ENSTO

Chago Pro and Chago Premium
EVF200/100 and EVC200/100

(ENG)

Installation instruction
Operation instruction

CE

Contents

Ensto Chago Pro

Ensto Chago Pro (EVF) is a solution for the charging of one or two electric vehicles. It is engineered especially for fast AC charging (22kW/3x32A), but the station can be equipped also with domestic sockets (1x16A).

Mode 3 compatible EV charging

User identification via RFID tag or mobile phone / app

Diverse variety of communication and connectivity options: Ethernet, 3G

3-color LED indicates the charging point's status

Optionally compartment for domestic socket Type F/E/G with or without lockable hatch

Hinged maintenance compartment allows easy access to electrical components

Compatible basic charging modules allows modularity based on customer's needs

Safety Instructions

- *Chago Pro and Premium must be installed by a qualified person.*
- *Read the instruction manual before installation and usage of the charging station.*
- *The instruction manual must be stored in a safe location and be available for future installation and service.*
- *Follow the guidelines in the instruction manual when installing and using the charging station.*
- *The installation must be done according to the local safety regulations, restrictions, dimensioning, codes and standards.*
- *The information provided in this manual in no way exempts the user of responsibility to follow all applicable codes and safety standards.*

Delivery Contains

- EVF or EVC charging station
- Installation and Operation instruction

Note! The delivery does not include any installation accessories. Please order needed accessories based on following order sets.

Ensto Chago Premium

Ensto Chago Premium (EVC) is a solution for the charging of one or two electric vehicles. It is engineered especially for fast AC charging (22kW/3x32A), station is also equipped also with domestic sockets (1x16A).

Mode 3 compatible EV charging with a lockable hatch.

3-color LED indicates the charging point's status

User identification via RFID tag or mobile phone / app

Mode 3 Type 2 socket and Domestic socket

Maintenance compartment allows easy access to electrical components

Acid proof steel

Diverse variety of communication and connectivity options: Ethernet, 3G

Compatible basic charging modules allows modularity based on customer's needs

Safety Instructions

- *Chago Pro Premium must be installed by a qualified person.*
- *Read the instruction manual before installation and usage of the charging station.*
- *The instruction manual must be stored in a safe location and be available for future installation and service.*
- *Follow the guidelines in the instruction manual when installing and using the charging station.*
- *The installation must be done according to the local safety regulations, restrictions, dimensioning, codes and standards.*
- *The information provided in this manual in no way exempts the user of responsibility to follow all applicable codes and safety standards.*
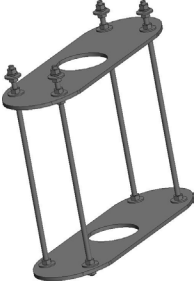
Delivery Contains

- EVC charging station
- Installation and Operation instruction

Note! The delivery does not include any installation accessories. Please order needed accessories based on following order sets.

Order Sets Example

Order accessories depending on mounting method.

Ground mounting on concrete			Please order suitable anchor bolts separately from a local supplier.
Ground mounting on ground mounting frame		**EVTL32.00:** Ground mounting box, cable entry from bottom **or** 	 **EVTL28.00:** Ground mounting frame
Ground mounting on Unimi concrete foundation	**EVF200/100 and EVC200** Charging station	**EVTL34.00:** Ground mounting box, cable entry from top	Unimi Concrete Foundation, see www.unimi.se
Wall mounting	 **EVF200/100** Charging station	 **EVTL31.00:** Wall installation kit including installation rail and box	

Installation Accessories
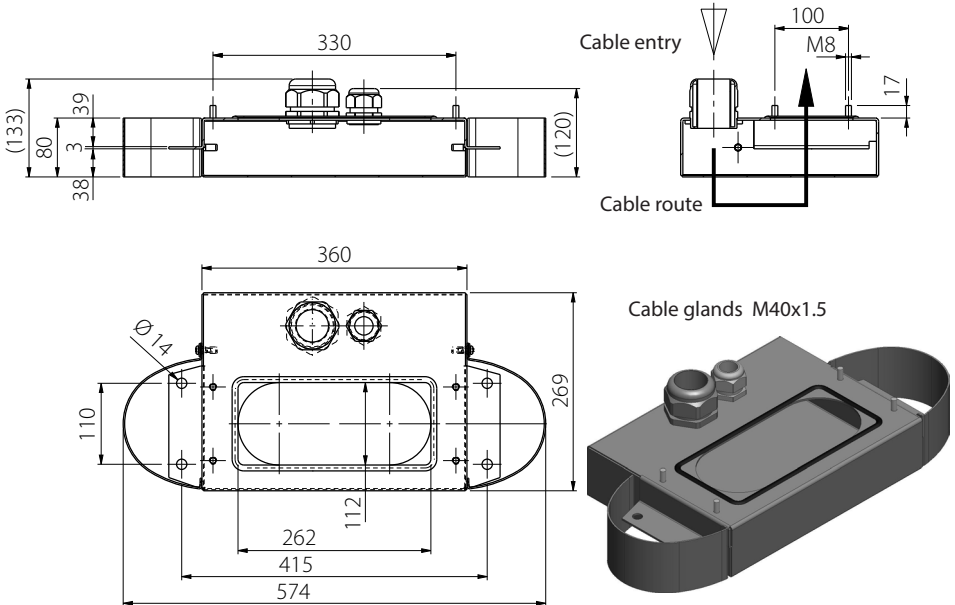
Order numbers and dimensions.

Ground Mounting Box EVC200 and EVF200/100

EVTL32.00

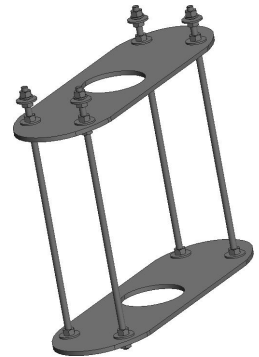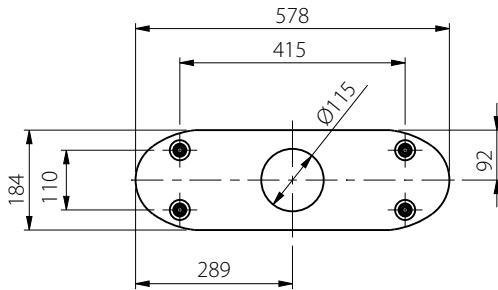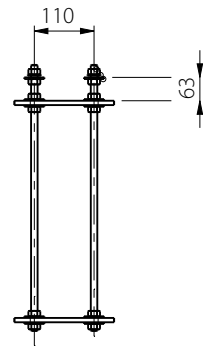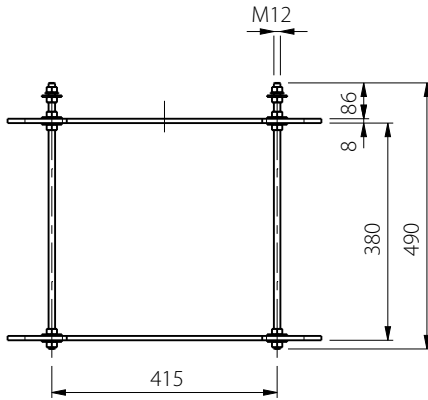EVTL32.00 is a ground mounting box with cable entry from bottom.

Cable entry

Cable glands M40x1.5
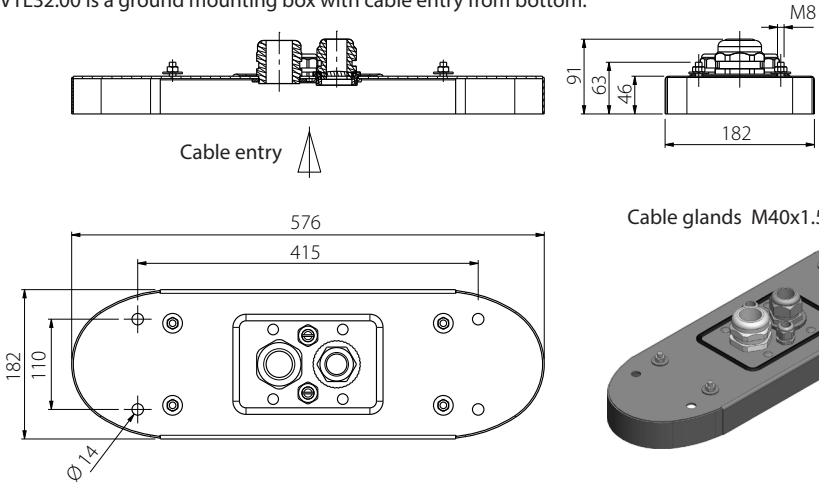
Ground Mounting box EVC200 and EVF200/100

EVTL34.00

EVTL34.00 is a ground mounting box with cable entry from top.

Cable entry

Cable route

Cable glands M40x1.5

**Ground mounting frame EVC200 and EVF200/100
EVTL28.00**

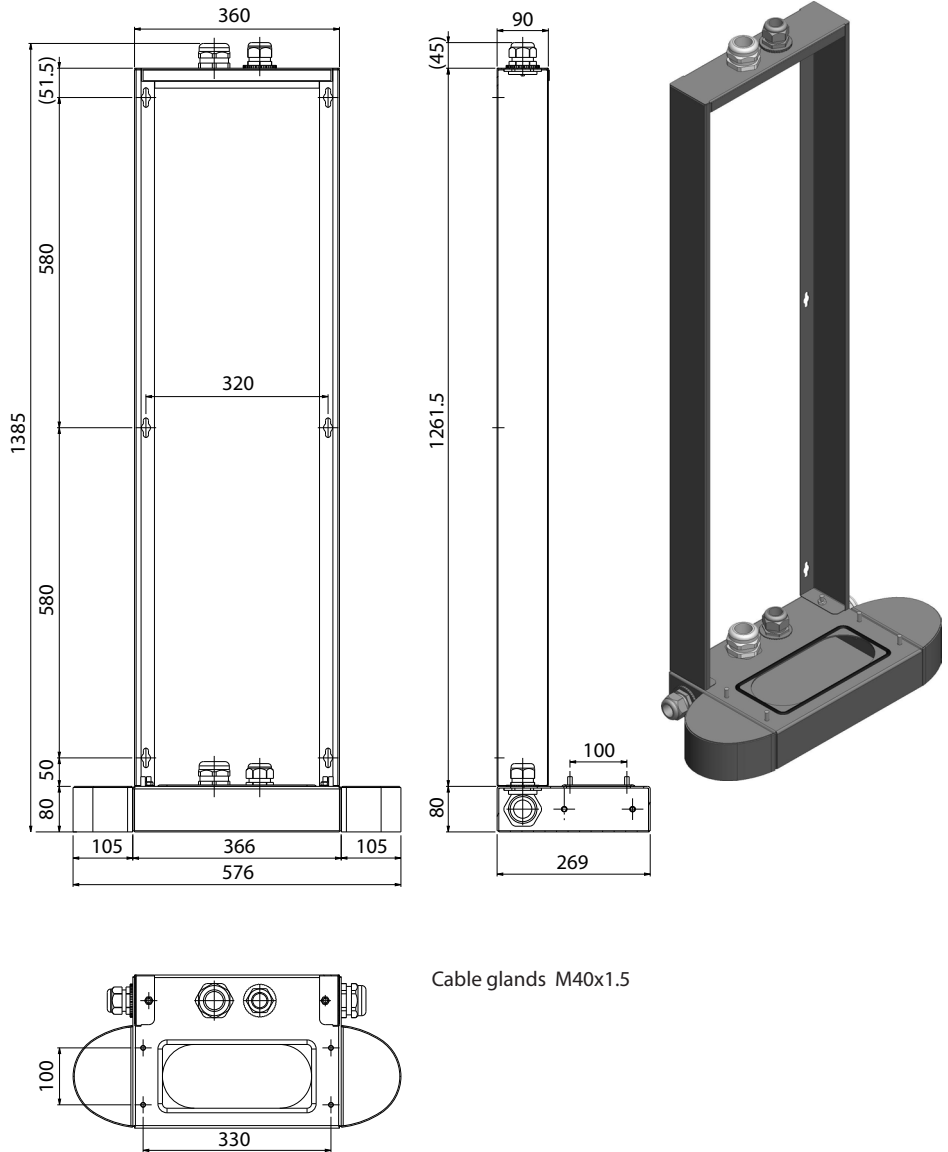EVTL28.00 is a whole set as shown on the picture.
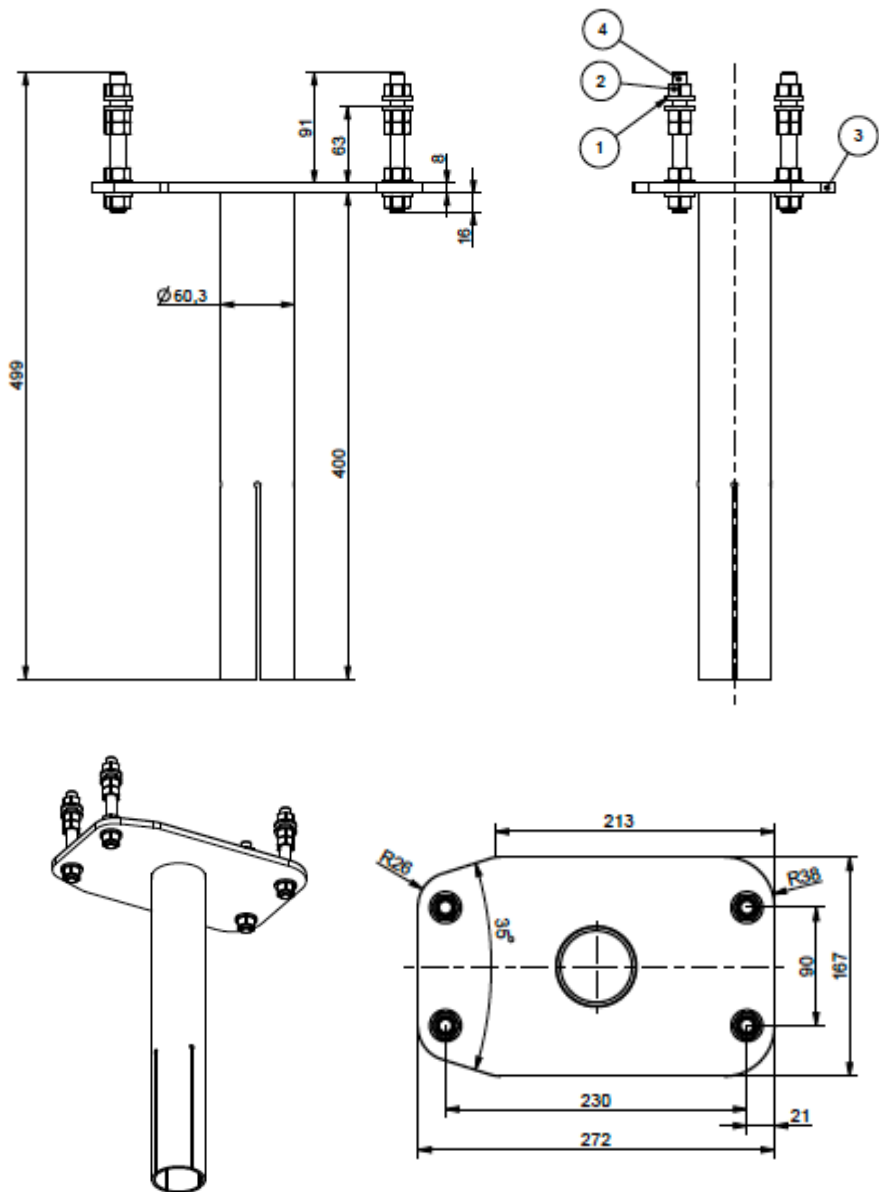
Wall installation kit EVF200/100

EVTL31.00

EVTL31.00 is a wall installation kit including installation rail and box.

Note! This installation kit is only available for EVF produc not for EVC (Chago Premium product)

Cable glands M40x1.5

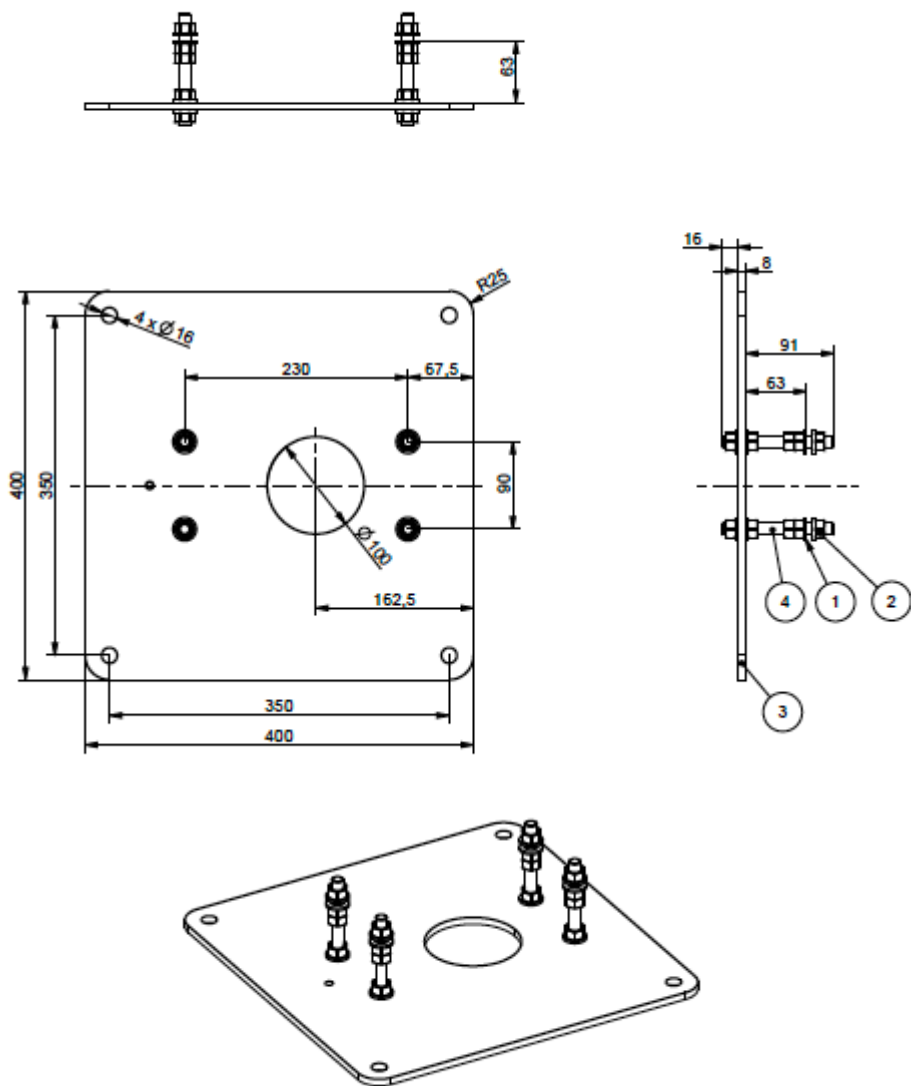**Ground mounting frame EVC100**
EVTL46.00

EVTL46.00 is a whole set as shown on the picture.

SCALE 1:5
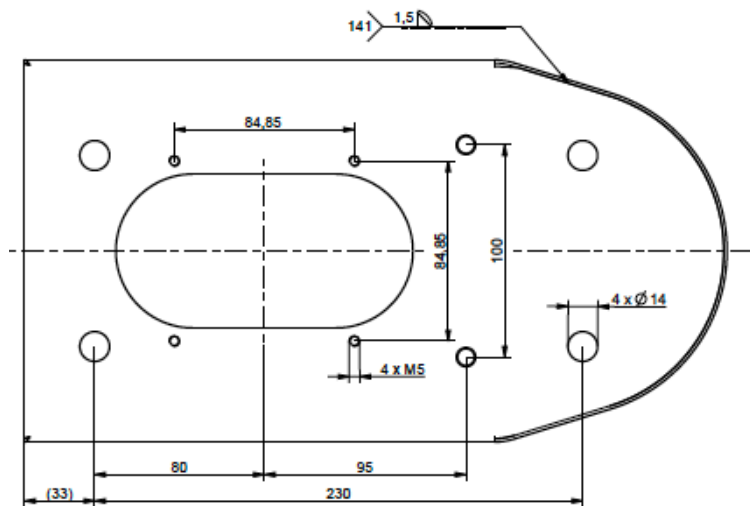
Ground mounting frame EVC100
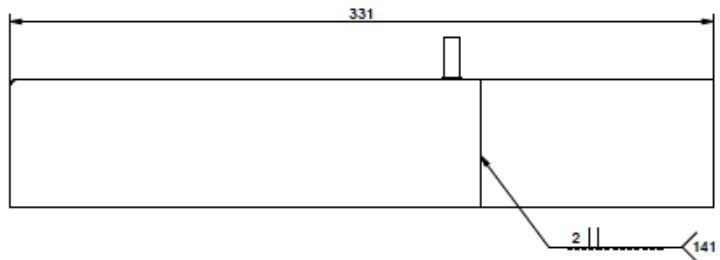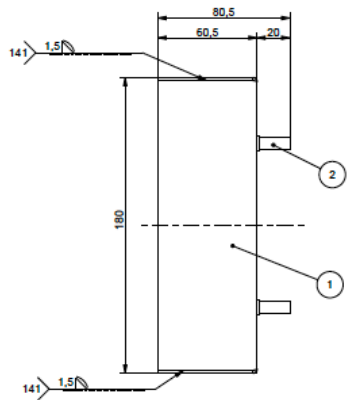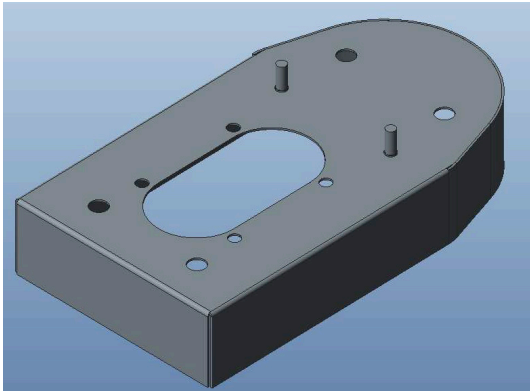**EVTL47.00**

EVTL47.00 is a whole set as shown on the picture.

SCALE 1:5

Ground mounting box EVC100
EVTL42.00

EVTL42.00 is a whole set as shown on the picture.

Installation

Before Installation

Remove the package around the EVF/EVC. Remove the film protecting the metal parts only after the installation is finished.

When selecting the installation location, take into consideration the minimum space needed for operating and maintenance. Note that EVC does not have hinges on the maintanance door!
- 1000 mm in front of the maintenance space
- 150 mm around the charging point
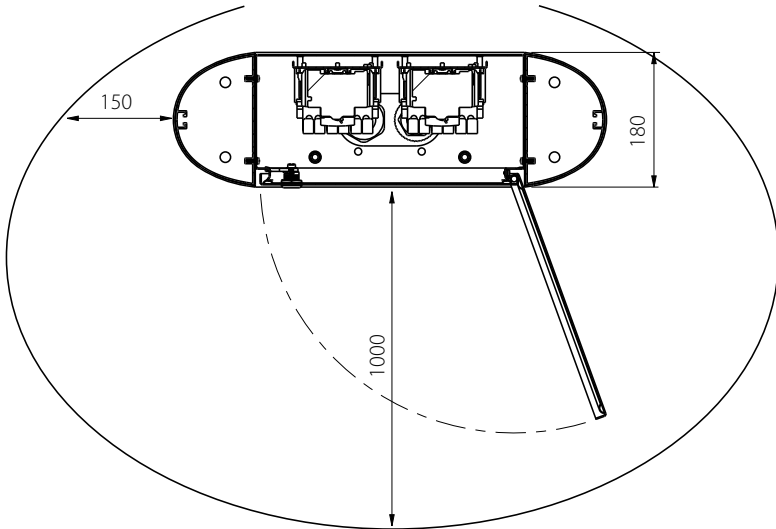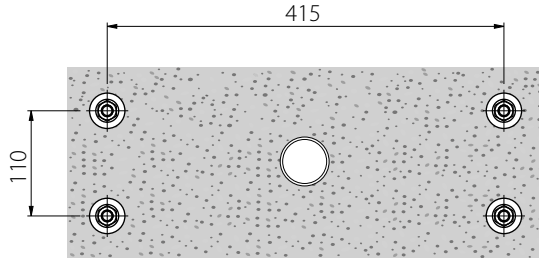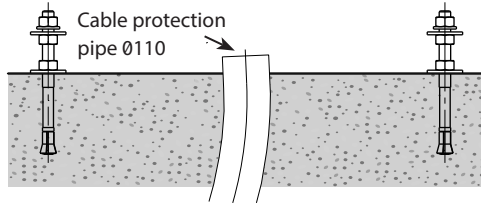

Ground Mounting Installation

On ground mounting installations make shure that proper cable glands are used for feed in cables and the bottom pass thru plate seals any holes on the bottom.!

Ground Mounting on Concrete

Items needed: 1 pcs   Ground Mounting box EVTL32.00 or EVTL34.00 or EVTL42.00
4 pcs   Anchor bolts M12
Washers
Nuts

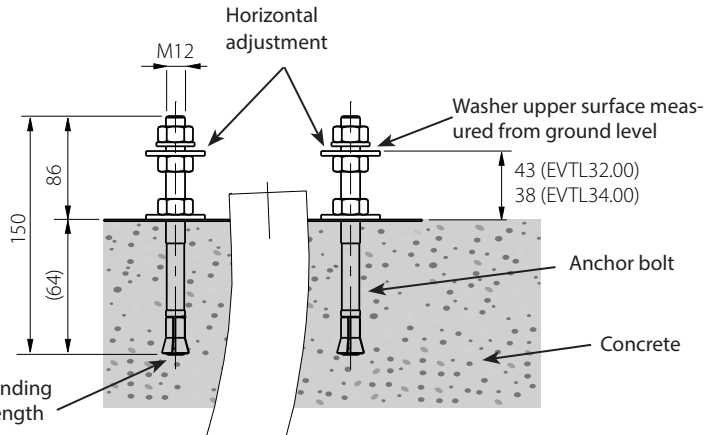*Make sure that the materials used for the concrete foundation and the installation procedures follow local building regulations and safety standards.*

- Dig a pit for the concrete foundation. The pit floor should be trampled and horizontal.
- Put cable and possible drain pipes in place.
- Fill the pit with concrete.
- Let the concrete solidify, make sure the surface stays solid and level during the process.

Cable protection pipe Ø110

415

110

Installation Steps

1. Drill a hole in the concrete for the anchor bolts. For more information see the anchor bolt instructions. Use the ground mounting box as a jig.
2. Put the anchor bolts in place and tighten the anchor bolt nuts.
3. Adjust nuts and washers on the anchor bolts horizontally.

Horizontal adjustment

M12

Washer upper surface measured from ground level

86

150

(64)

43 (EVTL32.00)
38 (EVTL34.00)

Anchor bolt

Concrete

Select anchor bolts depending on the thickness and strength of the concrete

4. Place the ground mounting box on the concrete.
5. Attach the mounting box to the anchor bolts using suitable washers and nuts.
6. **EVTL32.00**: Pull the supply cable(s) and possible data cable through the ground mounting box cable gland(s) approx. 400 mm measured from the upper surface of the mounting box.
   EVTL34.00: Pull the supply cable(s) and possible data cable through the ground mounting box cable gland(s) and further through the mounting box cable hole approx. 400 mm measured from the upper surface of the mounting box.
7. Tighten the cable gland. Close the unused cable entries with cable gland plugs.

Ground mounting box EVTL32.00

Use EVTL32.00 holes as a drilling jig
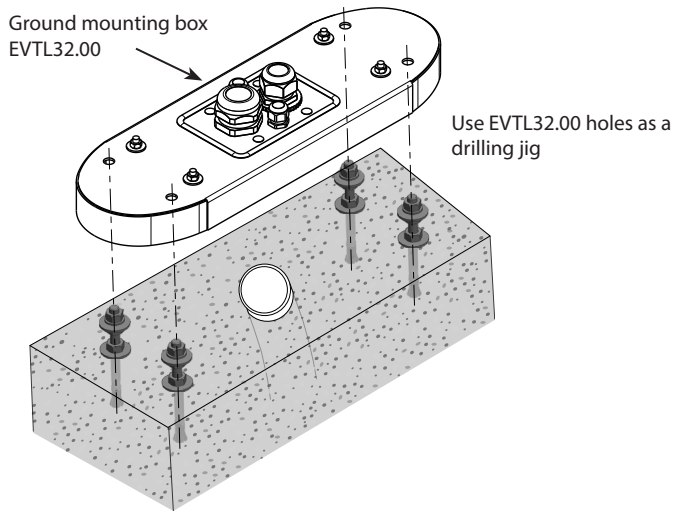
8. **EVTL32.00:** Remove the supply cable sheath at the length of max. 200 mm.
   EVTL34.00: Remove the supply cable sheath beginning from the cable gland exit.
9. Open the maintenance door.
10. Remove the nuts and washers from the ground mounting box.
11. Lift the EVF/EVC on the ground mounting box and pull the supply cable(s) and possible data cable through the cable hole.
12. Bolt the EVF/EVC in place using washers and nuts you removed from ground mounting box.
13. Cut the supply cable leads in different lengths and strip them at the length of 25 mm.
14. Connect the supply cable leads to the power connectors.
15. Ensure that the PE is connected to the EVF/EVC.
16. Switch on F0, F1, F2 (if present) and QF1.
17. Close the maintenance door.

Ground Mounting on Ground Mounting Frame
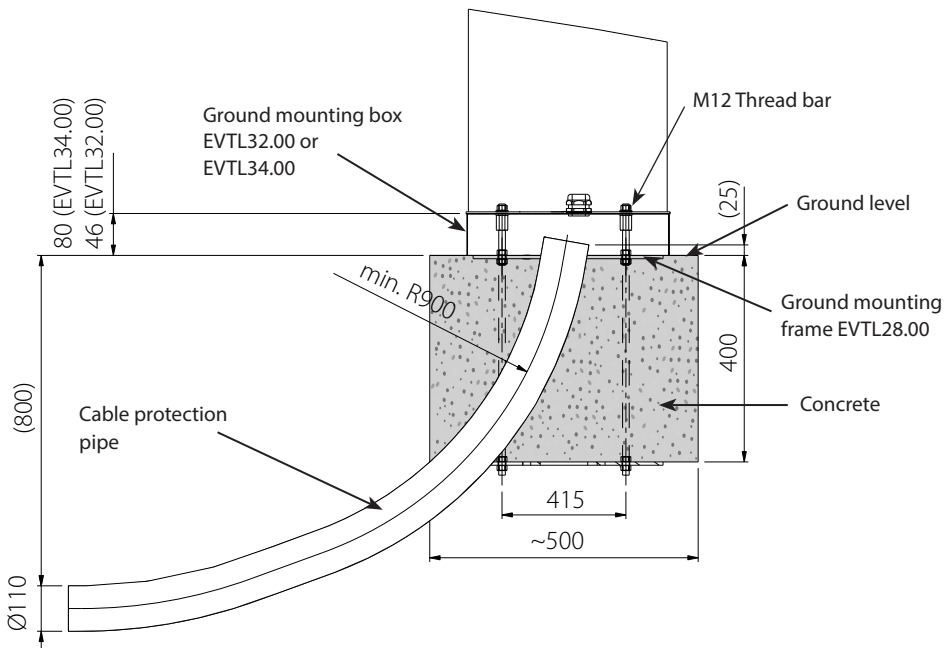
Items needed: 1 pcs   Ground mounting frame EVTL28.00
                   1 pcs   Ground mounting box EVTL32.00 or EVTL34.00

Make sure that the materials used for the concrete foundation and the installation procedures follow local building regulations and safety standards.

• Plan the installation depth so that the top surface of the ground mounting frame is not below the ground surface.
• Dig a ca 490 mm deep hole in the ground. The pit floor should be trampled and horizontal
• Place the ground mounting frame in the hole.
• Put cable and possible drain pipes in place.
• Pour concrete over the frame and pipes.
• Let the concrete solidify, make sure the surface stays solid and level during the process.

Installation Steps

1. Remove the upper nuts and washers on the top of the ground mounting frame bolts.
2. Place the mounting box on the mounting frame.
3. Adjust the the nuts on the mounting frame bolts so that the top surface of the mounting box is horizontal.
4. **EVTL32.00:** Pull the supply cable(s) and possible data cable through the ground mounting box cable gland(s) approx. 400 mm measured from the upper end of the mounting box.
   EVTL34.00: Pull the supply cable(s) and possible data cable through the ground mounting box cable gland(s) and further through the mounting box cable hole approx. 400 mm measured from the upper end of the mounting box.
5. Tighten the cable gland. Close the unused cable entries with cable gland plugs.
6. **EVTL32.00:** Remove the supply cable sheath at the length of max. 200 mm.
   EVTL34.00: Remove the supply cable sheath beginning from the cable gland exit.
7. Open the maintenance door.
8. Lift the EVF on the mounting box and pull the supply cable(s) and possible data cable through the cable hole.
9. Bolt the EVF in place using the washers and nuts you removed from the mounting frame bolts.
10. Cut the supply cable leads in different lengths and strip them at the length of 25 mm.
11. Connect the supply cable leads to the power connectors.
12. Ensure that the PE is connected to the EVF/EVC.
13. Switch on F0, F1, F2 (if present) and QF1.
14. Close the maintenance door.

Ground Mounting on Unimi Concrete Foundation

This installation example describes the installation procedure using a concrete foundation supplied by Unimi - Solutions.

Items needed: 1 pcs   Ground mounting box EVTL32.00 or EVTL34.00 or EVTL42.00
Please order the following items from www.unimi.se
1 pcs   Concrete foundation Chago Pro, product code 100-1
1 pcs   Cover plate
1 pcs   Ensto EVF compatible adapter element, product code 100-13

Installation Steps

Figure 1

- Prepare trenching for cable conduits and the concrete foundation to necessary depths.
- Add gravel to the bottom of the trench, to such thickness that the top of the foundation will reach desired level when lifted into the hole. Note! Consider the possible paving materials when setting the level.
- Cover the unused conduit openings with plugs accompanying the foundation.
- Lift the foundation into the installation hole, the attachment bar embedded in the foundation can be used as a lifting point. The attachment bar should be oriented to allow attachment of the EVF into desired position.
- Lay the cable conduits into the trenches and install conduits to relevant inlets.
- Pull electric cables through the conduits into the foundation.

Figure 2

- Tighten the foundation to its place by filling the excess space outside the foundation with gravel.
- Set the final layer of gravel so that the top of the foundation will be flush with ground or the final paving material.
- Always place a cover plate on the foundation if the EVF charging station is installed in a separate session than the foundation.

Figure 3

- When starting the installation of the EVF/EVC charging station remove the cover plate.
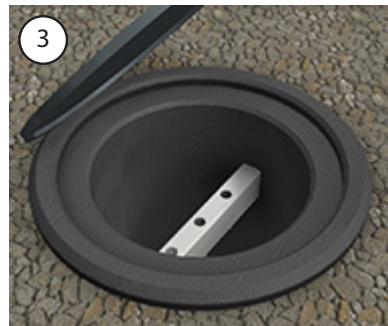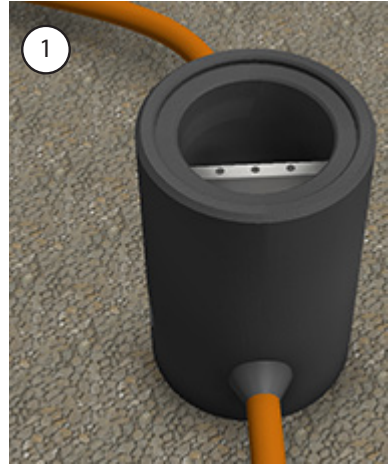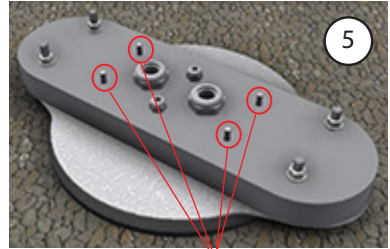
Figure 4

- Place the adapter element on the foundation and tighten the captive screws, 3 pcs.
- Remove the upper nuts and upper pair of washers from the adapter element. (Ensure there is one poly-amide washer on each side of the mounting box.)
- Pull the supply cable and possible data cable through the hole in the center of adapter approx. 450 mm measured from the upper surface of the adapter.


Figure 5

- Place the mounting box on the adapter element.
- Bolt the mounting box in place using the washers and nuts you removed from the adapter element. (Ensure there is one polyamide washer on each side of the mounting box.)
- Hint: to make it easier to ascertain that the mounting box is levelled, first flip it upside down and position the nuts under it so that it becomes levelled and then flip it over again and tighten the upper nuts and washers.

- **EVTL32.00:** Pull the supply cable(s) and possible data cable through the ground mounting box cable gland(s).
  EVTL34.00: Pull the supply cable(s) and possible data cable through the ground mounting box cable gland(s) and further through the mounting box cable hole.
- Tighten the cable gland. Close the unused cable entries with cable gland plugs.
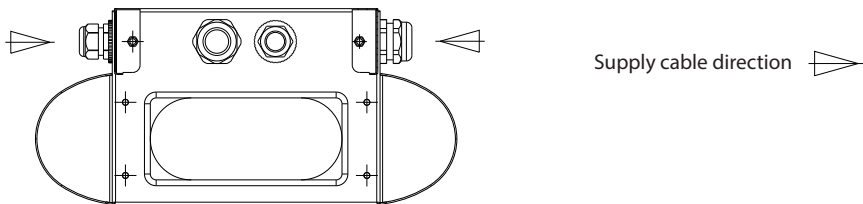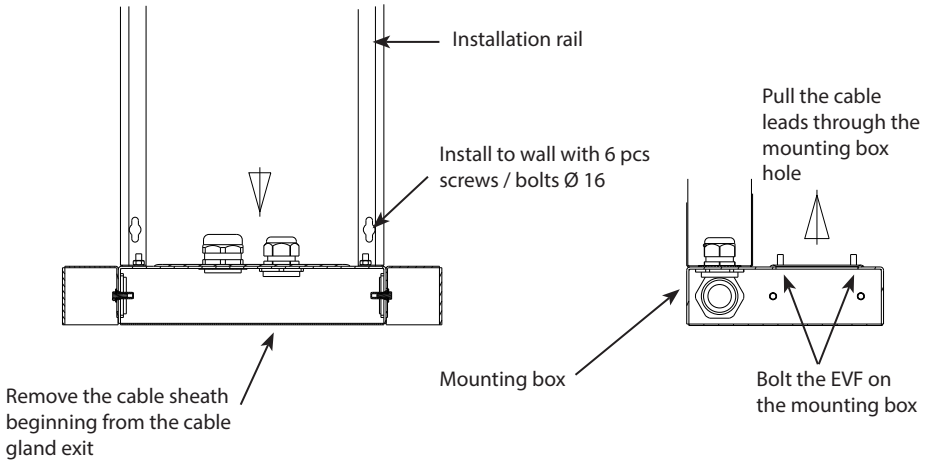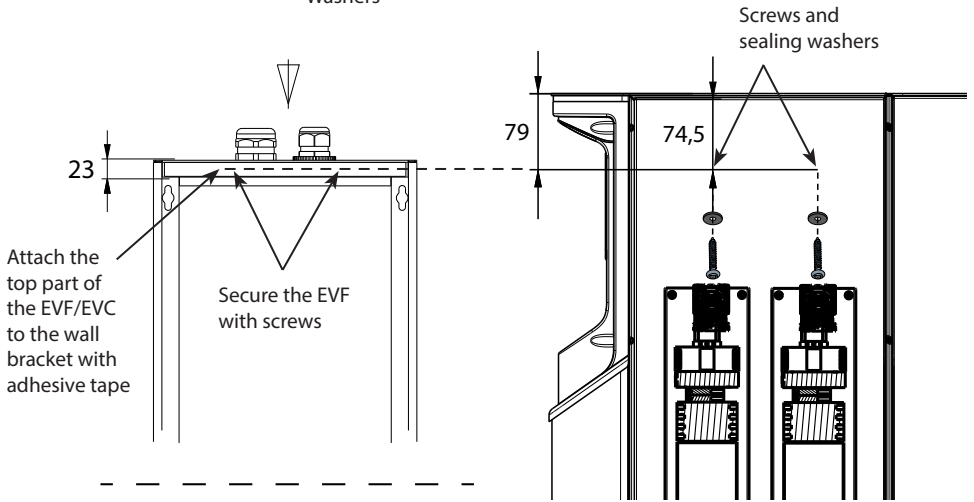

Bolt the EVF in place

Figure 6

- Open the maintenance door.
- Lift the EVF on the mounting box and pull the supply cable(s) and possible data cable through the cable hole(s).
- Bolt the EVF in place using suitable washers and nuts.
- **EVTL32.00:** Remove the supply cable sheath at the length of max. 200 mm.
  EVTL34.00: Remove the supply cable sheath beginning from the cable gland exit.
- Cut the supply cable leads in different lengths and strip them at the length of 25 mm.
- Connect the supply cable leads to the power connectors.
- Ensure that the PE is connected to the EVF.
- Switch on F0, F1, F2 (if present) and QF1.
- Close the maintenance door.
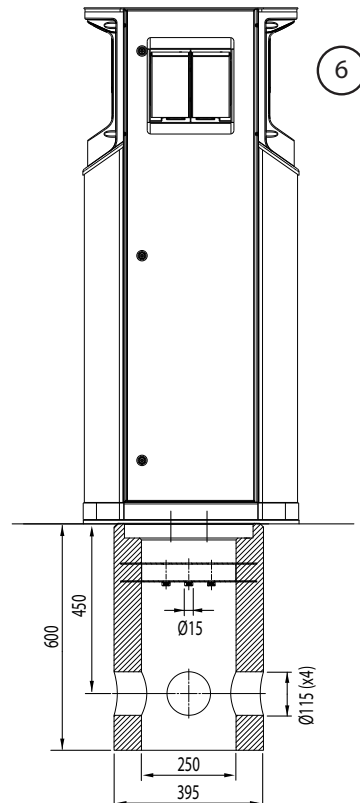
Wall Mounting Installation

Note! Wall mounting is not available for EVC200 units!

Items needed: 1 pcs   Wall mounting kit EVTL31.00
                                  Screws or bolts
   Washers

Screws and
sealing washers

79

74,5

23

Attach the
top part of
the EVF/EVC
to the wall
bracket with
adhesive tape

Secure the EVF
with screws

Installation rail

Pull the cable
leads through the
mounting box
hole

Install to wall with 6 pcs
screws / bolts Ø 16

Remove the cable sheath
beginning from the cable
gland exit

Mounting box

Bolt the EVF on
the mounting box

Supply cable direction

Nuts

Installation steps

1. Ensure that the wall is robust and stable. The mounting surface must be flat and vertical.
2. Prepare the wall for installation and select the screw / bolt type depending on the wall type. Excercise extreme caution when drilling holes in the wall.
3. Install the wall mounting kit EVTL31.00 on the wall using 6 pcs of suitable screws / bolts, washers and nuts.
4. Adjust the installation rail so that the mounting box is perpendicular to the ground.
5. Pull the supply cable(s) and possible data cable through the cable gland(s) on wall mounting bracket roof approx. 2 m.
6. Alternative cable entry is from mounting box sides.
7. Pull the supply cable(s) and possible data cable through the cable gland(s) on the mounting box.
8. Tighten the cable glands. Close the unused cable entries with cable gland plugs.
9. Remove the supply cable sheath, beginning from the cable gland exit.
10. Open the maintenance door.
11. Lift the EVF on the mounting box and pull the supply cable leads through the cable hole.
12. Bolt the EVF in place.
13. Attach the top part of the EVF to the wall mounting bracket with adhesive tape (included the delivery).
14. Drill 2 pcs holes through the EVF enclosure and top bar of the wall mounting bracket; 74.5 mm measured from inside the enclosure. Make sure not to damage any components or internal wiring when drilling the holes.
15. Secure the EVF to the wall bracket with screws and sealing washers (included the delivery). Place the sealing washer between the screw and the enclosure.
16. Cut the supply cable leads in different lengths and strip them at the length of 25 mm.
17. Connect the supply cable leads to the power connectors.
18. Ensure that the PE is connected to the EVF.
19. Switch on F0, F1, F2 (if present) and QF1.
20. Close the maintenance door.

Supply Connection

The voltage and current ratings including cables and line protector dimensioning must comply with national regulations. System dimensioning must be done by a qualified electrical designer.
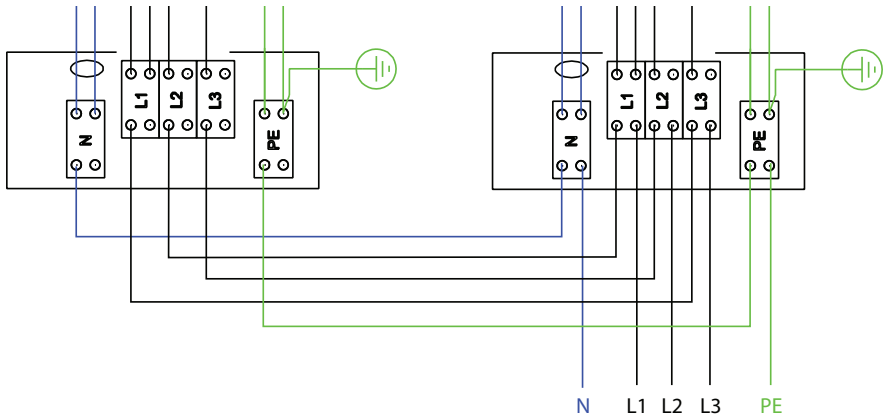
Possible supply connections:
- Use separate supply cables for each charging point
- Use one supply cable and chain internally to the charging points

Commissioning

Before commissioning the Chago Pro or Premium unit must be installed according to the installation instructions.

By default all EVF and EVC products are operating in free charging mode (standalone operation). In this free charging mode external communication (3G, optional Ethernet) is not active. If the product is going to be connected to some back-office (online mode), first make sure that the basic functionality is working before establishing communication.

NOTE: More detailed configuration instructions are available that explain the different configuration use cases. For that refer to the controller configuration manual "ComissioninEnstoChagoChargers.pdf" that can be downloaded from https://wiki.chago.com/display/public/CHWI/Installation+Instructions.
Also more infromation can be found from https://wiki.chago.com.

Connecting to EVF and EVC controller unit

If you want to change the default settings, you must connect to the units controller via web configuration tool to be able to proceed with the commissioning settings.

Below image shows how to connect the a computer to the charging station controller unit with USB cable. For this a USB A to USB Micro B cable is needed.
(This cable usually comes for example with Android mobile phones)

NOTE: On EVF200 and EVC200 units always connect USB cable to the right side controller unit

The USB cable micro end is the one connected to the chargers controller.
Insert the USB cable so that the longer edge of the is facing away from you.

Do not remove any existing USB devices from any of the controller units!
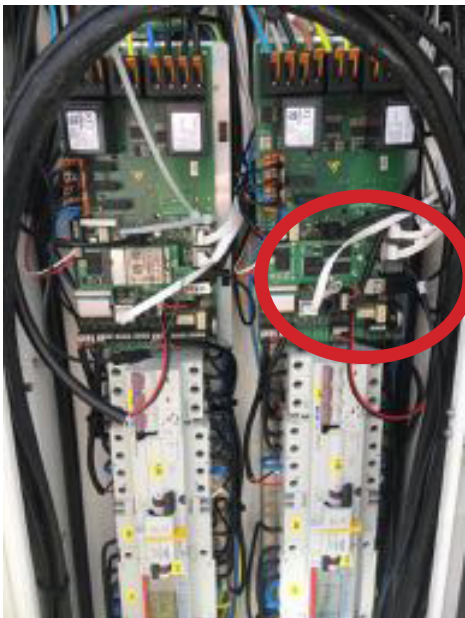
User Instructions

User Interfaces

LED signal lights will show the status of the charging point as described below:

Charging point status	LED light	LED operation
Charging point free and ready to use	Green	Stable
RFID read, user login ongoing	Green	Flashing
User login fail, access denied	Red	Stable
User loggin passed, charging allowed	Green	Waving
While connecting the cable	Green	Flashing twice
Vehicle connected, charging not started	Blue	Waving
Vehicle connected, starts charging	Blue	Waving
Charging ongoing	Blue	Stable
Error state	Red	Stable

Charging

Free charging
- Plug in your electric vehicle to start charging.
- Unplug your electric vehicle to stop charging.

Charging with RFID
You must have an RFID tag which has a permission to access the charging point.

Start Charging with RFID
- When the charging point is free and the indicator light shows green, you can start a charging event.
- Show the RFID tag to the RFID reading area.
- When the RFID tag is read, the charging point will flash green and verify the user permission to charge. If the user login is failed, the indicator light turns to red. If the user login is passed, the indicator light turns to waving green.
- Now you are logged in to the charging station.
- Plug in the electric vehicle for charging. The indicator light turns to stable blue.

Stop Charging with RFID
- Show the RFID tag to the RFID reading area.
- When you stop the charging event, the indicator light turns to waving green and you are able to unplug the charging cable.
- After you have unplugged, you are logged out from the charging point and the charging point is free for the next user.

Installation / Commissioning Checklist

Introduction

This checklist is a guidance for ensuring both mechanical and electrical installation as well as commissioning of the Chago Pro or Premium.

Before Installation

Read the product specific installation instructions before performing any actions.

⚠️ *Note! Only trained electrician may perform the installation in accordance with the applicable local and national electrical rules and standards.*

Checking the Installation

Go through the visual, mechanical and electrical installation when the charging point is un-powered.

CATEGORY	X	ITEM	NOTES
Overall look		Ordered material has been received.	
		Protective plastic wrapping have been removed.	
		No scratches or damages may be seen.	
Mechanical installation		Charging point is fixed properly on the wall.	
		The front cover opens and closes smoothly.	
Electrical installation		Charging point's power supply capacity meets electrical planning (cable size, MCB…).	Review local electrical design plan.
		Gently push the charging point with a hand to create vibration to ensure no bad contact / connection exist (wire or PCB).	
		Gently push the controller to create vibration to ensure no bad contact / connection exist (wire or PCB).	
		Check tightness of the PE-cable screw.	
		Power supply cables (L1, L2, L3, N and PE) are properly connected.	
		Insulation of power supply cables is intact (L1, L2, L3, N and PE)	
		Voltage between PE and N is less than 10 V	
		PE quality is less than 3 Ω	
Operational check		All the LED states / color (green, blue, red) and RFID reader is functioning.	Create fail and charge (with RFID tag). Red at bootup, green at idle and blue while charging.
		Available electricity at the sockets. All the contacts (L1, L2, L3) must be tested.	Use Mode 3 tester.
		Verify that when charging point LED is green, there is no power at the socket contact (L1, L2, L3, N).	
		With Mode 3 tester, test the functioning of Mode 3 (from green to blue).	

Maintenance / Preventive Maintenance Instructions

1 x per year

⚠️

> *WARNING! Danger of electrical shock or injury.*
> *Disconnect power before working inside the device or removing any components.*

X	MAINTENANCE ACTION
	Retighten all screws (electric components).
	Check the Mode 3 socket and if needed change it (burn or parts damage) (socket cost not under warranty).
	Check the charging cable and if needed change it.
	Check the sealings.
	Gently push the charging point with a hand to create vibration to ensure no bad contact / connection exist (wire or PCB).
	Gently push the controller to create vibration to ensure no bad contact / connection exist (wire or PCB).
	Create fail and charge (with RFID card) to check all the LED states / color (green, blue, red) and RFID reader is functioning.
	Test available electricity at the sockets; use Mode 3 tester if needed. All the contacts (L1, L2, L3 must be tested).
	With Mode 3 tester, test the functioning of Mode 3 (from green to blue).
	Check tightness of the PE-cable screw.
	Test voltage between PE and N (must be less than 10 V).
	Test PE quality (must be less than 3 Ω).
	SW update if needed (if in service contract).
	Restart the station from F0, ensure it will restart properly.

Maintanance
performed by: _____

Date: _____

Troubleshooting

Charging station is off, no lights on

Issue	Corrective action
Mains voltage does not exist in supply connector L1.	Ensure proper power supply.
Circuit breaker F0 is off.	Turn F0 on.
12V power unit has no LED on.	Ensure 230V power supply to 12V power unit; if ok replace the power unit.
The controller has no PWR LED on.	Ensure power supply to the controller; if ok replace the controller.

Charging cable is locked in Mode 3 socket outlet

Issue	Corrective action
Unexpected fault has occurred while power is on.	Option 1: If equipped with Mode 3 lock release functionality, turn off the power from F0 and pull charging cable out from the socket. Option 2: Turn off the power. Switch Mode 3 lock manually into open position.
Power is off.	Open the front cover. Switch Mode 3 lock into open position. Note! If the station has a Mode 3 Lock Release functionality, then during power cut the Mode 3 lock opens automatically.

Configuration via web browser

Issue	Corrective action
PC does not recognize micro USB plug and connection to the controller cannot be established via web browser.	Check from Windows 7 / 10 operating system settings via "Device Manager" that RNDIS network adapter is available. If not, update the related Windows driver.

Technical Information

Electrical connections

Nominal voltage	230 Vp-n / 400 Vp-p
Nominal current	2× 32 A (Mode 3 socket) On EVF as Option and on EVC: 2 x 16A (Domestic socket) Only either Mode 3 or Domestic socket can be in use at the time
Nominal frequency	AC 50 Hz
Rated power supply	EVF100: • 22kW: 1x 3x32A EVF200: • 22kW per charging outlet: 2x 3x32A EVC100: • 22kW 1x 3x32A EVC200: • 22kW per charging outlet: 2x 3x32A Optionally: • Dynamic load management (DLM) based on available power supply • Static current limitation
Supply connections and terminals	L1, L2, L3, N, PE Cu 2.5 - 50 mm², Al 6 - 50 mm² Tightening torque Nm: 4 Nm (2.5 - 4 mm²), 12 Nm (6 - 50 mm²)

Design and mechanics

Material / color	EVC Acid proof brushed steel EVF Painted aluminum and stainless steel Two basic colors: • RAL9016S "Traffic White" • RAL7021 "Anthracite"
Enclosure class	IP54
IK class	IK10
Operating temperature	-30 ... +55 ºC
Directive	LVD directive 2006/95/EC EMC 2004/108/EC RoHS 2011/65/EC
Standard	EN61439-1 EN61439-3
Operation and communication	according to IEC 61851-1
Approvals / Markings	CE

Features

No. of simultaneous users	EVF100: 1 user EVF200: 2 users EVC100: 1 user EVC200: 2 users
Connection to car	Default: Mode 3 charging, Type 2 / Type 3 Option: Mode 2 charging, Type F / E / G
Lockable lid for Mode 3 socket	EVC product only
Lockable lid for Domestic socket	Option for EVF products
Charging status indication	LED: • Blue = Charging • Green = Available • Red = Malfunction
User access & control	Standalone mode: • Default: Free use, RFID Online mode: • Option: RFID reader (ISO/IEC 1443A / B, ISO/IEC 15693) • Option: Mobile like SMS, call, app (through communication interfaces) • Option: Remote control (through communication interfaces)
Energy measurement	Default: Current transformers (per charging point) Option: MID class kWh metering (per charging point)

Safety features

Over-current protection (MCB)	Default
Residual current protection (RCD)	Default: Type A (30mA AC) Option: Type B (6mA DC)
Automatic reset of RCD and RCD remote test	Option
Automatic release for Mode 3 socket in case of sudden power outage	Option
Surge, overvoltage protection	Option
Low control voltage 12 VDC	Default

Connectivity and Communication

Connectivity	Default: GSM (3G) Option: Ethernet
Communication	Default: OCPP 1.5 or OCPP1.6, both fully implemented.

Warranty

Warranty conditions, see www.ensto.com.

EVF200 Dimension Drawing

Chago Pro with two charging points.
Note! Domestic sockets optional.
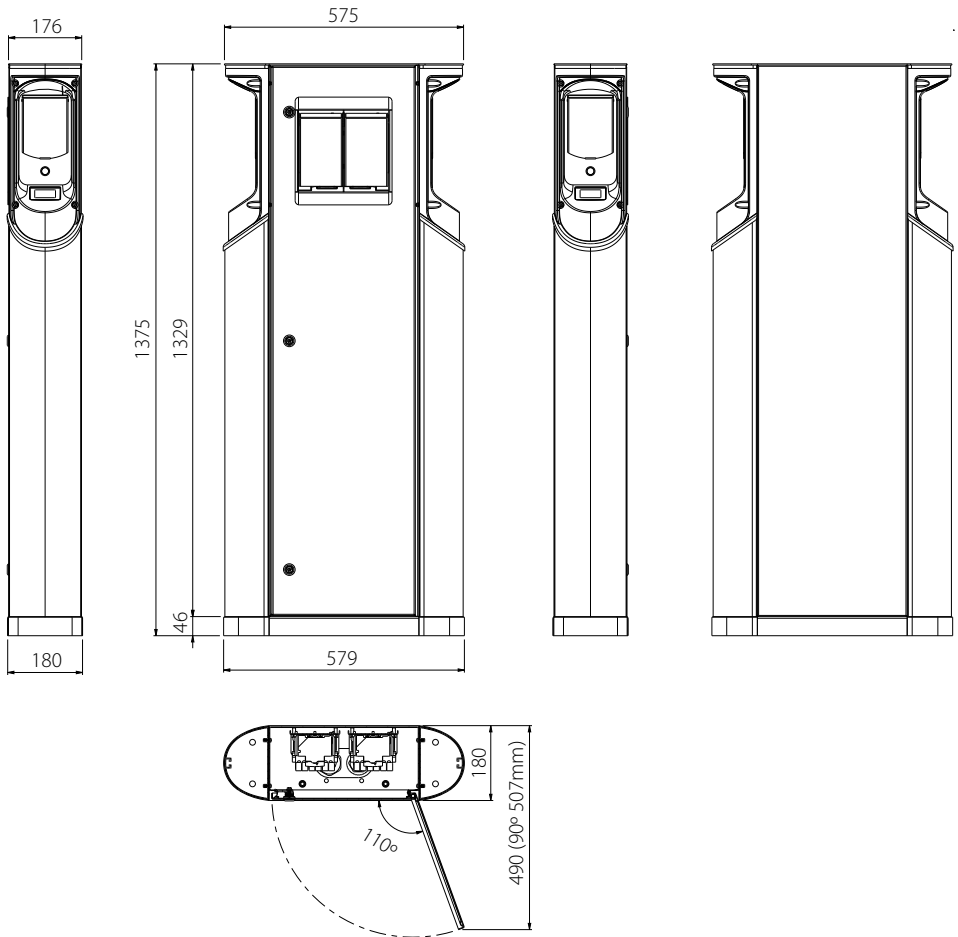
EVF100 Dimension Drawing

Chago Pro with one charging point. The side of the charging point can be placed on the right or the left side based on customer request.
Note! Domestic sockets optional.
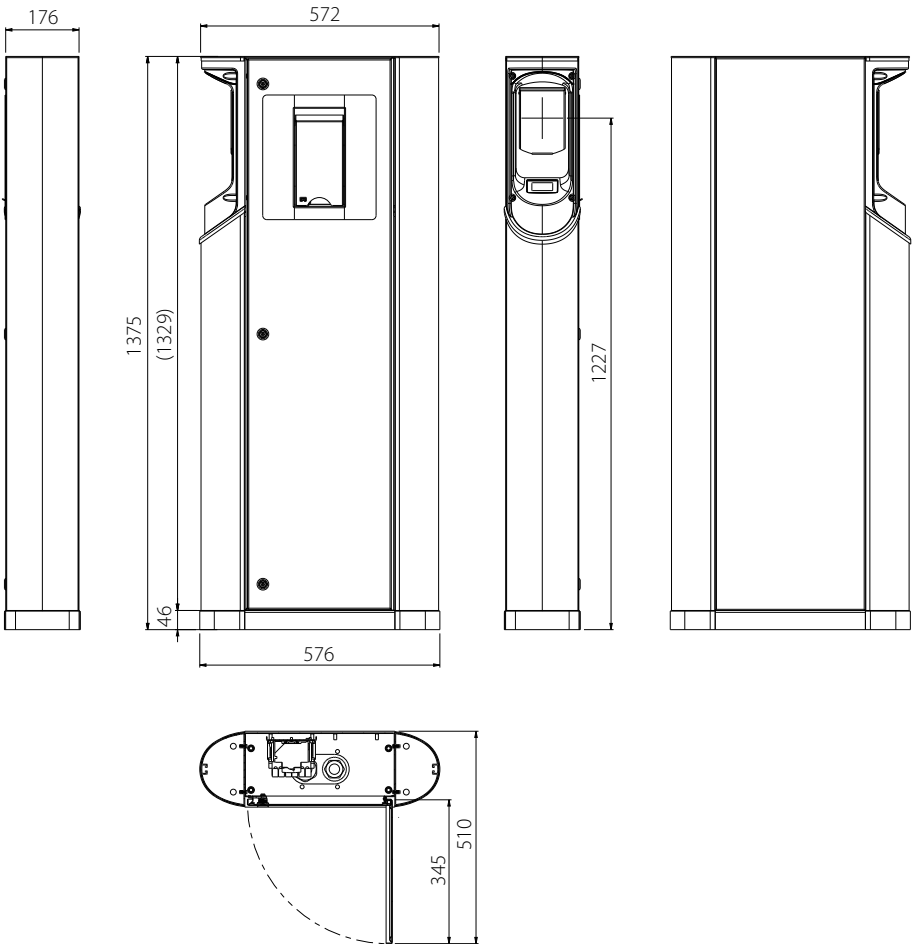
EVC200 Dimension Drawing

Chago Premium with two charging points.
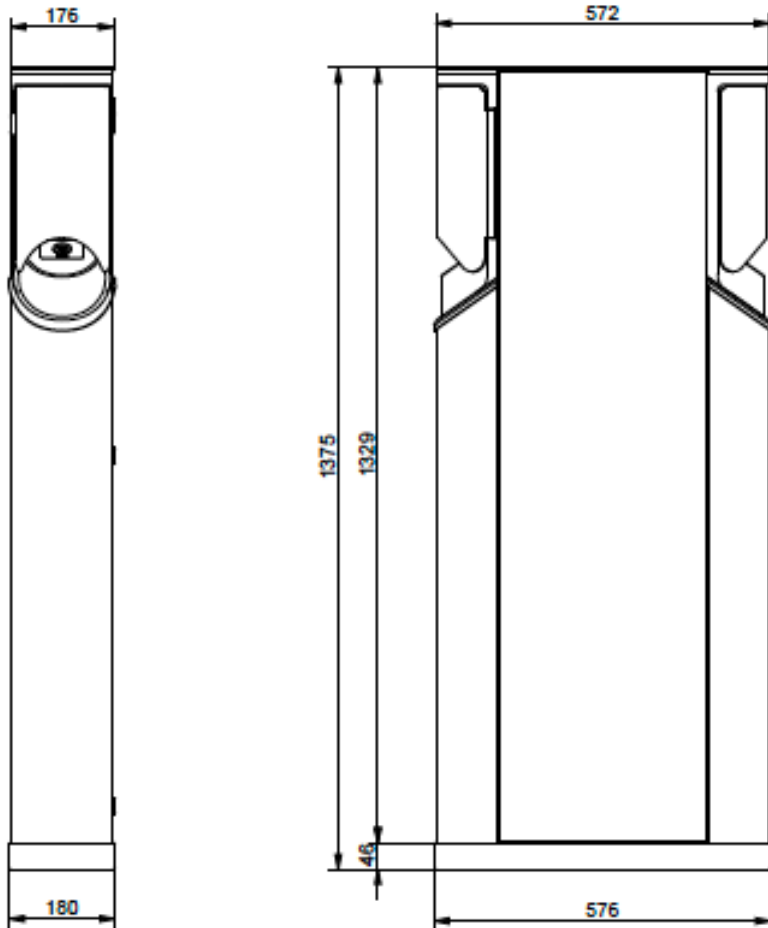
EVC100 Dimension Drawing

Chago Premium with one charging point
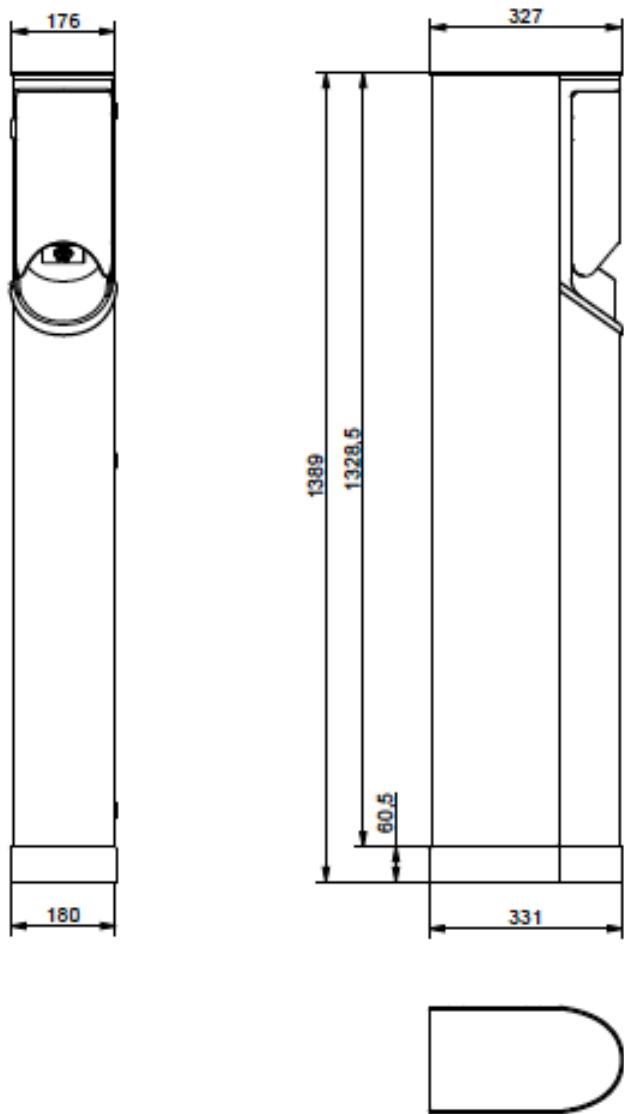
EVC and EVF internal wiring diagram (one insert)

Both of the EVF200 and EVC200 inserts are the same and one USB capble is connected between the controllers. With EVF100 and EVC100 there is only one insert.