EVBox Troniq Modular

Installation and user manual

EVBox
Troniq Modular

Installation and user manual

Contents

EN

1. Revision

Beta version: This version of the Troniq Modular Installation Manual is still in the process of being reviewed and validated. It will be finalized based on the feedback we receive after the first Troniq Modular installations at pilot sites.

Validation

Created by	Verified by	Validated by
Grosset-Grange N.		

Change history

Revision	Date	Description
D002186AA0.10B1		Creation
D002186AA0.1.0B2	2021/06/15	Add installation Implantation plan update

2. Introduction

This Installation and User Manual explains the installation requirements and steps for EVBox Troniq Modular, as well as how to use the station.

These instructions are valid for several models of the charging station. It is possible that some features and options described may not apply to your charging station.

2.1. Important information

The present document is drawn up by way of information only and does not constitute an offer binding upon EVBox. EVBox has compiled the contents of this document to the best of its knowledge. No express or implied warranty is given for the completeness, accuracy, reliability or fitness for particular purpose of its content and the products and services presented therein. Specifications and performance data contain average values within existing specification tolerances and are subject to change without prior notice. Prior to ordering, always contact EVBox for the latest information and specification. EVBox explicitly rejects any liability for any direct or indirect damage, in the broadest sense, arising from or related to the use and/or interpretation of this document.

2.2. Scope of the document

Keep this manual for the entire lifetime of the EVBox Troniq Modular.

This manual is intended as a resource for qualified personnel with experience working on High Voltage projects who are capable of identifying the requirements and taking all necessary precautions to safely complete a EVBox Troniq Modular installation.

All EVBox manuals can be downloaded from www.evbox.com/manuals.

www.evbox.com/support

2.3. Product classification

This product has the following classification:

Table 1. Classification

Power supply input	EV supply equipment permanently connected to AC supply network.
Power supply output	DC EV supply equipment.
Normal environmental conditions	Outdoor and indoor use.
Mounting method	Stationary equipment, surface-mounted on the ground.
Protection against electric shock	Class 1 equipment.
Charging modes	Level 3.

2.4. EVBox Troniq Modular - Product presentation

Modular and scalable architecture with a power output ranging from 90 kW to 240 kW.

Make the most of your space by charging up to three vehicles simultaneously using CCS2 (dry or cooled), CHAdeMO, or AC Type 2 (AC Type 2 Socket not available at launch).

Field-upgradable and easy to maintain architecture that improves uptime thanks to multiple power converters ensuring service continuity.

Built-in smart load management technology that helps you to reduce peak demand charges.

Best-in-class driver experience with auto-retractable cables, 15" screen, LED guiding lights, and charging indicators.

3. Safety instructions

Read and obey the following safety precautions before you install, service, or use your EVBox Troniq Modular charging station. The installer must ensure that the charging station is installed in accordance with the relevant country-specific standards, and local regulations.

3.1. Save these instructions

This manual contains important instructions for EVBox Troniq Modular that shall be followed during installation, operation and maintenance of the unit.

3.2.  WARNING: Risk of electric shock

- Switch off input power to your charging station before you install or service the charging station. Keep the power off until the charging station is fully installed with its covers secured.
- In the event of danger and/or an accident, a certified electrician must immediately disconnect the electrical supply from the charging station.
- Do not operate the charging station if it is physically damaged or if the charging cable has cracks, excessive wear, or other visible damage. Contact EVBox or your distributor if you suspect that the charging station is damaged.
- Do not direct powerful jets of water toward or onto the charging station. Never operate it with wet hands. Do not put the EV charging plug into any liquid.
- Do not put fingers or other objects inside the charging port or plug port.
- Read the user instructions delivered with your EVBox charging station and the User Manual for your electric vehicle before charging.

3.3.  Warning: Accumulation of gasses

- Some electric vehicles require an external ventilation system to prevent the accumulation of hazardous or explosive gasses when charging indoors. Refer to your vehicle User Manual to check if your vehicle releases hazardous or explosive gasses when charging.

3.4.  CAUTION

- Use this charging station to charge Level 3 compatible electric vehicles only. Refer to your vehicle user manual to check if your vehicle is compatible.
- This charging station may affect implanted electronic medical devices. Before you charge your vehicle, consult the supplier of the electronic medical device to determine if it can be influenced by charging effects.
- This charging station may only be installed, serviced, relocated, and repaired by qualified persons. Incorrect installation, repairs, or modification can result in danger to the user and may void the warranty and liability.
- This charging station contains no user-serviceable parts. The user must not attempt to service, repair, or relocate the charging station. Contact EVBox or your distributor for more information.
- Make sure that the charging cable cannot become damaged (kinked, jammed, or driven over) and that the plug(s) do not come into contact with heat sources, dirt, or water.

- Only use the charging station under the specified operating conditions.
- Do not use explosives or flammable substances near the charging station.
- If you are unsure about how to use a charging station, ask for help.
- Do not allow children to operate a charging station. Adult supervision is required when children are near a charging station that is in use.
- While charging, the cable must be completely unwound and connected to the vehicle without overlapping loops. This is to avoid the risk of the charging cable overheating.
- Only pull on the charging plug hand grip and never on the charging cable itself.
- Adapters, conversion adapters, or cord extensions must never be used on this charging station.

4. Transport and storage

4.1. Transport and storage

- Only transport and store the charging station in its original packaging. No liability can be accepted for damage incurred when the product is transported in non-standard packaging.
- Store the charging station **away from exposure to the sun** and in a dry environment in the temperature range given in the specifications.
- **If the charging station is stored outside, the heating system must be activated.**
- **If the inside storage location does not meet the storage temperature range given in the specifications, the heating system must be activated.**
- Disconnect input power before removing the charging station for storage or relocation.

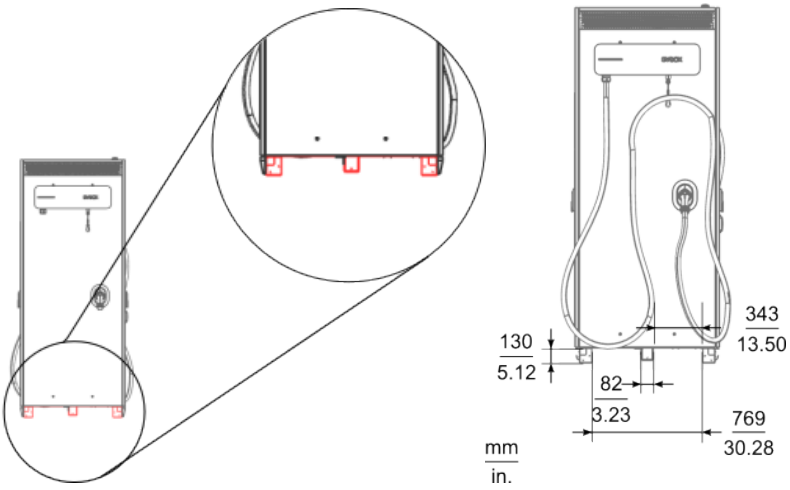
4.2. Handling

Packaging handling

Handle the packaging with a forklift or with a crane with slings.

4.2.1. Handling with forklift

Troniq Modular can be handled by a forklift.



4.2.2. Handling with crane

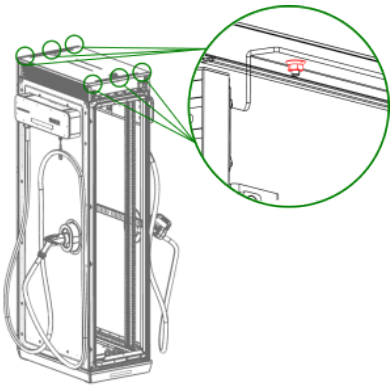
Troniq Modular can be handled by a crane.

Before inserting the lifting rings, it is necessary to remove the roof.

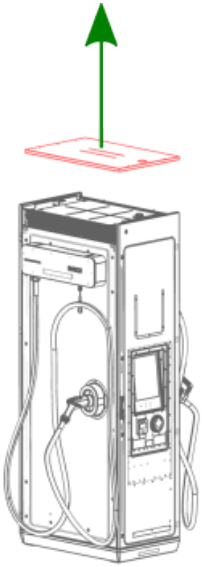
Two people and two stepladders are required for this operation.

1. Open the front and the rear door. (see Open the Troniq Modular door on page 24).
2. Remove the 6 M4 nuts that maintain the roof

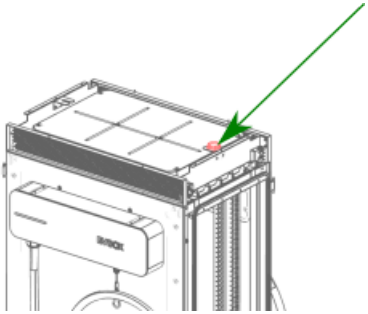
Tool: 7 mm wrench.



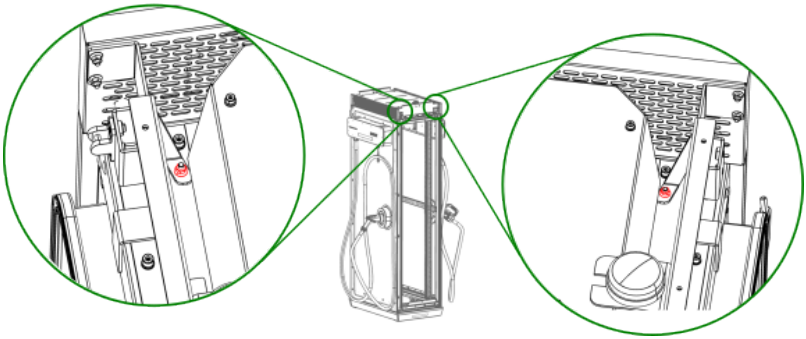
3. Remove the roof:



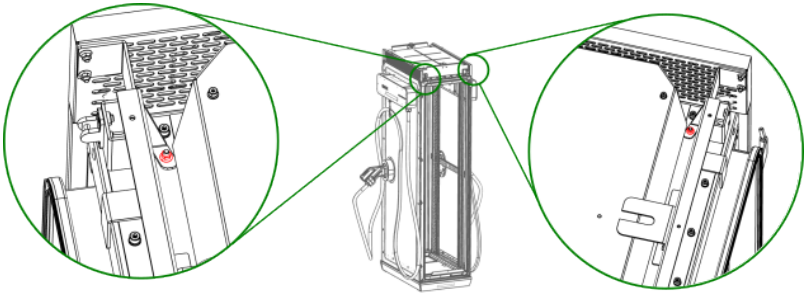
4. Remove the antenna



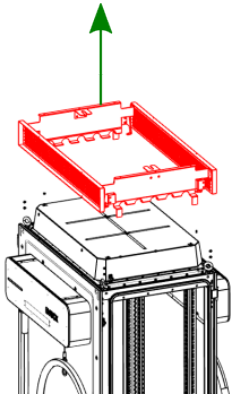
5. Remove the 2 M4 nuts that maintain the front plate.
Tool: 7 mm wrench.



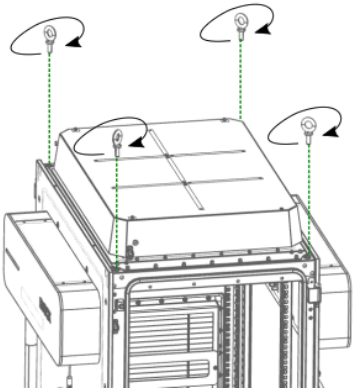
6. Remove the 2 M4 nuts that maintain the back plate.
Tool: 7 mm wrench.



7. Remove the front plate, the back plate, the left ventilation grid and the right ventilation grid together:



8. Screw the 4 lifting rings:



9.

4.3. Long term power off

- Charging station should not be left/placed in power off status for more than one week.
- For installed charger, in case of long term power off, preventive maintenance must be done prior to switching on the charging station. Refer to your local contact for support.

4.4. Verify the packaging

Shock indicator

Packaging are equipped with TiltWatch® indicator which will indicate if the package has been subjected to a shock, even if the package looks not damaged (see below).

Grey indicator	Red indicator
	
Package can be accepted if no damage visible.	Package should not be accepted even if no damage is visible.

Visual inspection

Check if:

- The exterior packaging has been damaged.
- Exterior panels of the charger are damaged (shock, scratch, ...).
- The doors are working properly.
- The interior of the charger is clean and not damaged.

4.5. Delivered components

5. Product features

5.1. Product parts presentation

Table 2. External view

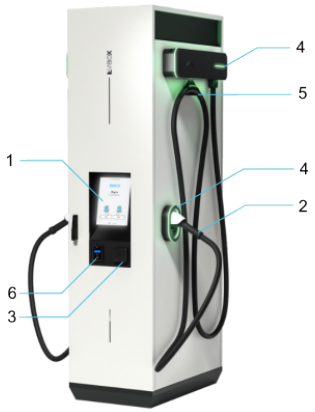
Illustration	Description
	1. 15" touchscreen. 2. Charging cable (CCS2, CHAdeMO, depending on the configuration). 3. T2 outlet (depending on the configuration). 4. LED indicators. 5. Auto-retractable system. 6. Payment terminal (depending on the configuration).

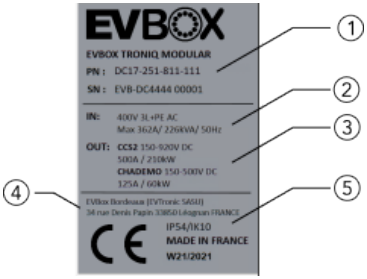
Table 3. Internal view

Illustration	Description

5.2. Nameplate

They are 2 nameplates on the product:

- Above the screen inside the front door.
- On the right side at the bottom.

Nameplate	Description
	1. Product number. 2. Input power characteristics. 3. Output power characteristics. 4. Manufacturing location. 5. Conformities.

6. Technical data

Electrical properties

Table 4. AC input

Technical data	Characteristic					
Voltage range	400 Vac +/- 10%					
Number of phases	3P + PE 3P + N + PE (with AC Socket option).					
Frequency	50 Hz					
Nominal input current	**M90**	**M120**	**M150**	**M180**	**M210**	**M240**
	146A	194A	242A	289A	337A	384A
Maximal input current	**M90**	**M120**	**M150**	**M180**	**M210**	**M240**
	162A	215A	268A	321A	374A	427A
Power factor	> 0.99					
Efficiency	95 %					
Grounding system	TT or TN-S					
Stand-by power consumption	100 W; 1.1 kW in heating mode					

Table 5. DC output

Technical data	Characteristic
Output power	up to 240 kW (8 Modules)
Output power per module	30 kW
Output voltage range	150 Vdc - 920 Vdc
Output current range	Up to 500 A

General specifications

Table 6. Charging modes

Technical data	Characteristic
Mode 4 (DC charging)	CCS2 up to 500 A / 920 Vdc and CHAdeMO up to 125 A / 500 Vdc

Table 7. Connector type

Technical data	Characteristic
Mode 4	CCS2 500A dry, CHAdeMO (JEVS G105) Type 2 socket (22 kW)

Table 8. Cable reach

Technical data	Characteristic
Mode 4	Cable Management activated: more than 5 m reach

Table 9. Structure and physical properties

Technical data	Characteristic
Enclosure material	Power coated steel (Corrosion protection proven for C4-M environment ISO 1294)
Enclosure ratings	IP54 / IK10
Operating temperature	-30°C to +50°C
Storage temperature	-40°C to +70°C
Operating humidity	5% to 95% non-condensing
Cooling	Forced ventilation
Maximum installation height	1000m
Dimensions in mm (W x H x D)	600 x 1000 mm, floor space (Not considering cable management systems nor cable ground projection) height <= 2500 mm
Packaging dimensions in mm (W x H x D)	< 960 x 2550 x 1200 Wood box

Technical data	Characteristic
Weight	<700 kg
Colors	Body: Traffic white (RAL 9016) Other: Black grey (RAL7021), Jet Black (RAL9005)
Pollution degree	3
EMC classification	Environment B according to 61000 series
Mechanical resistance	Medium (according to 61439-7)

Table 10. Connectivity

Technical data	Characteristic
Authorization	Contactless reader RFID/NFC (ISO 14443, ISO 18092, ISO 15693, ISO 18000-3, Calypso, Mifare Ultralight C, -Classic, -Desfire)
HMI	15" anti-vandalism LCD color touchscreen
Communication standard	4G/LTE, Ethernet
Communication protocol	OCPP 1.6J, ready for update to OCPP 2.0

Table 11. Conformities

Technical data	Characteristic
Conformities	CE, EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU, EN/IEC 61851-1, EN/IEC 61851-21-2, EN/IEC 61851-23 Directive RED 2014/53/EU Directive RoHS 2011/65/EU EN/IEC 61851-24

7. Prepare for installation

The following recommendations are a guide to help you prepare for the installation of the EVBox Troniq Modular charging station.

7.1. Safety precautions

You must read and obey the safety precautions on page 18 at the beginning of this manual before you install, service, or use the EVBox Troniq Modular charging station. The installer must ensure that the charging station is installed in accordance with the relevant country-specific standards and local regulations.

7.2. Plan installation

- Calculate the existing electrical load to find the maximum operating current for the charging station installation.
- Calculate the distance from the local power supply panel to the charging station installation to find the voltage drop. Local regulations may be applicable and can vary depending upon the region or country.
- Obtain all necessary permits from the local authority that has jurisdiction.
- PE grounding connector must be not spliced.
- Refer to local wiring regulations to select the conductor sizes.
- Use the correct tools and provide sufficient material resources and protection measures.
- Make sure that there is good cellular reception where the charging station will be installed.
- Prepare the installation areas with the correct power wiring and data cabling.

DC Smart Charging

If the DC Smart Charging feature is used in the installation, an Ethernet network should be installed.

Observe the following rules:

Ethernet cables must be separated from high voltage cable by:

- A distance barrier of 5 cm,
- Or, isolation barrier.

7.3. Choose location

The charger is intended for outdoor or indoor area.

Position the charging station, where possible, in surroundings where it is not exposed to extreme sunlight and vulnerable to external damage.

The charger is intended for location with non-restricted area.

Note:
On locations with harsh weather conditions (high temperatures, snow,...), it is recommended to provide additional protection such as canopy or roof protection.

7.4. Parking space placement

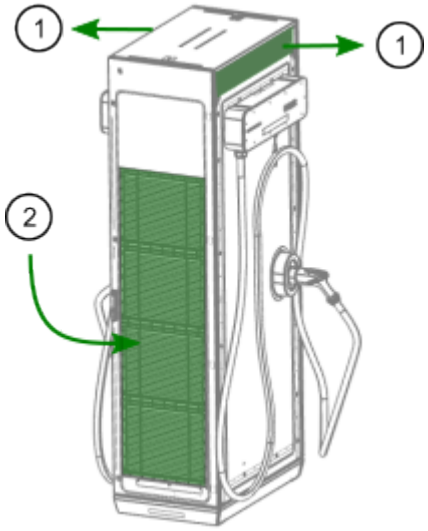
To have the maximum cable length, it is recommended to place the Troniq Modular as described in Parking placement on page 38.

Note:
For person with reduced mobility access. Is is recommended to install the Troniq Modular on plain ground.

7.5. Cooling

The air inlet is at the back door of the charger and the air outlet is on the roof of the charger.

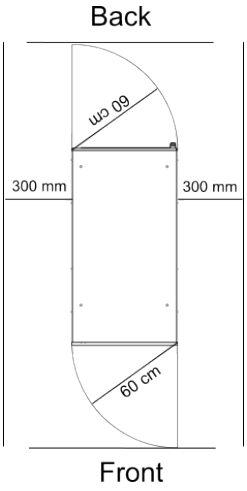
For indoor use, the room must have a ventilation superior at 400 m^3/h.



1. Air outlet.
2. Air inlet.

7.6. Clearance

Troniq Modular needs the following space for maintenance.



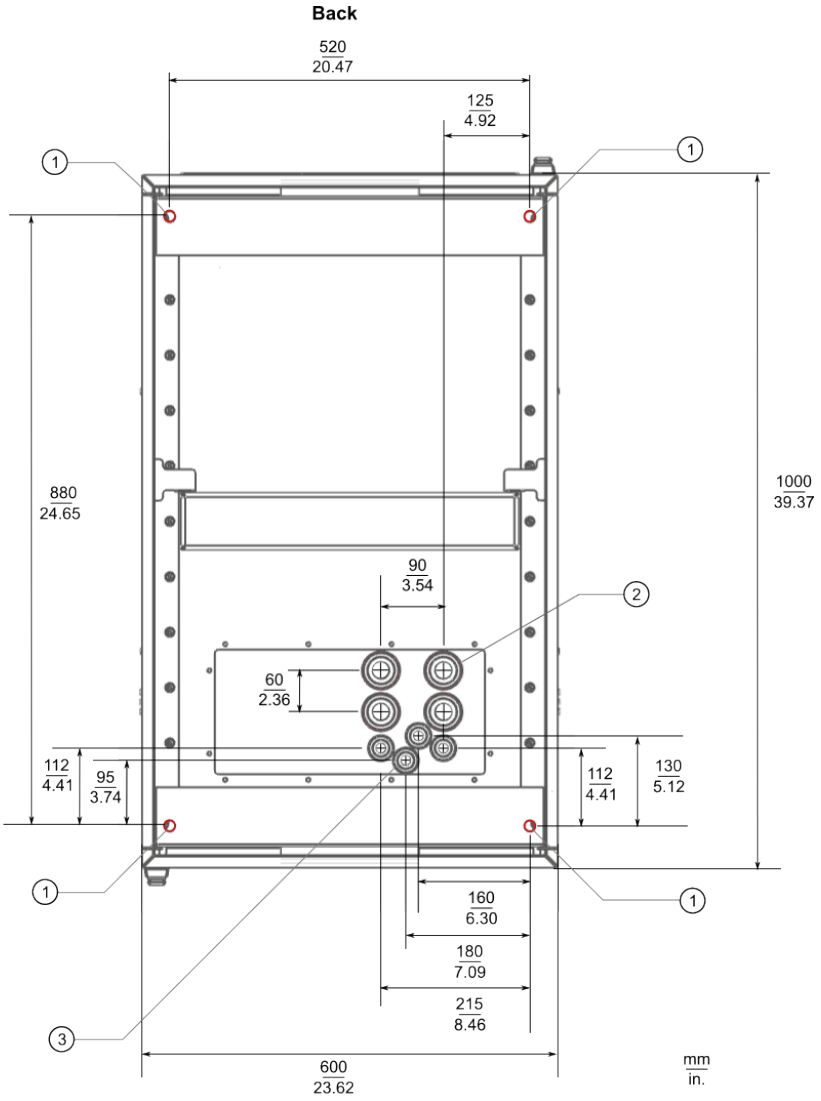
7.7. Foundations

Observe the following rules regarding the foundations:

- Foundations must be carried out in accordance with local regulations.
- Concrete characteristics must be calculated regarding the technical data of the charging station.
- The concrete should be frost-proof.
- Thickness of the foundations must be calculated in accordance with the weight of the system and the installation site.
- The foundation shall be flat and leveled.
- A slope deviation left/right or front/back may cause infiltration of water and damage the charging station.
- Foundations must be under the ground.
- Charger must installed on the ground.

7.8. Implantation plan

Prepare the foundations according to the diagram below:



EVBox Troniq Modular top view

Front

1: Fixation holes x 4. Diameter 16 mm.

2: 4 cable glands (3P + PE) for power supply.

3: Cable gland for PE, heater and Ethernet.

7.9. Route power supply cables

The cables are coming from the bottom of the charger see Implantation plan on page 20.

Note:

- Only one cable per cable gland is allowed.
- Cable gland size for phases cables is PG40.
- Cable gland size for protective earth and Ethernet cables is PG25.

Failure to these instructions will result of water and dust ingress.

7.10. Protection against electric shock

The charging station contains the following devices to protect against electric shock.

- IMD (Insulation Monitoring Device), Bender brand. One on each outlet on CHAdeMO and CCS2.
- RCD (Residual Current Device) on 24 Vdc power supply.
- RCD (Residual Current Device) 300 mA in main switch board (outside of the charger).

7.11. EMS - Energy Management System

7.12. Electrical requirements

7.12.1. Upstream requirements

Electrical connection must be carried out by a professional electrician according to the local regulation.

Charging station must be connected to an electrical network with the following characteristics:

- 3 Phases (3P + PE)
- 400 Vac +/- 10%
- 50 Hz

This connection must be protected upstream by:

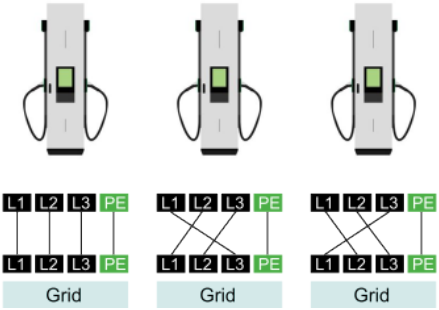
- Adjustable MCCB, set to: Io = 360 A / Isd = x 10 & RCD 300 mA, Type A, HI, (S)
- Circuit breaker 1P + N, 220 Vac / 6A / C curve for heating system.
- PE cross section shall be minimum 70 mm² copper.

Ground impedance must be lower than 20 ohms in dry conditions.

The charger needs 2 PE connections.

7.12.2. Phase rotation

In case of several EVBox Troniq Modular stations, with T2 plugs, at the site location. To avoid overloading the first phase, it is recommended to rotate the phase as stations illustrated below.



7.12.3. Grounding instructions

To achieve EMC compliance, the chassis must be bonded to earth locally to the charger.

7.12.4. Short circuits protections

- Combo and CHAdeMO outlet protected by fuse.
- Each converter protected by 63A circuit breaker.
- 24 Vdc power supply protected by circuit breaker.

8. Install the Troniq Modular

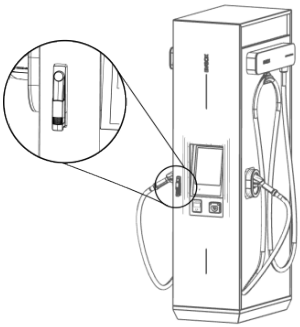
8.1. Handling

WARNING:

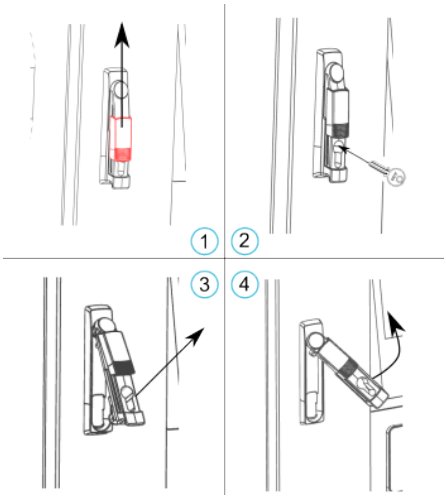
- Always transport charger in upright position.
- Do not manipulate the charger when it is electrically connected.
- Do not use a crane type hoist that cannot support the weight of the charger.
- The center of gravity of the charger is high, be careful when handling.

8.2. Open the Troniq Modular door

Locate the handle



Open the door:

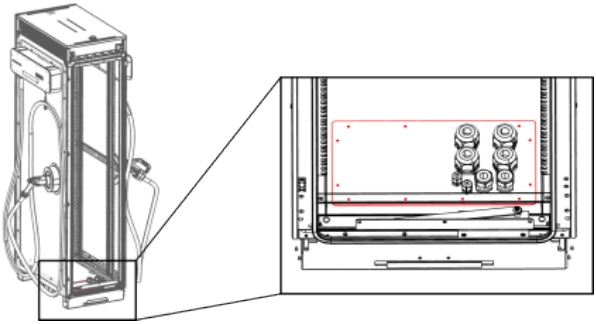


1. Lift up the handle cover.

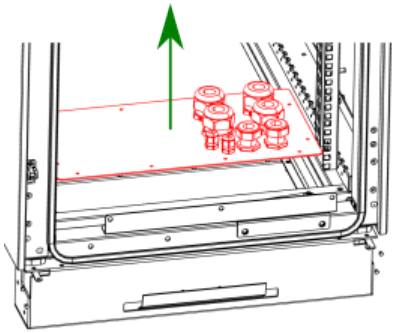
2. Use the key to open the lock.
3. Pull the handle.
4. Turn the handle clockwise.
5. Open the door.

8.3. Remove the bottom plate

1. Open the front door.
2. Locate the bottom plate:



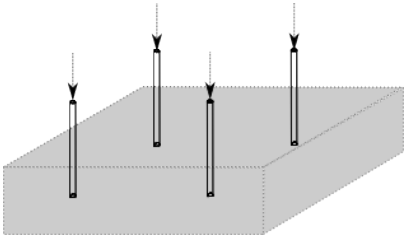
3. Remove the 12 M4 nuts.
   Tool: 7 mm wrench
4. Remove the plate:



8.4. Placing

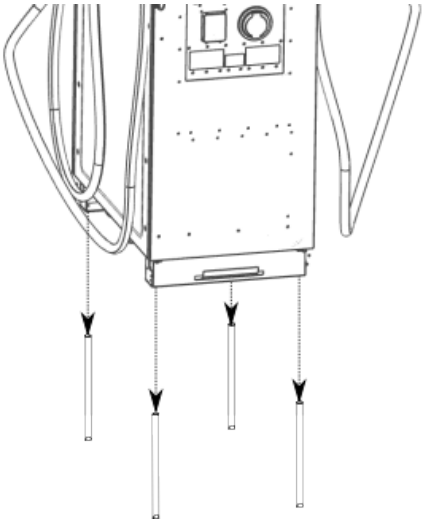
When the installation area is prepared, you can install and connect the charging station.

1. Insert the 4 threaded rods in the foundation. (Use chemical sealing for example).

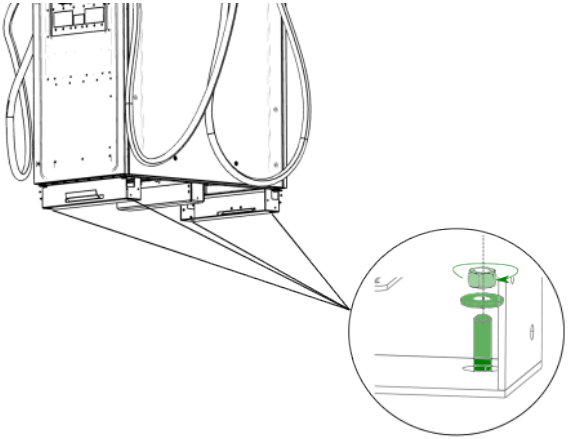


2. Maneuver the Troniq Modular to its location.
3. Place the charging station on the four threaded rods

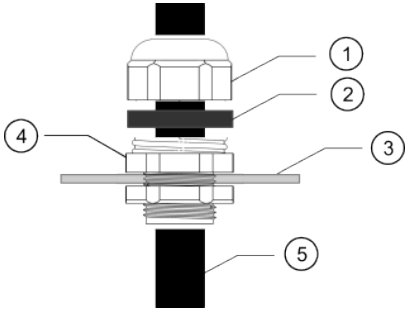
Note:
Check that the charging station is level.



4. Affix four nuts and washers to the exposed threaded rods and tighten until secure.



8.5. Install the bottom plate



1. Top part of the cable gland.
2. Seal.
3. Bottom plate.
4. Cable gland.
5. Cable.

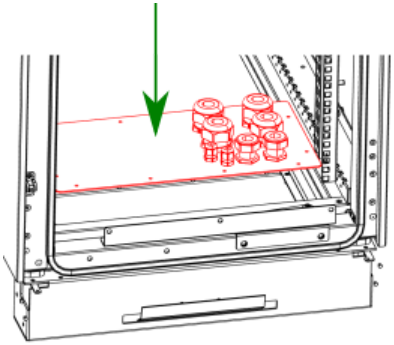
1. Take the bottom plate removed in chapter Remove the bottom plate on page 25.

2. Open the top part of the cable glands (1) and remove the seals (2).

3. Pass the cables (5) through the cable glands according to the implantation plan (Implantation plan on page 20).

4. Pass the seal (2) and the top part of the cable gland (1) through the cables.

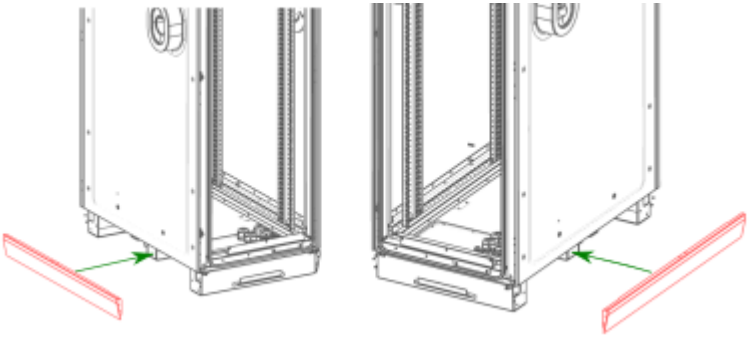
5. Place the bottom plate to its location.



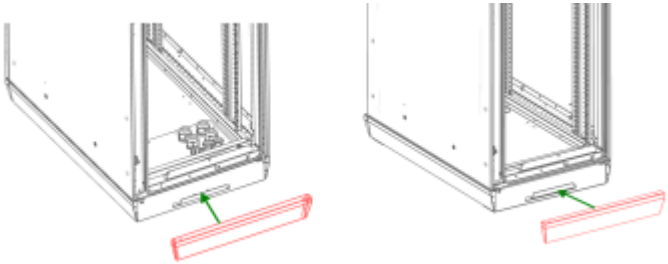
6. Screw the 12 M4 nuts of the bottom plate.
   Tool: 7 mm wrench.
7. Tighten the top part of the cable gland (1).

8.6. Install the plinths

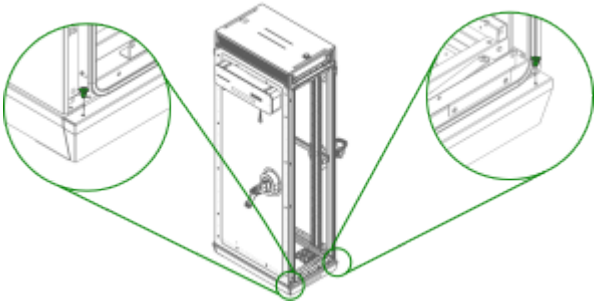
1. Place the side plinths at the bottom of the Troniq Modular.



2. Place the front and back plinths.



3. Screw the 2 x 2 cruciform screws to maintain the front and back plinths.



8.7. Electrical connections

Power connection

Terminal: L1, L2, L3

Terminal type: Schneider electric Compact INV 400

Table 12. Power connection

Conductor	Terminal	Size	Terminal diameter	Terminal maximum width	Tightening torque	Hex
Extra flexible multicore	Tubular lugs	Up to 300 mm² (600 kcmil)	10 mm (0.4 in.)	32 mm (1.25 in.)	50 Nm (442 lb-in)	16 mm

9. Commissioning

9.1. Danger: risk of electric shock

DANGER:
Risk of electric shock.

- Even if Q1 is OFF, power supply is still present on the charger before servicing. Switch off power at the main breaker.

Note:
The unit needs to be properly assembled in accordance with the assembly instructions.

To start the charging station, follow the commissioning report.

10. Use the EVBox Troniq Modular

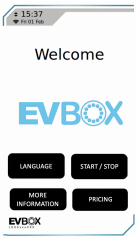
The use of the charger is allowed for ordinary people (no special qualification or training is needed).

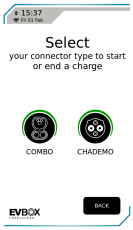
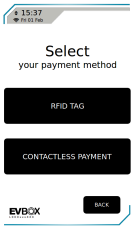
10.1. Charger and LED status

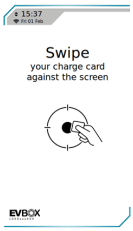
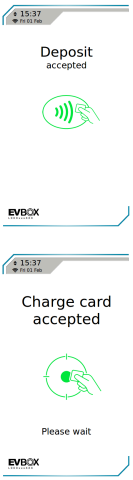
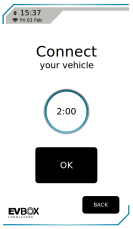
LED color	What it means	What to do
 LED are green	Troniq Modular is ready for use.	• Activate the touchscreen. • Select the charging cable to use. • Select the payment method (for example,charge card or QR code).
 LED are blue	Troniq Modular is charging the vehicle.	• Extend the selected charging cable and plug it into the vehicle. • Charging can be stopped at any time. • Wait until the vehicle has charged.
 LED are red	Troniq Modular is unavailable	• Contact your local support

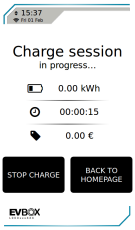
10.2. Step of a charging session

10.3. Start charging with EVBox Troniq Modular

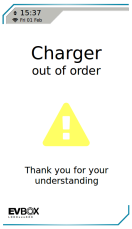
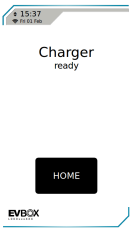
Step	Topic	Description	Illustration
1	Welcome screen	The welcome screen offers the choice to select the language, start a charging session, access to pricing policy and more information.	

Step	Topic	Description	Illustration
2	Selection of connector type	If the EVBox Troniq Modular is set up with two different connector types, select the appropriate connector.	
3	Method of payment	If the EVBox Troniq Modular has a contactless payment terminal, select your payment method. Otherwise, the RFID TAG method will be set as a default. Depending on the product configuration, one of the two options can be set by default.	
4	Contactless payment process	If you chose the contact less-payment method, you will be informed about the charging station's price policy. Click on "GENERAL TERMS AND CONDITIONS "for more information about the price policy. If you agree, click "OK".	
5		Now, please follow the payment terminal instructions.	

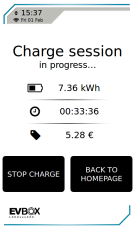
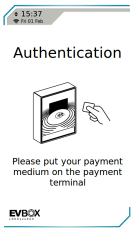
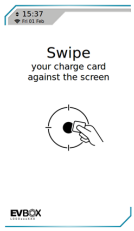
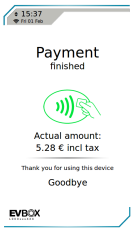
Step	Topic	Description	Illustration
6	RFID TAG process	If you have chosen RFID TAG as the payment authentication method, or if it is the default choice on your station, swipe your card against the screen as shown on the HMI screen, then wait for validation.	
7	Acceptance	The payment has been accepted.	
8	Connection with the vehicle	Having connected, the charger will synchronize with your vehicle.	

Step	Topic	Description	Illustration
9		The charge session will carry on until you stop charging, or the charge is completed.	

10.4. State of the EVBox Troniq Modular

Topic	Description	Illustration
Charger out of order	In the event that the EVBox Troniq Modular is out of order, the following screen will be displayed, and the charger light will turn yellow. You may call the maintenance service.	
Charger ready	Once the emergency stop button is back to its position, please validate the system restart by pressing "HOME".	

10.5. Stop charging with EVBox Troniq Modular

Step	Topic	Description	Illustration
1	Stop the charge	Click on the "STOP CHARGE" button to stop the charging session.	
2	Authentication	If you have been authenticated for the first time using a NFC bank card, re-enter your payment method on the terminal in order to be authorized to stop the charge.	
		If you have been authenticated by RFID TAG, you will also be invited to swipe your card on the screen.	
3	Vehicle unplugged	Once the vehicle has been unplugged, the total session amount will be displayed. You can leave the charging station, and the screen will return to the welcome page within 20 seconds.	

11. Decommissioning

EN

12. Appendix

12.1. Circuit diagram

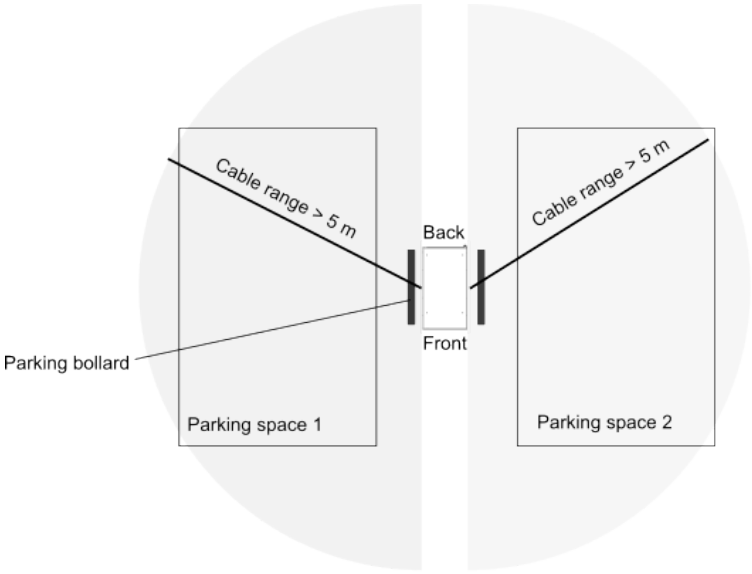
12.2. Hydraulic diagram

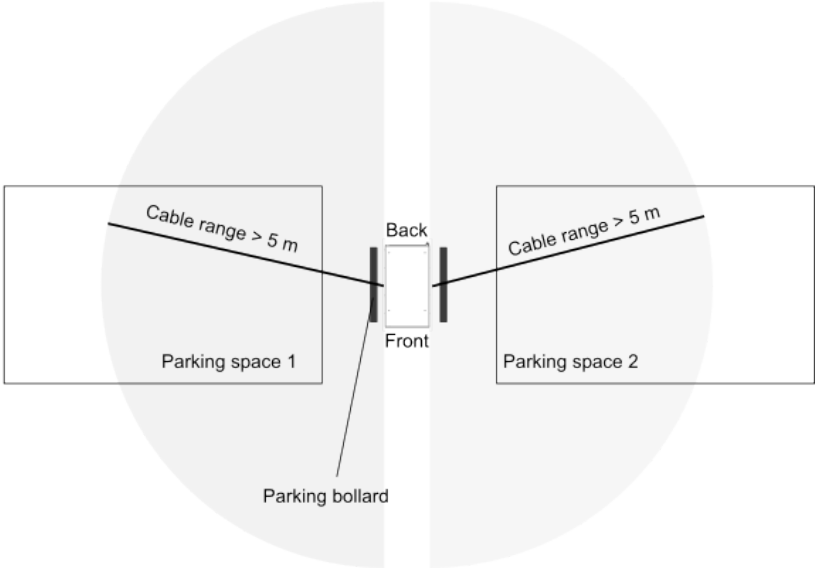
12.3. Clamping kit description

12.4. Troniq Modular - Dimensions

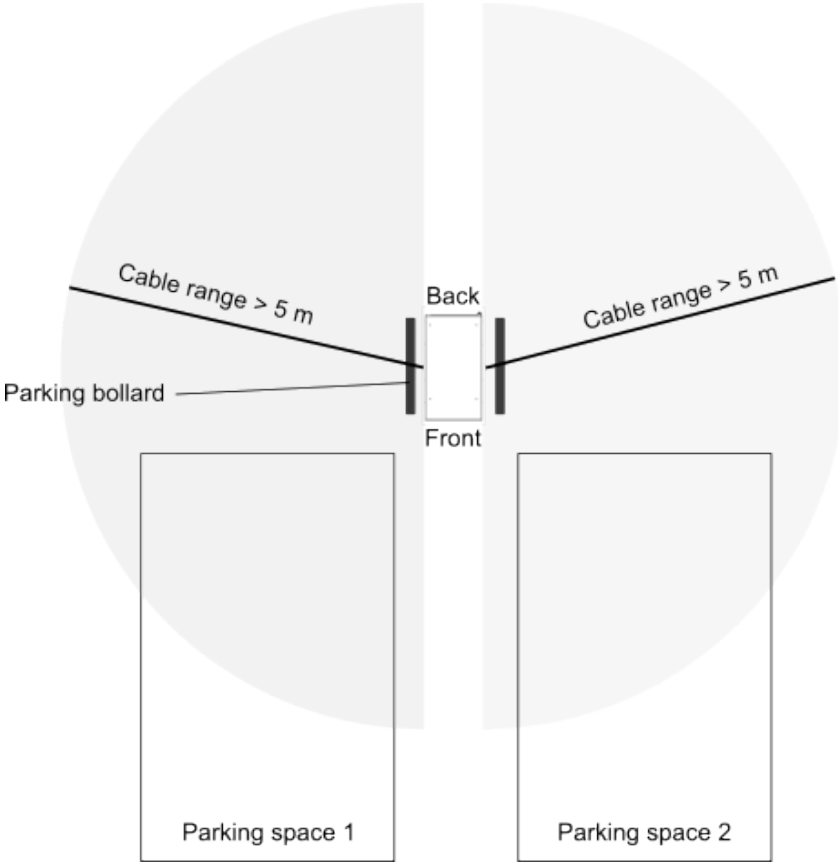
12.5. Disabled access

12.6. Parking placement





EN


Cable range > 5 m
Back
Cable range > 5 m
Parking bollard
Front
Parking space 1
Parking space 2