully before you start the installation work.**
- **Obey the instructions in this Installation Manual, and make sure that the installation complies with national safety regulations, installation methods and restrictions.**
- **The information provided in this Installation Manual in no way exempts the installer or user from responsibility to obey all applicable safety regulations.**
- **This Installation Manual is a part of the product and must be stored in a safe location so that it is available for future installation and service.**

WARNING

Danger of electric shock! Risk of fire!

- ***Improper installation can cause personal injury and property damage.***
- ***Do not switch on the power supply before the installation work is completed.***

2. Description of symbols

	WARNING - Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury or considerable damage to the equipment.
	Electrically skilled person
	Identifier for plug and socket outlet AC / EN62196-2 / Type 2
	Load management

3. Abbreviations

Abbreviation	Description
DLM	Dynamic Load Management to limit charging current if needed to protect the main fuses
LED	Light Emitting Diode
MCB	Miniature Circuit Breaker, protects cables from over load and short circuits
RCBO	Residual current Circuit Breaker with Overcurrent protection
RCD	Residual Current Device, protects humans and animals from electric shock
RDC-DD	Residual Direct Current Detecting Device
RS-485	Recommended Standard 485, standard defining the electrical characteristics of drivers and receivers for use in serial communications systems

4. Delivery contents

- EVH Charging station
- Cable gland M32/M25 (depending on the model)
- Installation Manual in English,
  other languages please see www.ensto.com/building-systems.
- Multilingual User Guide

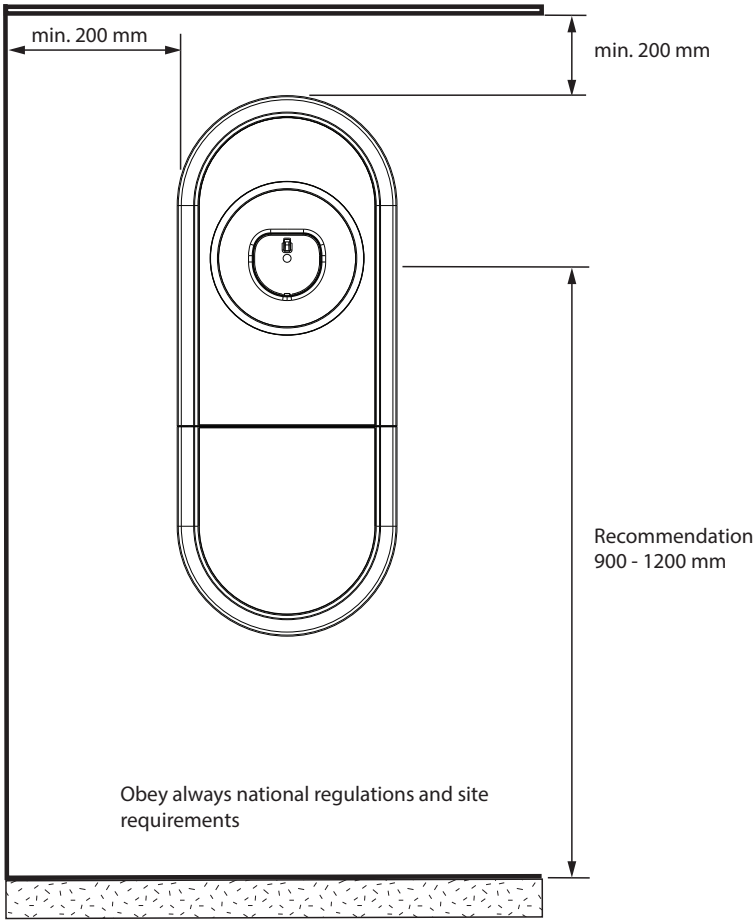
5. Mounting instructions

5.1. Before installation

Remove the charging station from its package. Do not scratch the surface of the charging station after removal from the package.

When selecting installation site, take into account the following:

- The charging station is suitable for indoor and outdoor use.
- In order to ensure the optimal charging performance, the charging station should not be exposed to direct sunlight.
- The minimum space needed for operating and maintenance.



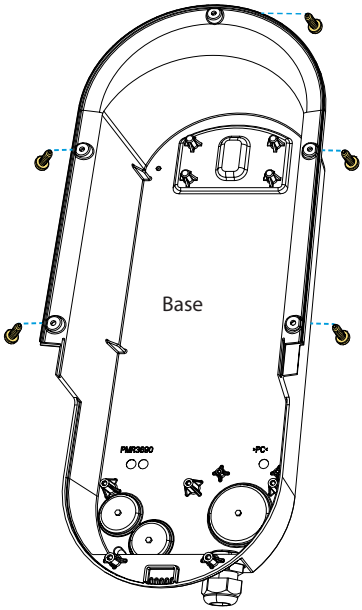
5.2. Cable entries

- Take the cable routing into consideration when planning the installation. The supply cable can be routed into the enclosure from the rear or bottom. Default cable routing is from the bottom.
- The M32 cable gland for the supply cable is pre-assembled on the bottom of the charging station.
- If it is necessary to open additional cable entries, you have to disassemble the charging station.

Installation steps when cable routing is from alternative cable entries

1. Disassemble the charging station.

4 Remove the screws 5pcs.
Remove the installation box from the base.



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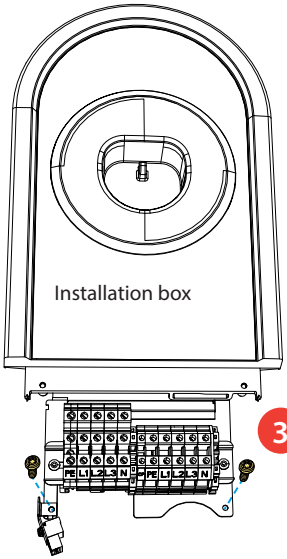
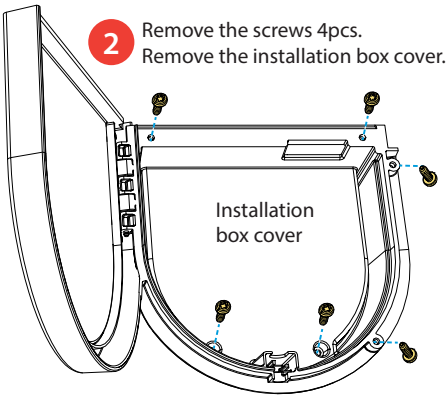


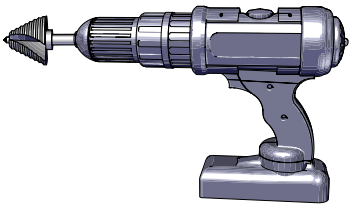
3 Remove the screws 2pcs.

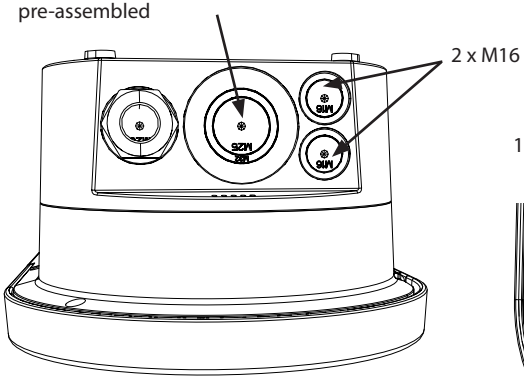
2 Remove the screws 4pcs.
Remove the installation box cover.

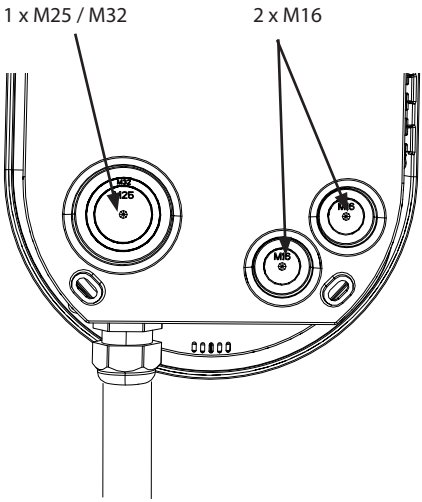


1 Screw fixing: Remove the screws 2pcs.
Mechanical lock: Unlock the hatch with a coin or suchlike.

2. Open the necessary cable entries with a step drill bit. M16 cable entries are suitable for the RS-485 or dry contact cablings.
3. Prepare the cable entries with suitable accessories.
4. Remove the included cable gland from the bottom and close the cable entry with a cover plug, PMR1217.32B (accessory).
5. Assemble the base and insert.
6. Assemble also the installation box cover, if electrical cables are installed in a separate session.



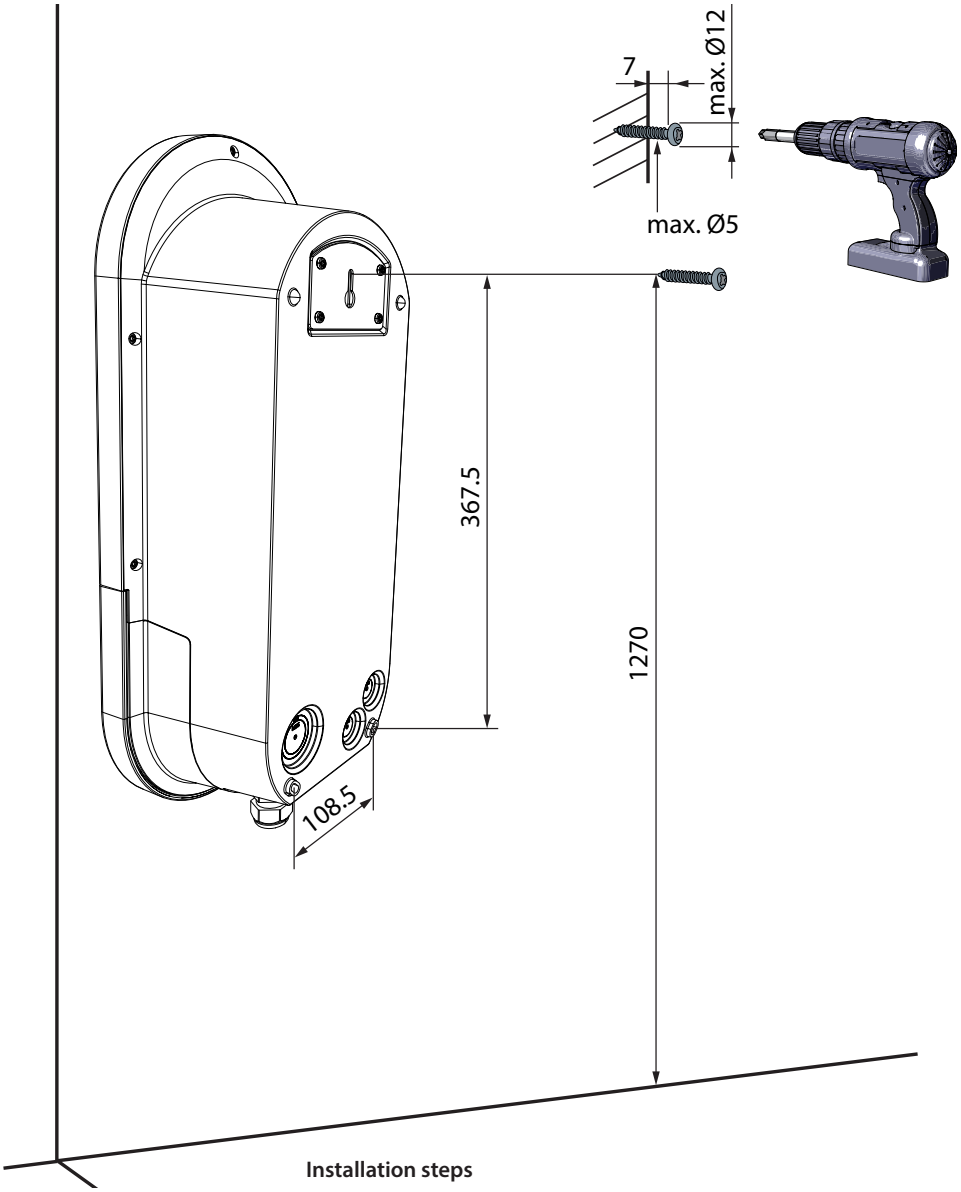




Accessories		
Part number	**Description**	**Note**
PMR1217.32B	Black cover plug for M32 opening	
KTM24.25/BLACK	M25 cable gland for cable Ø 10 - 16mm	EVH16...: included 1pc
PMR1219.3225B	Black reduction nipple, M32 => M25	EVH16...: included 1pc
RGM16B	Membrane gasket for cable Ø 5 - 9mm	
RMM25B	Membrane gasket for cable Ø 8 - 17mm	
RMM32B	Membrane gasket for cable Ø 12 - 24mm	

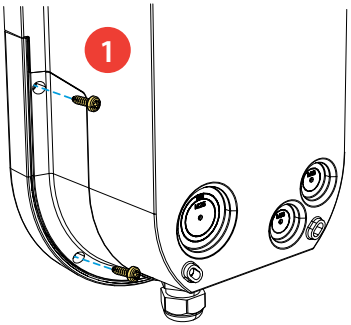
5.3. Wall mounting

- When selecting the installation location, make sure that the wall material is suitable and robust. The mounting surface should be flat and vertical.

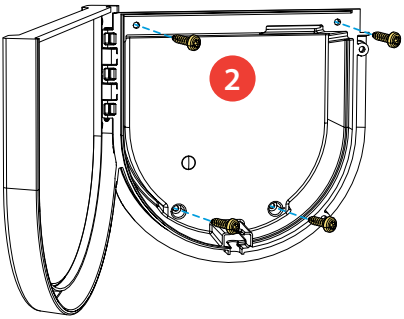


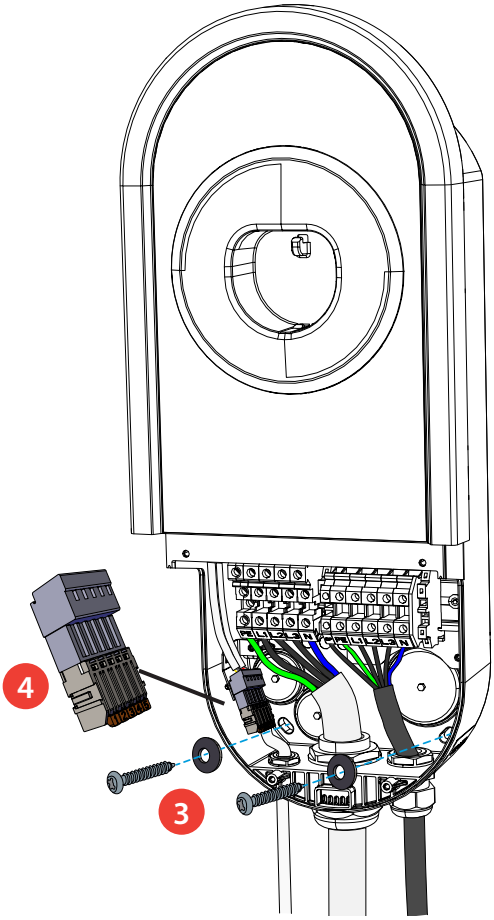
Installation steps

1. Use for the wall material suitable screws.
2. Fasten the upper screw 1270 mm measured from the ground surface. The plug holder will be at a height of 1200 mm.



TX20
Tightening torque 1,5 Nm





3. Open the installation box hatch by removing the fastening screws (2 pcs) / unlocking the hatch lock [1].
4. Remove the entire installation box cover by unscrewing the fastening screws (4 pcs) [2].
5. Hang the charging station on the screw you attached to the wall.
6. Attach the charging station on wall with two washers and fastening screws (not included) [3].
   Be careful not to damage the fixed charging cable!
7. Pull the electrical cables approx. 150mm through the cable glands.
8. Cut the supply cable conductors in suitable lengths. Leave the ground conductor long enough so that if a fault occurs it is the last one that comes loose.
9. Strip the conductors 11 mm and connect to the supply connectors.
10. Load management connections: If it is necessary to connect the charging station to an energy meter or an external control device, connect the required control cable to the pre-installed connector [4].
11. Put the installation box cover back in right position and fasten with the screws you removed.
12. Close the installation box hatch.

6. Electrical connections

The voltage and current ratings including cable sizes must comply with national regulations. The system dimensioning must be done by a qualified electrical designer.

The default setting for the earthing system is TN network. If you connect the charging station to an IT network, you have to change the settings for the charging station accordingly.

You can change the settings of the charging station with the Charger Control Application.

- Download the Charger Control application from Apple Store or Google Play.
- Pair your mobile device with the charging station.

For more information see the **User Guide** chapter **14. Charger Control Application** on pages 5 - 8.

Settings intended for qualified professionals only, see the chapter **12. Charger Control Application** on pages 22 - 23.

6.1. Power supply

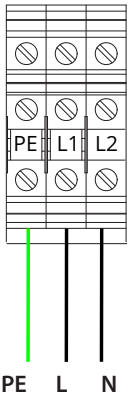
EVH161B-HC000 / EVH321B-HC000:

- Install a residual current device (RCD type A, 30mA) and a circuit breaker (MCB max. 16A or max. 32A depending on charging station model) to the supply line. In addition obey local regulations for the power supply line.
- These charging station models can be connected to an IT network.

  Note! The load management features do not support the IT network installation.

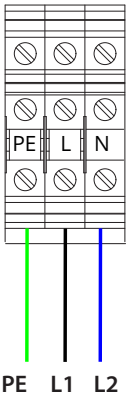
  Please contact your local representative for more information.

TN network



Supply
Cu 2.5 - 10 mm²

IT network

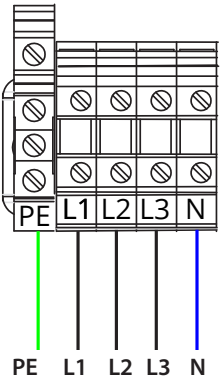


Supply
Cu 2.5 - 10 mm²

EVH163B-HC000 / EVH323B-HC000:

- Install a residual current device (RCD type A, 30mA) and a circuit breaker (MCB max. 16A or max. 32A depending on charging station model) to the supply line. In addition obey local regulations for the power supply line.
- Do not connect these charging station models to an IT network.

TN network

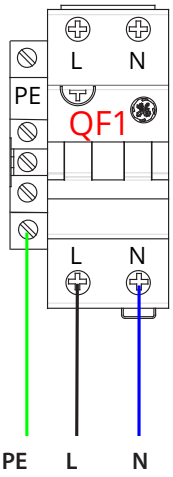


Supply
Cu 2.5 - 10 mm²

EVH161B-HCR00 / EVH321B-HCR00:

- A combined device with residual current circuit breaker and over current protection (RCBO) is integrated.
- A label set of RCBO testing instructions is included in the delivery. Attach a language specific label on the installation box hatch.
- Do not connect these charging station models to an IT network.

TN network

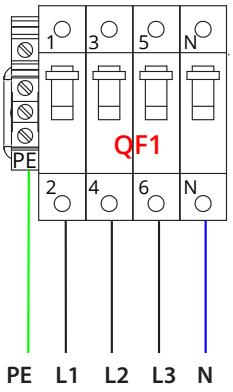


Supply
Cu 2.5 - 10 mm²

EVH163B-HCR00 / EVH323B-HCR00:

- A combined device with residual current circuit breaker and over current protection (RCBO) is integrated.
- A label set of RCBO testing instructions is included in the delivery. Attach a language specific label on the installation box hatch.
- Connect these charging station models to a 3-phase supply, otherwise the RCBO test button does not work.
- Do not connect these charging station models to an IT network.

TN network



Supply
Cu 2.5 - 10 mm²

6.2. Load Management connections

Connect external control devices for load management to the pre-installed connector.

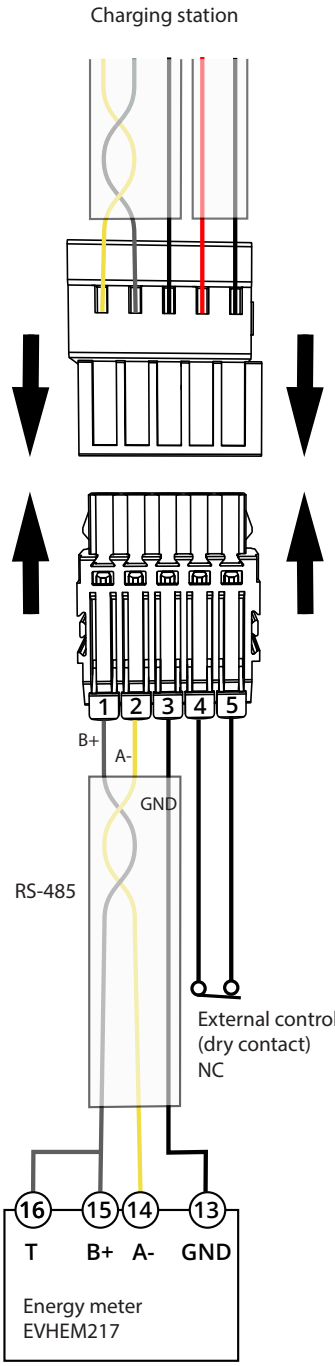
Note! Load management does not support IT earthing system.

If devices for load management functions are connected to the charging station, change the respective settings with the Charger Control Application.

Energy meter

Supported energy meter:
EVHEM217 (Carlo Gavazzi EM2172RVV23XOSX)

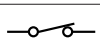
- Connect the energy meter to terminals 1 [B+], 2 [A-] and 3 [GND].
- Use a twisted pair instrumentation cable RS-485 when you connect the energy meter to the charging station.
- Recommended cable type: NESMAK-HF 2x2x0,5+0,5 or similar.
- The system has been tested with 100 m cable length.
- Make sure that the RS-485 baud rate is equal in the charging station and the energy meter.
- Do not change EVHEM217 Modbus default parameters.
  Modbus: client ID 1
  Databits: 8
  Parity: none
  Stopbits: 1
- Make sure that the signal wires are connected correctly to the energy meter.
- Terminate the transmission line in accordance with the wiring example on the next page. Please see the energy meter instructions for more detailed information.



External control device

- Connect a dry contact module for override mode to the terminals 4 and 5. Remove the jumper from the pre-installed connector.

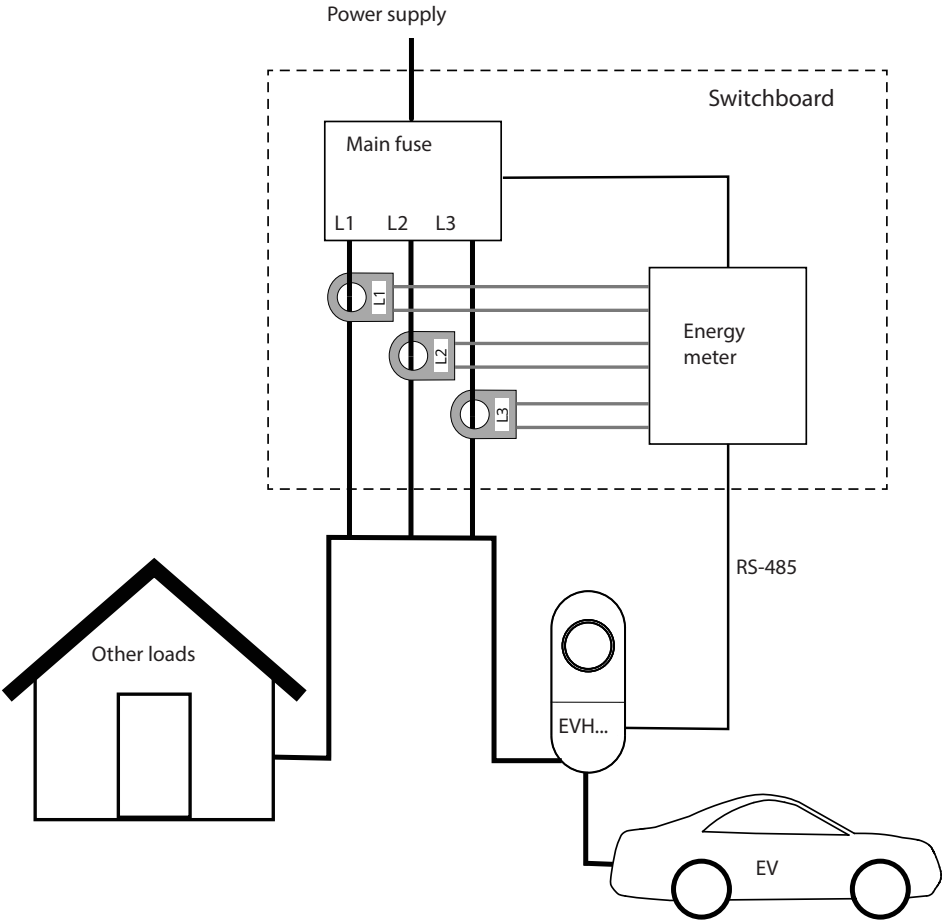
  Note! If you do not connect a dry contact module to the charging station, do not remove the jumper or change the related settings in the Charger Control application.
- The default setting for external control is NC (normally closed).
  When the contact is closed, charging is allowed.
  When the contact is opened, charging is not allowed.
- If you install the external control as NO (normally open), change the settings accordingly in the Charger Control application.

External control	Switch	Charging
Normally closed (NC)		Allowed
		Not allowed
Normally open (NO)		Allowed
		Not allowed

6.2.1. Dynamic Load Management (DLM)

You can implement dynamic load management with for this purpose compatible energy meter. The figure below shows an example how you can build up the system.

- The energy meter measures the total power consumption and the actual current per phase. If some other load over the set maximum current for load management is added when charging is ongoing, the charger will decrease the charging current. If the total power consumption reaches the allowed maximum power, the charging interrupts untill the the total power consumption has decreased to a value at which the charging can continue.



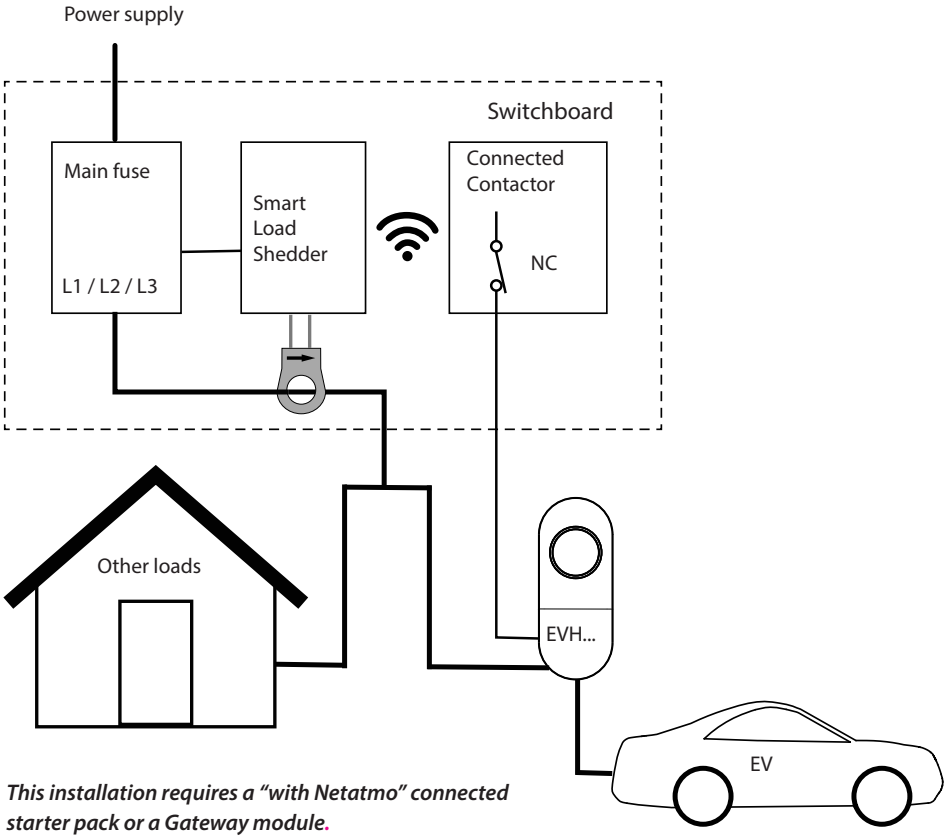
- Use only current transformers which have the same serial number, they are calibrated with one another.
- 1-phase measurement: select the correct parameters in the energy meter's settings.
- Please see the energy meter instructions for more detailed information.

6.2.2. Load Management in Override mode

Ensto One charging stations are compatible with a variety of home control systems.

The Legrand group has a wide assortment of devices for home control systems. The figure below shows an example how you can build up load management with Netatmo Connect.

- If the total load reaches the allowed maximum power, the Smart Load Shedder sends a signal to the Connected Contactor. The Connected Contactor switches off the charging current. When the Connected Contactor gets a signal that the total power consumption has decreased to a set value, it switches on the charging current.



This installation requires a "with Netatmo" connected starter pack or a Gateway module.

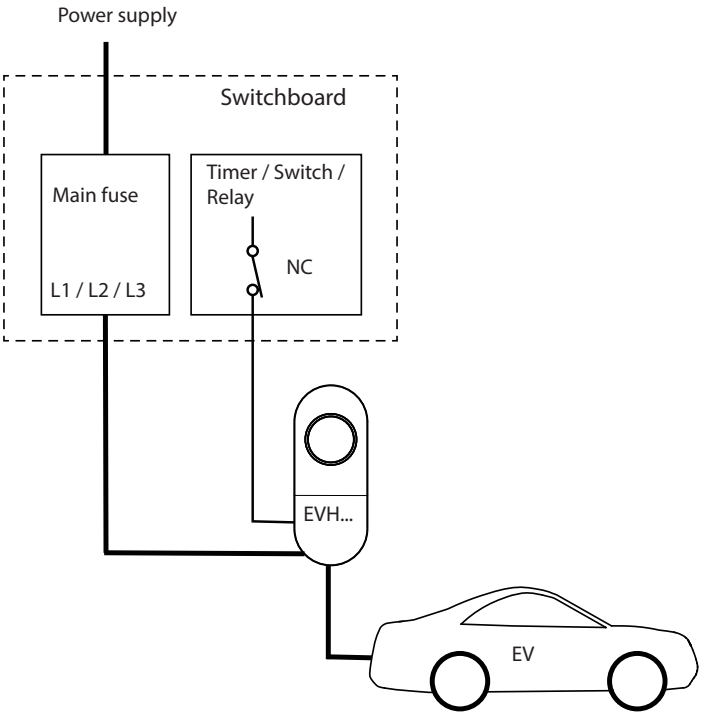
Device	Legrand catalogue part number
Smart Load Shedder	4 121 72
Connected Contactor	4 121 73

Please ask our local sales representative detailed information about the required devices for your installation.

6.2.3. Control of charging in Override mode

The charging events can be controlled by a dry contact module. The figure below shows an example how you can build up the override control of charging with a timer, switch, relay or similar.

When the dry contact is closed, the charging station gets power and can charge the connected vehicle. When the dry contact is open, the charging station does not get power and charging is not possible.



7. Technical information

Electrical Connections	EVH161B-HC000	EVH321B-HC000	EVH161B-HCR00	EVH321B-HCR00
Nominal supply voltage	1-ph, 230 VAC			
Nominal frequency	AC 50 Hz			
Charging current max.	1x16 A	1x32 A	1x16 A	1x32 A
Charging power max.	3600 W	7400 W	3600 W	7400 W
Idle power loss	Depends on the LED settings: LED 1% => 1,5W / LED 50% => 1,8W / 100% => 3,9W			
Supply connections and terminals	L1, N, PE Cu 2.5 – 10 mm² Tightening torque: 1.5 - 1.8 Nm		L1, N, PE Cu 2.5 – 10 mm² Tightening torque PE: 1.5 - 1.8 Nm L + N: 2.5 - 3.0 Nm	

Electrical Connections	EVH163B-HC000	EVH323B-HC000	EVH163B-HCR00	EVH323B-HCR00
Nominal supply voltage	3-ph, 400 VAC			
Nominal frequency	AC 50 Hz			
Charging current max.	3x16 A	3x32 A	3x16 A	3x32 A
Charging power max.	11 000 W	22 000 W	11 000 W	22 000 W
Idle power loss	Depends on the LED settings: LED 1% => 1,5W / LED 50% => 1,8W / 100% => 3,9W			
Supply connections and terminals	L1, L2, L3, N, PE Cu 2.5 – 10 mm² Tightening torque: 1.5 - 1.8 Nm		L1, L2, L3, N, PE Cu 2.5 – 10 mm² Tightening torque PE: 1.5 - 1.8 Nm L + N: 2.5 - 3.0 Nm	

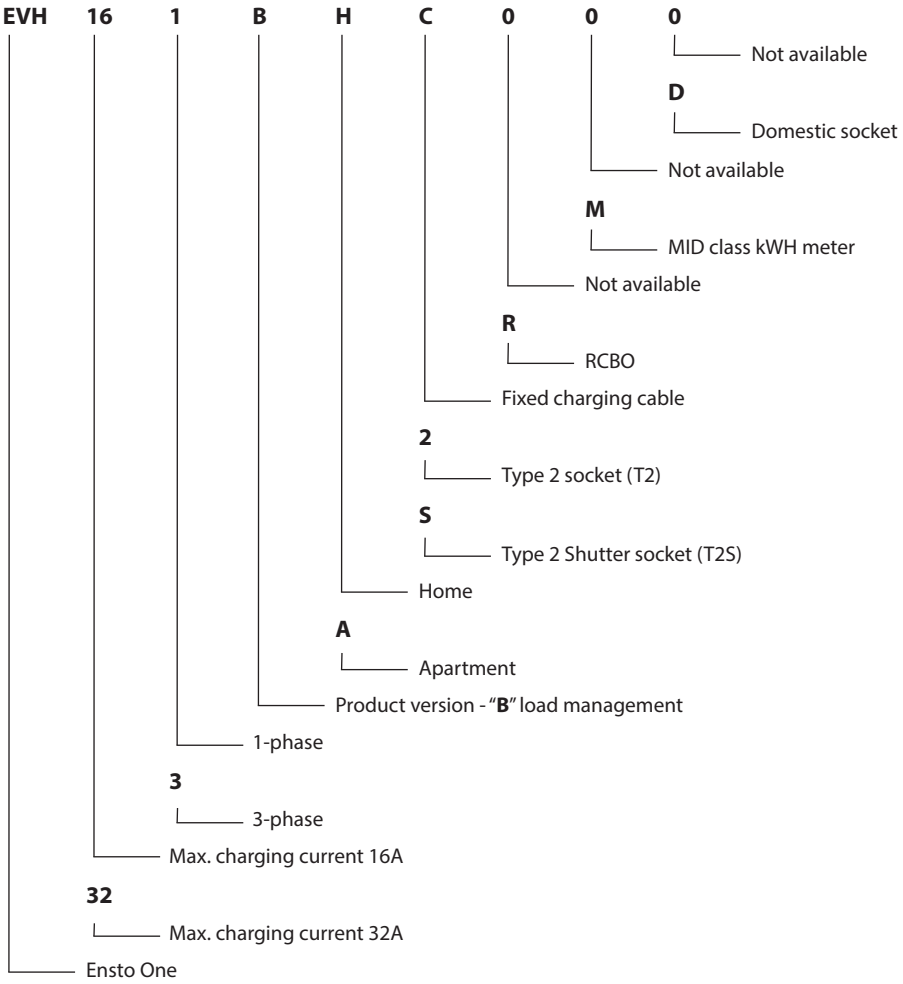
Design and Mechanics	EVH161B-HC000 EVH163B-HC000	EVH321B-HC000 EVH323B-HC000	EVH161B-HCR00 EVH163B-HCR00	EVH321B-HCR00 EVH323B-HCR00
Material	Polycarbonate			
Color	Frame: RAL7021 dark grey Cover: Silver			
Installation box	Screw fixing		Mechanical hatch lock	
Weight	approx. 7 kg			
Ingress Protection	IP54			
Impact Resistance	IK10			
Operating temperature	-40 °C … +50 °C			
Mounting	Wall / Ground			

User Interface	EVH161B-HC000 EVH163B-HC000	EVH321B-HC000 EVH323B-HC000	EVH161B-HCR00 EVH163B-HCR00	EVH321B-HCR00 EVH323B-HCR00
Connection to vehicle	Fixed cable, length 5m			
Charging status indication	4-color LED: Green = Ready / Blue = Charging / Red = Error / Yellow = Internal maintenance			
Use access	Free access or authorization mode Settings done via mobile application			

Safety Features	EVH161B-HC000 EVH163B-HC000	EVH321B-HC000 EVH323B-HC000	EVH161B-HCR00 EVH163B-HCR00	EVH321B-HCR00 EVH323B-HCR00
Residual current device RCD	Leakage detection integrated RDC-DD, 6mA RCD, type A 30mA must be installed in distribution board		Leakage detection integrated RDC-DD, 6mA Residual current circuit breaker and over current protection integrated, RCBO, 30mA	
Miniature circuit breaker MCB	Max. 16A must be installed in distribution board	Max. 32A must be installed in distribution board		

Control and Communication	EVH161B-HC000 EVH163B-HC000	EVH321B-HC000 EVH323B-HC000	EVH161B-HCR00 EVH163B-HCR00	EVH321B-HCR00 EVH323B-HCR00
Operation mode	Standalone			
Wireless	Bluetooth			
Load management	Dynamic Load Management • Supported energy meter (not included, sold separately): EVHEM217 (Carlo Gavazzi EM2172RVV23XOSX)			
	Override • required external control devices are not included			
Charging control system	"Simplified control pilot" functionality, specified in EN IEC 61851-1:2019, Annex A.2.3 is not supported. ZEReady 1.2b and EVReady 1.4b are not supported.			

8. Code key


EVH
16
1
B
H
C
0
0
0
Not available
D
Domestic socket
Not available
M
MID class kWH meter
Not available
R
RCBO
Fixed charging cable
2
Type 2 socket (T2)
S
Type 2 Shutter socket (T2S)
Home
A
Apartment
Product version - "B" load management
1-phase
3
3-phase
Max. charging current 16A
32
Max. charging current 32A
Ensto One

9. Installation / Commissioning checklist

Introduction

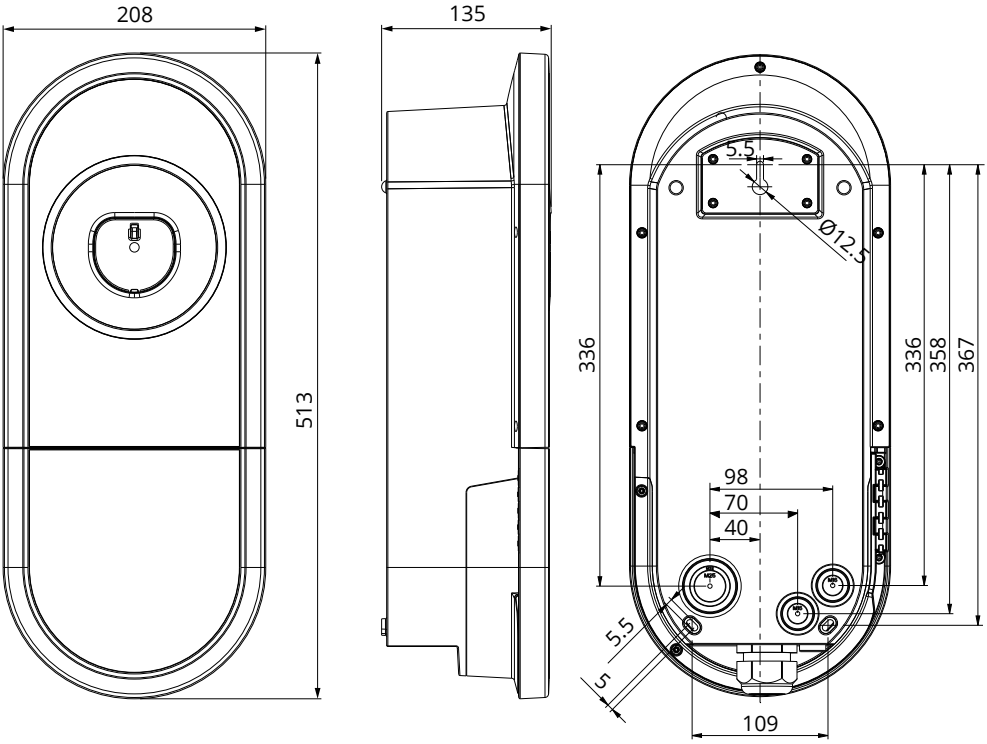
Examine the mechanical and electrical installation in accordance with this checklist to make sure that the charging station is properly installed.

Checking the Installation

Examine the visual, mechanical and electrical installation when the charging station ***is unpowered.***

CATEGORY	X	ITEM
Overall look		You have received the ordered material.
		You do not see any scratches or damages.
Mechanical installation		The charging station is fixed properly on the installation site.
Electrical installation		Charging station's power supply capacity meets the electrical planning (cable size, protective devices…). Review the local electrical design plan.
		The PE-cable screw is tight.
		The power supply conductors (L1, L2, L3, N and PE) are properly connected.
		The insulation of the power supply cable and conductors (L1, L2, L3, N and PE) is intact.
		TN network: • The voltage between PE and N is less than 10 V. IT network: • The voltage between L1 and N is 230 V. • The voltage between L1 and PE is 130 V.
		The PE conductor resistance is less than 3 Ω.
		The load management control cables meet the electrical planning requirements, if in use.
Operational check		All the LED states / color (green, blue, red) are functioning. • Use a car simulator. • Create fail and charge. • Red at bootup, green at idle and blue while charging.
		Test the functionality of load management, if in use.
		Test the functionality of the protective device.
Ready for use		Correct software is in use.

10. Dimension drawing



11. Troubleshooting

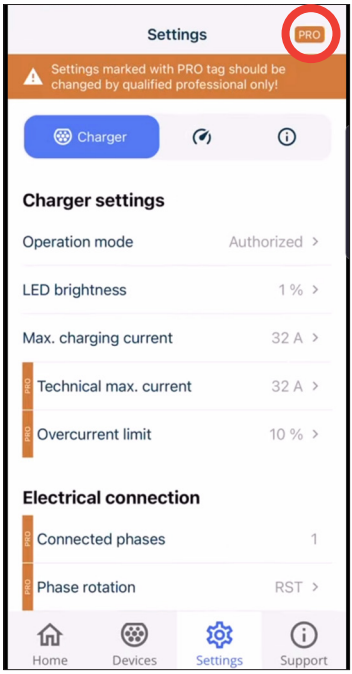
Charging station is off, no lights on

Issue	Corrective action
Mains voltage does not exist in supply connectors (L1, L2, L3).	Make sure that the supply conductors are properly connected. Make sure that there is power available.
The circuit breaker QF1 is off (EVH...-HCR00).	Turn the QF1 on.

12. Charger Control Application

- The charging station is ready to use after the installation is completed.
- You can control the charging station and change settings with the Charger Control Application.
- In this chapter is described the settings, which are only allowed for qualified professionals.
- For additional instructions please see the User Guide for the Ensto One Home charging station.

Note! Do not change the settings while charging is in progress.



12.1. Pro settings in the Charger Control Application

WARNING

Danger of electric shock! Risk of fire!

- ***Settings described in this chapter must only be done by a qualified professional.***

Open the Pro menu

- Open the Charger Control on your mobile device.
- Go to "***Settings***".
- Press ***PRO*** on the top right corner.
- Available settings depend on the installed charging system.

12.2. Charger Settings

In this menu you can find settings related to the charging station.

12.2.1. Technical max. charging current

- Maximum current that the electrical supply of the property can provide to the charging station.
- When you define the technical maximum current, take into account the main fuse size and the possible total energy consumption of the property. A safety limit prevents unnecessary triggering of the fuse and protective devices.

12.2.2. Overcurrent limit

- Certain car models tend to take more charging current than set as the charging station's maximum charging current.
- In case an overcurrent of 10% lasts longer than 2 minutes, it results an error state. If the overcurrent is 16% it results an error state immediately.
- You can prevent unnecessary error states by setting an overcurrent limit.
- If the charging current is lower than 10A, you can set the overcurrent limit up to 30%.

12.2.3. Connected phases

Select the phase the charging station is connected to.

12.2.4. Phase rotation (only 3-phase chargers)

Selection of phase rotation is only informative and does not affect the charging station's operation.

12.2.5. Earthing System

The default setting for power supply is TN network. If you connect the charger to an IT network, you have to change settings for the charger accordingly.

12.2.6. Start Self test

- The charging station performs a self test automatically at start-up.
- During the self-test, several components and their proper function is tested.
- The LED indicator is stable green during the self test.
- The extent and duration of the self test depend on the charging station model.
- If a critical fault is detected during the self test, the charging station will go to error state. You can see the error code in the error log.

12.2.7. Factory Reset

Here you can restore the charging station's factory settings.

12.3. Load Management Settings

In this menu you can find settings which are related to load management.

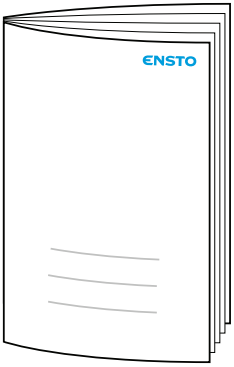
12.3.1. Property energy meter

In the submenus you can see the connected energy meter and modify the connectivity settings.

12.3.2. External control (dry contact)

Here you can change the settings for the override mode. The default setting for the contact is normally closed (NC).

- Charging is allowed when the contacts are closed.
- Charging is not allowed when the contacts are opened.



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