# CONNECTION REQUIREMENTS FOR 3X25A – 3X80A CHARGING STATIONS

**For the installation of a standardized grid connection in a public charging station**

RESEARCHING AN
D TESTING SMART
AND SUSTAINABL
E CHARGING

**ElaadNL** | July 2026 | Version 4.0

These requirements have been developed

in collaboration with the regional DSOs in the Netherlands.

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CHAPTER 1

# DOCUMENT INFORMATION

**Title:** Connection requirements for 3x25A – 3x80A charging stations
**Version:** 4.0
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**Issuing organization:** Stichting ElaadNL, on behalf of the Dutch DSOs
**Contact:** info@netbeheerderskeuringen.nl
**Inspection location:** Testlab ElaadNL, Westervoortsedijk 73, KB building, Arnhem
**Certified charging stations:** Certified objects • ElaadNL
**Relationship to previous versions:**

- This version supersedes version 3.1;
- Charging stations must be fully re-assessed and certified on the basis of v4.0 by 1 February 2027 at the latest in order to obtain a grid connection. Version 3.1 will no longer be valid from 1 February 2027. Charging stations that are not re-assessed and certified may no longer be installed from this date onward;
- All new charging stations to be installed and relocated where the grid connection cable (of the DSO) is disconnected, must always comply with the latest version of the connection requirements.

## 1.1 SCOPE OF APPLICATION

This specification applies to:

- Public charging stations with connection values from 3×25A to 3×80A, in which a standardized grid connection is integrated (see Figure 1);
- Charging stations with a new or to be relocated grid connection;
- Charging stations that are being retrofitted or refurbished, where the grid connection is renewed or replaced.

## 1.2 EXCLUDED

- Private charging stations;
- Semi-public charging stations;
- Charging stations without a grid connection;

CHAPTER 2

# CHANGE HISTORY

In this new version, changes have been made in relation to:

- Implementing the NTA 8042 "Slimme publieke laadpaalfunderingen";
- Restructuring to improve customer journey;
- Adjustment space DSO section;

The following changes have been made to the requirements of the Connection Requirements in the transition from version 3.1 to the revised version 4.0:

| New in version 4.0 |
|---|
| **Requirement 12 and 15**: related to the NTA 8042 (smart foundation) |
| **Requirement 32:** relates to the protection of outgoing cables to the secondary charging stations in a primary-secondary installation. |
| **Figures 1, 2 and Appendix B** |

| Removed from version 3.1 |
|---|
| **Requirement 1, 2, 5, 33 and 35:** removed as requirements to be assessed and added to the principles of chapter 3.3. |
| **Requirement 23**: removed and its content has been added to requirement 21 |
| **Appendices 2 and 3** |

| Modified in version 4.0 |
|---|
| **Requirement 7:** the frequencies have been adjusted, 1200 Mhz has been removed. |
| **Requirement 10:** the installation manual has been updated with the NTA 8042 requirements. |
| **Requirement 17:** it has been added that the physical center of the grid connection cable must be located exactly in the center of two mounting points of the NTA 8042 foundation. |
| **Requirement 18:** the minimum height has been changed to 760 mm. A minimum of 10 mm of free space on both sides of the compact connection module (CAM) must be ensured, therefore the width has been changed from 180 mm to 200 mm. |
| **Requirement 21:** the minimum thickness of the customer wiring for a grid connection up to and including 3×63A has been changed from 6 mm² to 10 mm². |
| **Requirement 25:** it has been added that the text color on the sticker must be black. |
| **Requirement 30:** it is included that this must be designed in such a way that outgoing cabling can be easily reconnected after replacing a charging station, regardless of the type of the new charging station. |

Other changes to the requirements in version 4.0 compared to version 3.1 consist of editorial revisions to the Connection Requirements.

CHAPTER 3

# NORMATIVE AND LEGAL FRAMEWORK

## 3.1 LEGAL OBLIGATIONS

- The requirements in this document follow directly from the authority of the DSO to set requirements for objects in which DSO components are placed;
- The DSO is obliged to use a smart kWh meter under the General Administrative Order "Alternative Fuels Infrastructure Decree" (since 24 June 2017), which can be read remotely.
- Be aware that if the charging station is part of a concession for public charging infrastructure, additional requirements may be requested. Refer to the tender documentation for further details.

## 3.2 APPLICABLE NORMS & STANDARDS

In order to obtain a grid connection, the charging station must at least comply with:

**Electrical safety**

- **NEN-EN-IEC 61851**, all parts;
- **NEN1010** requirements for grounding and electrical installation (for customer installation).

**Assembly & structural requirements**

- **NEN-EN-IEC 61439-1 and 61439-7;**
- **NTA 8042 – Smart public charging station foundations**[1];
- **NEN3011** for safety stickers.

## 3.3 PRINCIPLES

- **Grid connection and smart kWh meter**
  The grid connection in the charging station is installed by means of a compact connection module (CAM). To measure electricity consumption, the DSO installs a smart, remotely readable kWh meter. The housing of charging station forms a heavy barrier to the radio signal for the smart kWh meter, which is mounted in these charging stations. The radio attenuation of this signal at the location where the smart kWh meter is mounted is usually between 15 and 30 dB and depends mainly on the material of the housing and the frequency. The DSOs require a maximum radio attenuation of 8 dB, see requirement 7.
- **Grid connection cable diameter**
  The outer diameter of the grid connection cable for the charging stations can vary from 22 mm to 27 mm.
- **Definition of DSO components**
  Where the requirements refer to the charging station, this refers to the zone where the DSO components are mounted, unless the context shows that reference is made to the entire charging station, including the customer installation zone.

[1] Not applicable if the charging station falls outside the scope of the NTA 8042.

- **Ambient conditions**
  The connection requirements apply to normal ambient conditions in accordance with NEN-EN-IEC 61439-7. In specific cases, deviating conditions may apply for which specific additional requirements may be required.
- **Strain relief outgoing cables**
  The descending cable(s) to a secondary charging station must be equipped with its own strain relief of at least 400N, in accordance with NEN1010.
- **Distribution cabinet**
  If another object is used as a distributor in a primary-secondary setup, such as a street cabinet: consult ElaadNL for the DSO requirements that are set for this object. All approved objects with a low-voltage grid connection (≤ 3 × 80 A) in public spaces can be found on the ElaadNL website.
- **Technical documentation**
  Technical documentation can be requested additionally for any requirement, for example a product drawing, material declaration or product specifications.
- **Quality stickers**
  All applied stickers must be of such high quality that a long lifespan of at least 15 years is guaranteed.
- **Ground level reference**
  Where the document refers to “ground level”, this means the ground surface level or the (future) finished street level. If the base plate of a charging station is located above ground level, the specified dimensions shall apply from the base plate of the charging station.
- **NTA 8042 Smart Foundation**
  Charging stations shall be designed to allow installation on a smart foundation in accordance with NTA 8042. This supports the standardisation of public charging infrastructure pursued by DSOs and industry stakeholders[1].

CHAPTER 4

# QUALITY DOCUMENTS TO BE ASSESSED

## 4.1 TEST REPORTS

For each of the requirements below, a successful test report from an **accredited testing body must** be provided in accordance with the relevant standard. The testing body shall be accredited for the relevant standard by the Dutch accreditation council.

| # | Description |
|---|---|
| 1 | **Test report assembly and component safety**<br>The charging station complies with NEN-EN-IEC- 61439-1 and NEN-EN-IEC 61439-7. |
| 2 | **Test report safe charging station**<br>The entire charging station should comply with the current NEN-EN-IEC 61851, including all parts. |
| 3 | **Test report enclosure degree of protection**<br>The housing of the charging station has a protection of at least IP44 (in accordance with NEN-EN-IEC 61439-7 and NEN-EN-IEC 61851-1). |
| 4 | **Test report enclosure impact resistance**<br>The housing of the charging station has an impact resistance of IK10 (in accordance with NEN-EN-IEC 61439-7). |
| 5 | **Test report mechanical strength**<br>The mechanical strength of the charging station complies with the requirements for installation in public spaces in accordance with section paragraph 10.2.701 of the NEN-EN-IEC 61439-7. |
| 6 | **Test report heat development**<br>The air temperature in the charging station may not exceed 55 degrees Celsius on average, during a one-hour period at the same position as the compact connection module and the smart meter. This is based on a maximum ambient temperature (*) outside the charging station of 40 degrees Celsius (in accordance with section 10.10 of NEN-EN-IEC 61439-7). The temperature measurement is carried out at 5mm from the top of the kWh meter.<br><br>** Ambient temperature refers to the temperature outside the charging station at 1.5m distance. The grid connection is mounted inside the charging station, where the air temperature inside the charging station will be higher than the ambient temperature.* |
| 7 | **Test report attenuation charging station**<br>The attenuation of the charging station is lower than 8 dB for all current frequencies, namely the current 450, 800, 900 and 1800 MHz frequencies.<br><br>Examination report (carried out according to the applicable test protocol available at Requirements • ElaadNL) showing that the radio attenuation at the mounting position of the smart meter is below 8 dB for all current frequencies, carried out by an accredited testing body. |

## 4.2 OTHER DOCUMENTATION

**8 UV radiation**

The housing of the charging station does not allow any UV radiation to pass through, as a result the components of the DSO are not affected by UV radiation (leading to ageing).

**9 Selectivity between customer protection and grid connection protection**

There is selectivity between the protection in the customer area (and any connected secondary charging stations) and the protection in the grid connection. The applied protection in the grid connection conforms to the overview of applied protection per DSO (see Appendix A).

Selectivity shall be demonstrated by the supplier by means of a time-current coordination diagram showing the tripping curves for each applied combination of customer-side protection and main protection, including the characteristics of both protective devices.

Software selectivity is not accepted in RENDO area as a method to ensure selectivity between the security in the charging station and the security in the grid connection.

**10 Installation manual**

A Dutch installation manual is always provided with the charging station in accordance with the format. This format can be found on Requirements • ElaadNL as "format installation manual public chargers".

## 4.3 REQUIRED INFORMATION FOR PUBLICATION

For transparency regarding the assessment process, all certified charging stations will be published on the ElaadNL website.

Before the charging station can be published on the ElaadNL website, the following information is required:

- Company name;
- Product name;
- Address;
- Final version of the installation manual (Dutch);
- Product image or sketch (overview photo for the ElaadNL website).

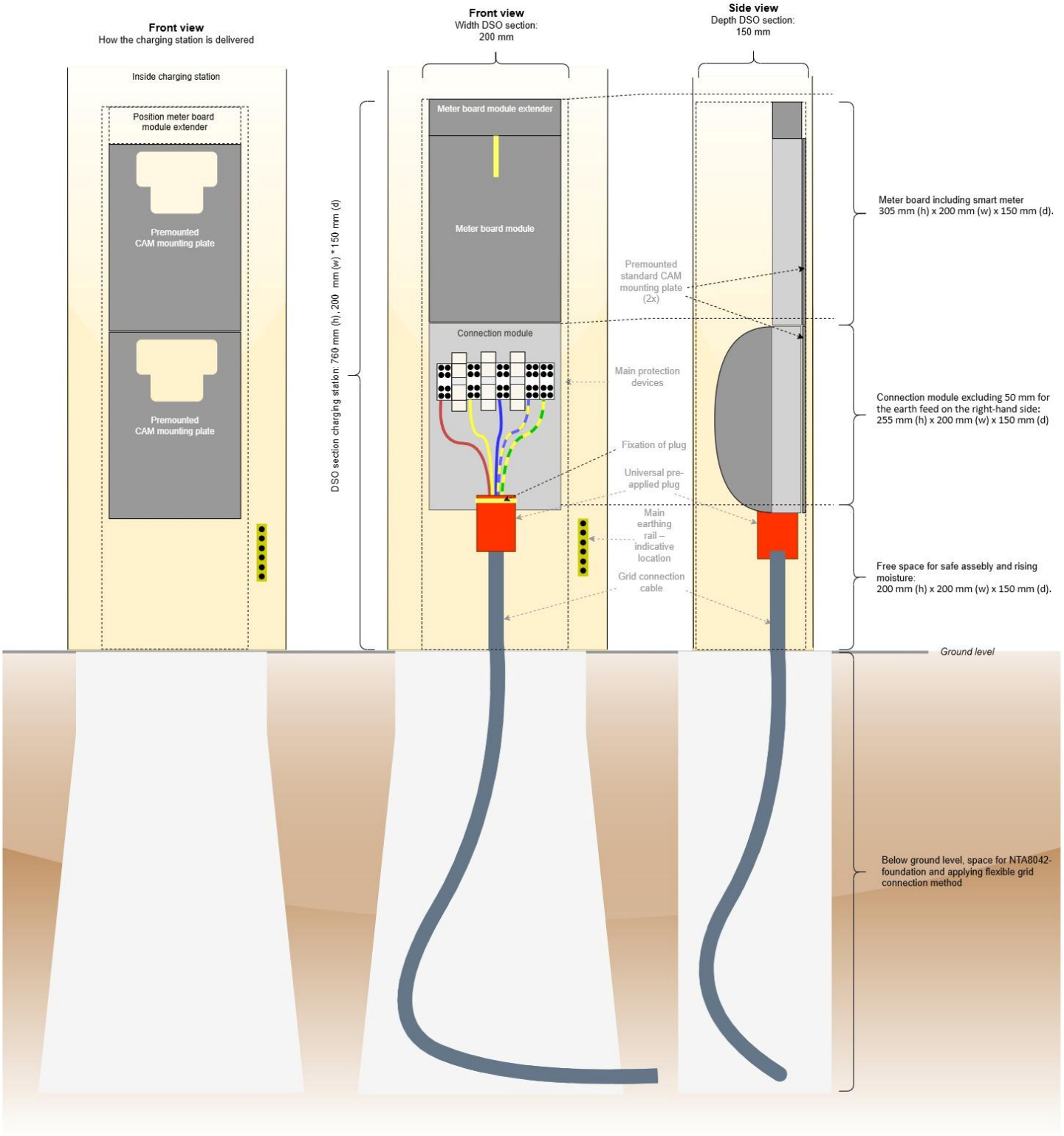



*Figure 1: layout and dimensions of the DSO section and the introduction of a grid connection cable with a smart foundation.*

CHAPTER 5

# VISUALLY ASSESSED REQUIREMENTS

## 5.1 ENCLOSURE AND PHYSICAL CONSTRUCTION REQUIREMENTS

**11 Condensation**

Condensation may occur in the charging station. This should not lead to dangerous situations or equipment failure. The condensation droplets must not come into contact with the DSO's components. Adequate measures should be taken to prevent this, for example: drainage pipes, an insulating ceiling or a sloping ceiling.

**12 Smart foundation**[1]

The charging station shall be suitable for installation on a smart foundation with mounting points of 140 × 140 mm using M12 fasteners, or with an adapter plate, in accordance with NTA 8042.

**13 Fixing the foundation**

The charging station is attached to the foundation. This connection can only be attached and removed from the inside of the charging station.

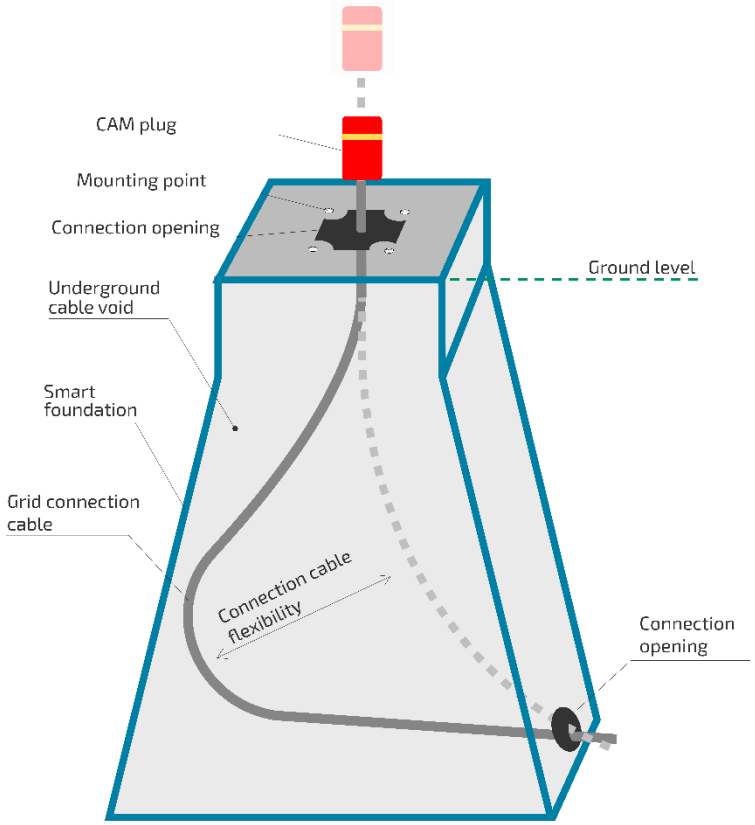



*Figure 2 Cross-section of an example of a smart foundation in which properties such as the flexibility of the connection cable are visualised.*

## 5.2 REQUIREMENTS WITH REGARD TO INTERNAL CONSTRUCTION AND CONNECTION SPACE

**14 Grid connection cable entry**

Inserting the grid connection cable and any earthing cable into the charging station may not lead to any damages to the grid connection cable.

**15 Repeated replacement**[1]

To allow repeated replacement of a charging station with the CAM plug, the charging station, base plate, and any adapter plate shall be provided with an opening equal in size to the connection opening (155 × 155 mm ±5 mm, see Appendix B). Alternatively, the seal at ground level may be smaller to close off the connecting cable, as long as they can be easily removed when the charging station is replaced and the grid connection cable with plug can be removed and attached.

**16 Grid connection cable in straight line**

Strain-relief is integrated in the compact connection module. To protect the grid connection cable, it is important that the grid connection cable can enter and be connected to the compact connection module in a straight line. The exact position of the cable hole must be at the center below the mounting plate and 6 cm away from the rear wall.

**17 CAM Mounting Plates**

Two standard CAM mounting plates (part number Connectens: CT100 403) should be fitted directly above each other (see Figure 1). The positioning of the CAM mounting plates on top of each other ensures the correct positioning of the CAM plug in relation to the foundation.

- The physical center of the grid connection cable is located exactly in the center of two mounting points of the NTA 8042 foundation[1].
- The bottom of the mounting plate shall be located at a minimum height of 200 mm from the bottom of the charging station (see Figure 1).

**18 Space DSO section**

The space required for the DSO section at the bottom of the charging station shall measure 760 mm (h) × 200 mm (w) × 150 mm (d), with the height measured from ground level. The CAM has a width of 180 mm; a minimum clearance of 10 mm shall be maintained on both sides of the CAM. This space shall remain free from customer installation components (see Figure 1).
The access hatch/door must be positioned directly in front of the CAM, as the CAM cover must be able to open fully on its hinge without obstruction.

**19 Smart kWh meter installation**

The smart kWh meter supplied by the DSO can be fitted and replaced in accordance with the relevant fitting instruction. It must be possible for the secondary wiring of the smart kWh meter to be connected to the main switch.

## 20 Main earthing rail and grounding*

A main earthing rail is mounted at the bottom of the charging station, the preferred position of the main earthing rail is at the bottom right, at the level of the CAM plug (see Figure 1). All connections must be mounted separately on the main earthing rail, including:

- The earth electrode (from the customer);
- The connection to all conductive parts, including the housing and access hatch in accordance with NEN1010;
- An additional connection point for the DSO for safety earthing;
- The foundation and possibly adapter plate[1].

When replacing a charging station, it shall be possible to reconnect the earthing without additional excavation work or modifications[1].
If earthing is offered by the DSO, earthing is connected to the plug of the compact connection module. This connection is located on the right side of the CAM plug.

* This requirement only applies to safety class 1 (NEN1010) charging stations.

## 21 Customer wiring

When connecting the wiring, sufficient working space shall be provided for connection to the terminals of the customer installation, measured from the top of the meter board extension. The bending radius of the wiring and the length of the wire ferrules shall be taken into account. The DSO normally supplies the wiring; however, if the wiring distance between the top of the meter board extension and the customer installation exceeds 150 mm, the supplier shall pre-install the wiring.

If the supplier installs the wiring himself, it must meet the following quality conditions:

- Flexible wiring (class 5);
- Wiring on the DSO's side must be equipped with 18 mm electric wire ferrule;
- Heat resistant up to 90 degrees Celsius (pD90);
- With ≤ 3x63A grid connection 10mm2;
- With 3x80A grid connection 16mm2;
- The cross-section of the neutral should be at least equal to the cross-section of the phase conductors.

## 5.3 ACCESS REQUIREMENTS

**22 Access hatch**

The access hatch/door of the charging station is equipped with a lever into which two cylinders can be installed. The access hatch must meet the following conditions:

- The lever is placed at a minimum height of 30 cm from ground level;
- The cylinder of the CPO should be placed before the charging station is connected by the DSO;
- The cylinder of the DSO (half europrofile S2) is placed by the DSO when the grid connection is realized;
- It must be possible for the DSO, without the intervention of third parties, to initially open the door by means of a (passe-partout)-key to realize the connection of the charging station and placement of the DSO cylinder;
- - The cylinder opening shall be protected against unauthorized entry;
- The installation manual should clearly describe how the DSO can initially open the charging station and how the cylinder should be positioned.

**23 Emergency number**

On the charging station the CPO/customer/owner's contact number is clearly, immediately visible and permanently displayed, so that unsafe situations can be reported and communication with the DSO can take place via the CPO. A digital display is not permitted.

**24 Application of the safety sticker**

The charging station has a safety sticker visible at the front, next to or under the access hatch, according to NEN-3011 indicating an electrical hazard.

**25 Selectivity sticker**

Place a yellow (warning colour) sticker in the object with black text stating that software selectivity is applied. The location of this sticker is on the inside of the door.

## 5.4 REQUIREMENTS FOR CHARGING STATIONS OUTSIDE THE SCOPE OF NTA 8042

Charging stations that fall outside the scope of NTA 8042 shall always be subject to custom assessments, for which prior coordination with ElaadNL is required.

**26 Conduit pipe**

The charging station is supplied with a round (red) impact-resistant conduit pipe with a wall thickness of 3 mm, smooth inside and diameter of around 50 mm. This is only intended for passing the grid connection cable from the DSO. If applicable, the earthing cable of the earthing electrode must be laid in a separate conduit pipe.

**27 Grid connection cable entry**

The grid connection cable can be inserted on at least two sides of the foundation. The entry height of the grid connection cable is 60 cm below ground level. To protect the grid connection cable, it must be routed through the foundation, where the foundation must not rest on the grid connection cable.

**28 Separate Cable Routing**

The descending cable(s) must not pass through the cable glands and/or conduit of the DSOs main grid connection cable.

## 5.5 REQUIREMENTS FOR PRIMARY-SECONDARY INSTALLATION (OPTIONAL)

This chapter describes the requirements for the primary-secondary installation. These are optional requirements and are only mandatory if the charging station will be used as a primary charging station. A charging station that does not meet the requirements of a primary charging setup may not be placed as such. Approval of this chapter will also be mentioned on the certificate.

The requirements for the primary-secondary installation of charging stations describe the requirements for the installation, where the primary installation secures the main power supply and protection of the system and the secondary installation is responsible for the onward flow of electricity to the other charging points.

**29 Space for outgoing cables**
There is sufficient space in the charging station to safely mount outgoing cable(s), in accordance with NEN1010. The outgoing cable(s) may not affect the safety, operation and accessibility of the DSO's components.

**30 Outgoing protection**
The outgoing cable(s) to the secondary charging station shall be connected to a dedicated protective device in the customer section of the primary charging station; looping directly from the grid connection is not permitted.
This must be designed in such a way that outgoing cabling can be easily reconnected after replacement of the charging station, regardless of the type of the replacement charging station.[1]

**31 Type outgoing cables**
The outgoing cable(s) of the primary charging station shall be clearly distinguishable from the DSO grid connection cable by means of a different colour, clear cable markings, or cable labelling. The conductor colours shall comply with NEN 1010.

**32 Selectivity secondary charging stations**
The protection of outgoing cables to the secondary charging stations must be selective and must be demonstrated in accordance with requirement 9.

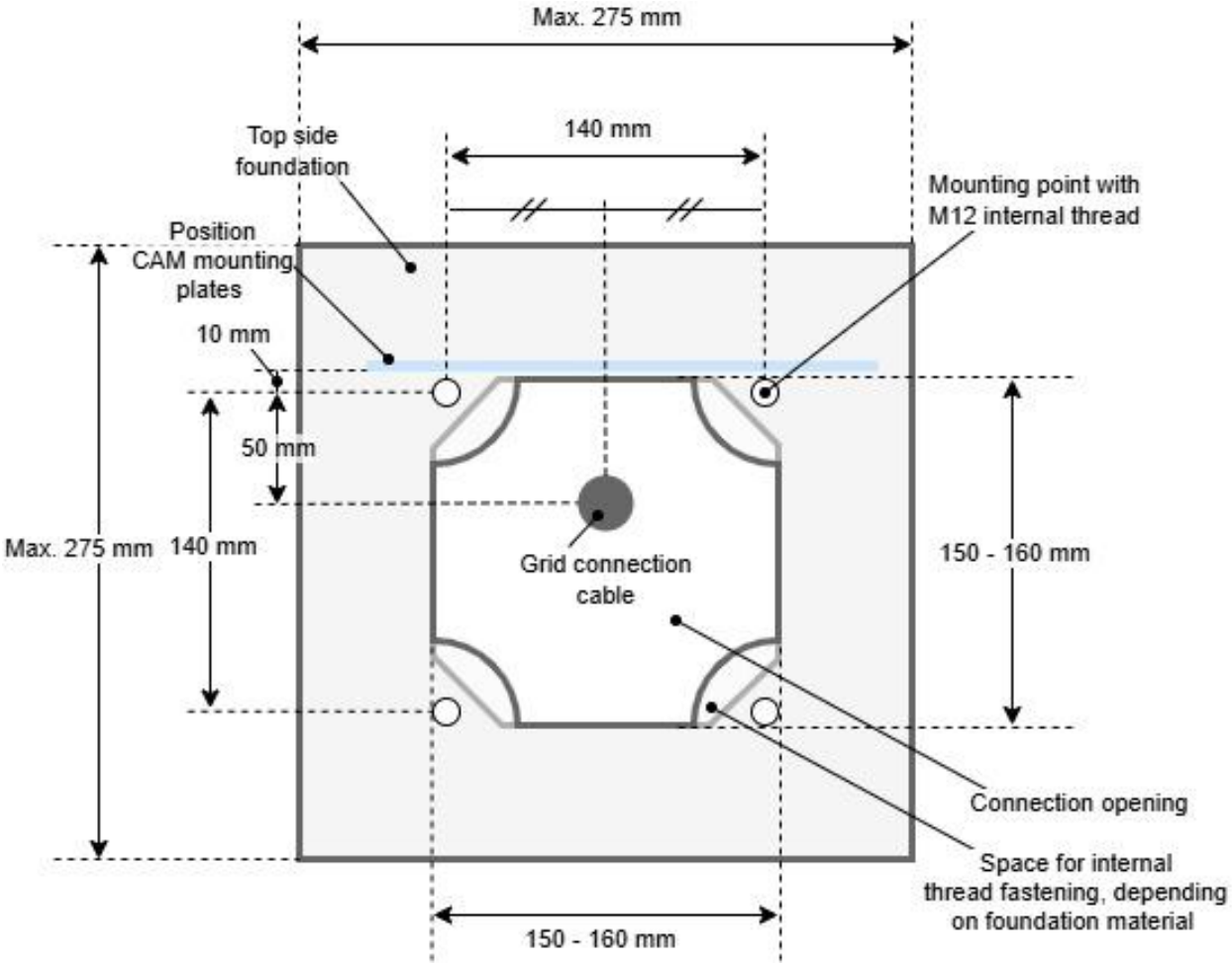
# ATTACHMENTS

## APPENDIX A: OVERVIEW OF APPLIED PROTECTIONS PER DSO

| Protection devices charging stations | | | DSO | | | | | |
|---|---|---|---|---|---|---|---|---|
| Capacity | Protection device DSO | Characteristic | Coteq | Enexis* | Liander | Rendo | Stedin | Westland Infra |
| 3 x 25A | Cartridge fuse 10,3 x 38 mm | gG | x | x | x | x | x | |
| 3 x 25A | Centered tag fuse NH000 | gG | | x | x | | x | x |
| 3 x 35A | Centered tag fuse NH000 | gG | x | x | x | x | x | x |
| 3 x 50A | Centered tag fuse NH000 | gG | x | x | x | x | x | x |
| 3 x 63A | Centered tag fuse NH000 | gG | x | x | x | x | x | x |
| 3 x 80A | Centered tag fuse NH000 | gG | x | x | x | x | x | x |

*Enexis offers the option of applying gFF characteristic protections devices.

# APPENDIX B: DIMENSIONS TOP SIDE OF THE FOUNDATION

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