POWERCHOICE 350

Installation Manual

Notice

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The presence of any such description of a standard or reference to a standard is not a representation that all of the PACCAR products referenced in this document support all of the features of the described or referenced standard. In order to determine the specific features supported by a particular PACCAR product, the reader should consult the product specifications for that particular product.

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Contents

Glossary

AC
Alternating Current.

CAF
Customer Acceptance Form.

CCS (Combo)
Combined Charging System (also called Combo) is the charging protocol for North America and European OEMs.

CHAdeMO
CHAdeMO is a trade name of a quick charging method for electric vehicles and a charging protocol standard by the CHAdeMO Association.

Contractor
Entity hired by the owner / site operator to do engineering, civil and electrical installation work.

DC
Direct Current.

Grid provider
Company responsible for the transportation and distribution of electricity.

HMI
Human Machine Interface; the screen on the charger.

HP CHARGER
High Power Charger.

PowerChoice 175
Power cabinet that provides 160 kW (175 kW peak) of DC power to a Charge Post. Gets its power from a power distribution board.

Interlock
The Interlock is an isolated current loop and is a feature that makes the state of two mechanisms or functions mutually dependent.

LAN
A computer network that interconnects computers systems within a limited area.

NOC
ABB Network Operating Centre; remotely checks the correct functioning of the charger.

MCB
Mechanical Circuit Breaker.

Owner
The legal owner of the charger.

PE
Protective Earth.

PPE
Personal Protective Equipment. Equipment such as safety shoes, helmet, glasses, gloves.

RCD
Residual-Current Device.

Site operator
The entity is responsible for the day to day control of the charger. The site operator can be the owner, but not necessarily.

User
The owner of an electric vehicle, who uses the Charge Station to charge that vehicle.

WiFi
A technology that allows electronic devices to connect to a wireless LAN (WLAN) network.

1. Introduction

1.1 Preface

This guide describes the planning and physical installation of the PowerChoice 350 at its location.

The PowerChoice 350 (HP Charger) is a DC fast charger system for electric vehicles with the CCS (Combo) charging protocol. It is not permitted to use the PowerChoice 350 to charge any other equipment, or to use the PowerChoice 350 for any other purposes. The PowerChoice 350 uses high-amperage electric currents. Therefore the installation must be planned carefully, and must be done by certified personnel only (according to local standards[1]).

Before installing the HP Charger, read this Installation Guide carefully and attentively. Follow the instructions in this Installation Guide. PACCAR is not responsible for any damage that has been caused by not or incorrectly following and executing the instruction described in this manual.

1.2 Intended use of this document

This document is intended to be used by the contractors who are responsible for site preparation and/or installation of the PowerChoice 350.

1.3 Signs

The following signs are used on the equipment and in this manual:

DANGER
Hazardous voltage
Identifies a hazard that could result in severe injury or death through electrocution.

WARNING
Various
Identifies a hazard that could result in severe injury or death.

WARNING
Rotating parts
Identifies a hazard that could result in injury due to the presence of rotating or moving parts.

WARNING
Rotating parts
Identifies a hazard that could result in injury due to the presence of rotating or moving parts.

WARNING
Pinch Hazard
Identifies a hazard that could result in injuries in which some body parts are pinched or crushed.

WARNING
Fall Hazard
Identifies a hazard that could result in injury due unsafe work at height.

[1]) Local regulations shall take precedence if they list different installation requirements than prescribed in this Installation Manual.

WARNING

Various

Identifies a hazard that could result in damage to the machine, other equipment, and/or environmental pollution.

WARNING

Environmental damage

Identifies a special indications as well as biddings and prohibitions to avoid damages in the environment. This sign refer to present national regulation according the environment.

NOTICE

Contains remarks, suggestions or advice.

1.4 Safety regulations

1.4.1 Owner responsibilities

The owner and site operator are required:

- To operate the charge station with the protective devices installed and to make sure all protective devices are correctly installed after carrying out installation or maintenance.
- To write an emergency plan that instructs people what to do in case of emergency.
- To prepare the site where the charge station will be installed, according to the requirements described in this guide.
- To make sure that there is enough space around the charger to carry out maintenance work.
- To appoint a person responsible for the safe operation of the charge station and for the coordination of all work.
- All works have to be carried out from qualified personnel. All qualified personnel has to estimate their transmitted works, identify and avoid. They must have experience and enough knowledge over: safety regulations and labor medical regulations, accident prevention regulations, guideline and approved safety regulations, and special instruction concerning occurrence of danger (especially remaining risk) possible dangers.
- You are not allowed to modify the charge system without the permission of PACCAR. The owner is cautioned that changes or modifications not expressly approved by PACCAR could void the owner's authority to operate the equipment and PACCAR's warranty policy
- Neither PACCAR nor its affiliates shall be liable to the purchaser of this product or third parties for damages, losses, costs or expenses incurred by purchaser or third parties as a result of: an accident, misuse or abuse of this product or unauthorized modifications, repairs or alterations to this product, or failure to strictly comply PACCAR operating and maintenance instructions.

1.4.2 Tilting and handling

CAUTION

Heavy equipment

Handling instructions:

1. Use crane or forklift truck when lifting or moving the Power Cabinet and Charge Post.
2. Do not drop parts of the PowerChoice 350.
3. Do not exceed a tilting of 30 degree for the Power Cabinet.

WARNING

Personal safety (PPE)

Always wear a safety helmet, safety gloves and safety shoes when you do the lifting and tilting work.

WARNING

Make sure that personnel cannot be crushed or become trapped during lifting and tilting work.

1.4.3 Electric hazards

DANGER

Hazardous voltage

The PowerChoice 350 conductors under hazardous electrical voltages. The grid terminals on the internal components may carry hazardous voltages, even if all circuit breakers are switched off.

1.4.4 Installation safety

WARNING

Personal safety (PPE)

Always wear a safety helmet, safety gloves and safety shoes when you do the lifting and tilting work.

WARNING

Visually examine the package for damage. See section Before unpacking on Page 40 and section Before unpacking on Page 68. If there is damage, do not install the system.

DANGER

Hazardous voltage

Instructions:

1. Always switch off the external group switch and the main switch in the cabinet, before performing any installation, disassembly, repair or replacement of components.
2. Do a voltage check and make sure that the electrical power is disconnected from the system.
3. Only ABB certified technicians are permitted to commission the PowerChoice 350.
4. When the system is in an open or dangerous condition, do not allow unqualified persons to go near it. Instruct and warn people about the potential harmful high voltages.
5. The installation and maintenance personnel must supply their own lighting equipment, since the Powerchoice cabinets has no lights inside the cabinet.
6. Always connect the Protective Earth (PE) first, before connecting the neutral (N) and Phase (P) wiring.
7. Correctly lock the door after installation or service operations.

WARNING

Make sure that there is a minimum free space of 1000 mm in front of the door of the Power Cabinet. The minimum space is necessary to allow service personnel to quickly move away from the Power Cabinet if there is an emergency when the door is open.

WARNING

Make sure that there is a minimum free space of 1000 mm in front of the door of the Charge Post. The minimum space is necessary to allow service personnel to quickly move away from the Charge Post if there is an emergency when the door is open.

CAUTION

Warranty

Installation and commissioning work must be carried out by certified personnel. The warranty will be void if any work carried out by non-certified personnel.

1.5 Environment and disposal of waste

CAUTION

Always observe the local rules and regulations with respect to processing (non-reusable) parts of the PowerChoice 350.

1.6 Contact information

ABB in your country

Please contact ABB in your country for delivery and service information.

ABB E-mobility

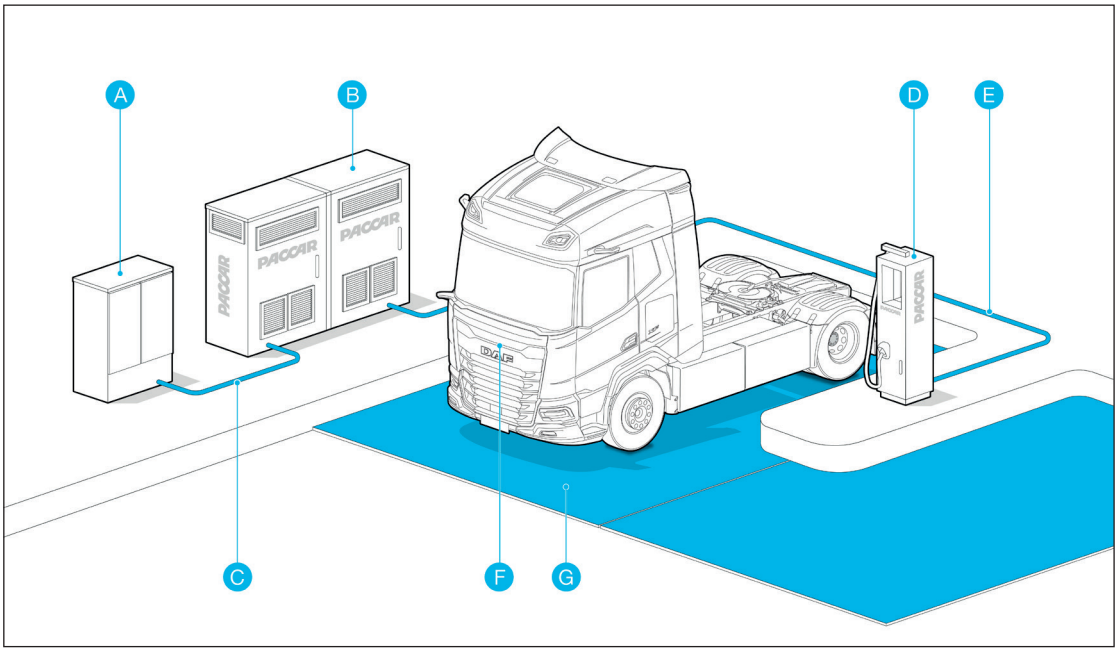
Heertjeslaan 6
2629 JG Delft
The Netherlands
Telephone +31 70 307 62 00
Mail info.evi@nl.abb.com

Write down here your local ABB contact details:

2. Description of the product

The PowerChoice 350 is a modular, configurable charging system, consisting of one or more Power Cabinets and one or more Charge Posts with single or dual outlet charge points.

2.1 Overview of the system



Example of a complete installation of a 175 kW charge system

A Low voltage power distribution cabinet
B Power Cabinet – 175 kW (Powerchoice 350)
C Input power cables in cable conduit
D Charge Post
E Cables between Power Cabinet and Charge Post in cable conduits
F Electric vehicle
G Parking space for charging

The PowerChoice 350 consists out of multiply components and it may require additional parts depending on the project and location of installation which dictates whether these parts are needed.

Common configurations include:
175 kW (375 A) charging system (HP 175 Charger) with 1 charge post:
- 1x Charge Post CP500 C
- 1x Powerchoice 350 Power Cabinet

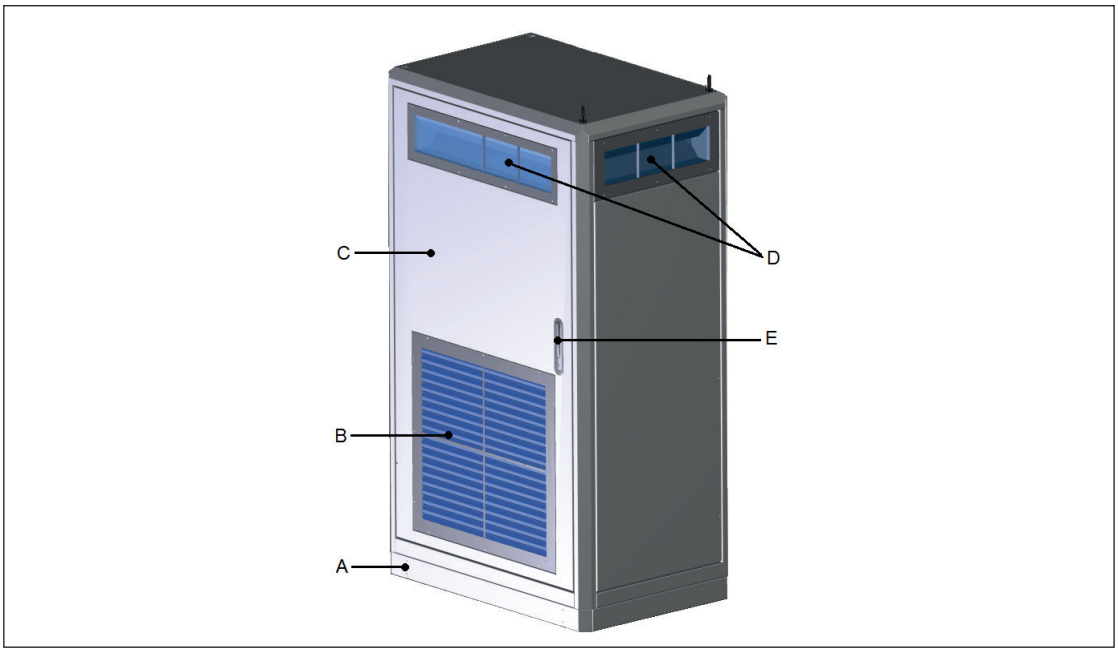
350 kW (500 A) charging system (HP 350 Charger) with 1 charge post:
- 1x Charge Post CP500 C
- 2x Powerchoice 350 Power Cabinet

350 kW (500 A) Dynamic DC charging system (HP 350 Dynamic DC Charger) with 2 charge post:
- 2x Charge Post CP500 C
- 2x Powerchoice 350 Dynamic DC Power Cabinet

Additional needed components can be ordered separately and are not part of the standard delivery. See section Accessories on Page 16.

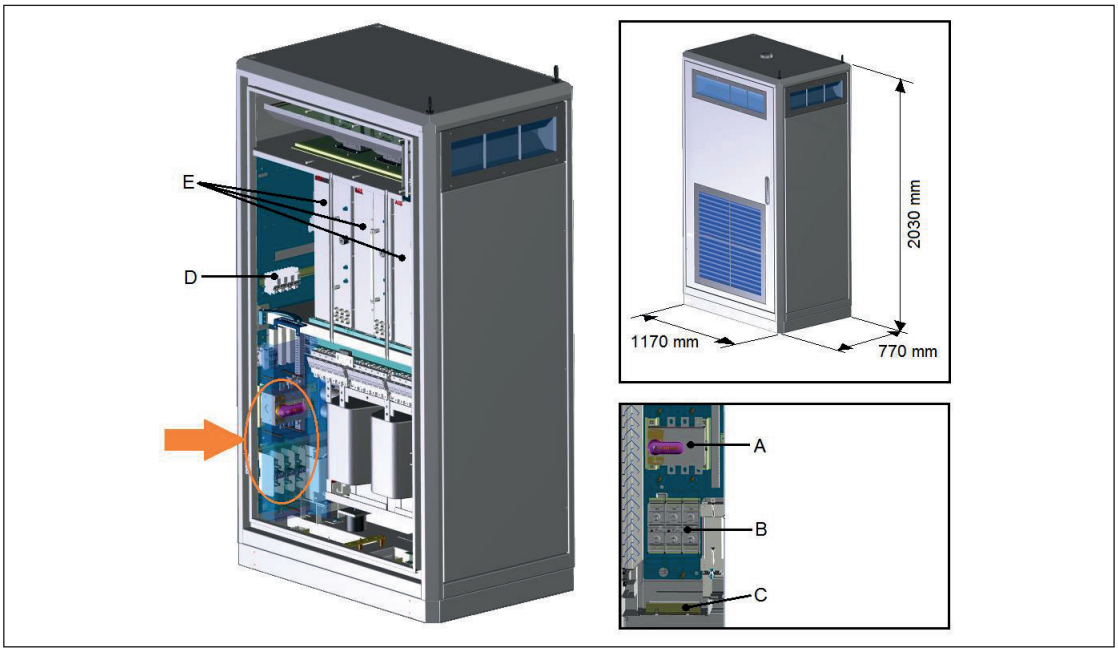
2.1.1 Powerchoice cabinet

Outside view of the Power Cabinet Powerchoice 350



A Base cover
B Air outlet
C Door
D Air inlets (also on the left and back side)
E Door handle / lock

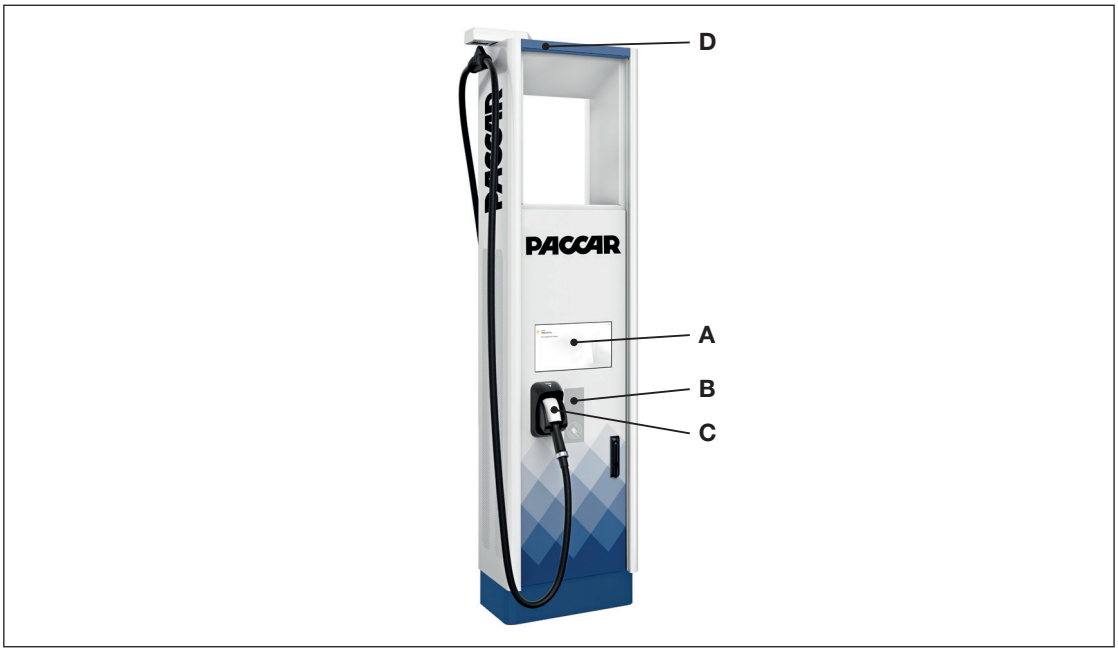
Inside view of the Powerchoice cabinet



A Main switch
B AC Power connection
C Guidance plate of the cables
D Data/communication connection
E Power Modules

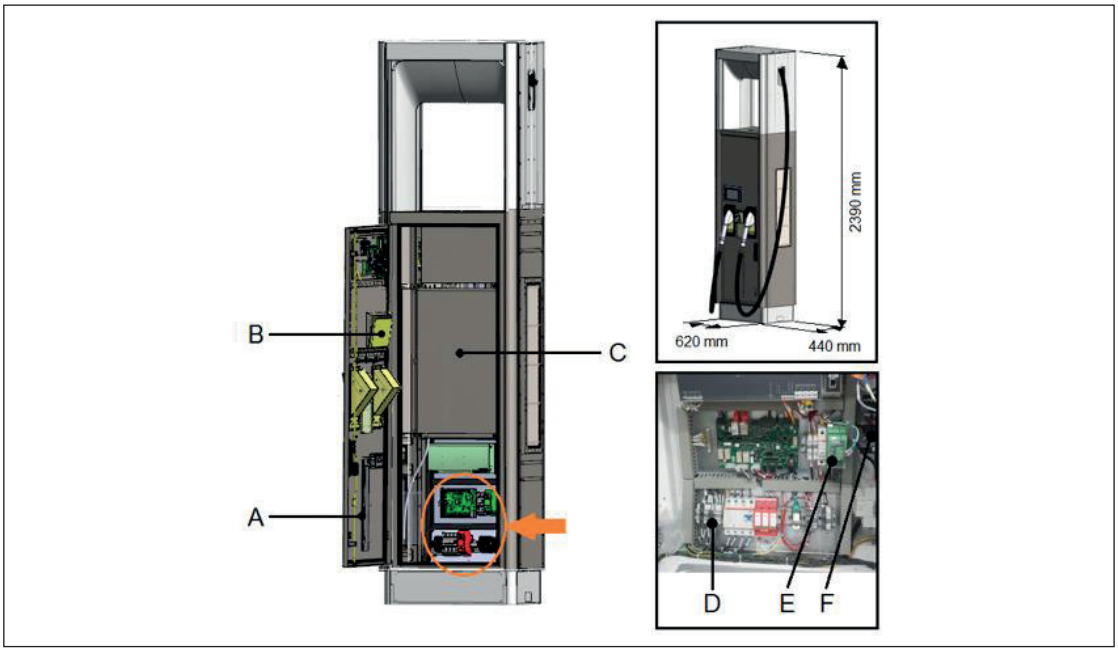
2.1.2 Charge Post

Outside view of the Charge Post CP500 C / CP500 CJ



A Display
B RFID card reader with payment terminal
C CCS DC plug and cable
D 3G Antenna

Inside view of the Charge Post CP500 C / CP500 CJ



A Front door
B HMI unit
C Cool unit
D AC utility power connector
E Communication connections
F DC-input connectors

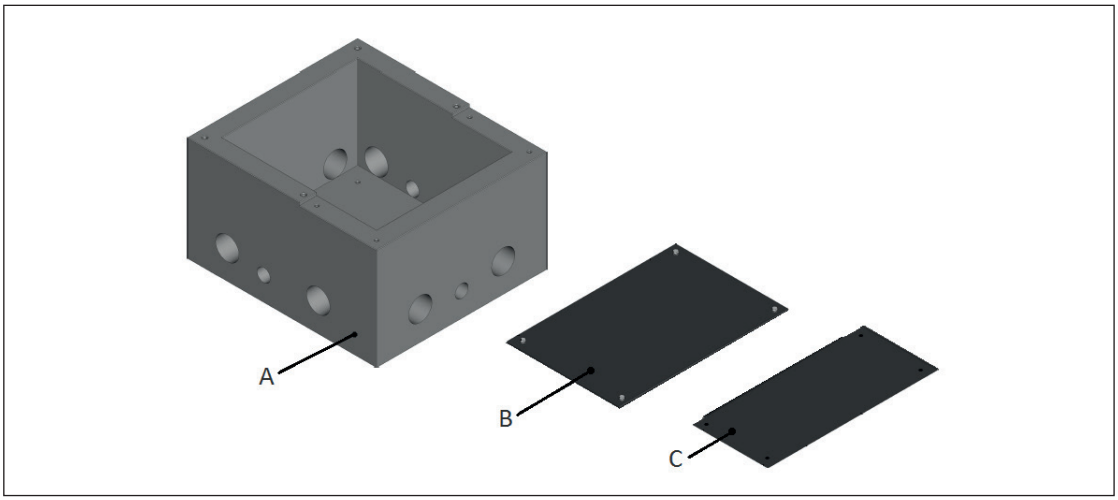
2.2 Accessories

The following parts can be ordered at the time of the initial order or afterwards. Contact PACCAR Sales department (see Contact information on Page 12 for contact details).

2.2.1 Foundation for Power Cabinet

Concrete foundation

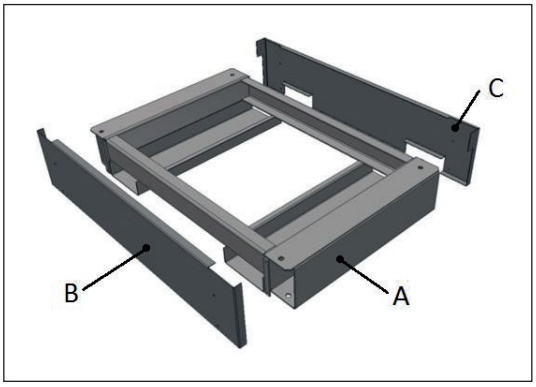
The concrete foundation can be used to install the Power Cabinet on soil.



A Foundation
B Top cover plate
C Front cover plate

Metal frame foundation

The metal frame foundation can be used to install the Power Cabinet on a solid surface.

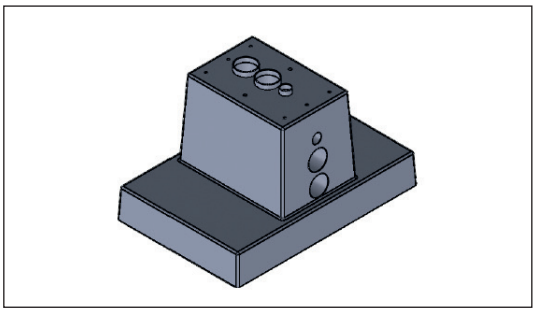


A Foundation
B Front border cover
C Rear border cover

2.2.2 Foundation for Charge Post

Concrete foundation

The concrete foundation can be used to install the Charge Post on soil.



2.2.3 Communication glass fiber cable

The CAN communication between the Power Cabinet and Charge Post and between the Charge Posts at Dynamic DC charge systems is done via a glass fiber cable. This glass fiber cable must be prefabricated and can be ordered separately.

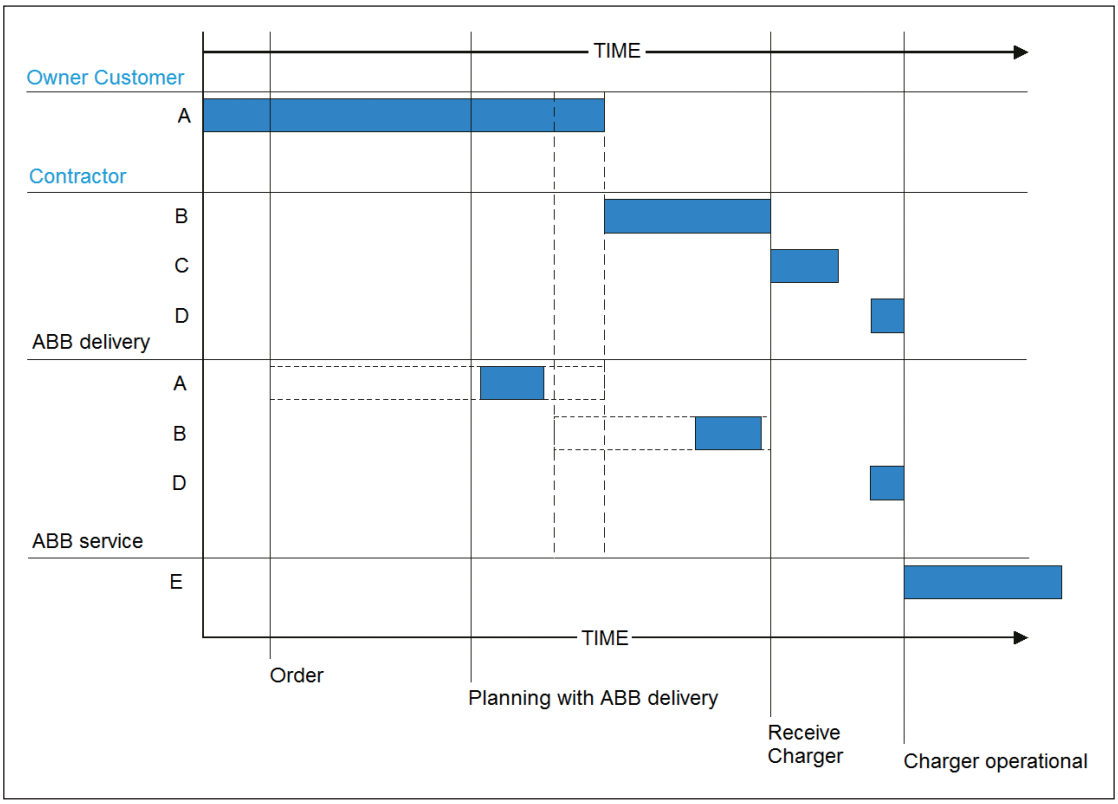
Cable length must be defined by the contractor performing installation during site survey.

Amount	Description
1 or 2(*)	OM3, PCF or fiberglass (multimode, 850 nm) optic cable with 4 fibers (2 for spare), with B-FCO(ST®) connectors. Example: Belden GOSN304 with prefabricated ST connectors.

(*) only for Dynamic DC charge systems

2.3 Project planning

Careful project planning is necessary before a PowerChoice 350 is purchased and put into operation. The different phases of the full project plan are shown in the figure below:



A. Preparation

The owner / site operator has ordered a PowerChoice 350. In this phase all preparation work must be done before the contractor can do the civil and electrical works. See About preparation on Page 19.

B. Construction

The contractor does all civil and electrical works. See About construction on Page 30.

C. Placement and Connection

The location is mechanically and electrically ready to receive the PowerChoice 350. See About placement and connection on Page 36.

D. Commissioning

The delivery department will bring the PowerChoice 350 into operation. See Commissioning preparation on Page 81.

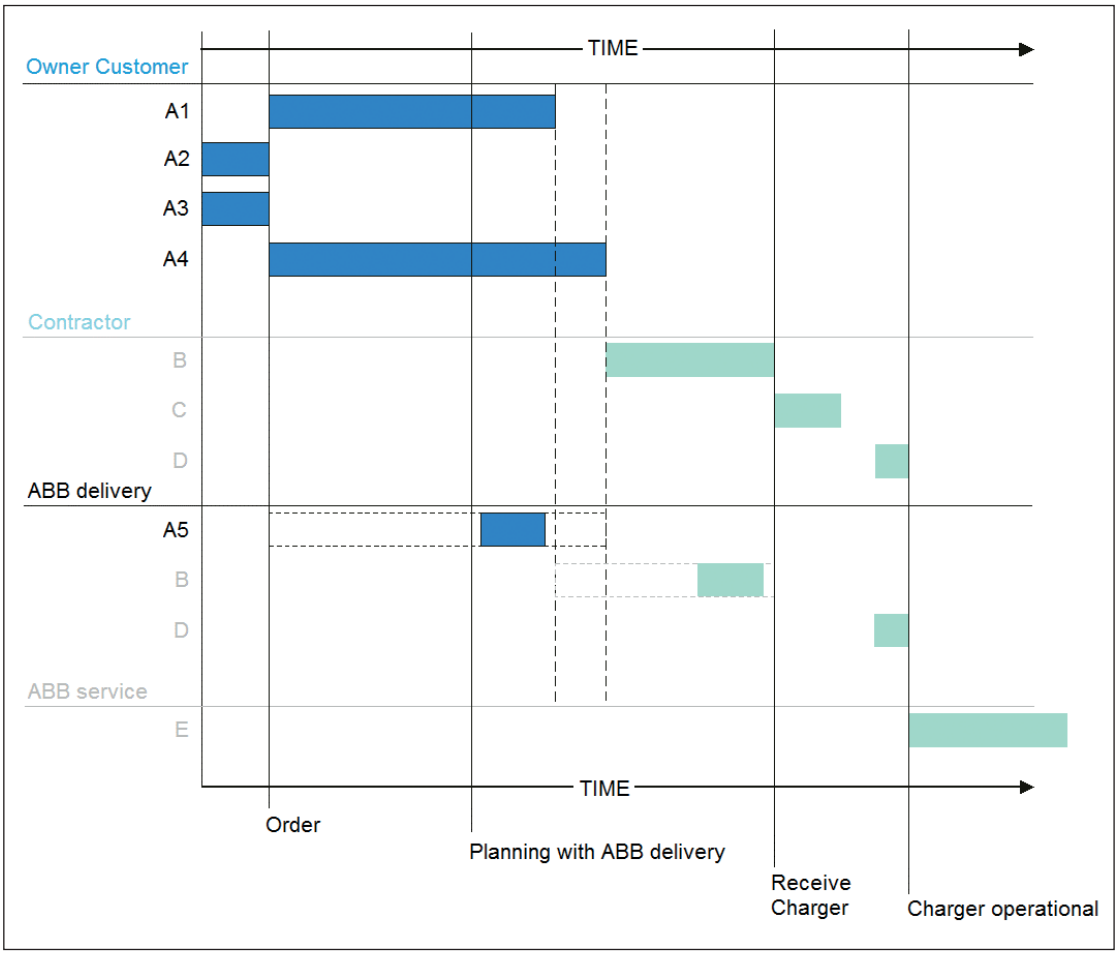
E. Service and Maintenance

The PowerChoice 350 is in operation. There are various options for service and maintenance. See About Service and Maintenance on Page 83.

3. Preparation

3.1 About preparation

The planning steps for the preparation phase are shown in the figure below:



A1 Ordering

Order the PowerChoice 350.

A2 Engineering

The owner / site operator selects a contractor to do the civil and electrical installation work.

The contractor is responsible for all construction documentation of the site, among other things: drawings, calculations, certifications, licenses and test reports.

The location of the PowerChoice 350 must be chosen. See section Location on Page 21 and section Geometry of infrastructure on Page 21.

A3 Get permits

Take care of all permits and local regulations. See section Permits on Page 20.

A4 Upgrade grid

If required, upgrade the electrical grid connection to 3-phase 400 V AC. See section Upgrade grid on Page 21.

A5 Transport foundation(s) on request

If it is necessary to order the foundation(s), the transport of the foundation(s) must be arranged with the PACCAR Delivery department. See Contact information on Page 12 for contact details.

NOTICE

It can take a long time to get the necessary permits and to upgrade the electrical grid. Make sure the plan includes the possibility for these delays.

3.2 Permits

The installation of a PowerChoice 350 will require a number of permits, depending on national and local laws. This section lists a number of points of attention.

3.2.1 Power connection

The PowerChoice 350 requires high current connections. A normal domestic or small business power connection is not sufficient.

Measure, check and report the position of the cables between the power distribution board and the Power Cabinet and the cables between the Power Cabinet and the Charge Post.

Contact your electricity retailer and/or grid owner if a grid update is required. Ask about the work that is needed to upgrade the connection to meet the requirements described in section Electrical installation on Page 25.

3.2.2 Construction permit

The installation of the PowerChoice 350 requires the following construction work:

- A solid base.
- Cable conduits for cables between the power distribution board and the Power Cabinet. Usually these cable conduits are installed below ground.
- Cable conduits for cables between the Power Cabinet and Charge Post.
- Parking spaces for the vehicle.

Contact your local government to obtain information about the necessary permits.

3.2.3 Parking permit

Make sure that it is permitted to park vehicles at the charging location.

3.2.4 Internet access

The PowerChoice 350 requires a connection to the internet. This connection is used for serviceability, remote access by PACCAR Service department and operator backend communication.

There are two options for the internet connection:

- Wireless, which requires coverage to a 3G network at the location. This is the preferred connection. A 3G modem with active SIM card is included with the PowerChoice 350 as standard part (a customer SIM card is not required).
- Ethernet (RJ45). If there is no 3G signal available or site-level communication modem is defined, a wired internet connection must be available at the location. For this option, contact PACCAR Sales department (see Contact information on Page 12 for contact details).

3.3 Upgrade grid

The PowerChoice 350 can be connected directly to the electrical grid or to an existing customer low voltage power distribution cabinet. In both cases a 277 A, 400 V AC, 50 Hz, 3P+PE connection to each Power Cabinet is necessary that meets the following requirements:

- Fuse (gG type) 3 x 315 A AC or 3 Phase 320 A AC circuit breaker.
- Main switch.
- PE connected to the main PE rail.
- The components used in the PowerChoice 350 are suited for a short circuit capacity of 25 kA.
- A TN-C earthing system. Possibly an extra 0.9 Ω earth electrode is required, consult the grid owner.
- EMC emission: The charge post complies with IEC 61000-6-3 Class B (residential). The power cabinet complies with Class A (industrial). If required an external Schaffner type FN 3359HV-400-99 EMC filter can be installed to make the power cabinet comply with Class B (residential).
- Specifications of the following parts must be determined by your electrical engineer. They depend on local laws, safety and electrical regulations:
  - Adjustable RCD in the range of 30 mA up to 300 mA. The Power Cabinet has an integrated 100 mA RCD (Type A) for the power section.
  - Class 1 Surge Protection Device (SPD).

3.4 Location

The location of the PowerChoice 350 must meet the following requirements:

- The height is not more than 2500 m above sea level.
- The PowerChoice 350 must not be immersed in water, or any other fluid.
- The operational temperature of the PowerChoice 350 is between -35 and 45 °C.
  - For locations where the PowerChoice 350 will be exposed to direct sunlight and high ambient temperatures for most of the day, it is recommended to install protection from direct sunlight. Otherwise the temperature inside the cabinet might exceed the maximum temperature.
- Do not install or use the PowerChoice 350 in areas where there is an explosion hazard. You must provide information about the PowerChoice 350 to the fire brigade.
- The protection rating of the housing of the Power Cabinet and Charge Post is IP54 and designed for outdoor use.

3.5 Geometry of infrastructure

3.5.1 Required space for the PowerChoice 350

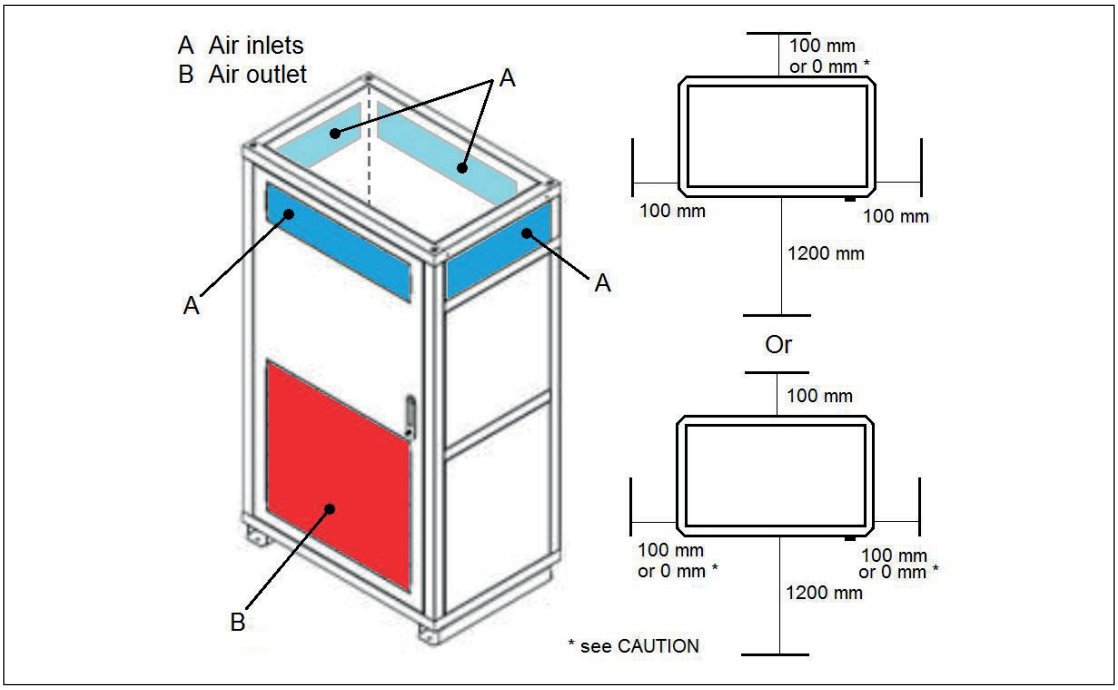
A single PowerChoice 350 requires a minimum space of 1170 x 2070 mm (W x D) or 1370 x 1970 mm (W x D). This space is calculated as follows:

- A cabinet footprint of 1170 x 770 mm.
- The following minimum free space around the cabinet:
  - 100 mm at the rear side or 0 mm at the rear side when both left and right side have a minimum free space of 100 mm.
  - 100 mm or 0 mm at the left side, if a second PowerChoice 350 is placed next to it.
  - 100 mm or 0 mm at the right side, if a second PowerChoice 350 is placed next to it.
  - 1200 mm at the front side in order to open the front door. If the cabinet is placed inside a room, consider extra free space in front of the open door (escape way for service people).

CAUTION

The cabinet needs at least the opening area of the front and rear side with a minimum free distance of 100 mm. This means that cabinets can stand in a row with one or both side entries blocked (distance on left/right side is 0 mm).

It is also possible that the cabinet can stand back to back (distance on the rear side is 0 mm). In this case both side entries must have a minimum free distance of 100 mm. If this is not the case, then the air supply is not sufficient.



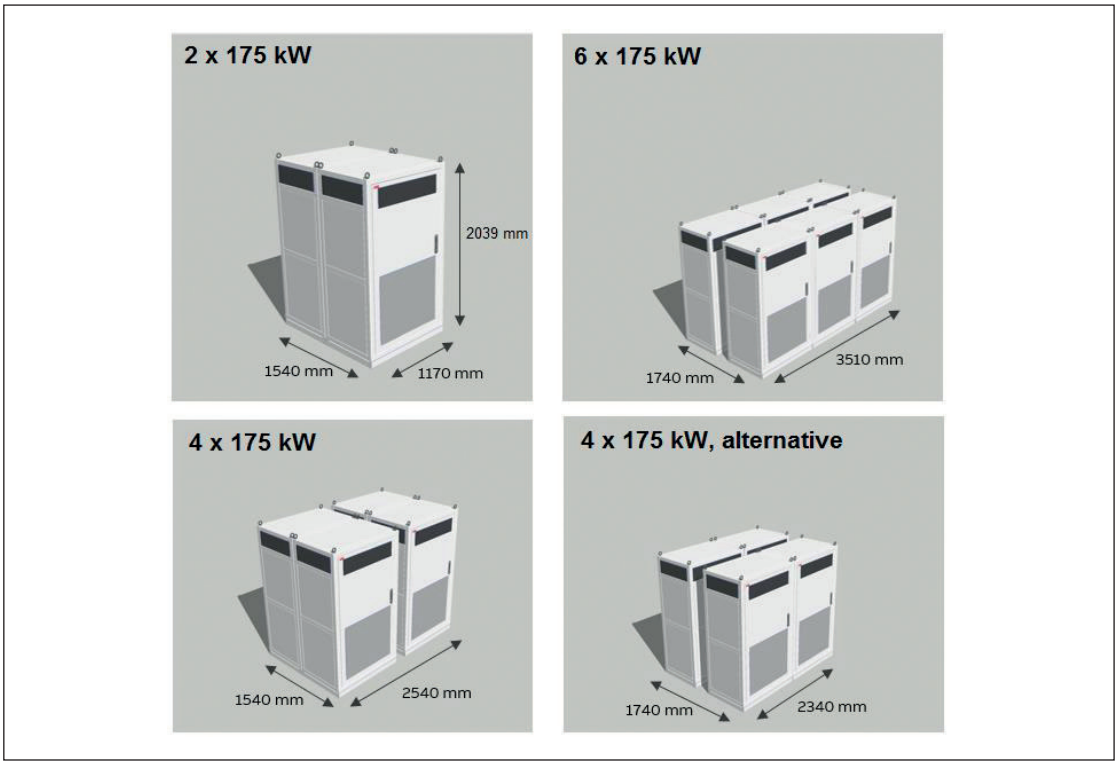
The PowerChoice 350 has air inlets (A) on all sides and air outlet (B) on the front to control the temperature inside the cabinet. Do not install any objects near these air inlets and outlets (see also Caution above). If necessary, take precautions to prevent snow, sand or dust from blocking the inlets and outlets.

Specifications for inside installation of the Power Cabinet

- Airflow required for one cabinet = 1450 m^3/h.
- Maximum allowed pressure drop = 300 Pa. If the pressure drop of the room is higher than 300 Pa an extra fan should be placed. Contact PACCAR Sales department (see Contact information on Page 13 for contact details).

3.5.2 Placement of multiple cabinets

There are some possible configurations for the placement of multiple Powerchoice 350 systems, see picture that follows.



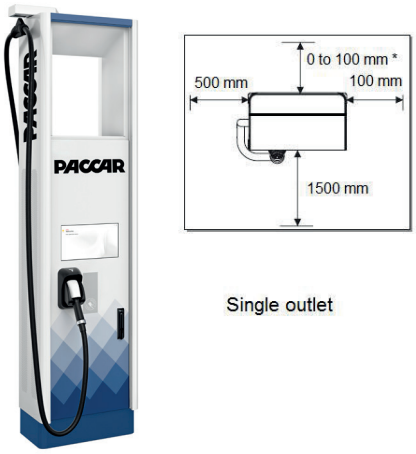
When placing multiple Powerchoice 350 systems, it is necessary to take the following into account:

- Cabinets can be placed side-by-side;
- Cabinets can be placed back-to-back with 200 mm distance (2x 100 mm) or when the sides are free with 0 mm distance;
- Door on front side must be kept accessible (recommended 1200 mm);
- See also Required space for the Power Cabinet on Page 21.

3.5.3 Required space for the Charge Post

The Charge Post requires a minimum space of 1620 x 1940 mm (W x D) for a dual outlet or 1220 x 1940 (W x D) for a single outlet. This space is calculated as follows:

- A cabinet footprint of 620 x 440 mm.
- The following free space:
  - 0 mm to 100 mm (recommended) at the rear side when the Charge Post is in front of a wall.
  - 500 mm at the left and right side (free space needed for the DC charge cables).
  - 1500 mm at the front side in order to open the door (escape way for service people).

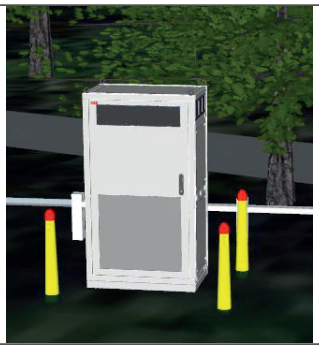


Single outlet

* when placed in front of a wall, recommended to keep 100 mm of space.

3.5.4 Recommendations

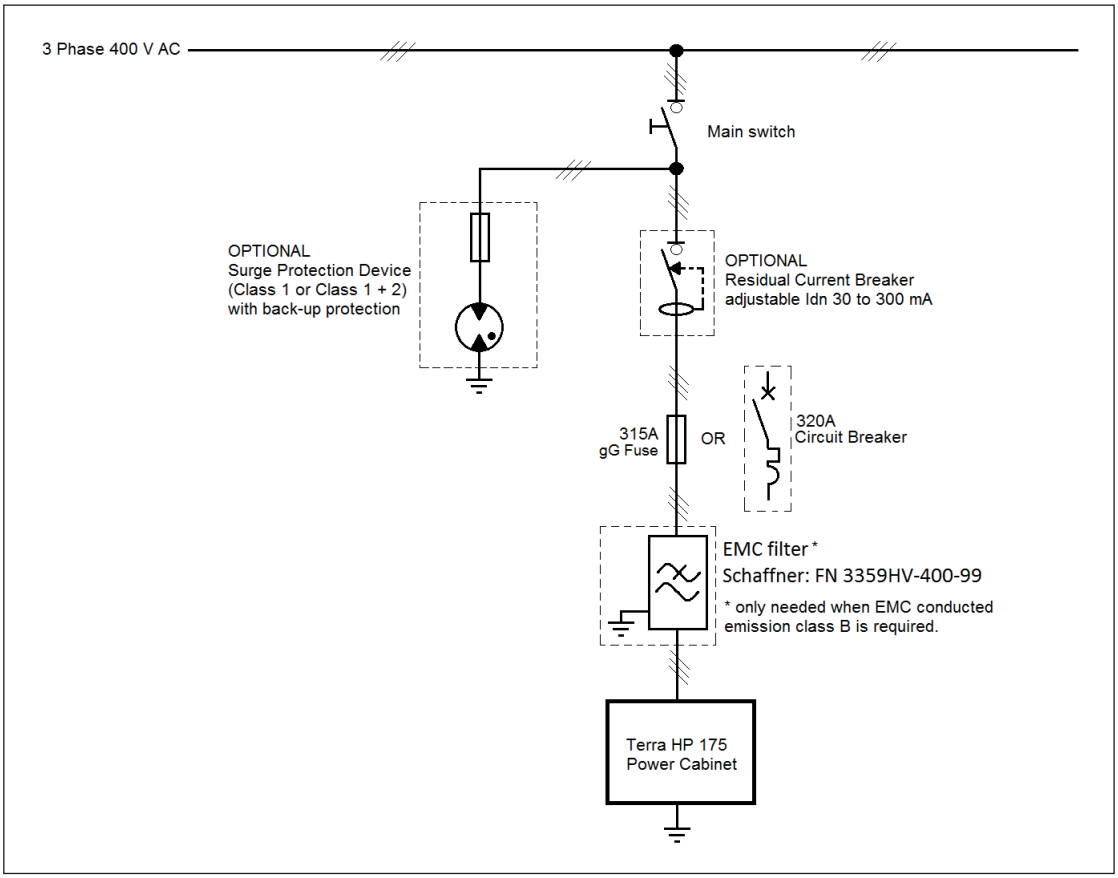
- Use road signs and/or special markings to indicate that the parking space is used to charge an electric vehicle and not for normal parking.
- Install the Charge Post at a level that is raised approximately 15 mm above the parking space to prevent the base of the Charge Post being flooded.
- Install the Charge Post on a slope that is able to drain the water away from the Charge Post.
- Design the layout of the parking space for easy access to the DC cable. Electric vehicles have their own charging connector at the front or at one of the rear corners. Make sure that the DC cable can reach all possible positions.
- To provide a secure comfortable environment for users and to prevent vandalism and/or theft:
  - Install the PowerChoice 350 at a location where it can be clearly seen and/or monitored.
  - Use 24/7 security control.
  - Install sufficient lighting around the PowerChoice 350.
- Install barriers or posts (for example, there can be installed bollards, see picture below as example) around the Power Cabinet and/or between the Charge Post and the parking space or increase the height of the pavement to give extra protection against collision.



3.6 Electrical engineering

3.6.1 Electrical installation

The electrical installation must be completed according to the local safety and electrical regulations and laws. See section Upgrade grid on Page 21 for the requirements of the electrical connection. A one line diagram for the electrical connection to one PowerChoice 350 is shown in the figure that follows.
The diameter of the electrical conductor (maximum cross section is 240 mm^2) in the AC power cable depends on the length and method of installation. This must be determined by your contractor.

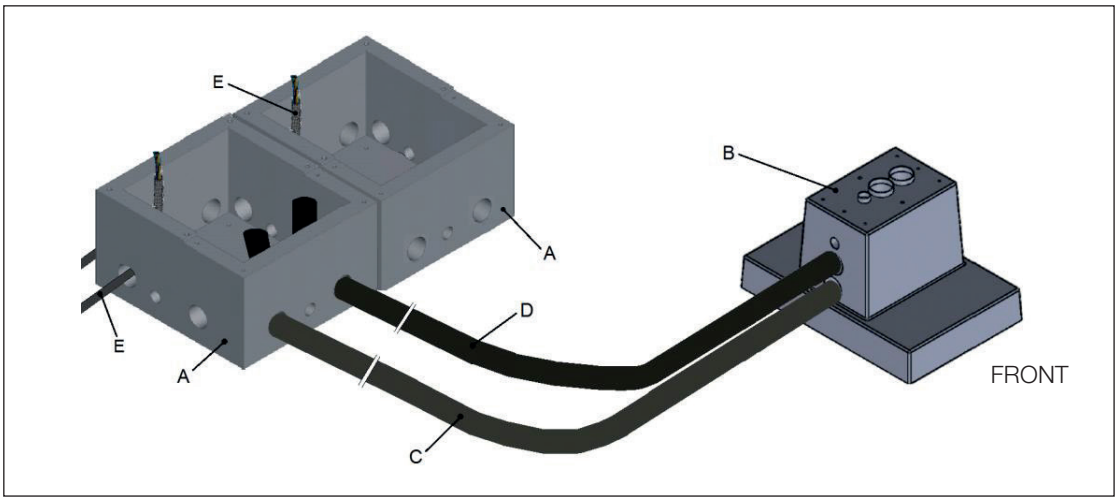


3.7 Civil installation

DC power cables, AC utility power cable, PE wire and data cables must be routed between the Power Cabinet and the Charge Post. Therefore two flexible cable conduits with an outer diameter of 125 mm must be installed between the foundation of the Power Cabinet and the foundation of the Charge Post. The DC power cables must be installed in separate cable conduit with respect to the AC utility power cable, PE wire and data cables. The maximum length of the cables between the Power Cabinet and the Charge Post is 60 m. Both conduits must be at least 600 mm deep in the ground.
The AC power cable from the distribution board can also be installed in a cable conduit (is not mandatory).

NOTICE

It is recommended to place an extra flexible cable conduit with an outer diameter of 40 mm in the cable conduit intended for the AC utility power cable, PE wire and data cables. This extra cable conduit is meant for the glass fiber cable.



Example of civil installation for the HP 350 Charger

A Foundation of Power Cabinet
B Foundation of Charge Post
C Flexible conduit for DC power cables
D Flexible conduit for AC utility power, GND wire and data cables
E AC power cable

NOTICE
Document the location of all the cables in the ground between the Power Cabinet and the Charge Post. The routing of the cables can be found easily in the future, for example, to prevent damage by excavation work.

3.8 Lightning protection

One electrode (ground rod) of maximum 10 Ω must be placed in to the earth near the Power Cabinet foundation. In some cases also additional grounding is required at the Charge Post side. This is dependent on the local regulations and should be determined by the contractor.
If the grid is TT based, consult the grid owner. It is possible that an extra 0.9 Ω electrode will be required. This requirement must be determined by the contractor.
Consult a local specialist for the options of lightning protection. The Power Cabinet has to be within the protection angle of the lightning distraction. This requirement must be determined by the owner and a local specialist (according to NEN-EN-IEC 62305).
The implementation of the lightning protection depends on the local laws, safety and electrical regulations. This requirement must be determined by the contractor and owner of the site / PowerChoice 350.

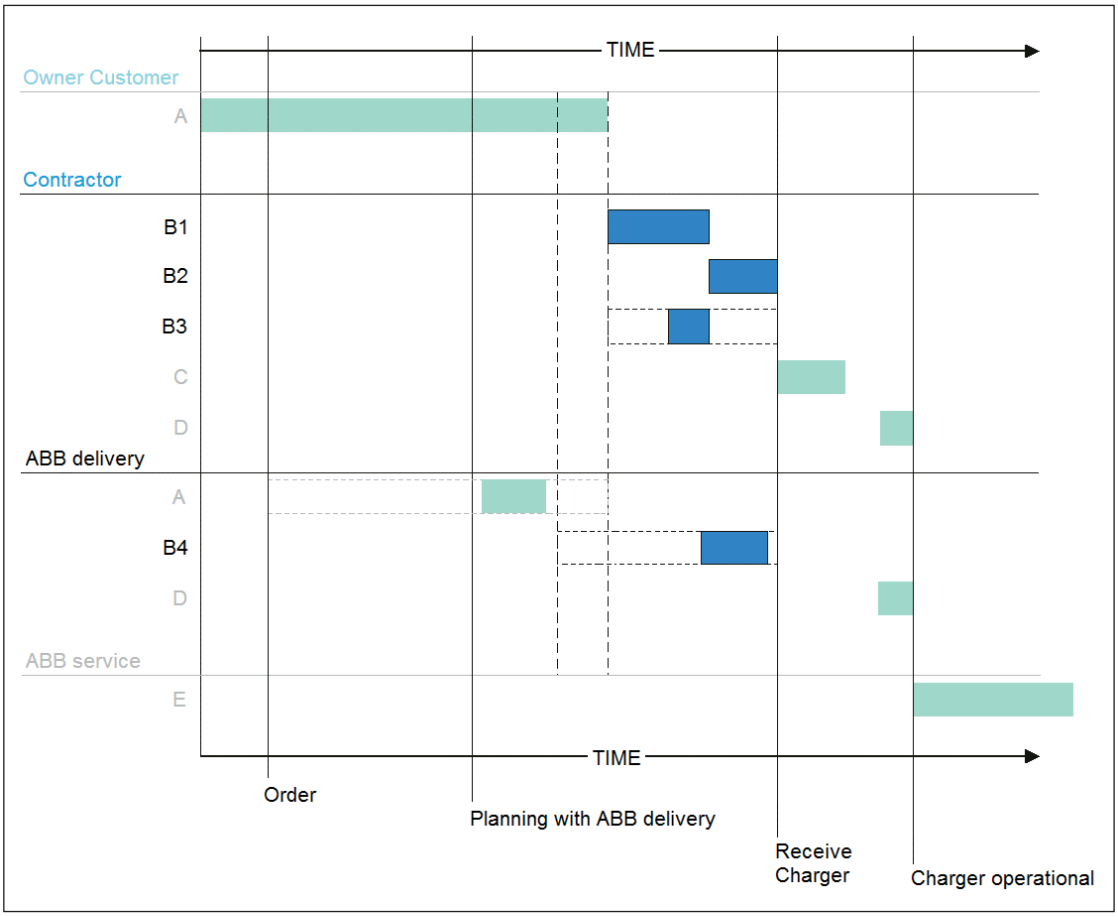
4. Construction

4.1 About construction

The construction phase includes all work required to prepare the location and make it ready for the placement and connection of the PowerChoice 350. The construction phase can start when:

- All engineering work is done.
- All permits are granted.
- The grid connection is available.

The planning steps for the construction phase are shown in the figure below:



B1 Civil engineering works

Construction of the foundation. See section Construct foundation of the Power Cabinet on Page 28 and section Construct foundation of the Charge Post on Page 31. Installation of the cables. See section Cabling on Page 33. Construction of the parking spaces. See section Geometry of infrastructure on Page 21.

B2 Electrical engineering works

See section Electrical engineering on Page 25 and section Upgrade grid on Page 21.

B3 Internet access (optional)

This step can be ignored if the location has sufficient 3G coverage. Otherwise an Ethernet (RJ45) connection has to be installed. See section Internet connection on Page 37.

B4 Transport

Arrangement for the delivery of the PowerChoice 350 with the PACCAR Delivery department. See Contact information on Page 12 for contact details. The delivery time is at least four months.

4.2 Construct foundation of the Power Cabinet

4.2.1 Options

Use the correct foundation for the type of surface that the Power Cabinet will be installed on:

- **Soil**

  Use a concrete foundation to get a firm fixation on soil.

  A concrete foundation can be ordered separately. See section Accessories on Page 16. For detail drawings see Appendix D Dimensions concrete foundation Power Cabinet.

- **Solid floor**

  1. Use a metal frame foundation to guide the cables from the cabinet to the cable duct. This foundation can be ordered separately. See section Accessories on Page 16. For detail drawings see Appendix E Dimensions metal frame foundation Power Cabinet.
  2. The Power Cabinet is installed directly on a solid floor, through which the floor is accessible from below (related to the feed through of the cables). For detail drawings see Appendix A Dimensions Power Cabinet.

The cables must be embedded in the ground within cable conduits. See section Cabling on Page 33 and section Civil installation on Page 25.

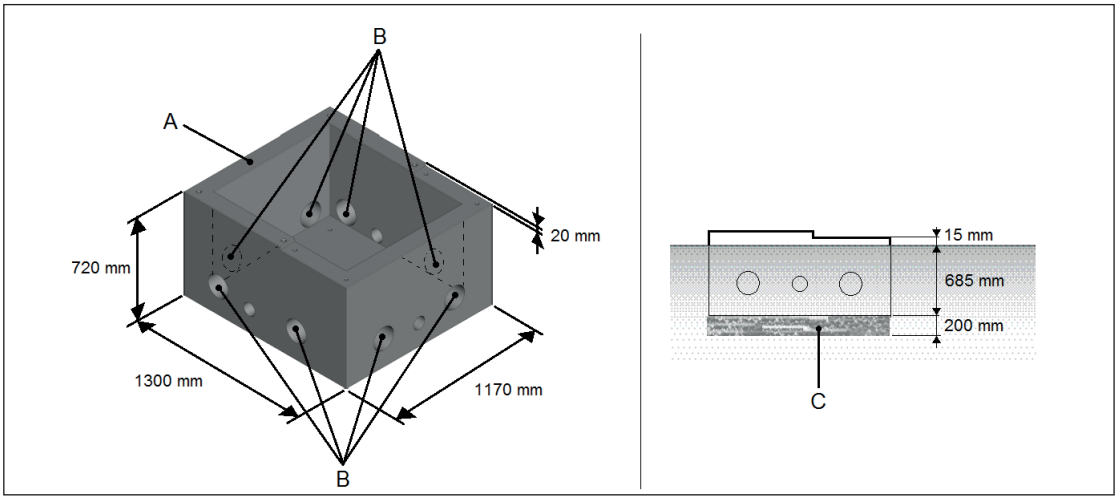
NOTICE

It is advised to install traction wires into the conduits to install the electrical cabling afterwards.

NOTICE

Be aware of the bending radius of the AC power input cables when using the metal frame foundation. This metal frame foundation has a height of 180 mm.

4.2.2 Workflow with concrete foundation



WARNING

Make sure that personnel cannot be crushed or become trapped while moving the foundation. Be aware that the weight of the concrete foundation is about 1300 kg.

CAUTION

Before you lower the foundation, remove sharp edges of the cable holes (B) in the foundation to protect the cables.

1. Make a hole in the ground with at least a minimum depth of 885 mm, shown in the figure above.
2. Fill the hole with (minimum) 200 mm lean concrete (C), see figure above.
3. Make sure that the conduits are routed to one of the indicated positions (B). The conduits must come out of the foundation with a length of about 250 mm.
4. Make sure that the AC power cable is routed to one of the indicated positions (B).
5. Lower the foundation (A) into the hole.
6. Make sure that the front top surface of the foundation is at least 15 mm above ground level (see figure above).
7. Make sure that the top surface of the foundation is leveled.
8. Route the conduits through one of the eight holes (B).

NOTICE

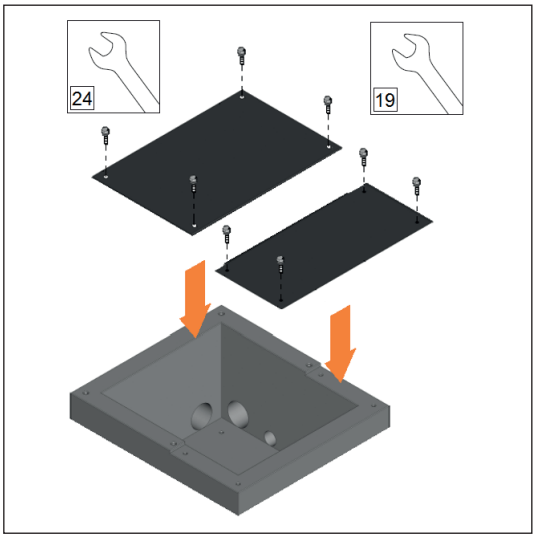
Make sure that the end of the cable conduits are 300 to 500 mm above the top of the foundation.

9. The conduits must be installed with a curve inside the foundation in order to prevent that water from entering the conduits, and seal the space between the conduits and all open holes.
10. Route the AC power cable through one of the eight holes (B). Make sure that a cable length of 1000 mm is available above the surface of the foundation for internal routing in the cabinet.

NOTICE

This extra cable length is required to connect the AC power cable with the connectors in the Power Cabinet without problems.

11. Place both cover plates on the appropriate place on the foundation.

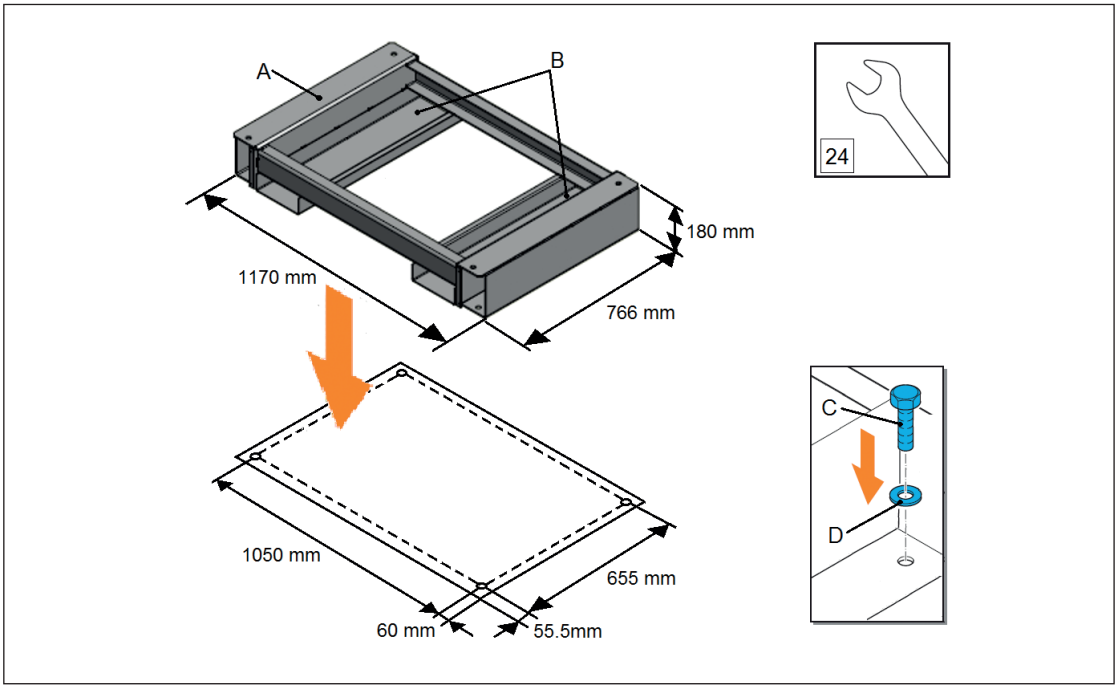


12. Secure the top cover plate with M16 bolts (4x) and the front cover plate with M12 bolts (4x).

WARNING

These cover plates are required to prevent people from falling into the foundation.

4.2.3 Workflow with metal frame foundation



1. Place the frame (A) in the desired position and mark the position of the holes for drilling.

NOTICE

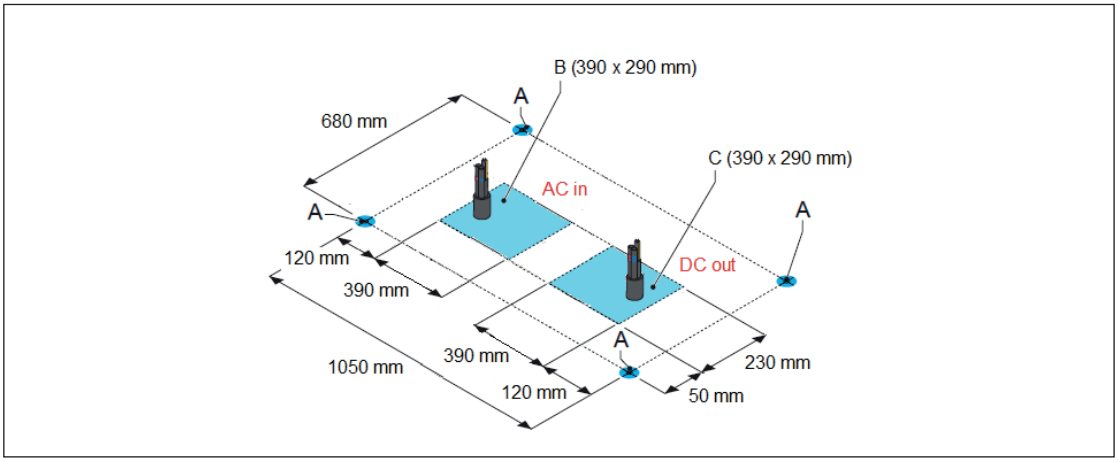
The hole distance of 655mm on either side of the metal frame foundation is not equal to the hole distance (680 mm) from the Powerchoice 350 cabinet. See also the mechanical drawing in Appendix A Dimensions Power Cabinet on Page 88.

2. Remove the frame.
3. Drill and tap holes at the marked positions. The holes must be suitable for bolt size M16.
4. Route the cables tray through one of the cable openings (B).
5. Align the frame (A) with the tapped holes.
6. Insert the bolts (C) fitted with the washers (D) into the holes (4x).
7. Tighten the bolts.
8. Route the AC power cable through the left cable opening (B). Make sure that a cable length of 1000 mm is available above the floor for internal routing in the cabinet.

NOTICE

This extra cable length is required to connect the AC power cable with the connectors in the Power Cabinet without problems.

4.2.4 Workflow mounting Power Cabinet direct on a floor (footprint)



1. Drill and tap holes in the floor at the indicated positions (A). The holes must be suitable for bolt size M16.
2. Make rectangular holes on the indicated positions (B) and (C). For detail drawings bottom view of Power Cabinet see Appendix A Dimensions Power Cabinet.
3. Make sure that the AC power cable and other cables comes out of the floor within the marked area (B).
4. Make sure that the DC power cables come out of the floor within the marked areas (C).
5. For the AC and DC power cable, make sure that a cable length of 1 m is available above the floor for internal routing in the cabinet.
6. For the other cables, make sure that a cable length of 3 m is available above the floor for internal routing in the cabinet.

NOTICE

This extra cable length is required to connect the cables with the connectors in the Power Cabinet without problems.

NOTICE

To prevent dust from entering the tapped holes, it is recommended that you cover them until you are ready to do the placement.

4.3 Construct foundation of the Charge Post

4.3.1 Options

Use the correct foundation for the type of surface that the Charge Post will be installed on:

- Soil
  Use a concrete foundation to get a firm fixation on soil. A concrete foundation can be ordered separately. See section Accessories on Page 16. For detail drawings see Appendix E Dimensions concrete foundation Charge Post.
- Custom built
  The construction of the foundation is custom built.

The cables must be embedded in the ground with cable conduits. See section Cabling on Page 33 and section Civil installation on Page 25.

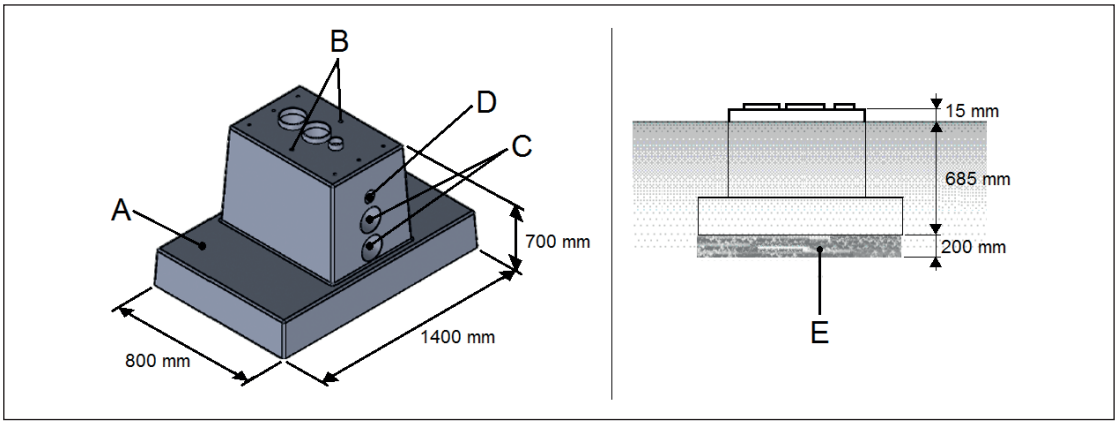
4.3.2 Workflow with concrete foundation

WARNING

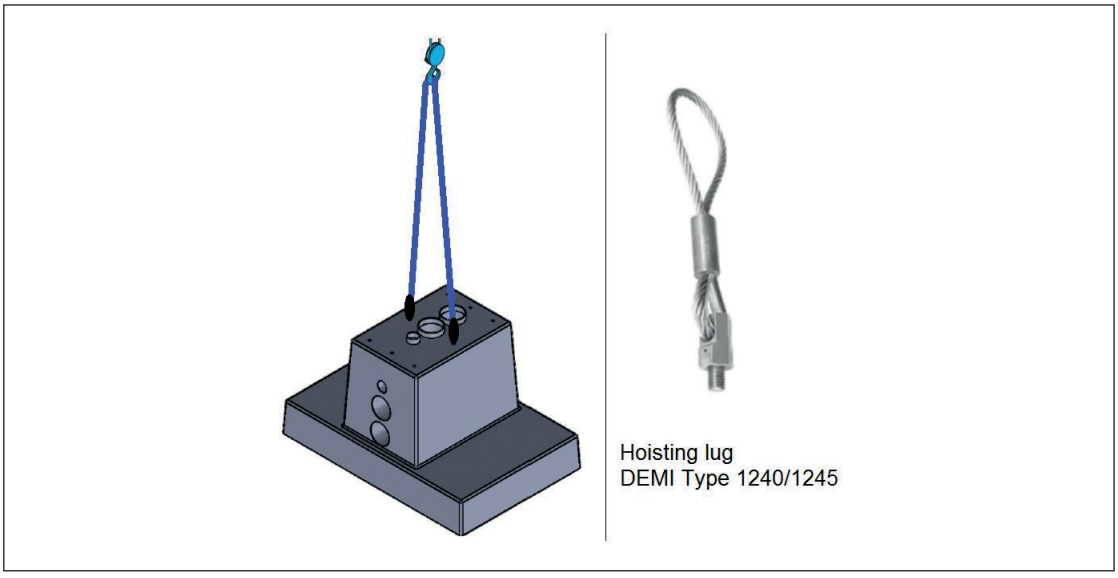
Make sure that personnel cannot be crushed or become trapped while moving the foundation. Be aware that the weight of the concrete foundation is about 980 kg.

CAUTION

Before you lower the foundation, remove sharp edges of the cable holes (C) in the foundation to protect the cables.



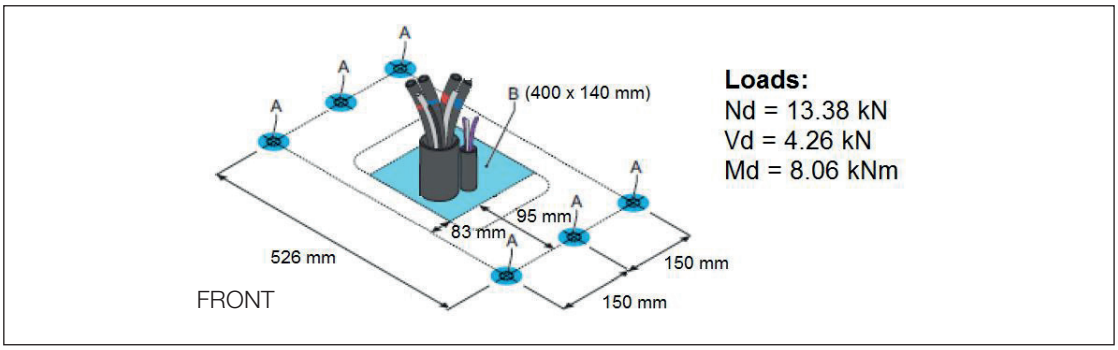
1. Make a hole in the ground with at least the minimum depth of 885 mm as shown in the figure above.
2. Fill the hole with (minimum) 200 mm lean concrete (E), see figure above.
3. Make sure that the conduits are routed to the indicated positions (C).



4. There are two DMEU anchors (B) in the foundation (A). Hoist the foundation by using two DEMI type 1240/1245 (with hairpins Ø10) hoisting lugs. Use slings or chains to connect to the hoisting lugs, make sure they have sufficient capacity. The weight is 865 kg.
5. Lower the foundation (A) into the hole.
6. Make sure that the top surface of the foundation is at least 15 mm above ground level (see figure above).
7. Make sure that the top surface of the foundation is leveled.
8. Route the conduits through the two holes (C) and make sure that the conduits fit well into the holes of the foundation.

9. Seal the tubes into the holes.
10. Route the lighting protection cable (optional, see section Lightning protection on Page 26) through hole (D), when there is used a ground electrode near to the foundation.
11. Cover the pipes on top of the foundation to prevent water, sand and/or other material enetering the conduits.
12. Fill the remaining gap with sand in layers of 300 mm each. Between each layer the soil has to be compacted with an advised pressure of 5 MPa. This sequence has to be repeated until the gap is filled to 15 mm under the top of the concrete foundation.

4.3.3 Workflow with custom foundation (footprint)



1. Drill and tap holes in the floor at the indicated positions (A). The holes must be suitable for bolt size M12. For detail drawings bottom view of Charge Post position see Appendix B Dimensions Charge Post on Page 90.
2. Make sure that the cables come out of the floor within the marked area (B).
3. Make sure that a cable length of 1 m is available above the floor for internal routing in the cabinet.

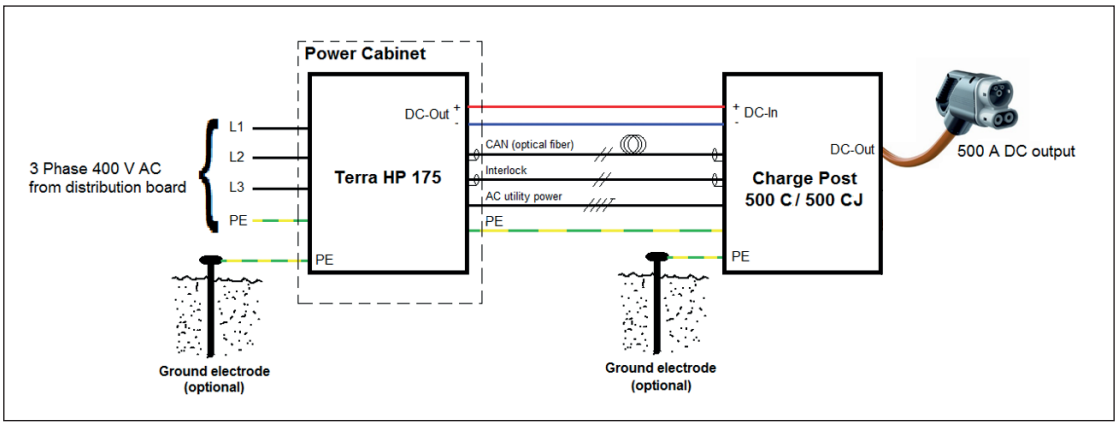
NOTICE

To prevent dust from collecting in the tapped holes, it is recommended that you cover them until you are ready to do the placement.

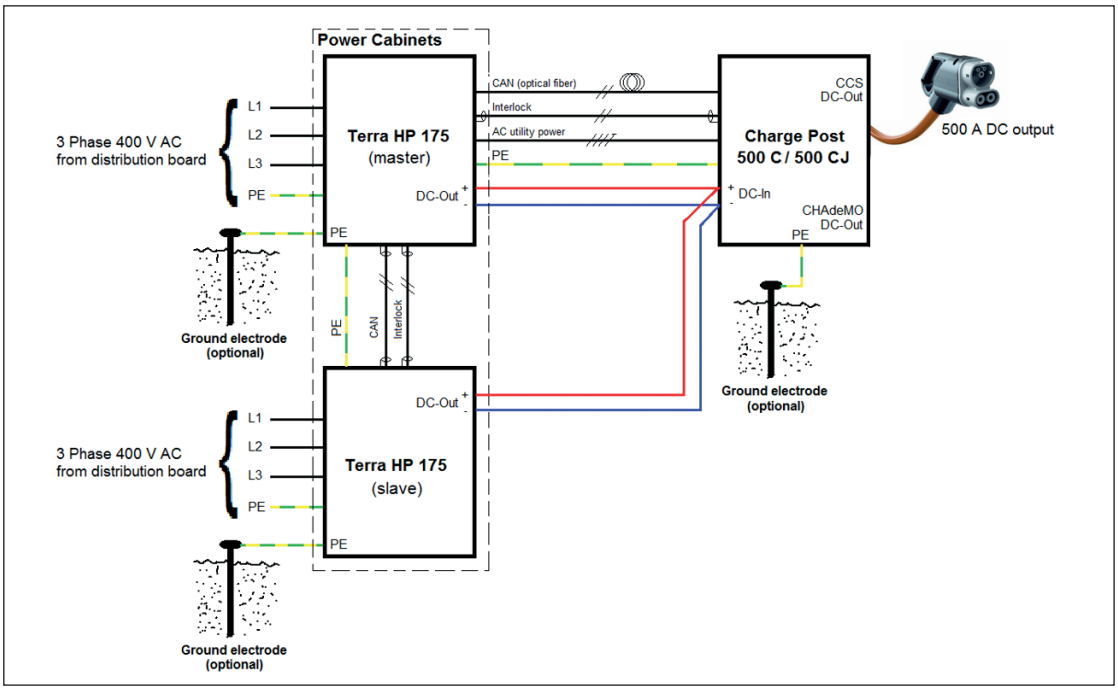
4.4 Cabling

4.4.1 Charge system configurations

There are various cabling solutions, depending on the installation situation and the cable types used.

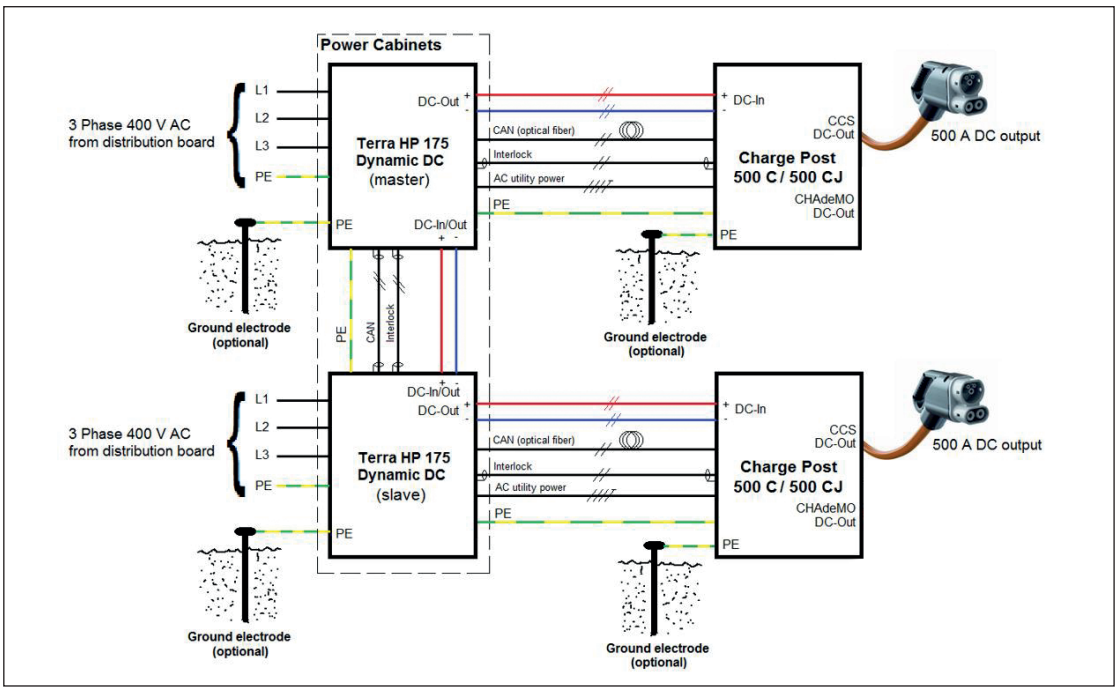


Overview electrical connections of a 175 kW charge system



Overview electrical connections of a 350 kW charge system

Note: “ Master” and “Slave” power cabinet is a configuration setting. Cabinets are identical. Appoint one cabinet to be the master cabinet.



Overview electrical connections of a 350 kW Dynamic DC charge system

Note: “ Master” and “Slave” power cabinet is a configuration setting. Cabinets are identical. Appoint one cabinet to be the master cabinet.

4.4.2 AC power cable

- Cable type: 3P+PE (optional shielded).
- The cable shielding (if present) must be attached to the PE Rail at both ends of the cable.
- The diameter of the cable conductor must be determined by your contractor.
- The maximum diameter of the cable conductor is 240 mm^2.
- The PE conductor of the power cable must have the same diameter as the phase conductors.

4.4.3 Cables between the Power Cabinet and the Charge Post

The following cables are not in the scope of supply of PACCAR.

- 2x or 4x DC power cables,
- 1x or 2x PE cable,
- 1x or 2x AC utility power cable,
- 1x Interlock cable,
- 1x or 2x communication glass fiber cable (consists of 4 fibers; 2 required, 2 spare).

Use local regulations and datasheet of the manufacturer to determine the cable diameter for the DC power cables:

- Recommended cable for a 350 kW system or a 175 kW system that might be upgraded to 350 kW is 185 mm^2 or 240 mm^2 (with a reinforced isolation > 5400 V DC, temperature rated 90 °C) for a maximum distance of 60 m.

4.4.4 Cables between Power Cabinets

The following cables (only needed for a charge system with multiply Power Cabinets) are not in the scope of supply of PACCAR. These can be ordered separately at an additional cost.

- 2x DC power cables (only needed for Dynamic DC charge systems),
- 1x PE cable,
- 1x Interlock cable,
- 1x CAN cable.

NOTICE

For detailed information about type of glass fiber cable which are needed, see Communication glass fiber cable on Page 17.

For the overview of the grounding of the system, see Appendix H Ground overview of the system on Page 99.

4.4.5 Cable specification list

Tables below provides general specifications for the needed cables. Use these tables to select cables, taking into account local installation conditions, cable length, cable temperature rating, losses and local regulations.

AC and DC power cables

Functional description	DC Power cable	PE cable	AC utility power cable
Number of cores	1	1	4
Cross section	185 – 300 mm^2	35 mm^2	2.5 mm^2
Min – Max external diameter to fit through gland	27 – 35 mm	13 – 21 mm	13 – 21 mm
Shielding	No	No	No
Conductor	Tinned copper or aluminum conductor, fine wire		
stranded acc. to VDE 0295 cl.5/IEC Cl.5	Fine strand copper wire acc. to VDE 0295 Cl. 5/ IEC 60228 Cl. 5	Bare copper, fine wired, bunch stranded acc. to VDE 0295 Cl.5/IEC Cl.5	
Insulation	Special rubber or PVC (outdoor use, UV-protected, oil resistant)	Special PVC (outdoor use, UV-protected, oil resistant)	Special PVC (outdoor use, UV-protected, oil resistant)
Nominal Voltage Uo/U	600/1000 Vac		
900/1500 Vdc	450/750 Vac	450/750 Vac	
Test Voltage	6 kV	4 kV	4 kV
Ambient Temperature range	-40ºC to 80ºC, permissible conductor operating		
temperature +90°C	-40ºC to 70ºC	-40ºC to 80ºC	
Core identification		gn/ye	Acc. to IEC 60446

Data cables

Functional description	Interlock cable	CAN cable	Ethernet (S/FTP, CAT6)
Number of (twisted) pairs	2 x 2	1 x 2	4 x 2
Cross section	0.75 – 2.5 mm^2	0.5 – 0.75 mm^2	0.25 – 0.75 mm^2
Min – Max external diameter to fit through gland	13 – 21 mm	inapplicable	13 – 21 mm
Shielding	Yes (tinned copper braid)	Yes (tinned copper braid)	Yes (tinned copper braid)
Conductor	Fine strand copper wire	Fine strand copper wire	Fine strand copper wire
Insulation	PVC or other material that can be used outdoor and are UV-protected	PVC or other material that can be used outdoor and are UV-protected	PVC or other material that can be used outdoor and are UV-protected
Characteristic impedance	120 Ω ± 10%	120 Ω ± 10%	100 Ω
Test Voltage	1.5 kV	1.5 kV	700 V
Ambient Temperature range	-40ºC to 70ºC	-40ºC to 70ºC	-40ºC to 70ºC
Core identification	Acc. to DIN 47100	Acc. to DIN 47100	TIA/EIA-568-B.1-2001 T568A

- Important: all cables must be resistant to being placed in the ground, submerged in conduit.
- All cables must have and isolation that are self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1-2.
- All cables must be corresponds to the VDE, CE and EAC Low Voltage Directive and must meet the RoHS compliance.
- To identify each cable it recommended to mark the cables every 2000 mm and at both ends.

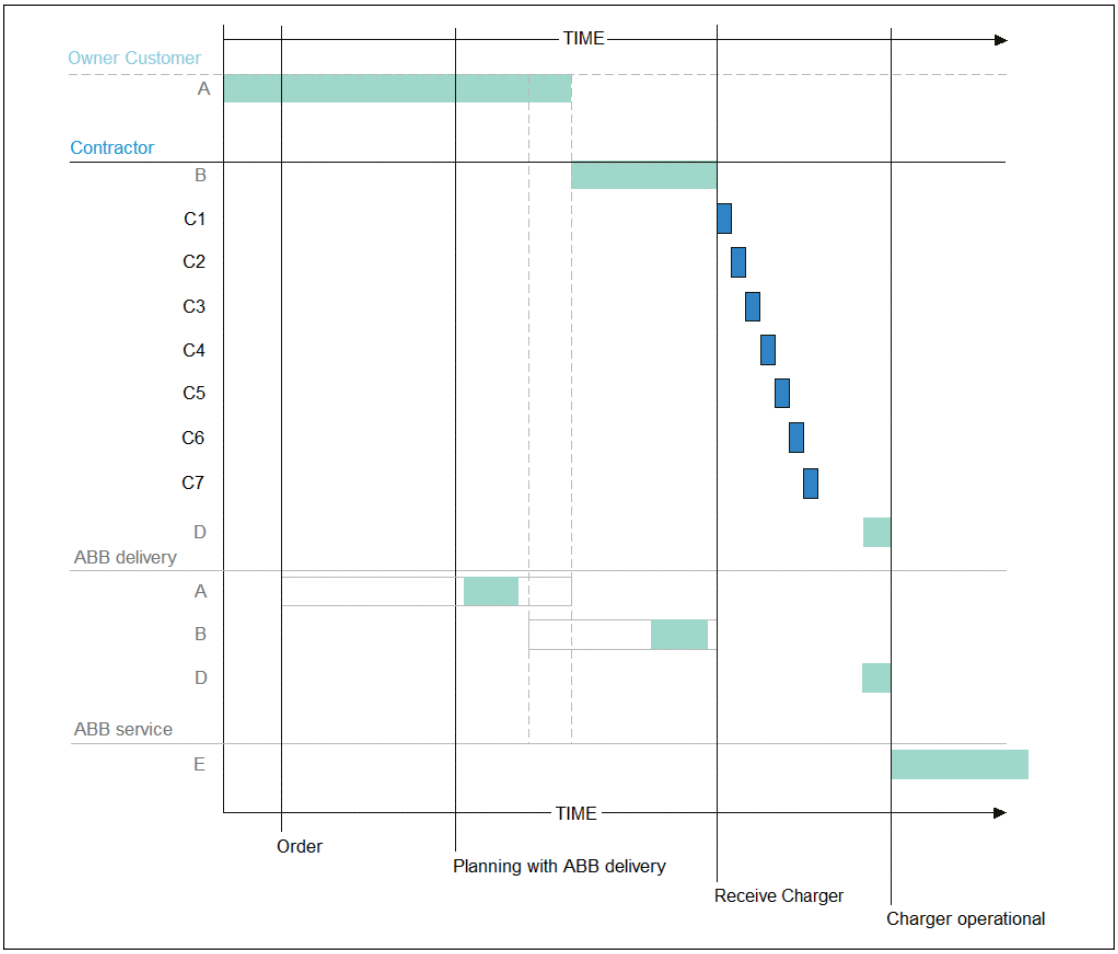
4.5 Internet connection

In most cases the integrated 3G modem is used for wireless internet access. A customer SIM card is not required. If there is no 3G signal available or centralized communication modem is used, a standard wired internet connection is required. For this option, contact PACCAR Sales department (see Contact information on Page 12 for contact details).

5. Placement and Connection

5.1 About placement and connection

When the construction phase is finished, the PowerChoice 350 can be placed and connected.
The planning steps for the placement and connection phase are shown in the figure below. Usually the procedure can be done within one day.



C1 Route the cables on Page 39.

C2 Unpack Power Cabinet on Page 44.

C3 Move Power Cabinet to position on Page 44 and Install Power Cabinet onto the foundation on Page 44.

C4 Connect the AC grid cable on Page 52, Connect the DC power cables Power Cabinet on Page 56, Connect AC utility power cable on Page 67 and Connect communication cables on Page 67.

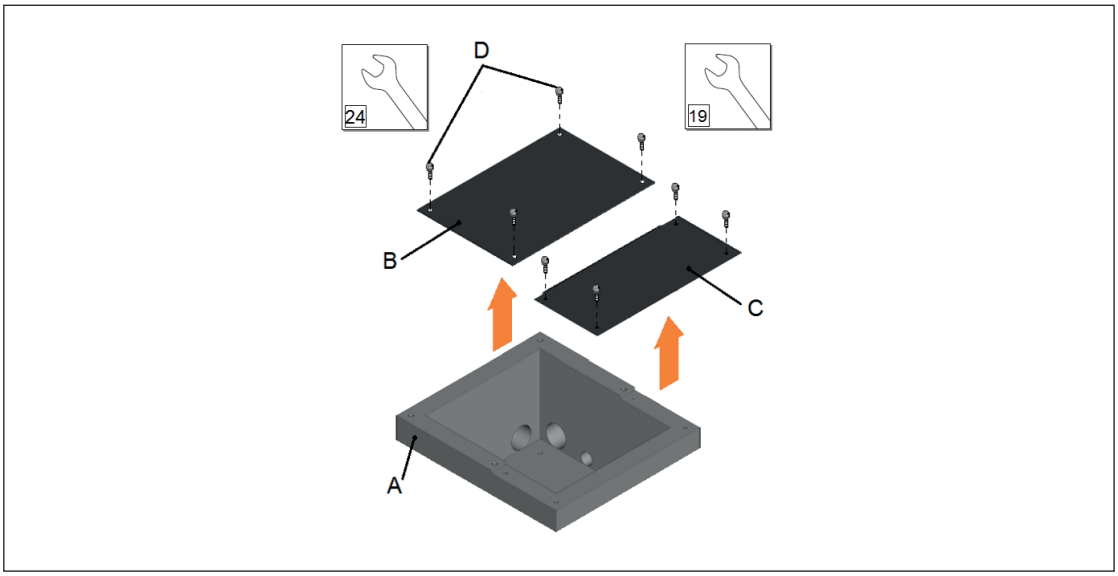
C5 Unpack the Charge Post on Page 38.

C6 Install Charge Post onto foundation on Page 70.

C7 Installation of the cables inside Charge Post on Page 73.

5.2 Route the cables

1. Unpack the cables. See Cabling on Page 33 for details which cables must be used.



2. Remove the top cover plate (B) and the front cover plate (C) from the foundation (A) by loosen the bolts (D).
3. Put the front cover plate (C) and its bolts (D) in a safe location as it will be installed again later on.

NOTICE

Step 2 and 3 are only applicable when the Power Cabinet is placed on a concrete foundation. The top cover plate is not needed any more after the cabinet is placed on the foundation.

4. Route the DC power cables through the 140 mm cable conduit.
5. Route the AC utility power, PE wire and Interlock cable through the other 140 mm cable conduit.
6. Route the communication glass fiber cable through the extra 40 mm cable conduit.

CAUTION

To prevent damage to the glass fiber optic cable, a minimum of two persons is required to route the glass fiber cable through the conduit. One person for pulling, the other person to guide the glass fiber cable.

Ensure that the glass fiber cable is carefully rolled out before it is pulled through the conduit, and do not use large traction forces, this can damage the glass fiber cable.

7. For the DC power cables, make sure that a cable length of 1000 mm is available above the surface for internal routing in the cabinet.
8. For the other cables, make sure that a cable length of 3000 mm is available above the surface for internal routing in the cabinet.

NOTICE

This extra cable length is required to connect the cables with the connectors in the Power Cabinet without problems.

5.3 Unpack Power Cabinet

5.3.1 Before unpacking

NOTICE

Unloading Power Cabinet

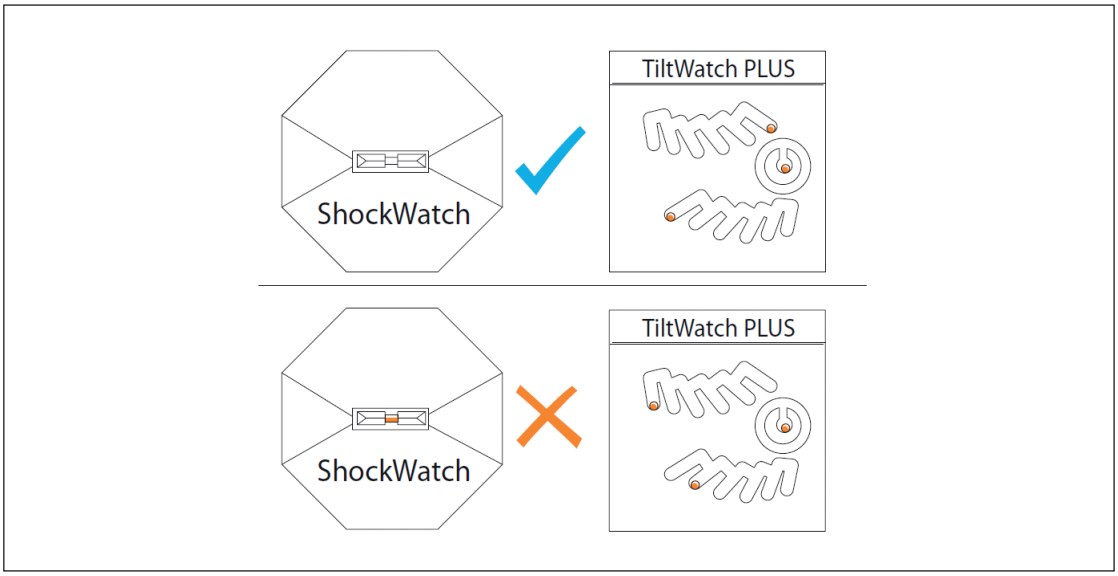
The delivery truck only unloads the pallet carrying the Power Cabinet. The delivery truck will not move the Power Cabinet to its final location. The placement of the Power Cabinet to its final location is the responsibility of the contractor. Upon request it is possible to order a truck with a crane.

WARNING

Do not pollute the environment with plastic and cardboard packing. Depollute these things according the regional applicable regulations as well as environment-friendly.

Preconditions:

- All construction work is completed.
- The product is delivered by a transport company at the confirmed date of delivery.

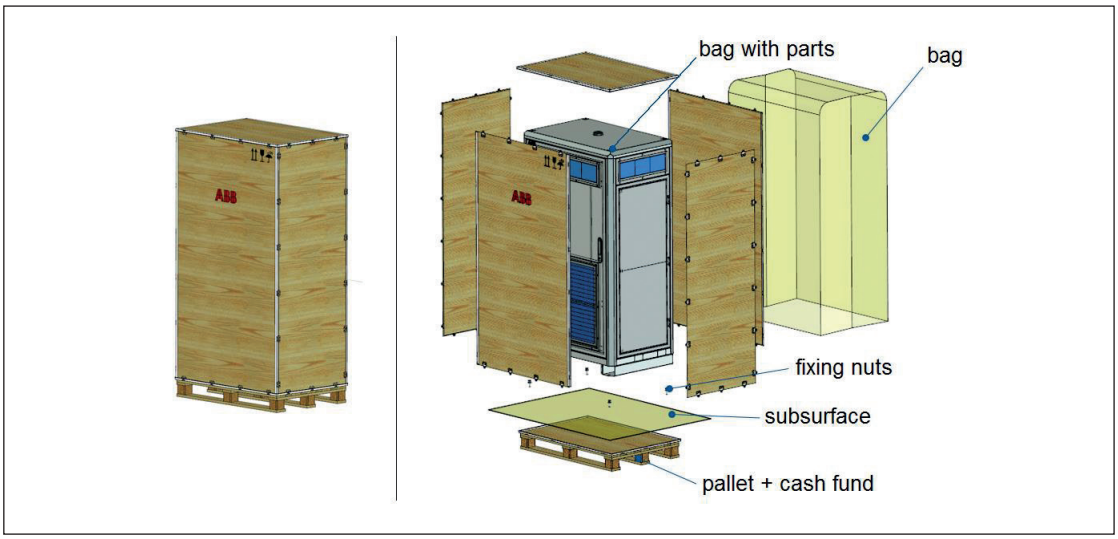


1. Make sure that the Power Cabinet has not been shaken or tilted over 30°.

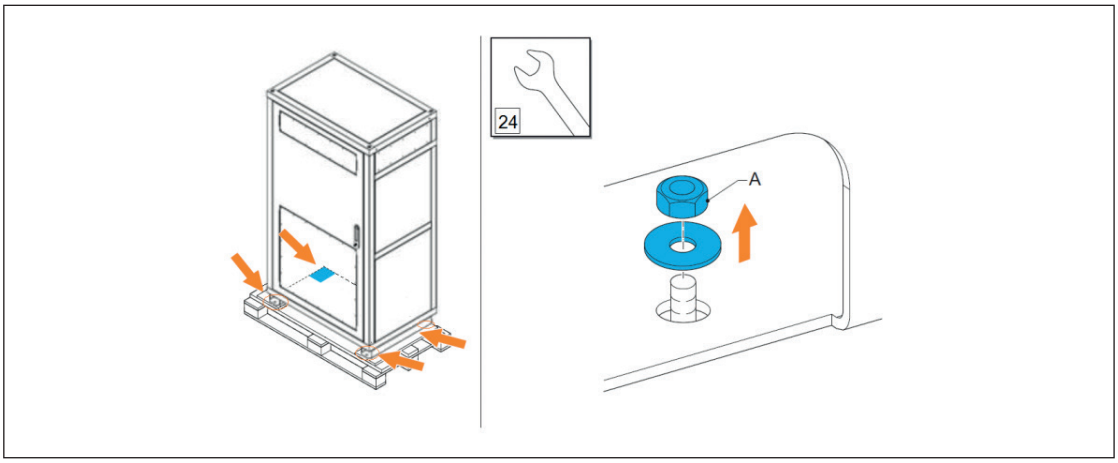
5.3.2 Remove packaging

Preconditions

- Tools: spanner (size 24).



1. Remove the packaging material from the Power Cabinet.
2. Remove the bag which contain the keys, cover caps and mounting material that are attached with tape on one of the lifting eyebolt at the top of the cabinet.
3. Keep this bag with parts in a safe place.



4. Remove the nuts (A) at the four corners.

5.4 Move Power Cabinet to position

There are two options to move the Power Cabinet from the delivery truck to the location.

- Use a hoist to lift the cabinet from the top. See Move cabinet with a hoist on Page 42.
- Use a forklift truck to lift the cabinet from the bottom. See Move cabinet with a forklift truck on Page 43.

Preconditions:

- All packaging material is removed from the Power Cabinet.
- The two cover plates are removed from the foundation.
- The tapped holes of the foundation are free from dust. If necessary, clean the holes with a vacuum cleaner. Use a thread tap to make sure that the bolts will go in smoothly.

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

WARNING

Make sure that personnel cannot be crushed or become trapped while moving the Power Cabinet.

CAUTION

Warranty

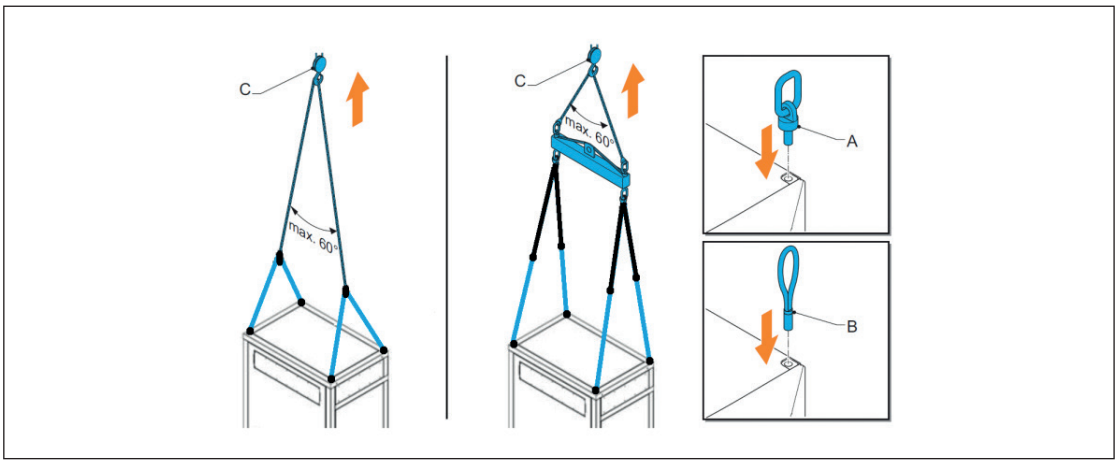
Damage due to moving the Power Cabinet to its position is not covered by the warranty.

CAUTION

Do not use a compressor to clean the Power Cabinet. Use a vacuum cleaner.

1. Use one of the two options to move the Power Cabinet to the foundation.
2. When the Power Cabinet is about 500 mm above its location, continue the installation procedure with Install Power Cabinet onto the foundation on Page 44.

5.4.1 Move cabinet with a hoist



A Swivel eye bolts (standard delivered with the cabinet)
B Lifting loops
C Hoisting equipment

Preconditions:

- A minimum of two persons is required: one person to operate the hoisting equipment, the other person to guide the Power Cabinet to its location.
- Use M16 swivel eye bolts (A) or M16 bolts with lifting loops (B).

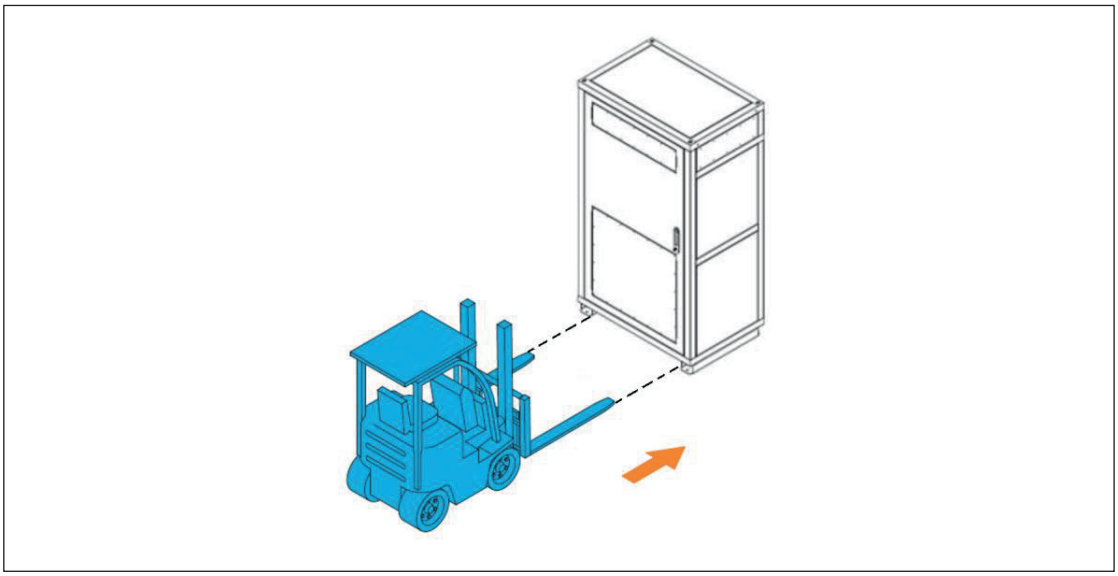
1. Insert the bolts (A) or (B) into the holes at the opposite corners of the cabinet, if not placed upon delivery.
2. Tighten the bolts.
3. Connect the hoisting equipment (C).

CAUTION

Keep the hoisting angle below 60°.

4. Move the Power Cabinet to the foundation.

5.4.2 Move cabinet with a forklift truck



Preconditions:

- A minimum of two persons is required: one person to operate the forklift truck, the other person to guide the Power Cabinet to its location.

1. Place wooden slats with a thickness of about 10 to 15 mm and a width equal to the width of the fork of the forklift truck on both forks.
2. Move the forks of the forklift truck next the gaps at the rear of the Power Cabinet.
3. Move the Power Cabinet to the foundation.

NOTICE

The use of the fork slides is mandatory. The distance between the outer side of the forks need to be 930 mm, lifting the cabinet outside the fork slides is NOT allowed and will damage the cabinet.

5.5 Install Power Cabinet onto the foundation

5.5.1 Connect Power Cabinet to foundation

Preconditions:

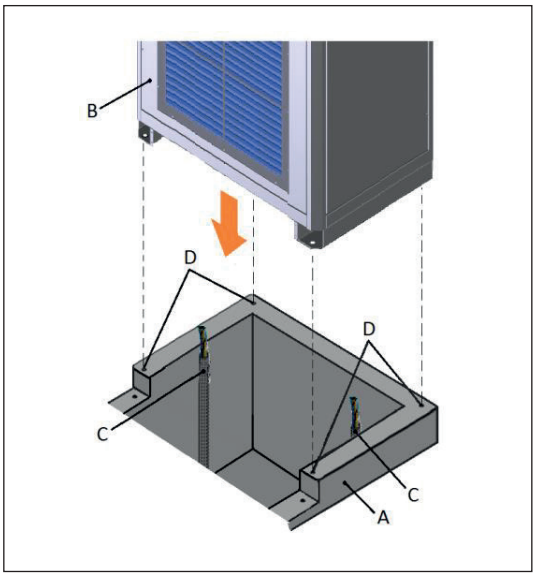
- Tools: spanner (size 24).
- Cover caps (4x) that were removed from the Power Cabinet (bag with parts).
- The Power Cabinet is about 500 mm above its location.

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

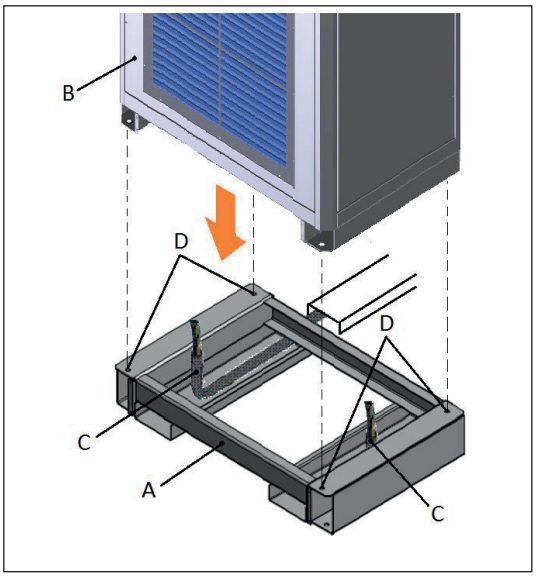
WARNING

Make sure that personnel cannot be crushed or become trapped while moving the Power Cabinet.



Placement on concrete foundation

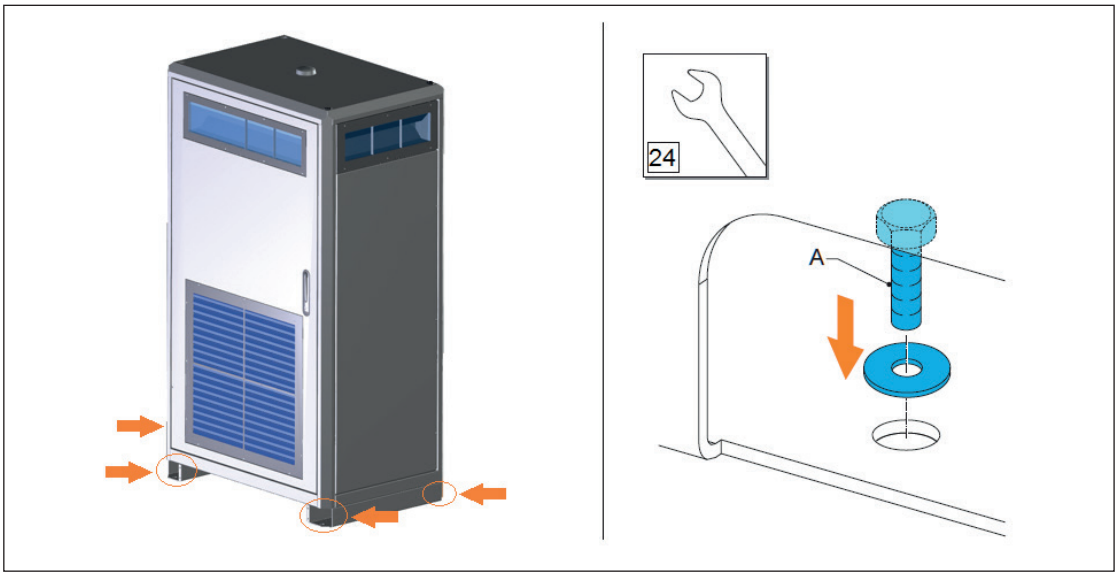
A Foundation
B Power Cabinet
C Cables
D Tapped holes



Placement on metal frame foundation

A Foundation
B Power Cabinet
C Cables
D Tapped holes

1. Carefully lower the Power Cabinet (B) onto the foundation (A).
2. Make sure that you do not trap the cables (C).
3. Make sure that the cabinet is aligned with the tapped holes (D).



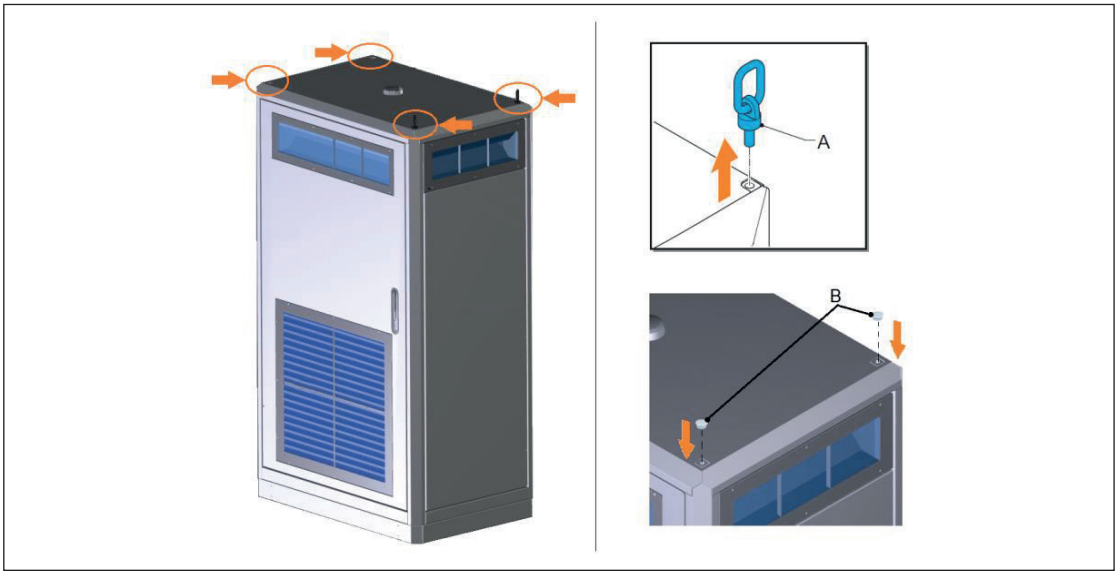
4. Insert the M16 bolts (A) fitted with the washers into the holes in the corners (4x).

NOTICE

A minimum of three M16 bolts are need to applied to securely mount the Power Cabinet onto the foundation.

In case of placing two Power Cabinets next to each other and (100 mm distance) against the wall, then one Power Cabinet can be secured by three M16 bolts on to the foundation.

5. Tighten the bolt with a tightening torque of 150 N·m.

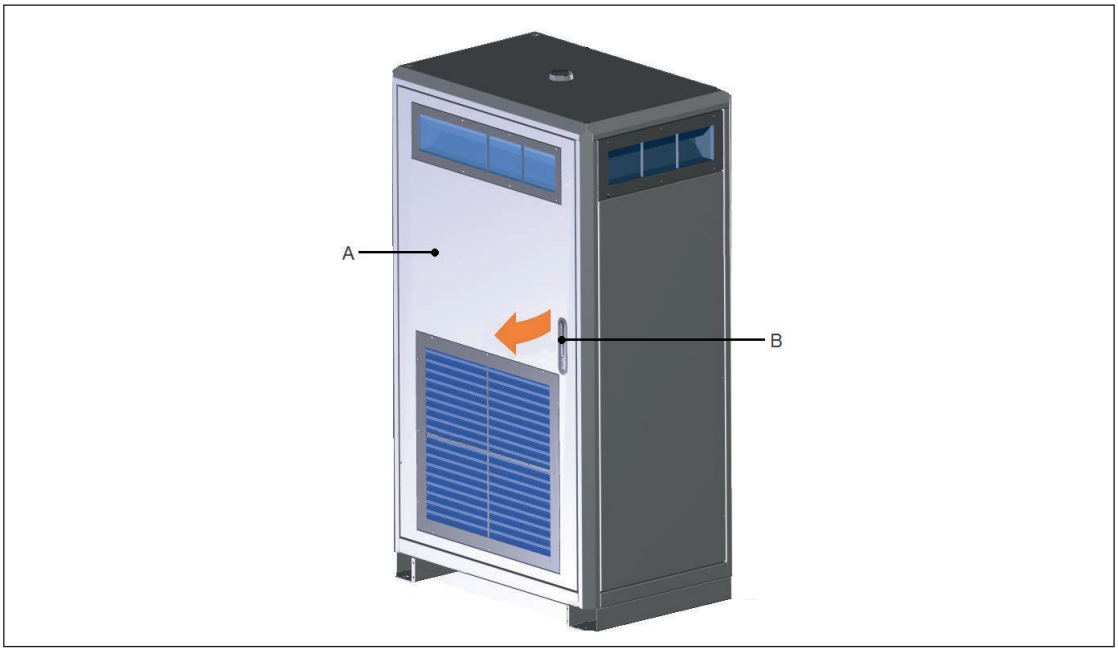


6. Remove the swivel eye bolts or lifting loops (A).
7. Place the cover caps (B) in the holes (4x).

5.5.2 Open the door of the Power Cabinet

Preconditions:

- Key that were removed from the Power Cabinet (bag with parts).

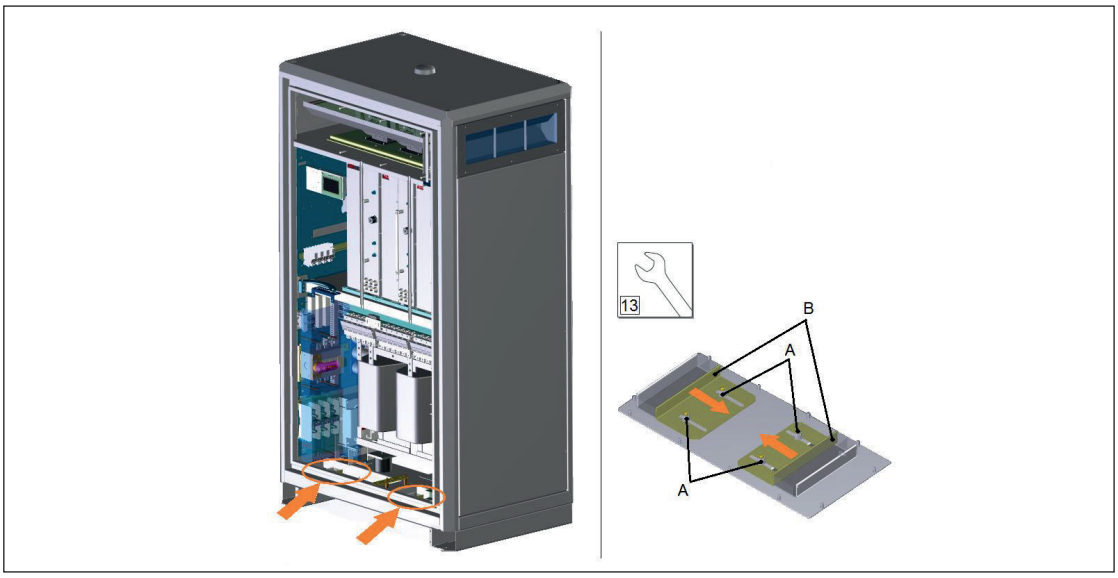


1. Unlock the handle (B)
2. Use the handle (B) to open the door (A).

5.5.3 Move the sliding plate of the guidance plates of the cabinet

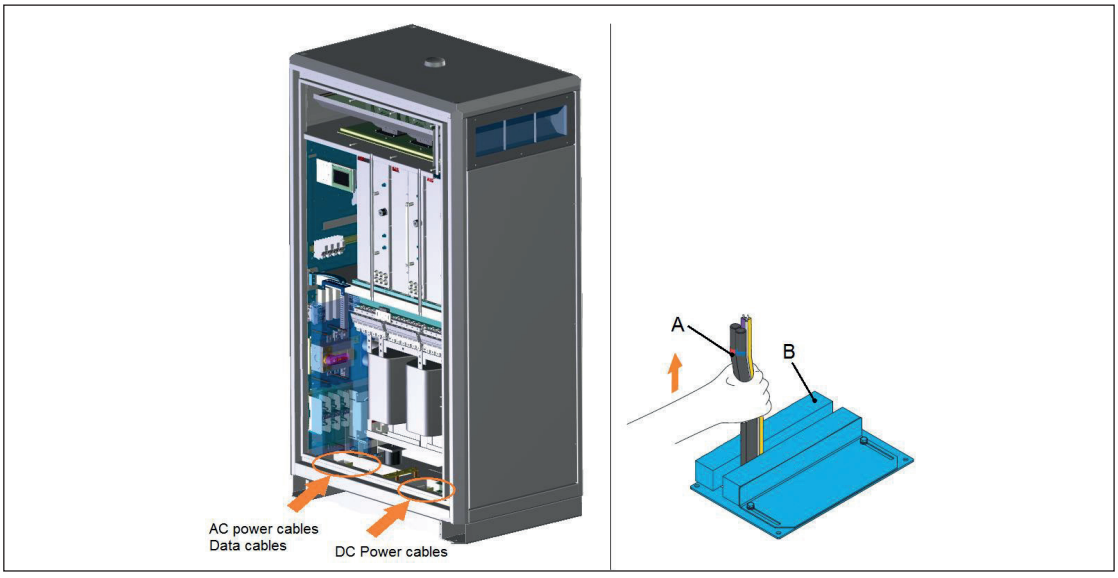
Preconditions:

- Tools: spanner (size 13).



1. Loosen the bolts (A).
2. Move the sliding plate (B) of the 2 guidance plates.

5.5.4 Route cables through guidance plates



1. Route the cables (A) through the right guidance plates (B).
2. Make sure that there is sufficient cable length to reach the connectors at the top of the cabinet.

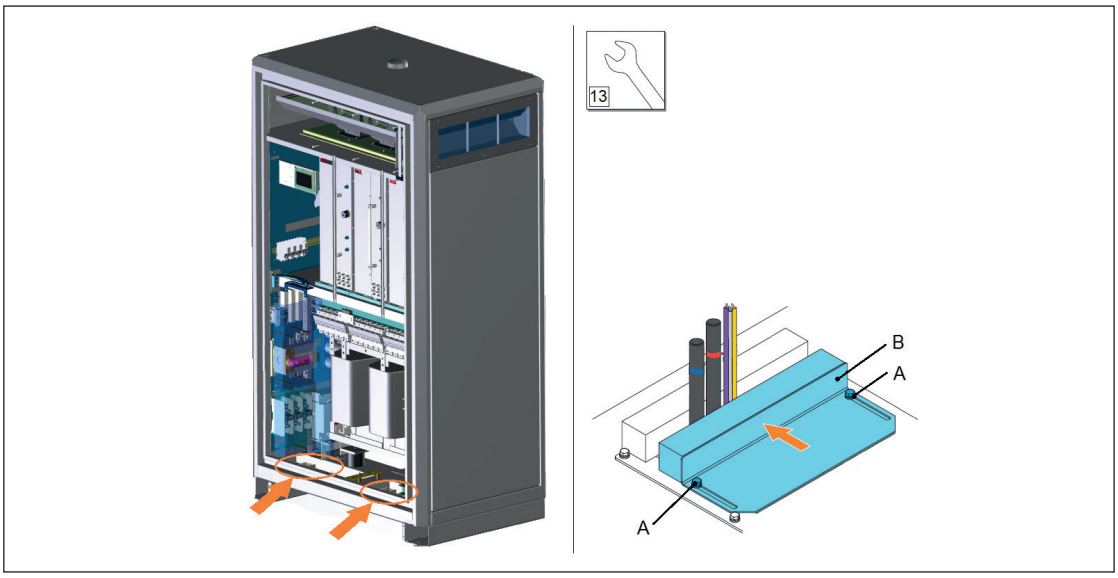
NOTICE

A length of 3000 mm is required, because the connection of the cables with the connectors in the Power Cabinet is at the middle of the cabinet.

5.5.5 Move sliding plates of the guidance plates of the cabinet

Preconditions:

- Tools: spanner (size 13).

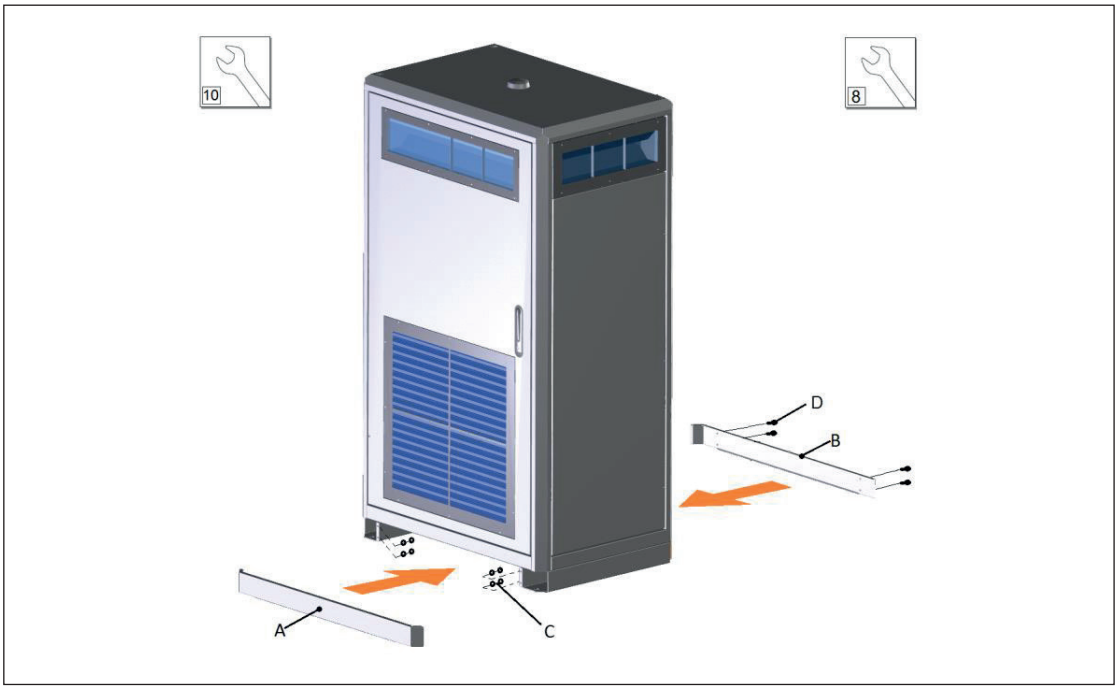


1. Move the sliding plates (B).
2. Tighten the bolts (A).

5.5.6 Install border covers of the Power Cabinet

Preconditions:

- Tools: spanner (size 8 and 10).
- M6 nuts and washers (4x) that were removed from the Power Cabinet (bag with parts).
- M5 bolts (4x) that were removed from the Power Cabinet (bag with parts).



1. Put the front cover (A) against the bottom front of the Power Cabinet by aligning the four bolts at the back side of the front cover (A) with the holes in the bottom front.
2. Insert the M6 nut and washer (C) onto the bolts of the front cover (A) (4x).
3. Tighten the nuts.
4. Put the rear cover (B) against the rear front of the Power Cabinet.
5. Insert the M5 bolts (D) into the holes (4x).
6. Tighten the bolts.

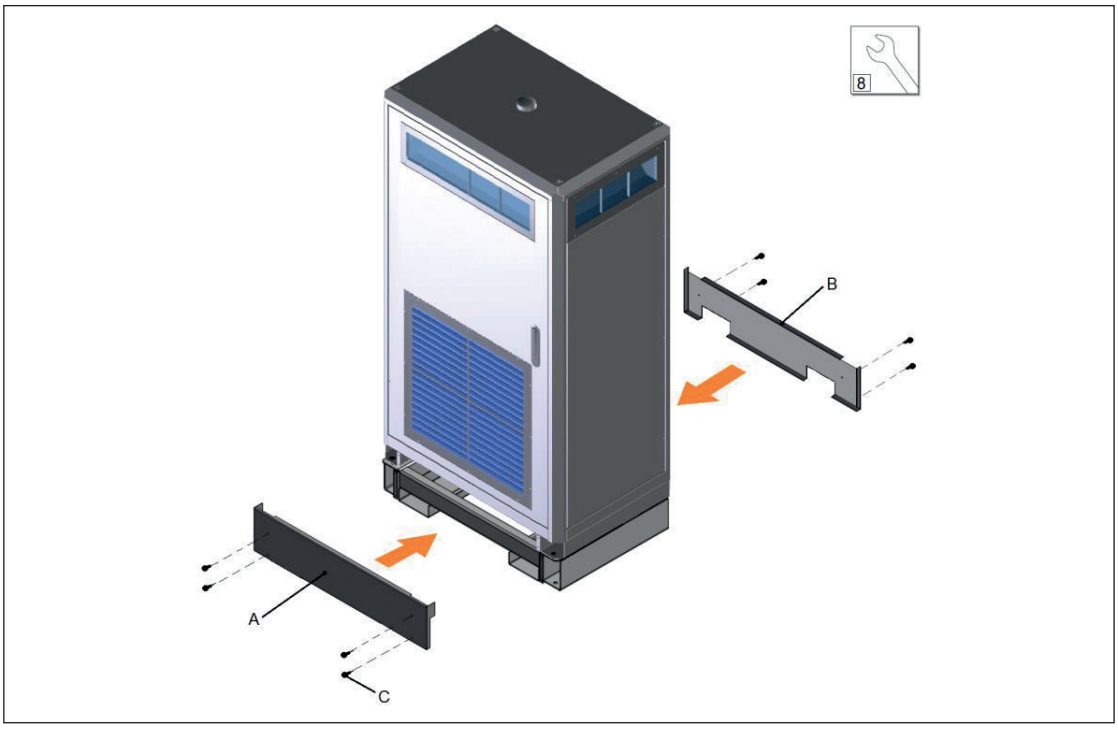
5.5.7 Install border covers of metal frame foundation

NOTICE

Only applicable when the Power Cabinet is placed on a metal frame foundation. The supplied front and rear cover on the Power Cabinet are not used in this case.

Preconditions:

- Tools: spanner (size 8)



1. Put the front border cover (A) against the bottom front of the Power Cabinet.
2. Put the rear border cover (B) against the rear front of the Power Cabinet.
3. Insert the M5 bolts (C) into the holes (8x).
4. Tighten the bolts.

5.5.8 Install front cover plate on foundation

NOTICE

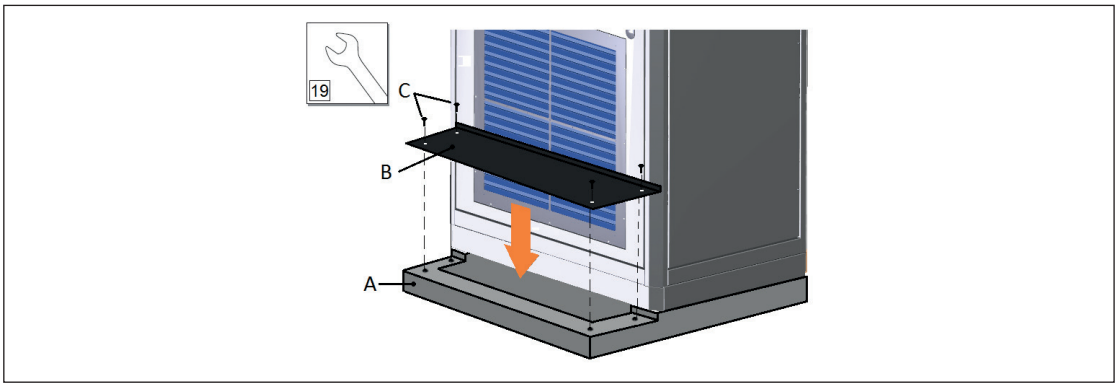
Only applicable when the Power Cabinet is placed on a concrete foundation.

WARNING

Danger: tripping hazard if the plate is not mounted. Fence of the site until the plate is installed.

Preconditions:

- Tools: spanner (size 19)



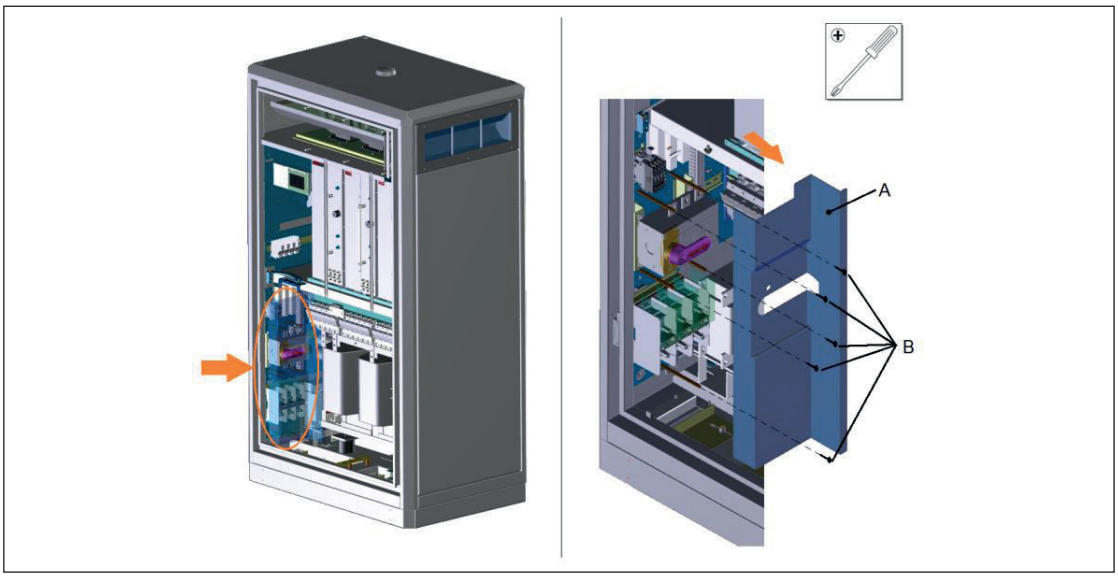
1. Place the front cover plate (B) on the foundation (A).
2. Make sure that the front cover plate (B) is aligned with the tapped holes within the foundation.
3. Insert the M12 bolts (C) into the holes (4x).
4. Tighten the bolts.

5.6 Connect AC grid cable and PE wires Power Cabinet

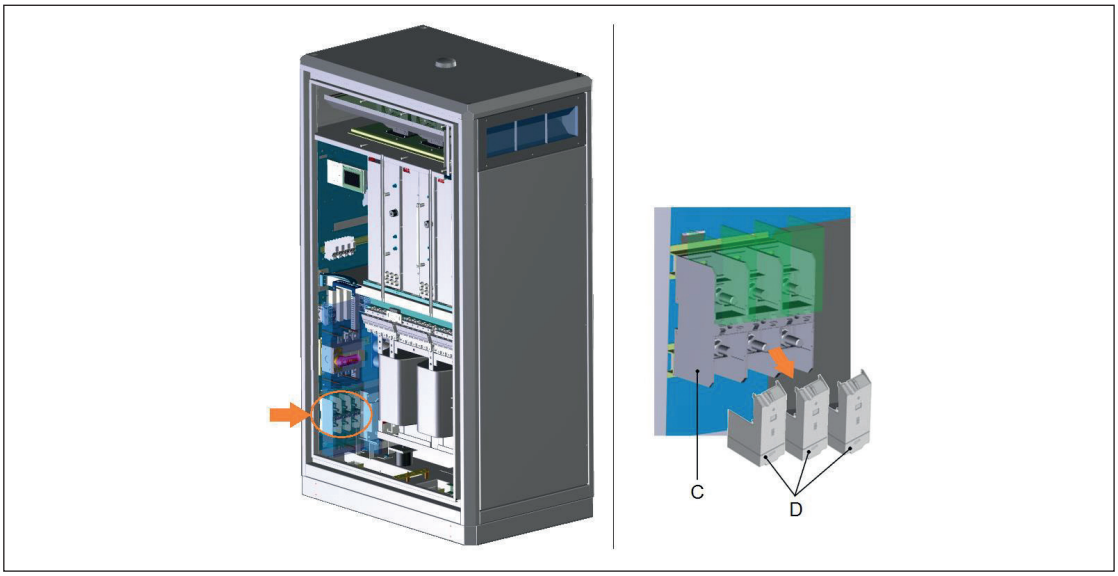
5.6.1 Remove the protection covers

Preconditions:

- Tools: cross-head screwdriver



1. Remove the protection plate (A) by loosening the screws (B).
2. Put the protection plate and screws in a safe location as it will be installed again later on.



3. Remove the 3 protection covers (D) from the connector blocks (C).
4. Put the protection covers in a safe location as it will be installed again later on.

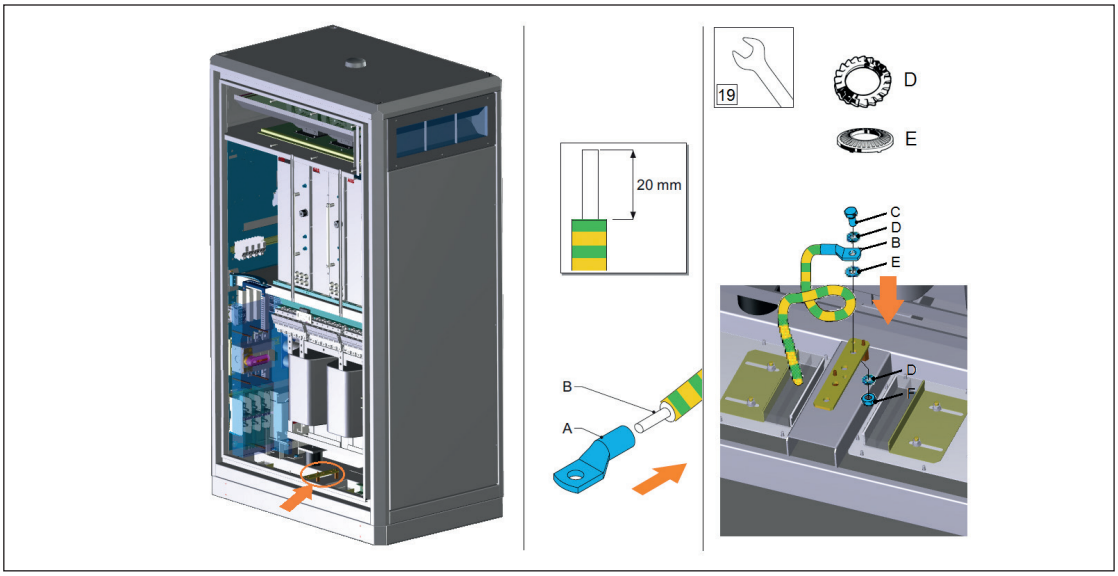
5.6.2 Connect the PE wire of the AC grid cable

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end ring, spanner (size 19), torque wrench (size 19).

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.



1. Make a loop in the PE wire.

NOTICE

For safety, it is recommended to make a loop in the PE wire so it is longer than the phase wires. This loop makes sure that the PE wire is not the first wire that is disconnected if the Power Cabinet is moved by a collision.

2. Cut the PE wire of the AC grid cable to the correct length to reach the PE rail. Do not make the wire routing too tight, or too loose.
3. Strip 20 mm of the insulation from the end of the PE wire.
4. Attach a wire end ring (A) to the end of the PE wire (B).
5. Remove the M12 bolt, nut and washers from the PE rail.
6. Fit the bolt (C) with toothed washer (D), the PE wire (B) and the contact washer (E).
7. Insert the bolt fitted with the PE wire into the PE rail.
7. Screw from the bottom of the PE rail a toothed washer (D) and a nut (F) on the bolt (C)
8. Tighten the bolt/nut connection with a tightening torque of 30 N·m.

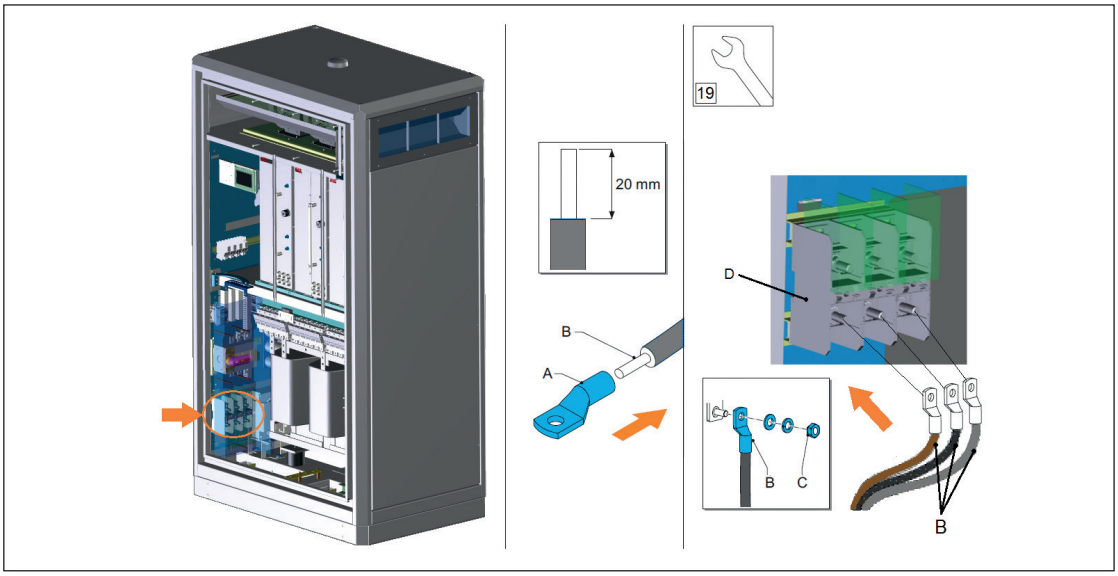
5.6.3 Connect the AC grid cable

Preconditions:

- Tools: wire cutter, wire stripper pliers, spanner (size 19), torque wrench (size 19).

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.



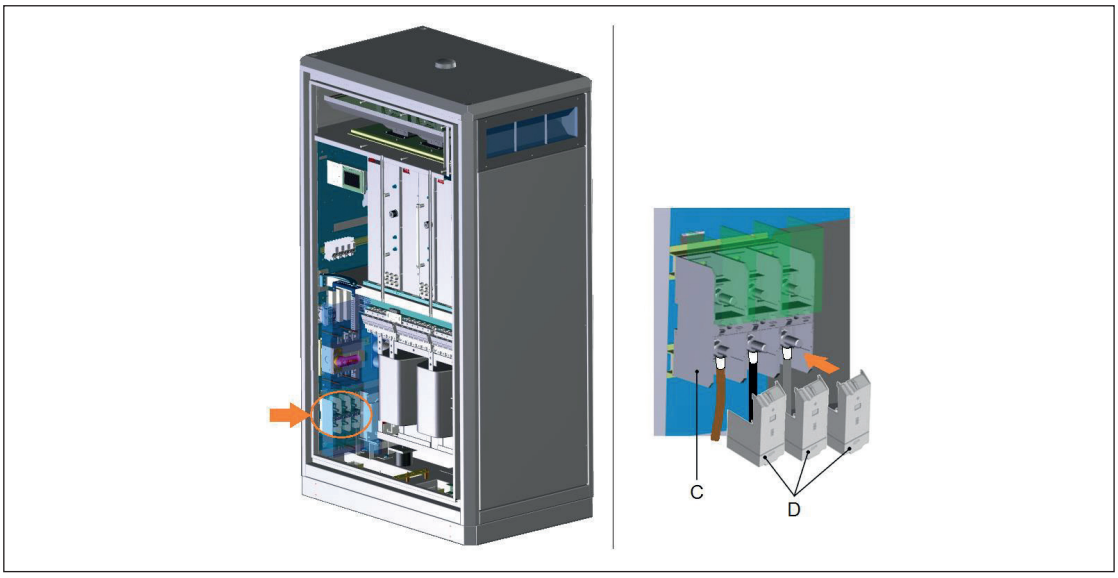
1. Cut the wires of the AC grid cable to the correct lengths to reach the connectors. Do not make the wire routing too tight, or too loose.
2. Strip 20 mm of the insulation from the ends of the wires (B).
3. Attach wire end rings (A) at the end of the wires.
4. Remove the nuts and washers (C) from the bolts (M12) of connector block (D).

5. Insert the 3 wires (B) with the nuts and washers onto the bolts of connector block (D).
   - From left to right:
     L1 (brown),
     L2 (black),
     L3 (grey).
6. Tighten the nuts (C) with a tightening torque of 30 N·m.

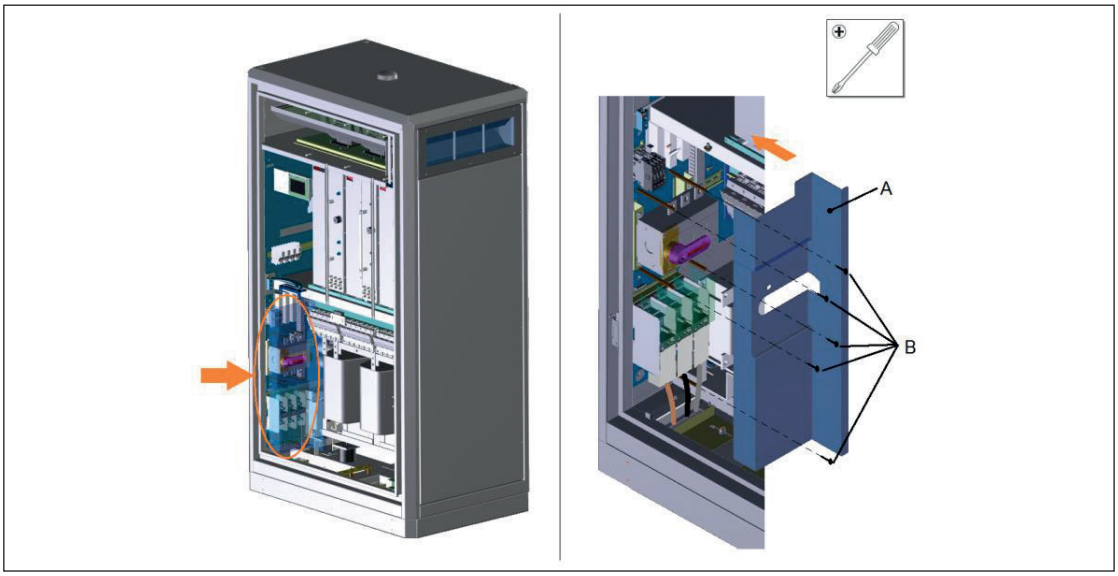
5.6.4 Install the protection covers

Preconditions:

- Tools: cross-head screwdriver



1. Take the 3 protection covers that was removed in Remove the protection covers on Page 50.
2. Place the protection covers (D) back on the connector blocks (C).



3. Take the protection plate and the screws that were removed in Remove the protection covers on Page 50.
4. Place the protection plate (A) back over the main switch and connector blocks and secure the plate by the screws (B).

WARNING

Leave the main switch switched off.

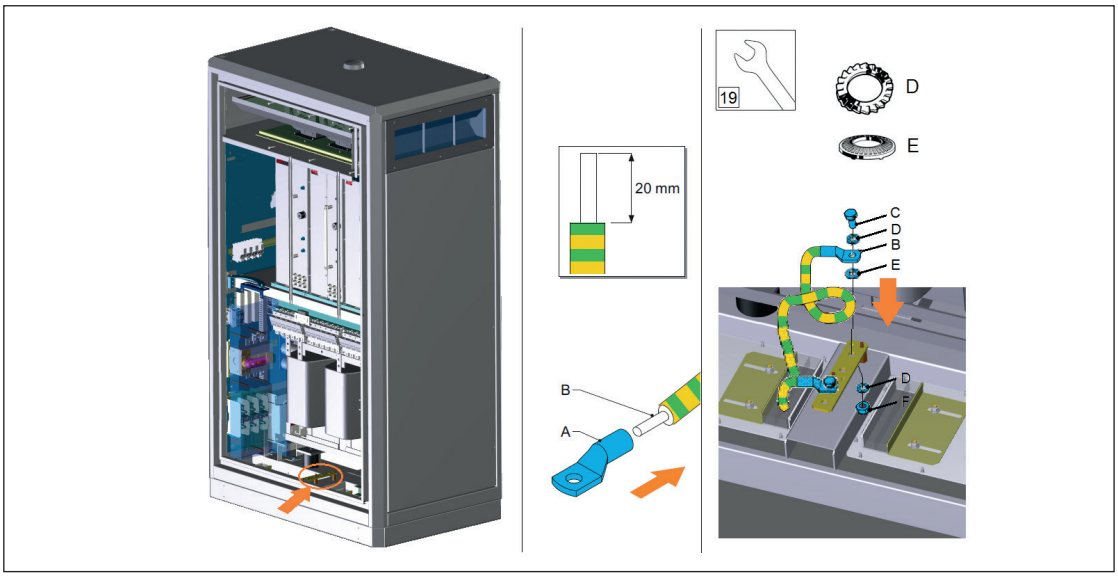
The Power Cabinet is not ready for use yet.

If there is no appointment for commissioning yet, contact the PACCAR Delivery department to make an appointment for commissioning. See Contact information on Page 12 for contact details.

5.6.5 Connect the PE wire of the ground electrode (optional)

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end ring, spanner (size 19), torque wrench (size 19).



1. Cut the wire of the PE cable from the ground electrode to the correct length to reach the PE rail. Do not make the wire routing too tight, or too loose.
2. Strip 20 mm of the insulation from the end of the wire.
3. Attach a wire end ring (A) to the end of the lightning protection wire (B).
4. Remove the M12 bolt, nut and washers from the PE rail.
5. Fit the bolt (C) with toothed washer (D), the lightning protection wire (B) and the contact washer (E).
6. Insert the bolt fitted with washers and the lightning protection wire into the PE rail.
7. Screw from the bottom of the PE rail a toothed washer (D) and a nut (F) on the bolt (C)
8. Tighten the bolt/nut connection with a tightening torque of 30 N·m.

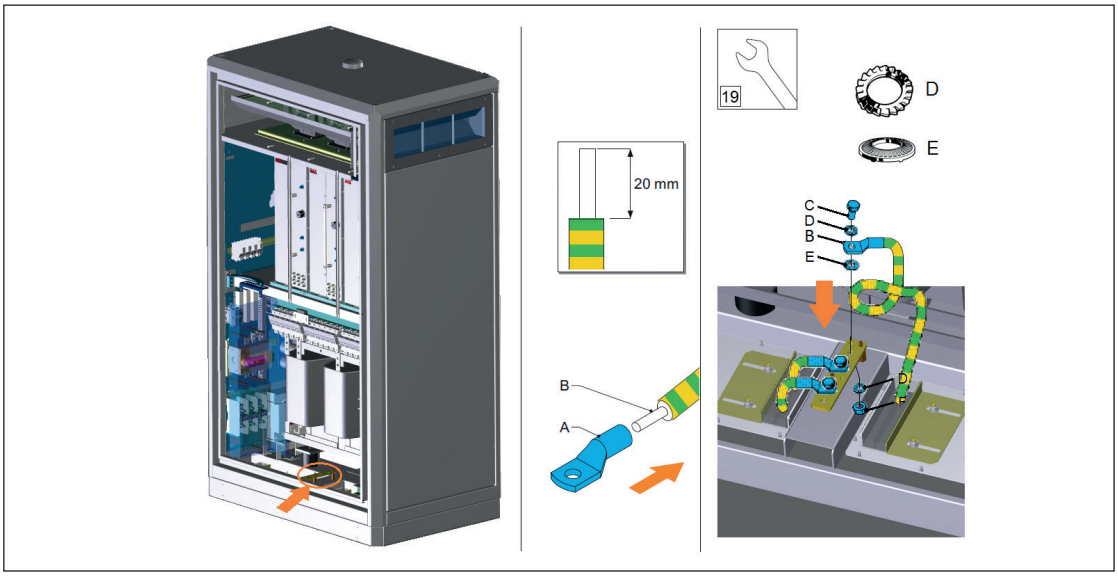
5.6.6 Connect the PE wire to the Charge Post

NOTICE

The PE wire to the Charge Post is only connected within one of the PowerChoice 350, see for more details section Cabling on Page 33.

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end ring, spanner (size 19), torque wrench (size 19).



1. Cut the PE wire of the power cable to the correct length to reach the PE rail. Do not make the wire routing too tight, or too loose.
2. Strip 20 mm of the insulation from the end of the PE wire.
3. Attach a wire end ring (A) to the end of the PE wire (B).
4. Remove the M12 bolt, nut and washers from the PE rail.
5. Fit the bolt (C) with toothed washer (D), the PE wire (B) and the contact washer (E).
6. Insert the bolt fitted with the PE wire into the PE rail.
7. Screw from the bottom of the PE rail a toothed washer (D) and a nut (F) on the bolt (C)
8. Tighten the bolt/nut connection with a tightening torque of 30 N·m.

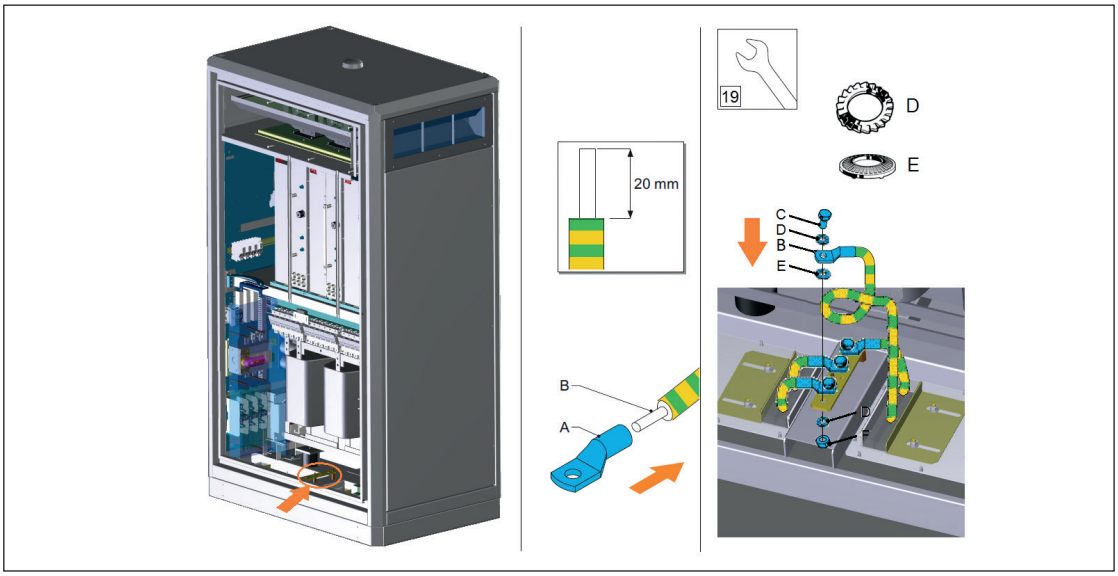
5.6.7 Connect the PE wire between Power Cabinets

NOTICE

The connection of the PE wire between PowerChoice 350 must only be carried out for 350 kW charge systems, see for more details section Cabling on Page 33.

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end ring, spanner (size 19), torque wrench (size 19).



Both PE wire connection must be made in the both Powerchoice 350 Power Cabinets:

1. Cut the PE wire of the power cable to the correct length to reach the PE rail. Do not make the wire routing too tight, or too loose.
2. Strip 20 mm of the insulation from the end of the PE wire.
3. Attach a wire end ring (A) to the end of the PE wire (B).
4. Remove the M12 bolt, nut and washers from the PE rail.
5. Fit the bolt (C) with toothed washer (D), the PE wire (B) and the contact washer (E).
6. Insert the bolt fitted with the PE wire into the PE rail.
7. Screw from the bottom of the PE rail a toothed washer (D) and a nut (F) on the bolt (C)
8. Tighten the bolt/nut connection with a tightening torque of 30 N·m.

5.7 Connect the DC power cables Power Cabinet

The connection of the DC power cables depends on the charge system configuration, see for more details section Charge system configurations on Page 33.

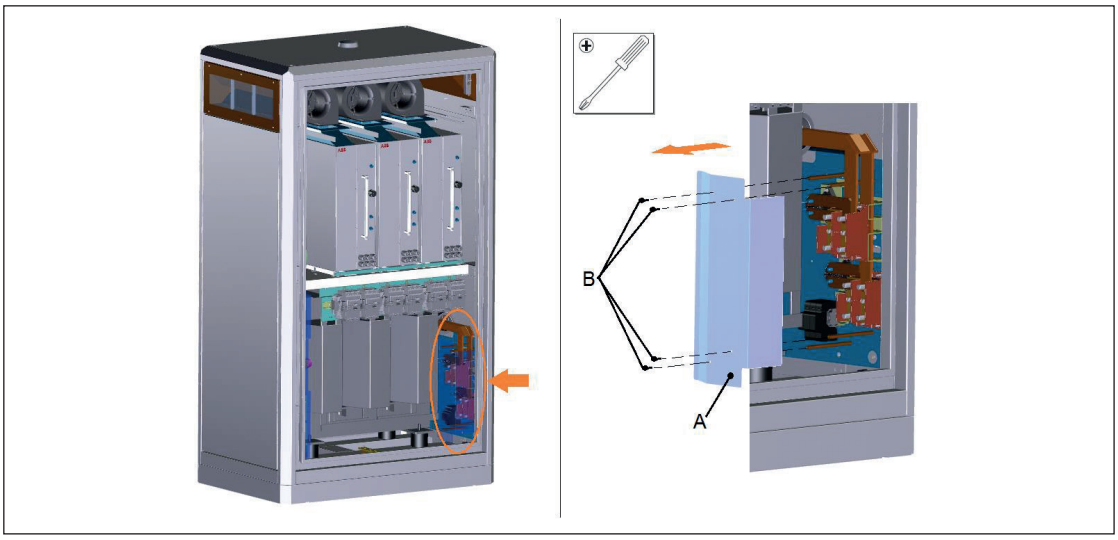
5.7.1 Remove the protection cover

Preconditions:

- Tools: cross-head screwdriver

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

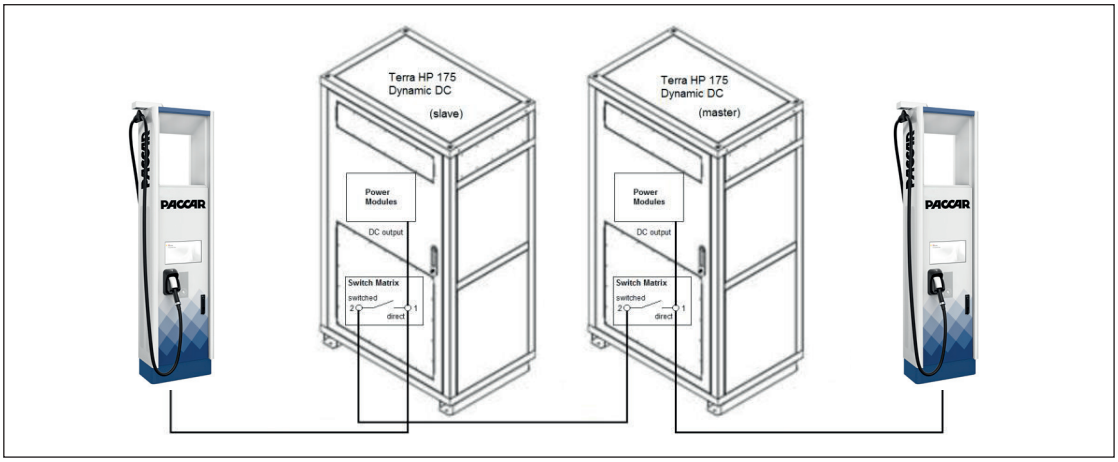


1. Remove the protection plate (A) by loosening the screws (B) (4x).
2. Put the protection plate and screws in a safe location as it will be installed again later on.

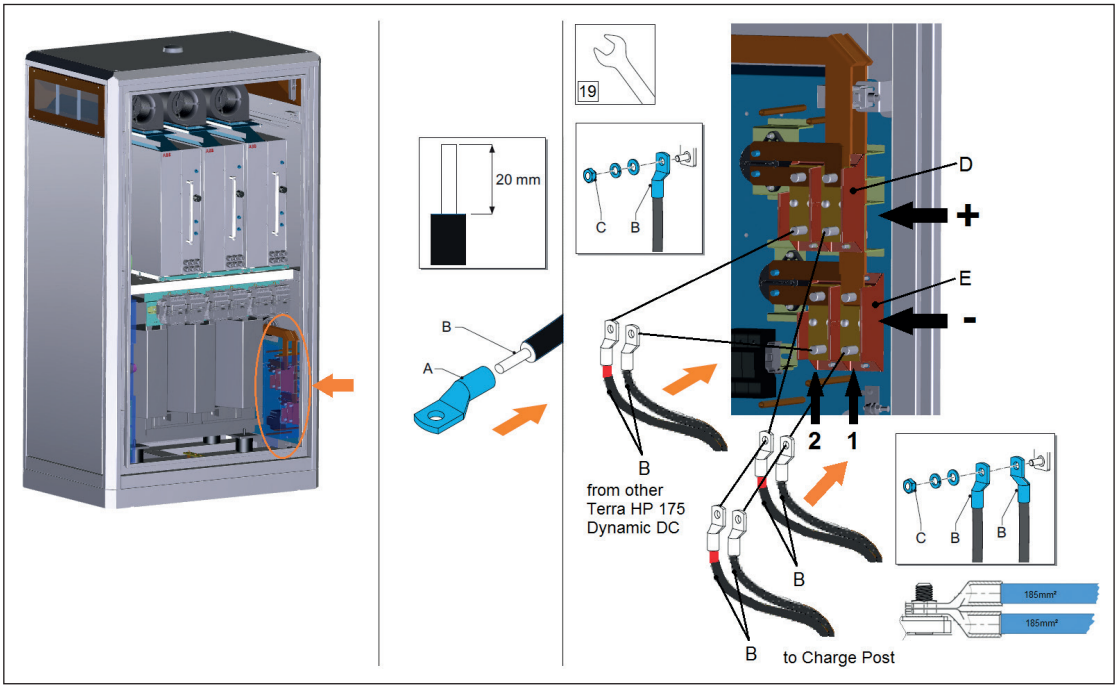
5.7.2 Connect the DC power cables for the HP 350 Dynamic DC Charger

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end rings, spanner (size 19), torque wrench (size 19).



350 kW Dynamic DC charge system

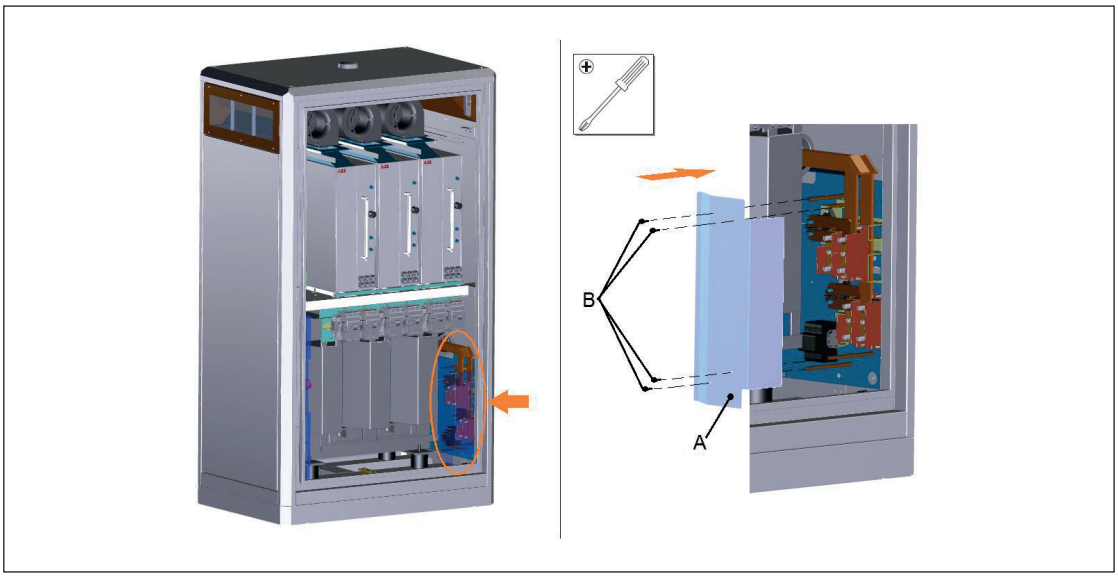


1. Cut the wires of the DC power cable to the correct lengths to reach the connector blocks. Do not make the wire routing too tight, or too loose.
2. Strip 20 mm of the insulation from the ends of the wires (B).
3. Attach wire end rings (A) at the end of the wires.
4. Remove the nuts and washers (C) from the bolts (M12) of connector block (D) and (E).
5. Insert the two DC+ wires (marked by red heat-shrink) that goes to the Charge Post with the nuts and washers onto the bolts of pin 1 of the connector block (D).
6. Insert the DC+ wire (marked by red heat-shrink) that comes from the other or slave Powerchoice 350 Dynamic DC Power Cabinet with the nuts and washers onto the bolts of pin 2 of the connector block (D).
7. Insert the two DC- wires that goes to the Charge Post with the nuts and washers onto the bolts of pin 1 of the connector block (E).
8. Insert the DC- wire that comes from the other or slave Powerchoice 350 Dynamic DC Power Cabinet with the nuts and washers onto the bolts of pin 2 of the connector block (E).
9. Tighten the nuts (C) with a tightening torque of 30 N·m.

5.7.3 Install the protection covers

Preconditions:

- Tools: cross-head screwdriver



1. Take the protection plate that was removed in Remove the protection cover on Page 56.
2. Place the protection plate (A) back over the DC connector blocks and secure the plate by the screws (B) (4x).

5.8 Connect AC utility power cable Power Cabinet

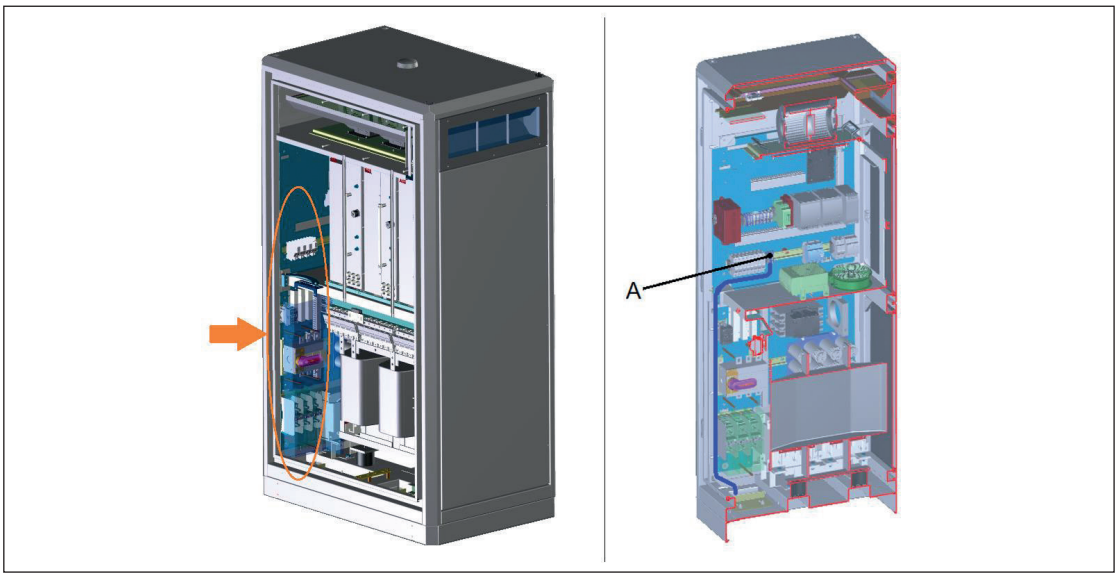
Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

5.8.1 Route the cable to the terminal block



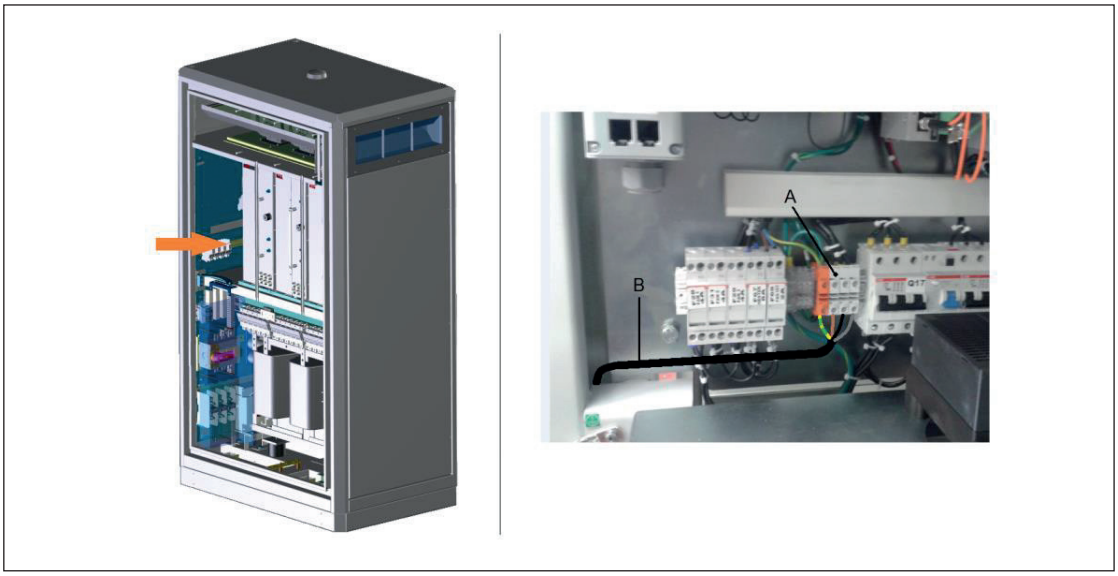
Preferred cable route

1. Route the AC utility cable to the terminal block (A). Refer to the figure for the preferred cable route inside the cabinet.

NOTICE

The AC utility power cable for the Charge Post is only connected within the master Power Cabinet for the HP 350 Charger and within the master and slave 1 Power Cabinets for the Dynamic DC charger systems, see for more details section Cabling on Page 33.

5.8.2 Connect the AC utility power cable



A Terminal block
B AC utility power cable

1. Move the cable towards the terminal block (A).
2. Strip 11 mm of the insulation from the ends of the wires.
3. Crimp a ferrule onto the end of the wire.
4. Loosen the connector screws.
5. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire color
PE	X341-1	Green/yellow
L1	X341-2	Brown
L2	X341-3	Black
L3	X341-4	Gray

6. Tighten the connector screws with a tightening torque of 1.3 N·m.

5.9 Connect Interlock cable(s) Power Cabinet

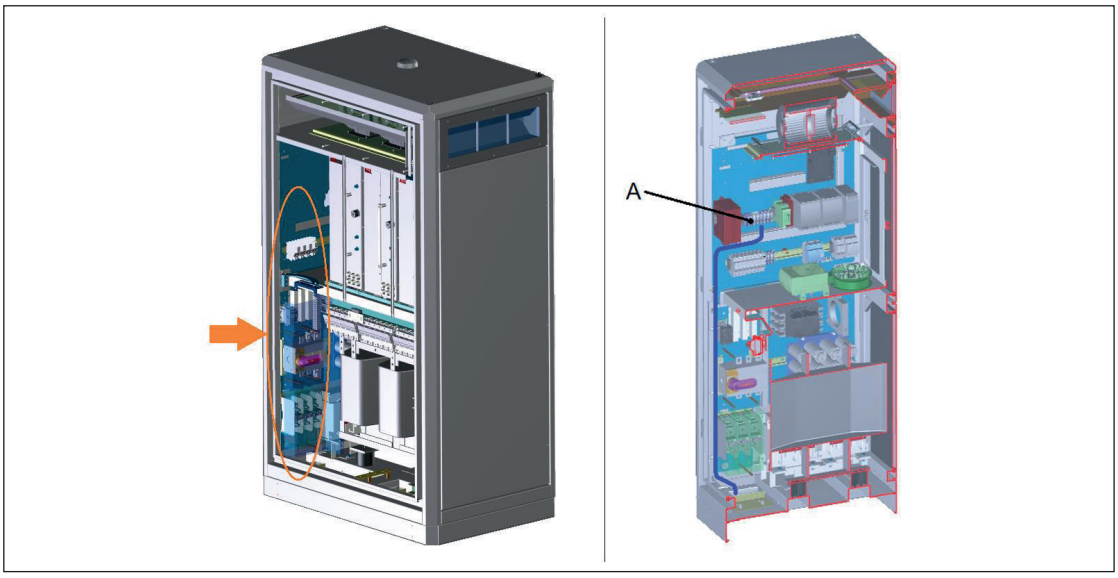
Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

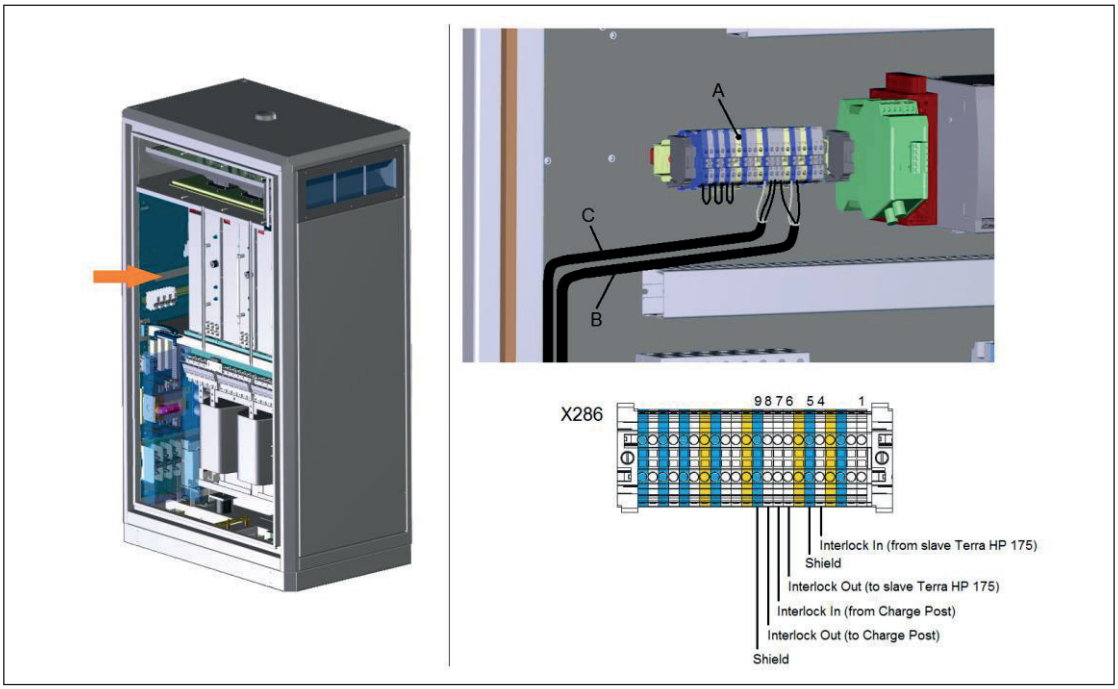
5.9.1 Route the cable to the terminal block



1. Route the Interlock cable(s) to the terminal block (A). Refer to the figure for the preferred cable route inside the cabinet.

5.9.2 Connect the Interlock cable for the HP 350 Dynamic DC Charger

Interlock cable connection in the master Powerchoice 350 Dynamic DC:



A Terminal block
B Interlock cable from/to slave Powerchoice 350 Dynamic DC
C Interlock cable from/to Charge Post

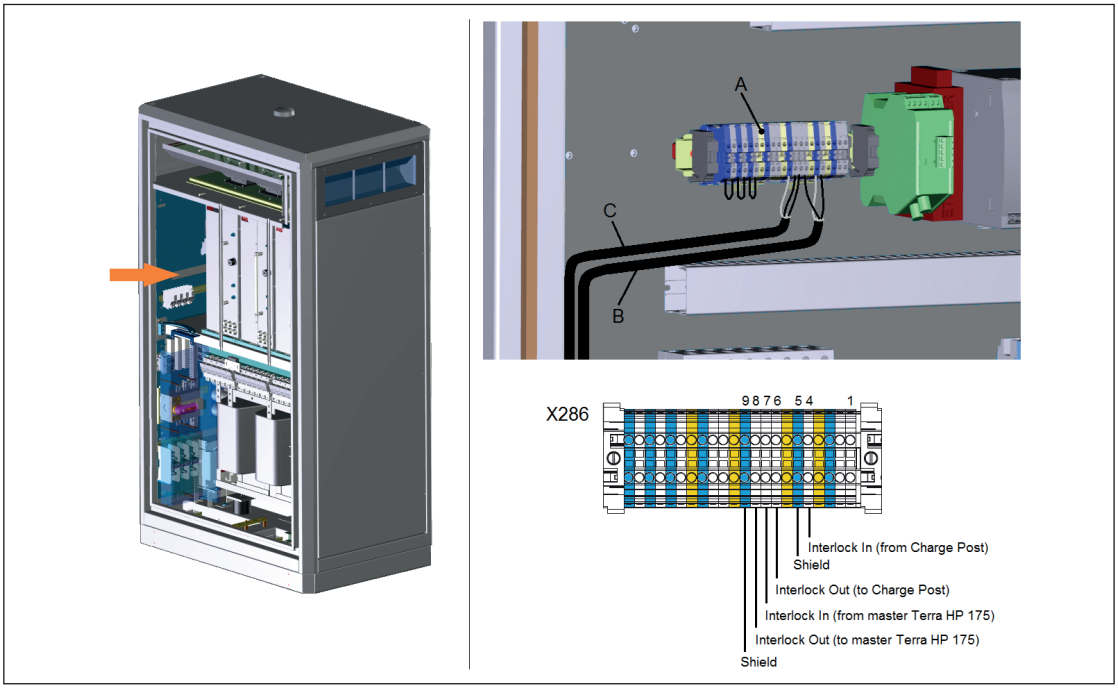
1. Move the cable towards the terminal block (A).
2. Strip 11 mm of the insulation from the ends of only the White and Brown wire!
3. Crimp a ferrule onto the end of the White and Brown wire.
4. Ensure that the unused wires, the Green and Yellow wire, are protected so that they cannot touch metal parts.
5. Loosen the connector screws.
6. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire color
Interlock In (Charge Post)	X286-7	Brown
Interlock Out (Charge Post)	X286-8	White
Interlock GND (Charge Post)	X286-9	Shield
Interlock In (slave Powerchoice 350)	X286-4	White
Interlock Out (slave Powerchoice 350)	X286-6	Brown
Interlock GND (slave Powerchoice 350)	X286-5	Shield

See also Appendix G Signal connection diagram.

7. Tighten the connector screws with a tightening torque of 1.3 N·m.

Interlock cable connection in the slave Powerchoice 350 Dynamic DC:



A Terminal block
B Interlock cable from/to Charge Post
C Interlock cable from/to master Powerchoice 350 Dynamic DC

1. Move the cables towards the terminal block (A).
2. Strip 11 mm of the insulation from the ends of only the White and Brown wire!
3. Crimp a ferrule onto the end of the White and Brown wire.
4. Ensure that the unused wires, the Green and Yellow wire, are protected so that they cannot touch metal parts.
5. Loosen the connector screws.
6. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire color
Interlock In (Charge Post)	X286-4	Brown
Interlock Out (Charge Post)	X286-6	White
Interlock GND (Charge Post)	X286-5	Shield
Interlock In (master PowerChoice 180)	X286-7	Brown
Interlock Out (master PowerChoice 180)	X286-8	White
Interlock GND (master PowerChoice 180)	X286-9	Shield

See also Appendix H Signal connection diagram.

7. Tighten the connector screws with a tightening torque of 1.3 N·m.

5.10 Connect CAN cable(s) Power Cabinet

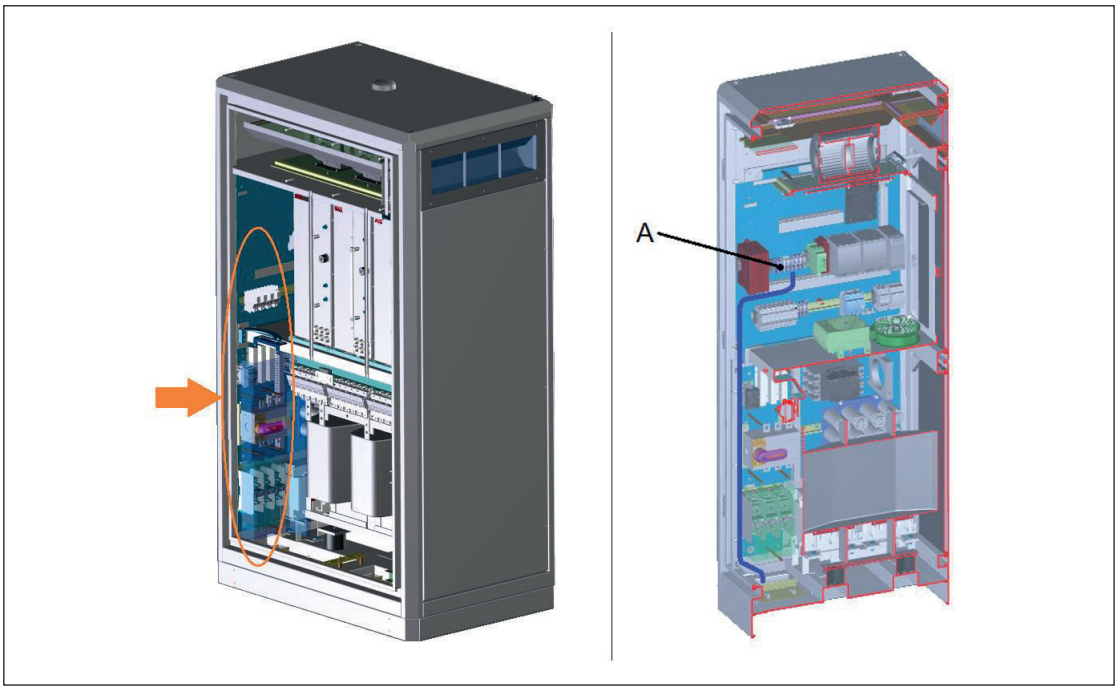
Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

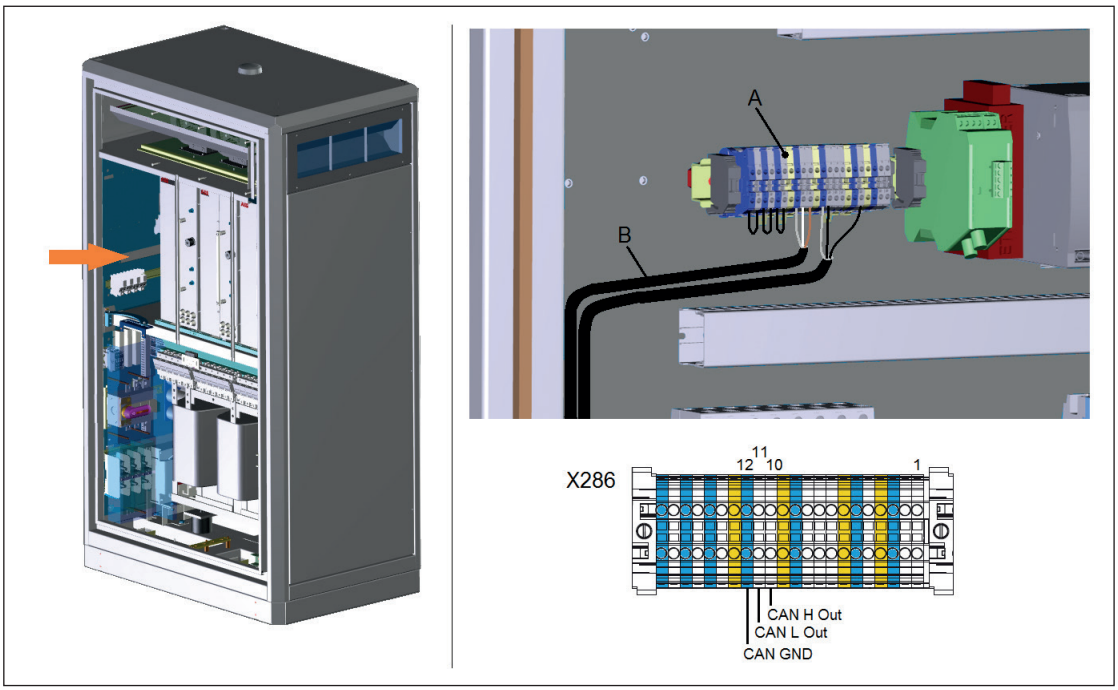
5.10.1 Route the cable to the terminal block



1. Route the CAN cable(s) to the terminal block (A). Refer to the figure for the preferred cable route inside the cabinet.

5.10.2 Connect the CAN cable for the HP 350 (and Dynamic DC) Charger

CAN cable connection in the slave Powerchoice 350:



A Terminal block

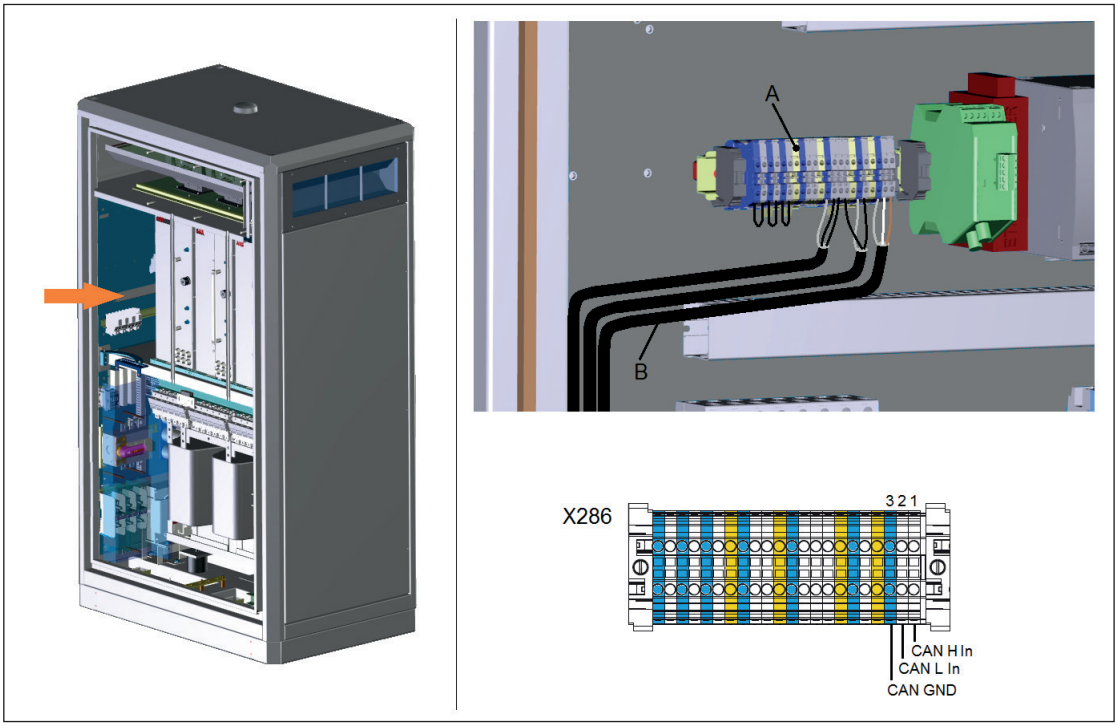
B CAN cable to master Powerchoice 350

1. Move the cable towards the terminal block (A).
2. Strip 11 mm of the insulation from the ends of the wires.
3. Crimp a ferrule onto the end of the wire.
4. Loosen the connector screws.
5. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire color
CAN H Out	X286-10	Brown
CAN L Out	X286-11	White
Shield	X286-12 or Shield Can Out	Shield

6. Tighten the connector screws with a tightening torque of 1.3 N·m.

CAN cable connection in the master Powerchoice 350:



A Terminal block

B CAN cable from slave Powerchoice 350

1. Move the cable towards the terminal block (A).
2. Strip 11 mm of the insulation from the ends of the wires.
3. Crimp a ferrule onto the end of the wire.
4. Loosen the connector screws.
5. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire color
CAN H In	X286-1	Brown
CAN L In	X286-2	White
CAN GND	X286-3 or Shield Can Out	Shield

See also Appendix G Signal connection diagram.

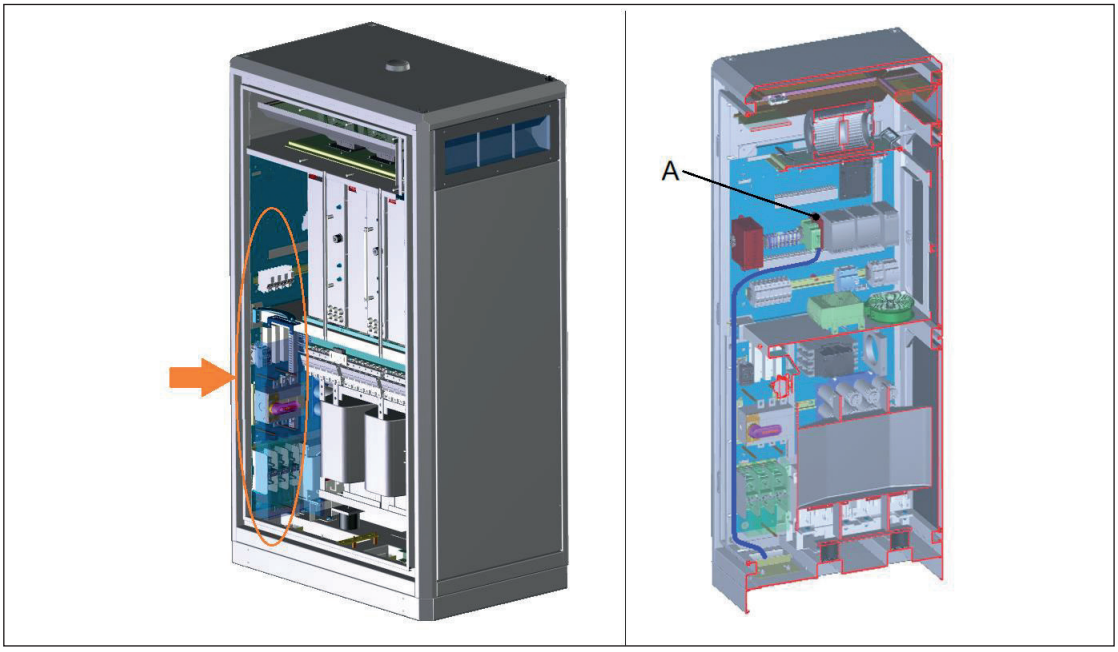
6. Tighten the connector screws with a tightening torque of 1.3 N·m.

5.11 Connect the communication fiber cable Power Cabinet

NOTICE

The communication fiber cables is only used for the CAN connection between the PowerChoice 350 and the Charge Post, see for more details section Cabling on Page 33.

5.11.1 Route the cable to the terminal blocks



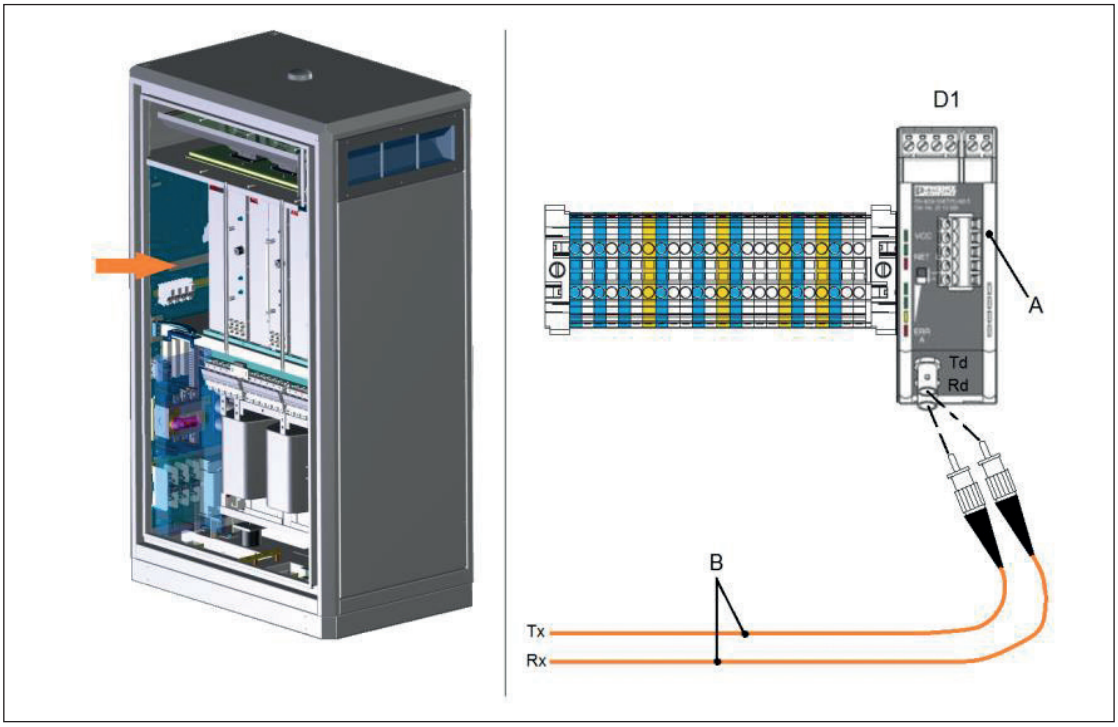
Preferred cable route

1. Route the communication fiber cable to module D1 (A). Refer to the figure for the preferred cable route inside the cabinet.

5.11.2 Connect the communication fiber cables

Preconditions:

- Tools: tak-ty or ty-raps



1. Remove the protection covers from the optical connectors.
2. Connect the two CAN bus fiber cables (B) onto module D1 (A):
   - Rx with Td D1;
   - Tx with Rd D1.

NOTICE

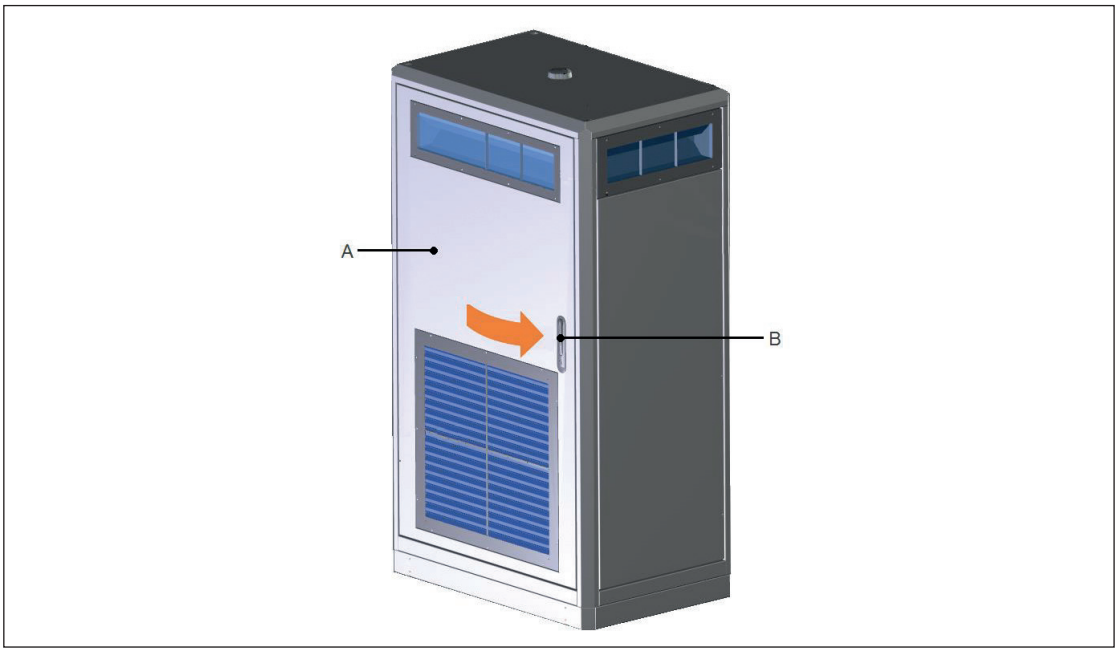
Two fiber cables are not connected. Those fiber cables are meant for spare.

4. Bind the cables together and secure the loops loosely with a piece of tak-ty or ty-rap.

CAUTION

Make the loop bend radius of the fiber cables not smaller than 64 mm, otherwise the core of the fiber cable may break.

5.12 Close the door of the Power Cabinet



Preconditions:

- Key that were removed from the Power Cabinet

1. Close the door (A).
2. Lock the handle (B).

5.13 Unpack the Charge Post

5.13.1 Before unpacking

NOTICE

Unloading Charge Post

The delivery truck only unloads the Charge Post.

The delivery truck will not move the Charge Post to its final location. The placement of the Charge Post to its final location is the responsibility of the contractor.

WARNING

Do not pollute the environment with plastic and cardboard packing. Depollute these things according the regional applicable regulations as well as environment-friendly.

Preconditions:

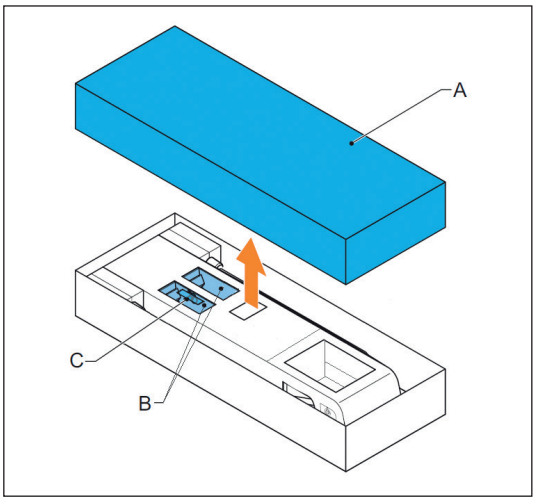
- All construction work is completed.
- The product is delivered by a transport company at the confirmed date of delivery.

1. Check the box for damages.

5.13.2 Remove packaging

Preconditions:

- The installation work must be carried out by at least two persons.



1. Remove the cover (A) from the wooden box.
2. Remove the bag (C) which contain the keys, cover caps and mounting material. The bag is attached with tape to one of the connector holders (B).
3. Lift the Charge Post out of the box. Read also section Move Charge Post to position on Page 70 how to use the hoisting equipment.

WARNING

Make sure that personnel cannot be crushed or become trapped while moving the Charge Post out of the box.

CAUTION

Warranty

Damage due to moving the Charge Post out of the box is not covered by the warranty.

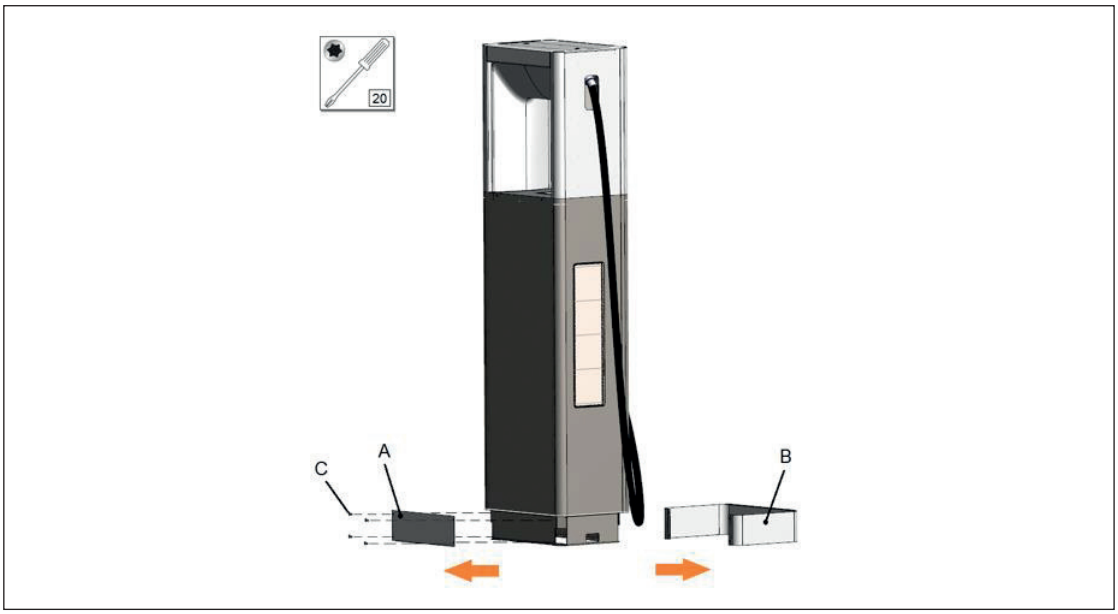
4. Place the Charge Post on the ground with its top facing up.
5. Remove all protective foam from the Charge post.

5.14 Install Charge Post onto foundation

5.14.1 Remove border covers from the Charge Post

Preconditions:

- Tools: torx screwdriver (size TT20).



1. Remove the M4 torx screws (C) (4x) of the back cover plate (A).
2. Put the torx screws (C) in a safe location as it will be installed again later on.
3. Remove the back cover plate (A).
4. Remove the front cover plate (B).
5. Put the back and front cover plates in a safe location as it will be installed again later on.

5.14.2 Move Charge Post to position

Preconditions:

- All packaging material is removed from the Charge Post.
- The tapped holes of the foundation are free from dust. If necessary, clean the holes with a vacuum cleaner. Use a thread tap to make sure that the bolts will go in smoothly.
- A minimum of two persons is required: one person to operate the hoisting equipment, the other person to guide the Charge Post to its location.
- Use M12 swivel eye bolts or M12 bolts with lifting loops.

DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

WARNING

Make sure that personnel cannot be crushed or become trapped while moving the Charge Post.

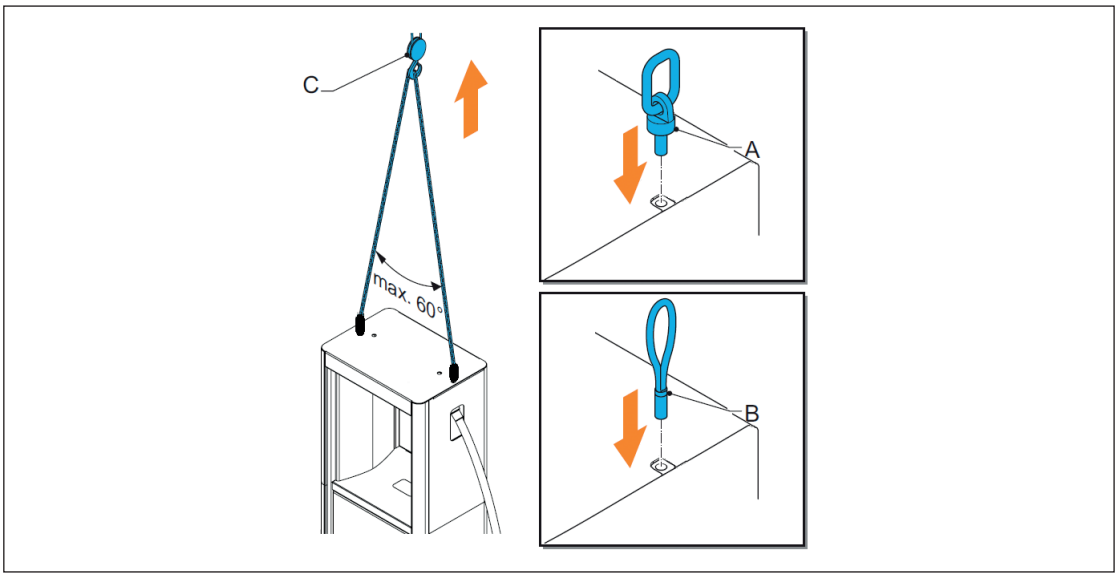
CAUTION

Warranty

Damage due to moving the Charge Post to its position is not covered by the warranty.

CAUTION

Do not use a compressor to clean the Charge Post. Use a vacuum cleaner.



A Swivel eye bolts
B Lifting loops
C Hoisting equipment

1. Insert the bolts (A) or (B) into the holes on each side of the Charge Post.
2. Tighten the bolts.
3. Connect the hoisting equipment (C).

CAUTION

Keep the hoisting angle below 60°.

4. Move the Power Cabinet to the foundation.

5.14.3 Connect Charge Post to foundation

Preconditions:

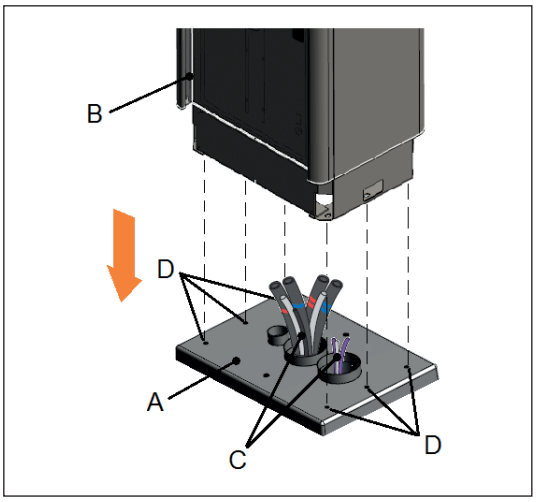
- Cover caps (2x) that were removed from the Charge Post (bag with parts)
- Tools: spanner (size 19), torque wrench (size 19).

DANGER

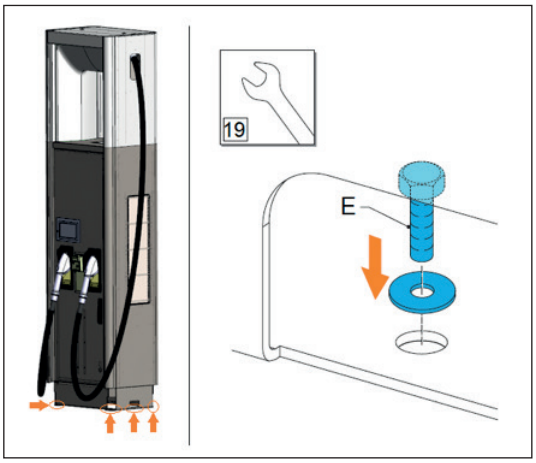
Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

WARNING

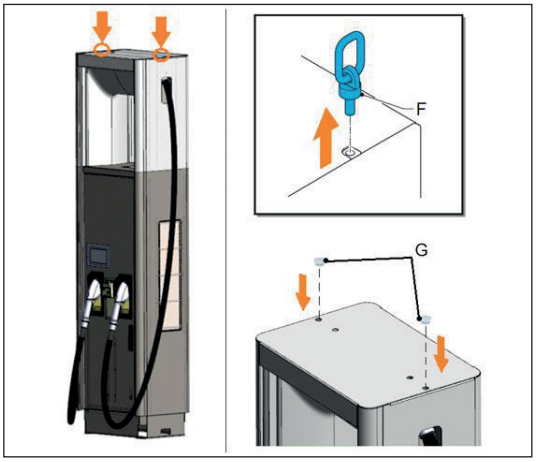
Make sure that personnel cannot be crushed or become trapped while moving the Charge Post.



1. Carefully lower the Charge Post (B) onto the foundation (A).
2. Make sure that you do not trap the cables (C).
3. Make sure that the Charge Post is aligned with the tapped holes (D).



4. Insert M12 bolts (E) (length 70 mm, A2-classe) fitted with washers into the holes.
5. Tighten the bolts with a tightening torque of 80 N·m.

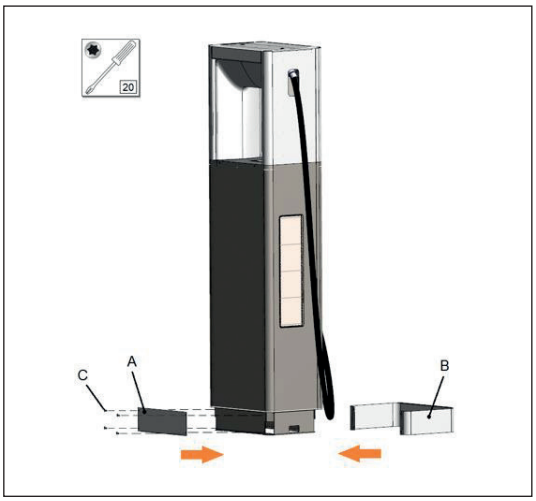


6. Remove the swivel eye bolts or lifting loops (F).
7. Place the cover caps (G) in the holes (2x).

5.14.4 Install border covers of the Charge Post

Preconditions:

- Tools: torx screwdriver (size TT20).



1. Put the front cover (B) around the bottom border of the Charge Post.
2. Put the back cover (A) against the rear bottom front of the Charge Post.
3. Insert the M4 torx screws (C) onto the holes (4x).
4. Tighten the torx screws.

5.15 Installation of the cables inside Charge Post

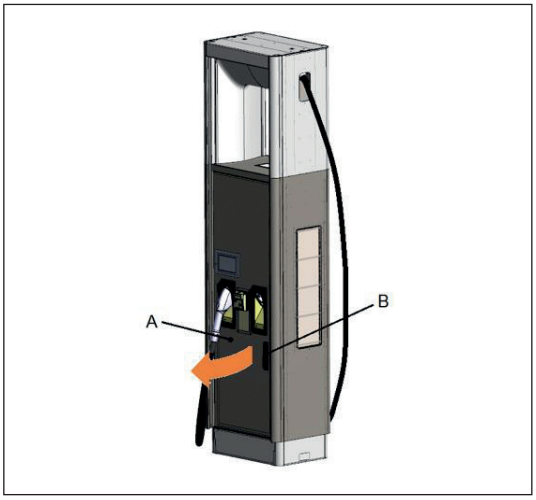
DANGER

Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

5.15.1 Open the door of the Charge Post

Preconditions:

- Key that was removed from the Charge Post (bag with parts).

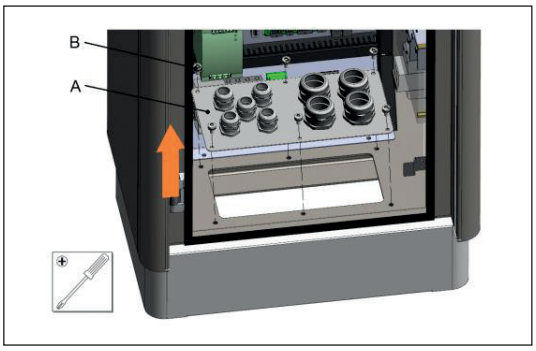


1. Unlock the handle (B)
2. Use the handle (B) to open the door (A).

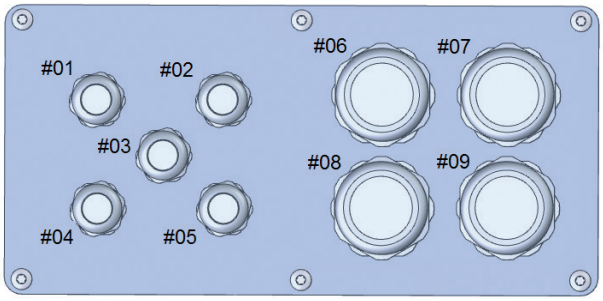
5.15.2 Route cables through gland plate

Preconditions:

- Tools: cross-head screwdriver.



1. Remove the screws (B) (6x).
2. Put the screws (B) in a safe location as it will be installed again later on.
3. Remove the gland plate (A) from the bottom of the Charge Post.



Top view

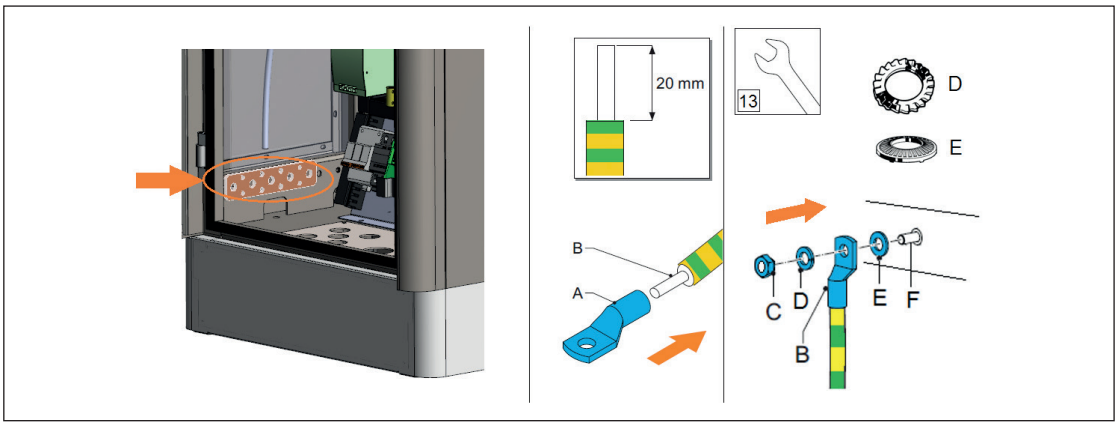
Gland#	Glamping Range ØF	Cable
1	10 – 17 mm	PE Wire
2	10 – 17 mm	AC utility power
3	10 – 17 mm	CAN (fiber cable)
4	10 – 17 mm	Ethernet or Lighting protection Wire (optional)
5	10 – 17 mm	Interlock
6	27 – 35 mm	DC- In (not used for the HP 175 Charger)
7	27 – 35 mm	DC- In
8	27 – 35 mm	DC+ In (not used for the HP 175 Charger)
9	27 – 35 mm	DC+ In

4. Loosen and remove all the cable gland's nuts.
5. Route the cables through the right gland (see picture above).
6. Make sure that there is sufficient cable length to reach the connectors inside the Charge Post.
7. Slide the cable gland's nut over each cable.
8. Place the gland plate (A) back at the bottom of the Charge Post.
9. Insert the screws (B) into the holes (6x) and tighten the screws.
10. Tighten all the cable gland's nuts to secure the cables.

5.15.3 Connect the PE wire of the Power Cabinet

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end ring, spanner (size 13).



1. Cut the PE wire to the correct length to reach the pin (F) on the PE rail. Do not make the wire routing too tight, or too loose.

NOTICE

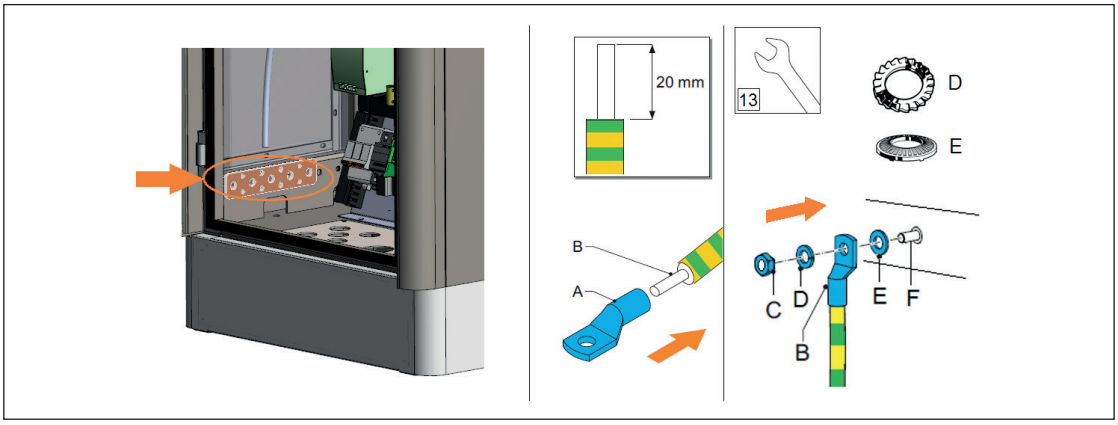
For safety, it is recommended to make a loop in the PE wire. This loop makes sure that the PE wire is not the first wire that is disconnected if the Charge Post is moved by a collision.

2. Strip 20 mm of the insulation from the end of the wire.
3. Attach a wire end ring (A) to the end of the PE wire (B).
4. Remove the M8 nut and washers from the PE pin (F).
5. Insert the nut (C) with toothed washer (D), the PE wire (B) and the contact washer (E) onto the PE pin (F).
6. Tighten the nut with a tightening torque of 15 N·m.

5.15.4 Install lighting protection (optional)

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end ring, spanner (size 19).



1. Cut the wire of the lighting protection cable to the correct length to reach the pin (F) on the PE rail. Do not make the wire routing too tight, or too loose.

NOTICE

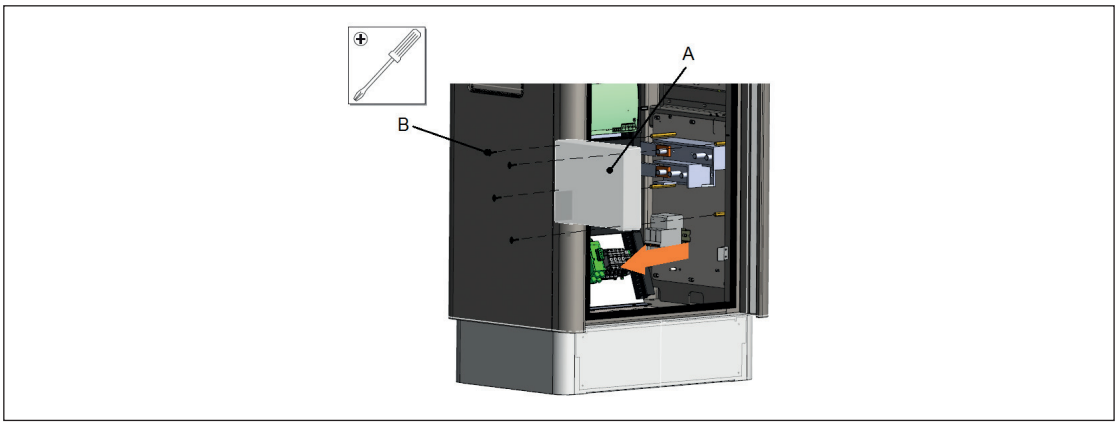
For safety, it is recommended to make a loop in the lighting protection wire. This loop makes sure that the lighting protection wire is not the first wire that is disconnected if the Charge Post is moved by a collision.

2. Strip 20 mm of the insulation from the end of the wire.
3. Attach a wire end ring (A) to the end of the lighting protection wire (B).
4. Remove the M8 nut and washers from the PE pin (F).
5. Insert the nut (C) with toothed washer (D), the PE wire (B) and the contact washer (E) onto the PE pin (F).
6. Tighten the bolts with a tightening torque of 15 N·m.

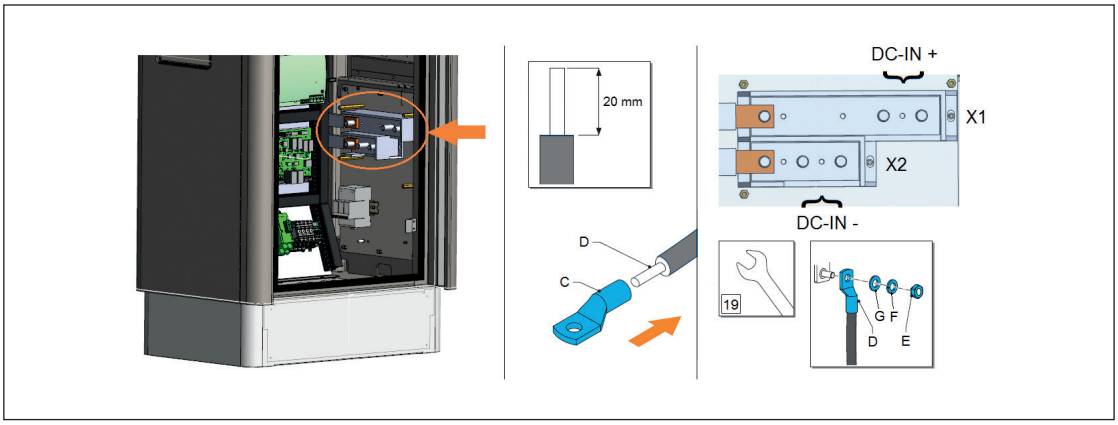
5.15.5 Connect the DC power input cables

Preconditions:

- Tools: wire cutter, wire stripper pliers, wire-end rings, spanner (size 19), torque wrench (size 19), cross-head screwdriver.

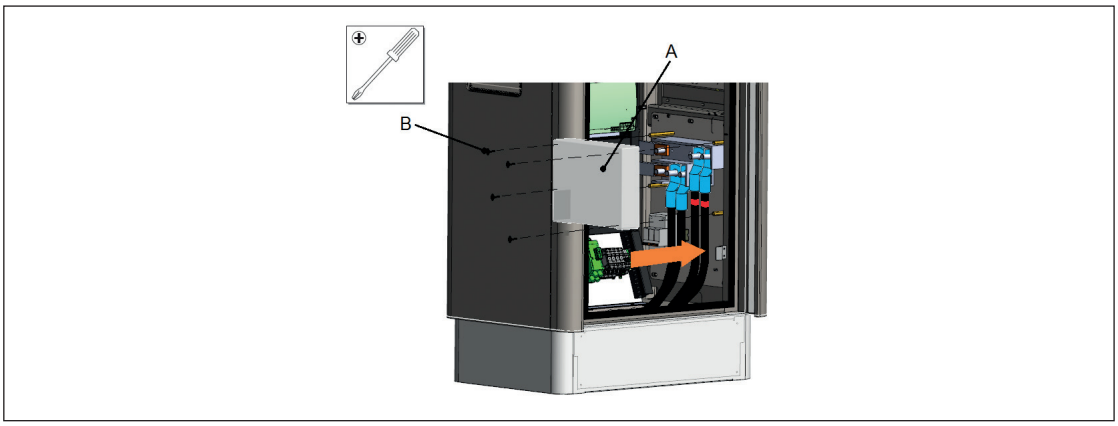


1. Remove the protection plate (A) by loosening the screws (B) (4x).
2. Put the protection plate and screws in a safe location as it will be installed again later on.



3. Cut the wires of the DC power cable to the correct lengths to reach the DC input connectors. Do not make the wire routing too tight, or too loose.
4. Strip 20 mm of the insulation from the ends of the wires (D).
5. Attach wire end rings (C) at the end of the wires.
6. Remove the nuts and washers from the bolts (M12) of DC input connectors.
7. Insert the DC+ wire(s) (marked by red heat-shrink) with the flat washer (G), the spring washer (F) and the nut onto the bolt of the DC+ Input connector(s).

8. Insert the DC- wire(s) with the flat washer (G), the spring washer (F) and the nut onto the bolt of the DC-Input connector(s).
9. Tighten the nuts (C) with a tightening torque of 30 N·m.

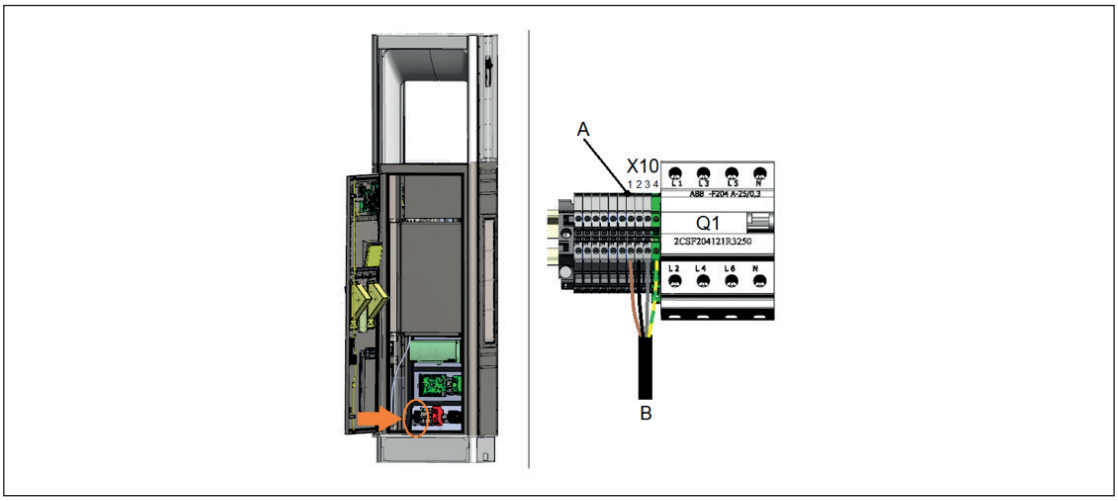


10. Take the protection plate (A) that was removed and place it back over the DC connector blocks.
11. Secure the plate by the screws (B) (4x).

5.15.6 Connect the AC utility power cable from Power Cabinet

Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.



1. Cut the AC utility power cable to the correct lengths to reach the connector block (A). Do not make the wire routing too tight, or too loose.
2. Strip the insulation from the AC utility power cable (B).
3. Cut the wires of the AC utility power cable (B) to the correct lengths to reach the connectors. Make sure the PE wire is longer than the other wires.
4. Strip 11 mm of the insulation from the ends of the wires.
5. Crimp a ferrule onto the end of each wire.
6. Loosen the connector screws.
7. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire color
L1	X10-1	Brown
L2	X10-2	Black
L3	X10-3	Gray
PE	X10-4	Green/yellow

8. Tighten the connector screws of connector block (A) with a tightening torque of 1.3 N·m.

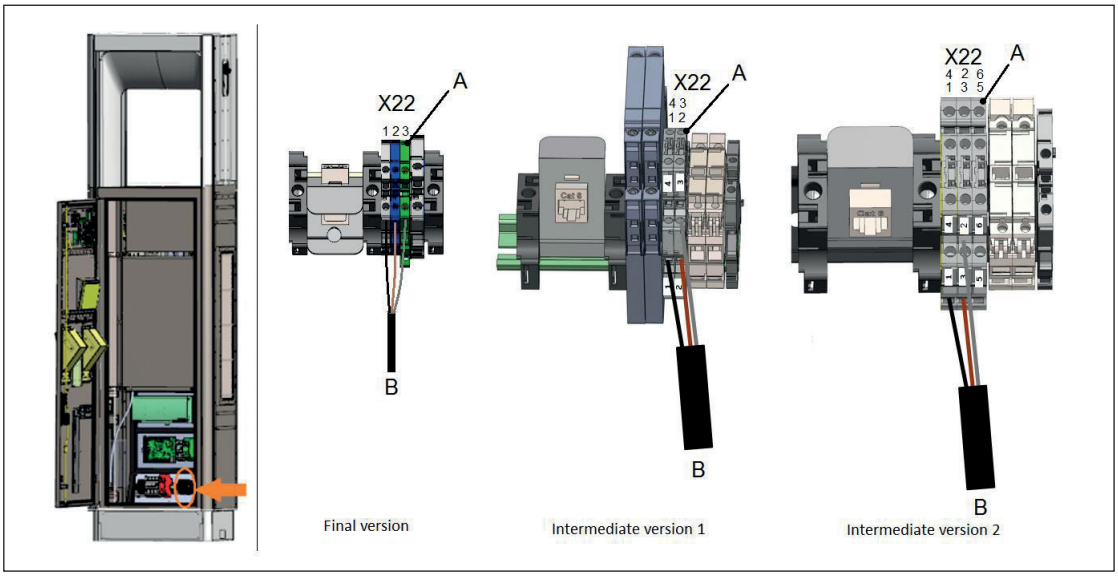
5.15.7 Connect the Interlock cable from the Power Cabinet

Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.

NOTICE

Beside the final version there are made two intermediate versions (version 1 and 2) of the Charge Post. All versions have different Interlock connections. Before connecting the Interlock cable, check with help of the picture below which connector block (A) is used in the Charge Post.

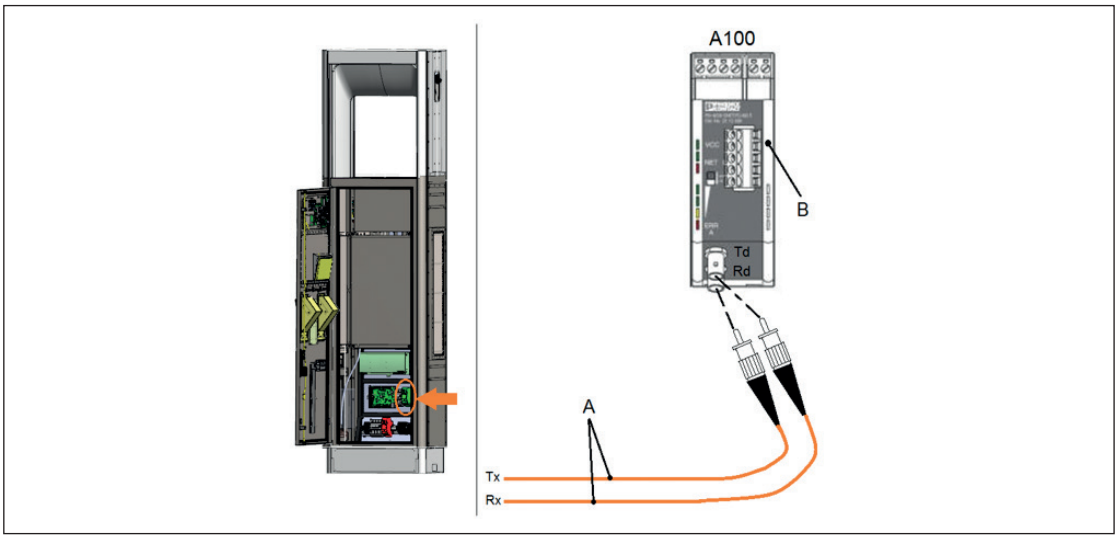


1. Cut the Interlock cable to the correct lengths to reach the connector block (A). Do not make the wire routing too tight, or too loose.
2. Strip the insulation from the Interlock cable (B).
3. Cut the wires of the Interlock cable (B) to the correct lengths to reach the connectors.
4. Strip 11 mm of the insulation from the ends of only the White and Brown wire!
5. Crimp a ferrule onto the end of the White and Brown wire.
6. Ensure that the unused wires, the Green and Yellow wire, are protected so that they cannot touch metal parts.
7. Loosen the connector screws.
8. Insert the wires into the connectors, see table below:

Functional description	Connector Final version	Connector Int. version 1	Connector Int. version 2	Wire number
Ext. Interlock IN	X22-1	X22-1	X22-1	White
Ext. Interlock OUT	X22-2	X22-2	X22-3	Brown
GND	X22-3	X22-3	X22-2	Shield

9. Tighten the connector screws of connector block (A) with a tightening torque of 1.3 N·m.

5.15.8 Connect the CAN cable from the Power Cabinet



1. Route the CAN fiber cable to module A100 (B).
2. Remove the protection covers from the optical connectors.
3. Connect the two CAN bus fiber cables (A) onto module (B):

- Rx with Td A100;
- Tx with Rd A100.

NOTICE

Two fiber cables are not connected. Those fiber cables are meant for spare.

4. Bind the cables together and secure the loops loosely with a piece of tak-ty or ty-rap.

CAUTION

Make the loop bend radius of the fiber cables not smaller than 64 mm, otherwise the core of the fiber cable may break.

5.15.9 Close the door of the Charge Post

Preconditions:

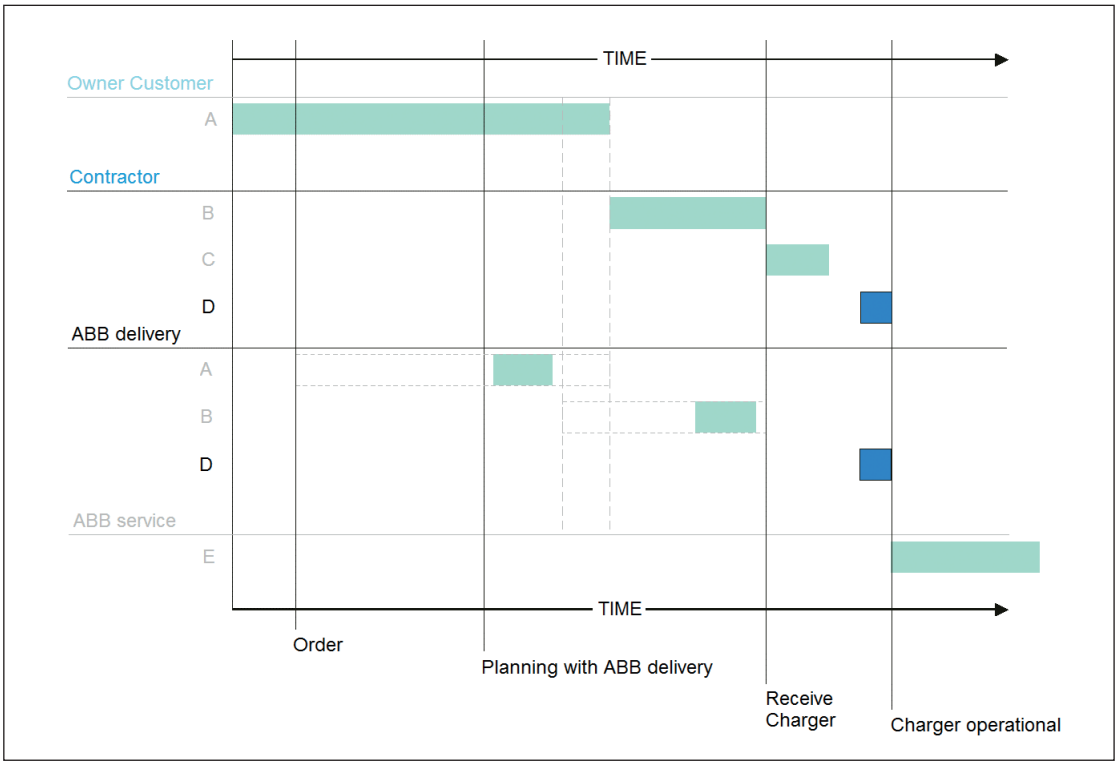
- Key that was removed from the Charge Post.

1. Close the door (A).
2. Lock the handle (B).
3. Place the charge plugs back in the holders.

6. Commissioning

6.1 Commissioning preparation

Commissioning is the last phase necessary to get the PowerChoice 350 into operation.
The planning steps for the commissioning phase are shown in the figure below.



D Commissioning

The commissioning of the PowerChoice 350 need to be performed by a service engineer from the ABB Delivery department and/or a certified local ABB service engineer. Both will need the support from the local contractor.

Before the service engineer can start, the following conditions must be met:

- All installation work is done.
- Grid power is available.
- A local technician is present for assistance and to switch the power on.
- A CCS compliant electric vehicle is available to perform the functional tests.

CAUTION

Warranty

It is not permitted to move the whole or parts of the PowerChoice 350 after the commissioning.

If the whole or parts of the PowerChoice 350 is moved without contacting the ABB Service department, the warranty will be considered void.

6.2 Customer Acceptance Form (CAF)

After the commissioning is completed, the owner / site operator will sign the Customer Acceptance Form (CAF). In certain circumstances PACCAR will be represented by a project engineer.

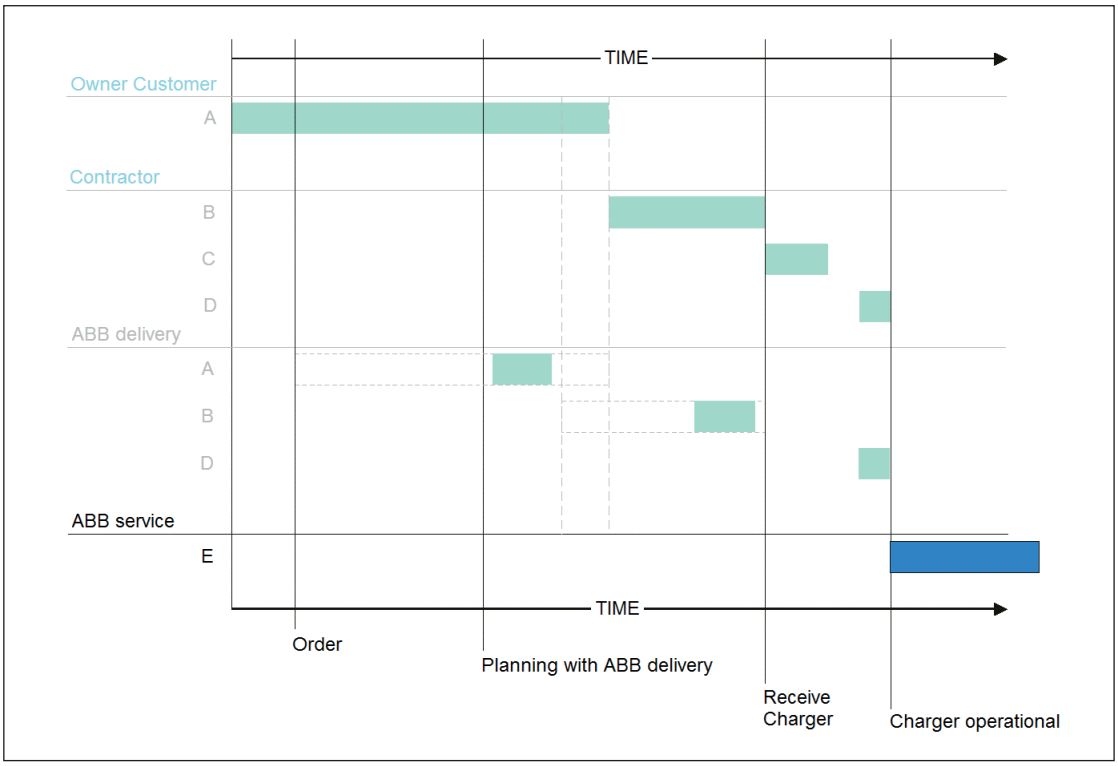
The CAF contains information about:

- the project (number, location, charger type),
- a checklist about the delivery,
- the commissioning SAT checklist,
- list of remaining items.

After the CAF has been signed, the customer support will be handled by the ABB Service department. If there are any remaining items, they can be noted on the CAF document, together with the agreed solution and the expected date of completion.

7. Service and Maintenance

7.1 About Service and Maintenance



E Service and Maintenance

Maintenance is done according the maintenance schedule. This is outside of the scope of this document.

7.2 Cleaning of the cabinet

The Power Cabinet and Charge Post is powder coated. This coating must be kept in good condition.

Clean the Power Cabinet and Charge Post three times a year in the following way:

- Remove rough dirt by spraying with low-pressure tap water.
- Apply a neutral or weak alkaline cleaning solution and let it soak.
- Remove dirt by hand with a non-woven nylon hand pad.
- Rinse thoroughly with tap water.
- Optionally, apply wax on the front for extra protection and gloss.
- Do a check on the coating for damage.

NOTICE

When the PowerChoice 350 is exposed to rain, it is sufficient to clean it twice a year.

CAUTION

Do not apply high-pressure water jets. Water may leak into the Power Cabinet. If a high-pressure water jet has been used, make sure that the inside of the Power Cabinet is dry.

- Only use cleaning agents with a pH value between 6 and 8.
- Do not use cleaning agents with abrasive components.
- Do not use abrasive tools.

8. Technical Specification

8.1 Electrical specification complete 175 kW system

Input	
Supply voltage	3-phase, 400 V AC: PE, L1, L2, L3
Input voltage range	400 V AC ± 10%
Input frequency range	50 Hz ± 1%
Maximum power dissipation	192 kVA
Power factor (cos φ)	≥ 0.97
Standby power consumption	≤ 80 W (for Power Cabinet) ≤ 70 W (for Charge Post)
Efficiency	≥ 94% at full load
Maximum input current	308 A AC at 360 V AC (175 kW output)
Nominal input current	277 A AC at 400 V AC (160 kW output)
Earth Leakage Current	DC 1.0 mA DC AC 100 mA (RCD integrated in Powerchoice 350)
Short Circuit Capacity	25 kA
Total Harmonic Distortion (THD)	< 8%
AC power connection	240 mm^2 (max)
DC output	
Maximum output power	160 kW (continuous)
Peak output power	175 kW
Output voltage range	150 – 920 V DC
Maximum CCS output current	375 A DC
Maximum CHAdeMO output current	200 A DC

8.2 Electrical specification complete 350 kW system

Input	
Supply voltage	3-phase, 400 V AC: PE, L1, L2, L3
Input voltage range	400 V AC ± 10%
Input frequency range	50 Hz ± 1%
Maximum power dissipation	384 kVA
Power factor (cos φ)	≥ 0.97
Standby power consumption	≤ 80 W (for Power Cabinet) ≤ 70 W (for Charge Post)
Efficiency	≥ 94% at ≥ 20% load
Maximum input current	616 A AC at 360 V AC (350 kW output)
Nominal input current	554 A AC at 400 V AC (320 kW output)
Earth Leakage Current	DC 1.0 mA DC AC 100 mA (RCD integrated in Powerchoice 350)
Short Circuit Capacity	25 kA
AC power connection	240 mm^2 (max)
DC output	
Maximum output power	320 kW (continuous)
Peak output power	350 kW
Output voltage range	150 – 920 V DC
Maximum CCS output current	500 A DC
Maximum CHAdeMO output current	200 A DC

8.3 Mechanical data

Mechanical specification Power Cabinet Powerchoice 350	
Dimensions (H x W x D)	2092 x 1170 x 770 mm (including swivel eye bolts)
Weight	1340 kg
Volume	1.87 m^3
Dimensions including packaging (H x W x D)	2250 x 1200 x 800 mm
Weight including packing	1400 kg
Weight concrete foundation	1300 kg
Mechanical impact protection	IK10
Housing	Stainless steel 430

Mechanical specification Charge Post	
Dimensions (H x W x D)	2390 x 620 x 440 mm
Weight	250 kg
Volume	0.65 m^3
Dimensions including packaging (H x W x D)	2570 x 900 x 825 mm
Weight including packing	250 kg
Mechanical impact protection	IK10 (screen: IK08)
Housing	Stainless steel 304

8.4 Environment

Environment specification Power Cabinet	
Ingression protection	IP54
Temperature range – Operation	-35 °C to +55 °C (with derating)
Temperature range – Storage	-10 °C to +70 °C
Humidity	5 % to 95 %, RH – non-condensing
Airflow	1450 m^3/h
Pressure drop	300 Pa
Altitude	2500 m (max.)
Storage conditions	Indoors, dry

Environment specification Charge Post	
Ingression protection	IP54
Temperature range – Operation	-35 °C to +55 °C (with derating)
Temperature range – Storage	-10 °C to +70 °C
Humidity	5 % to 95 %, RH – non-condensing
Altitude	2500 m (max.)
Storage conditions	Indoors, dry

CAUTION

Warranty

Warranty will be considered void when the PowerChoice 350 is damaged while badly stored at the customer's location.

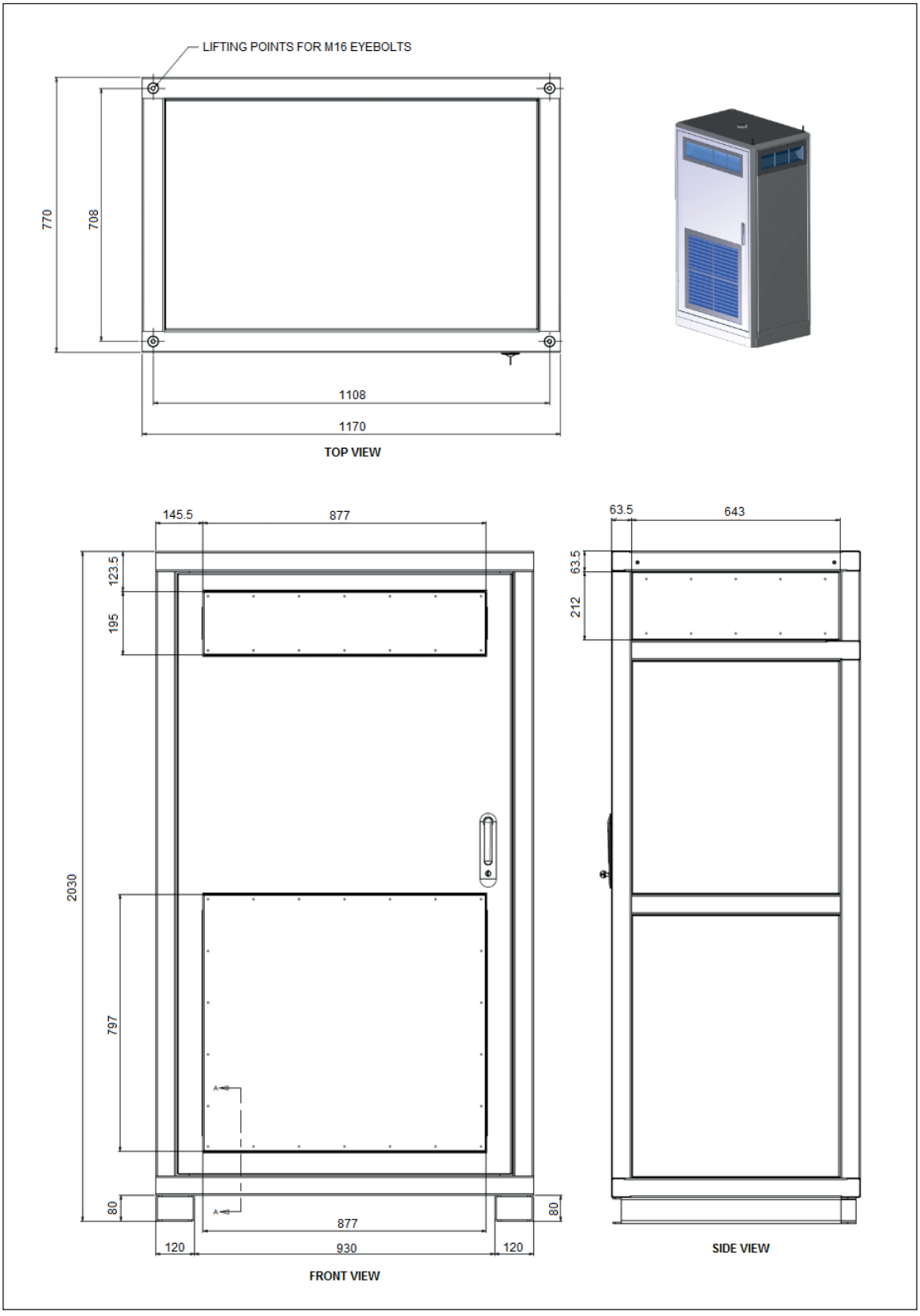
8.5 Certifications

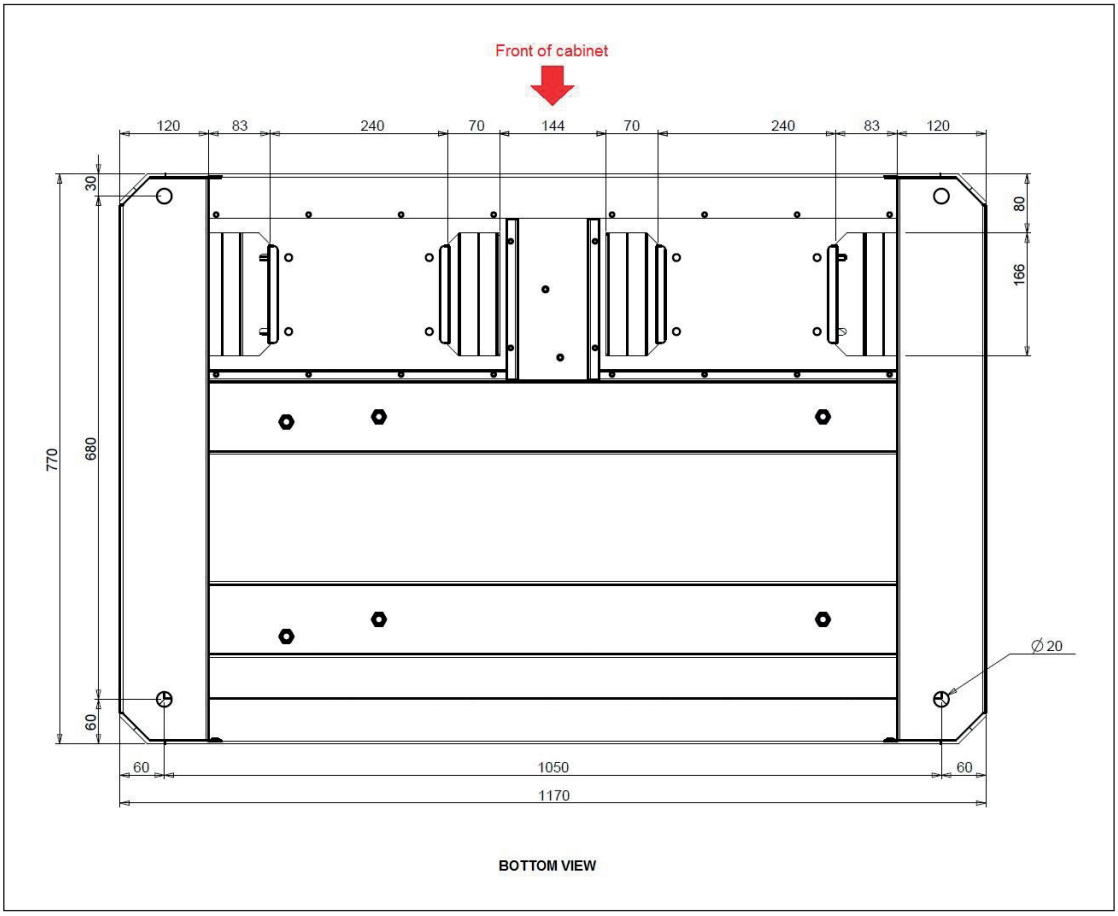
Certifications for complete system

CE	Declaration of Conformity Terra HP175: 20180124
	Declaration of Conformity Gen3 Charge Post: 20180717
Class of protection	1 with PE connection

9. Appendix

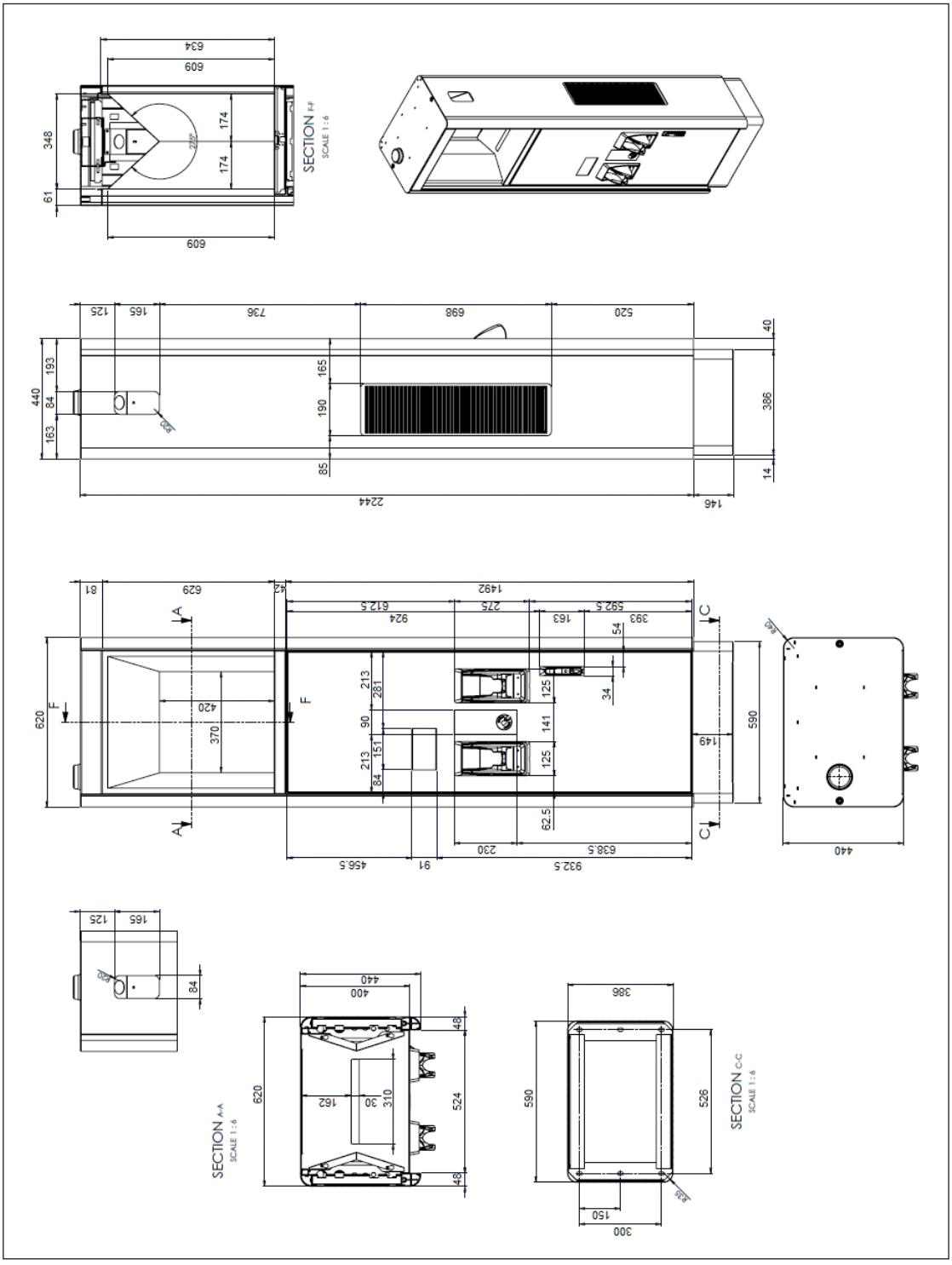
A. Dimensions Power Cabinet

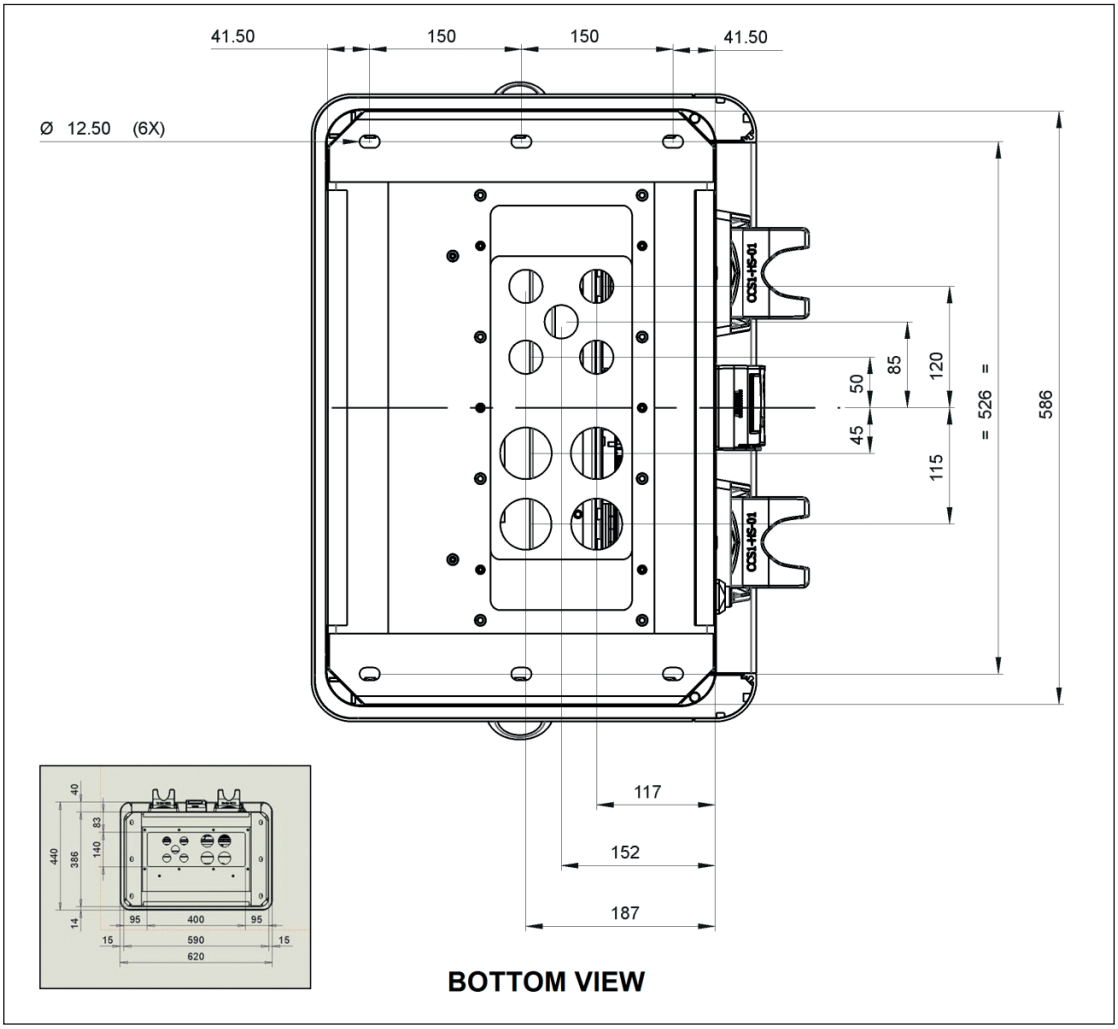



Front of cabinet
120
83
240
70
144
70
240
83
120
30
80
166
770
680
60
Ø 20
60
1050
60
1170

BOTTOM VIEW

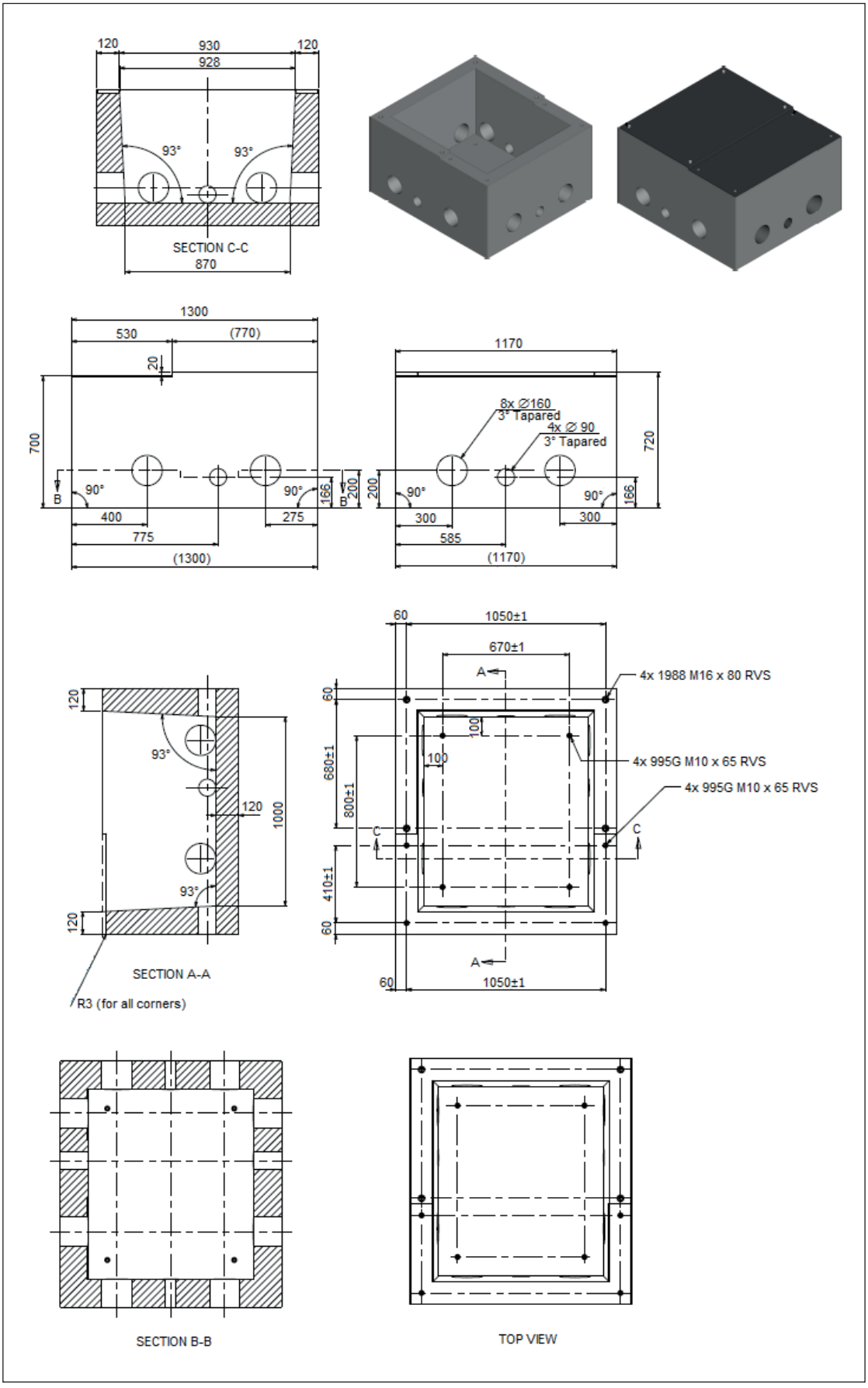
B. Dimensions Charge Post




41.50
150
150
41.50
Ø 12.50 (6X)
CCSI-HS-01
CCSI-HS-01
50
85
120
45
115
= 526 =
586
117
152
187
440
386
140
83
40
14
95
400
95
15
590
15
620

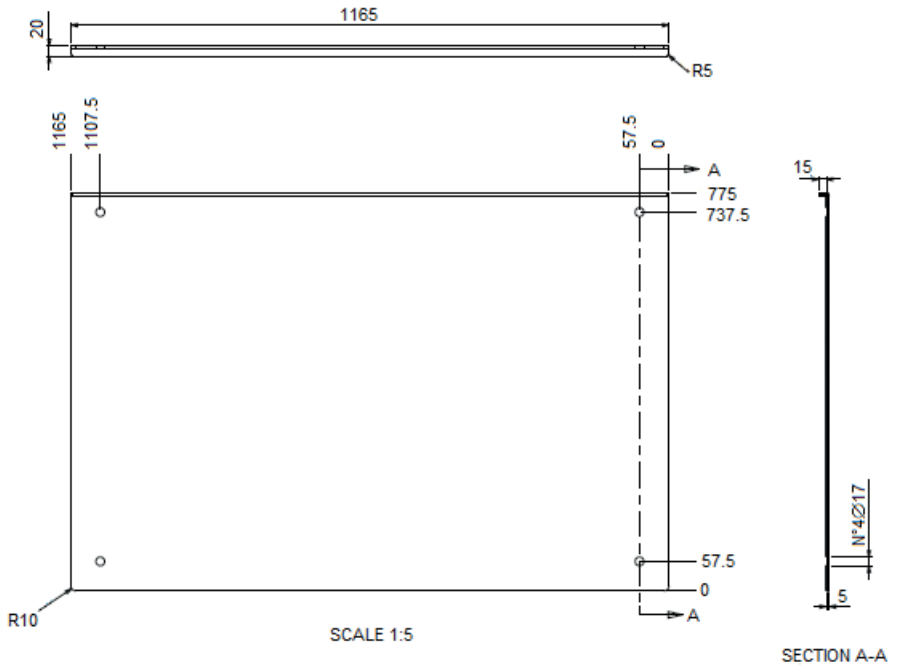
BOTTOM VIEW

C. Dimensions Concrete Foundation Power Cabinet



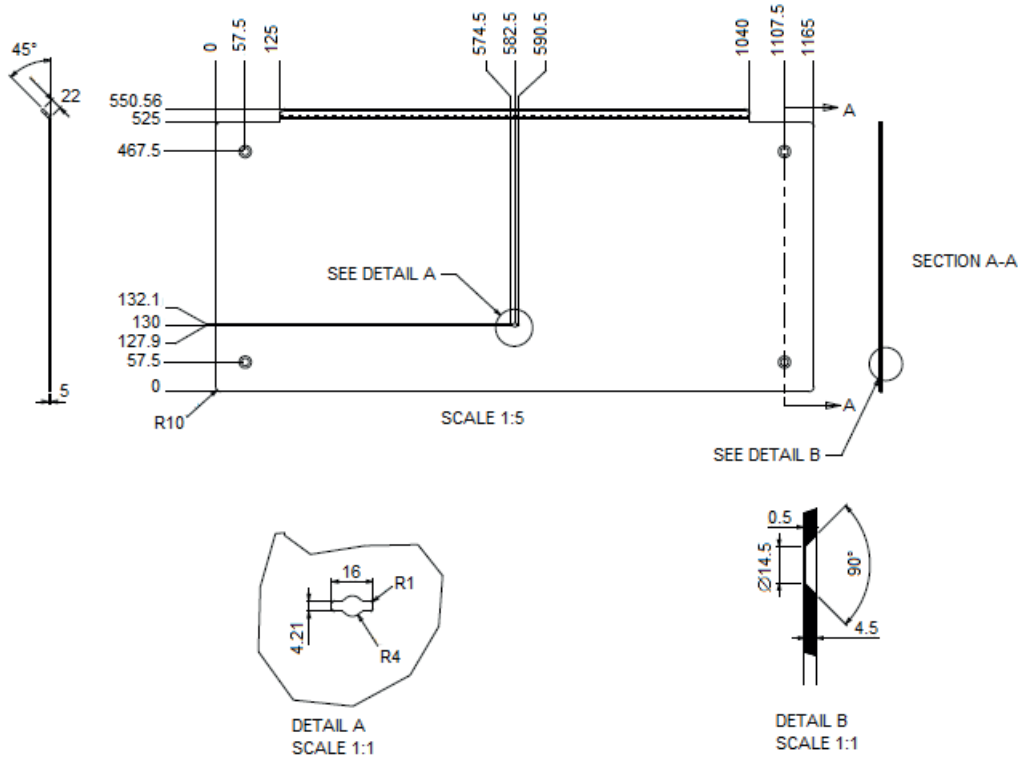
SHEET METAL TEXTURED - SINGLE TEAR PLATE

GALVANIZED STELL SHEET METAL

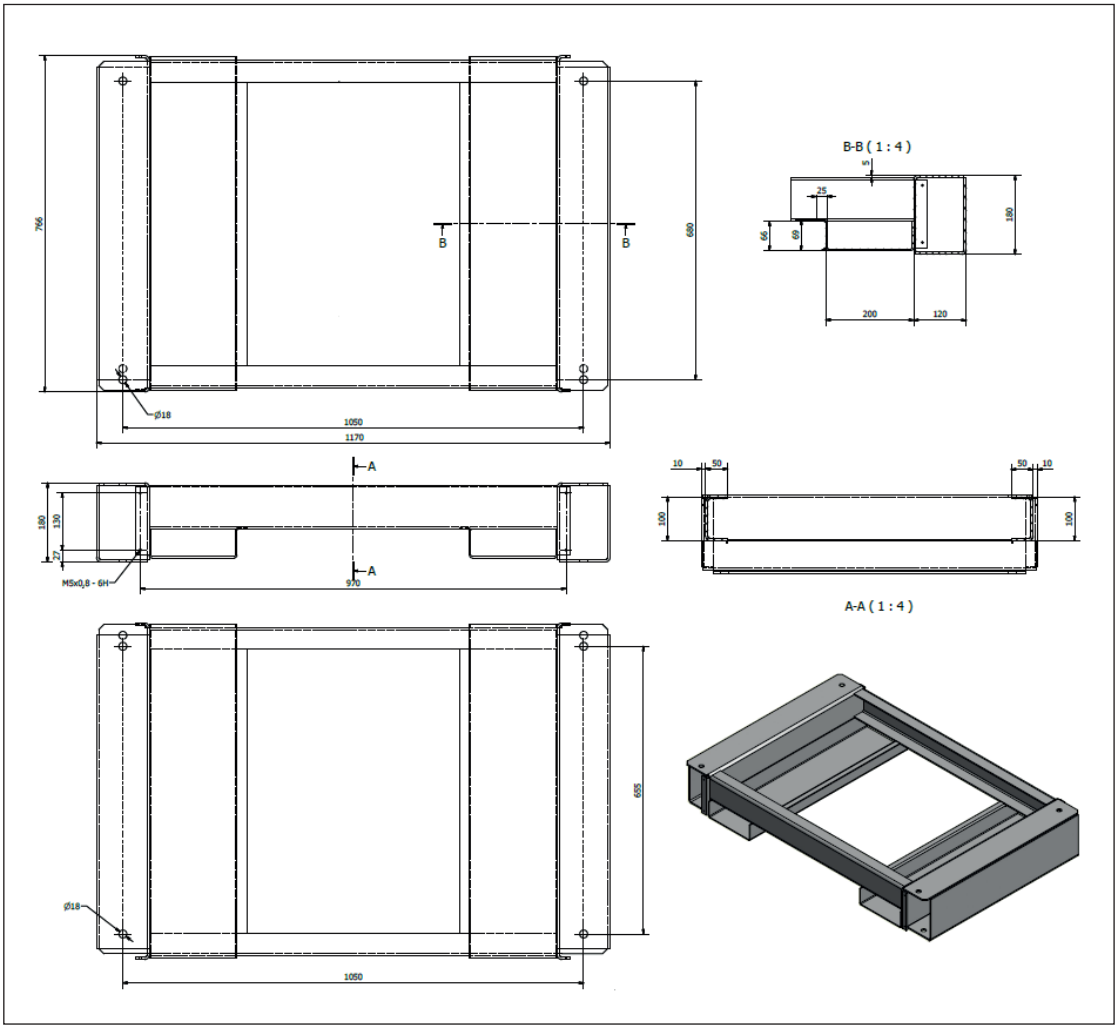


SHEET METAL TEXTURED - SINGLE TEAR PLATE

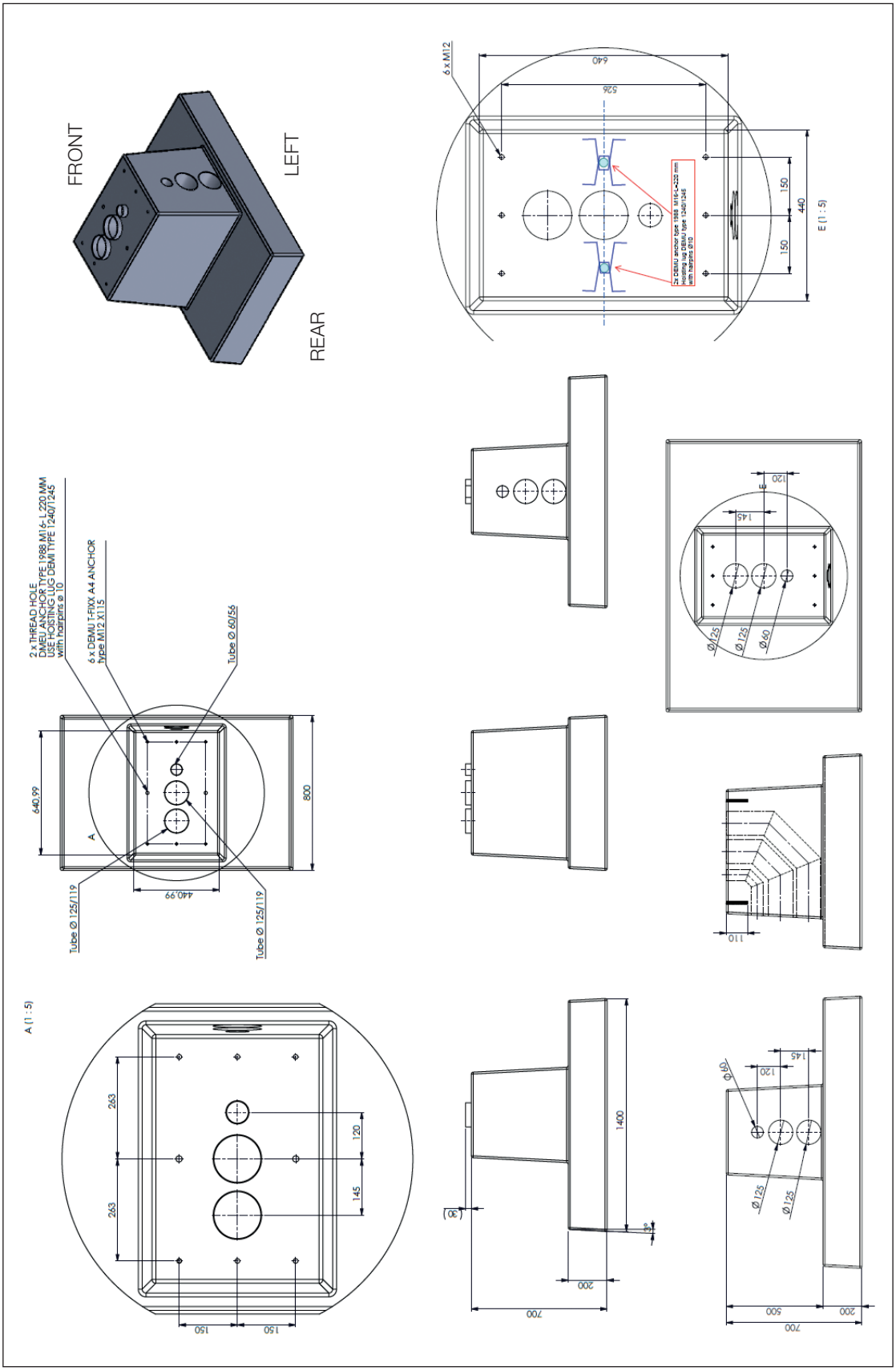
GALVANIZED STELL SHEET METAL



D. Dimensions Metal Foundation Power Cabinet

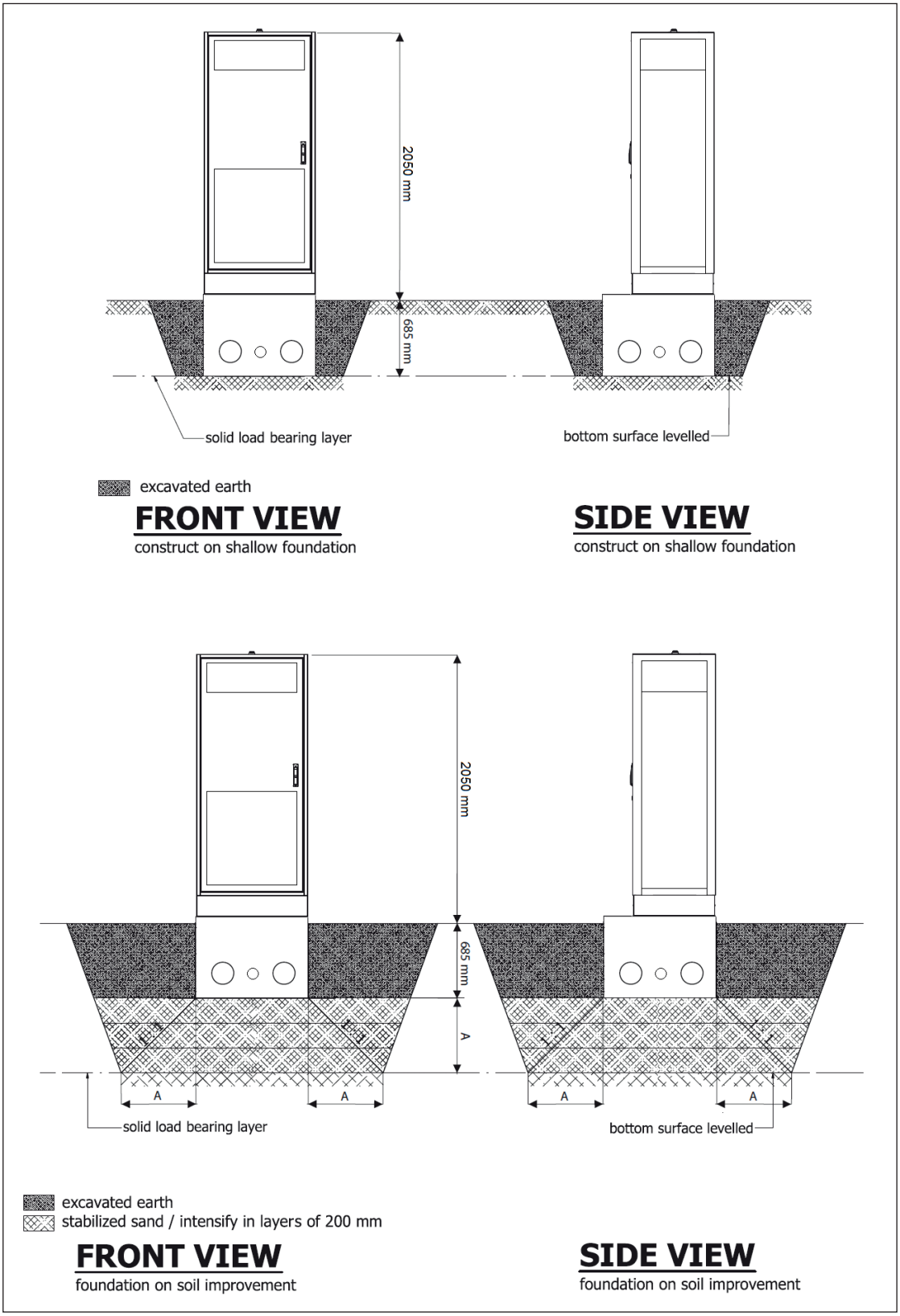


E. Dimensions Concrete Foundation Charge Post

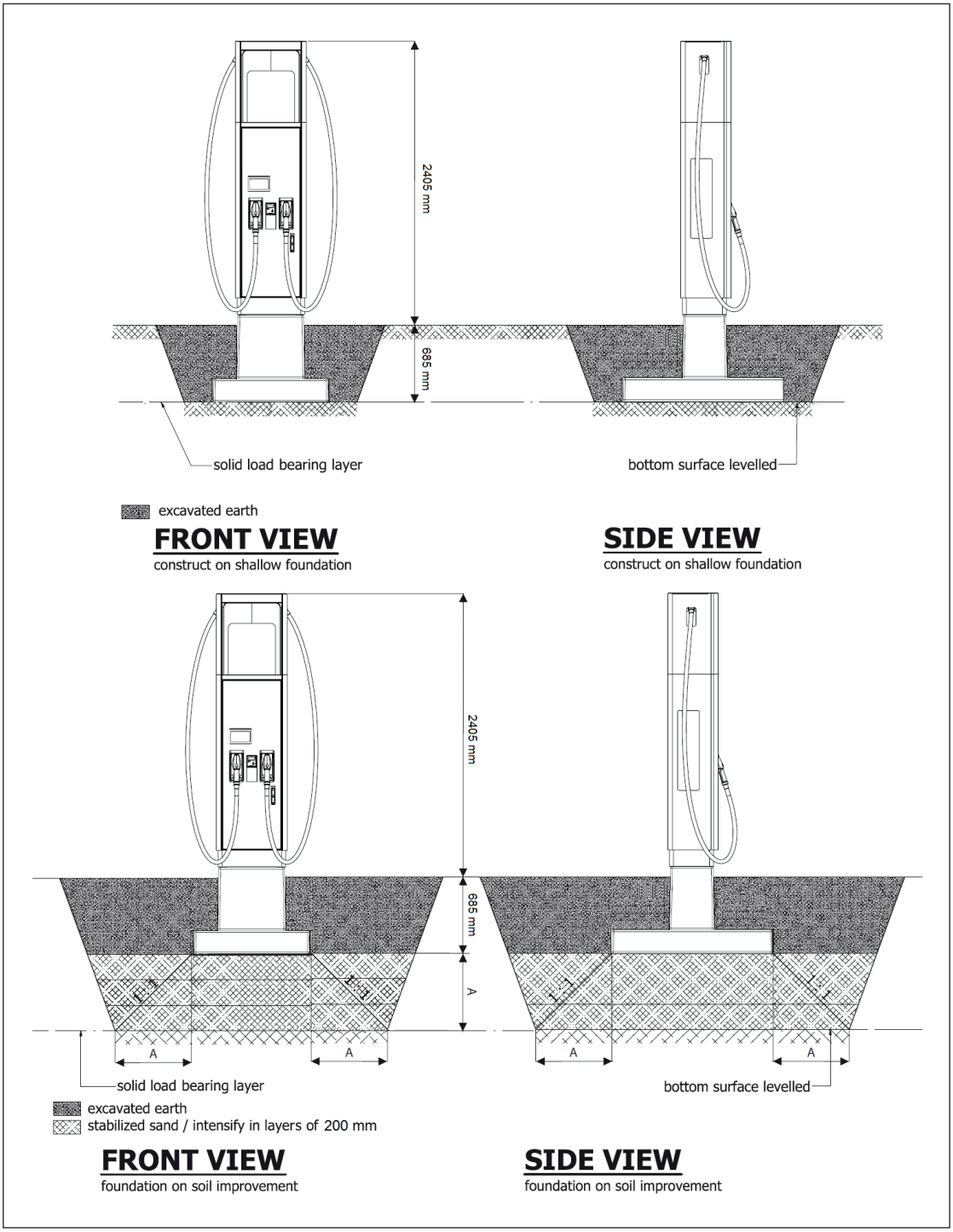


NOTE: Ducts exit the foundation from LEFT side as you face the charge post.

F. Power Cabinet – Outline with Foundation

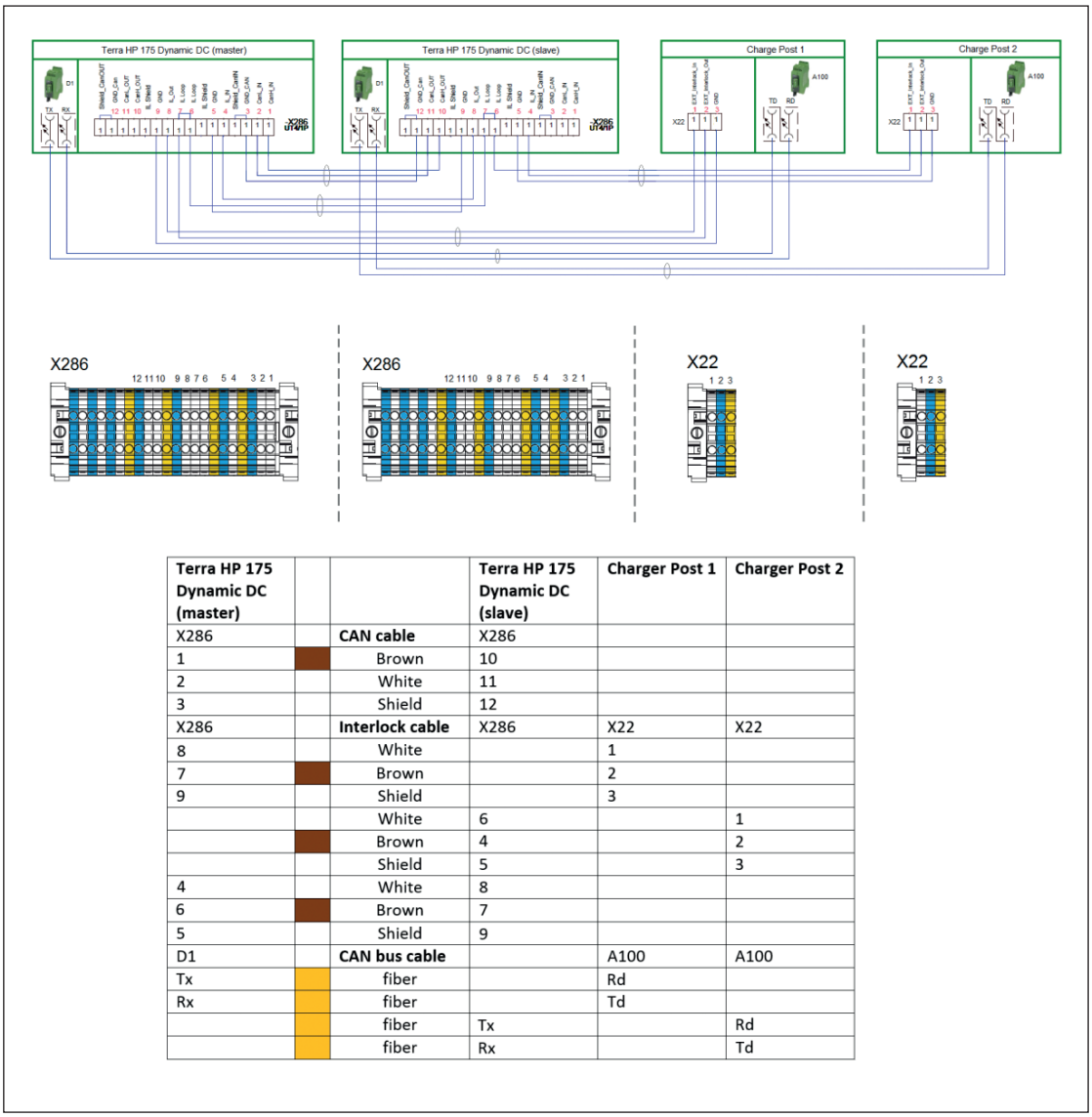


G. Charge Post – Outline with Foundation



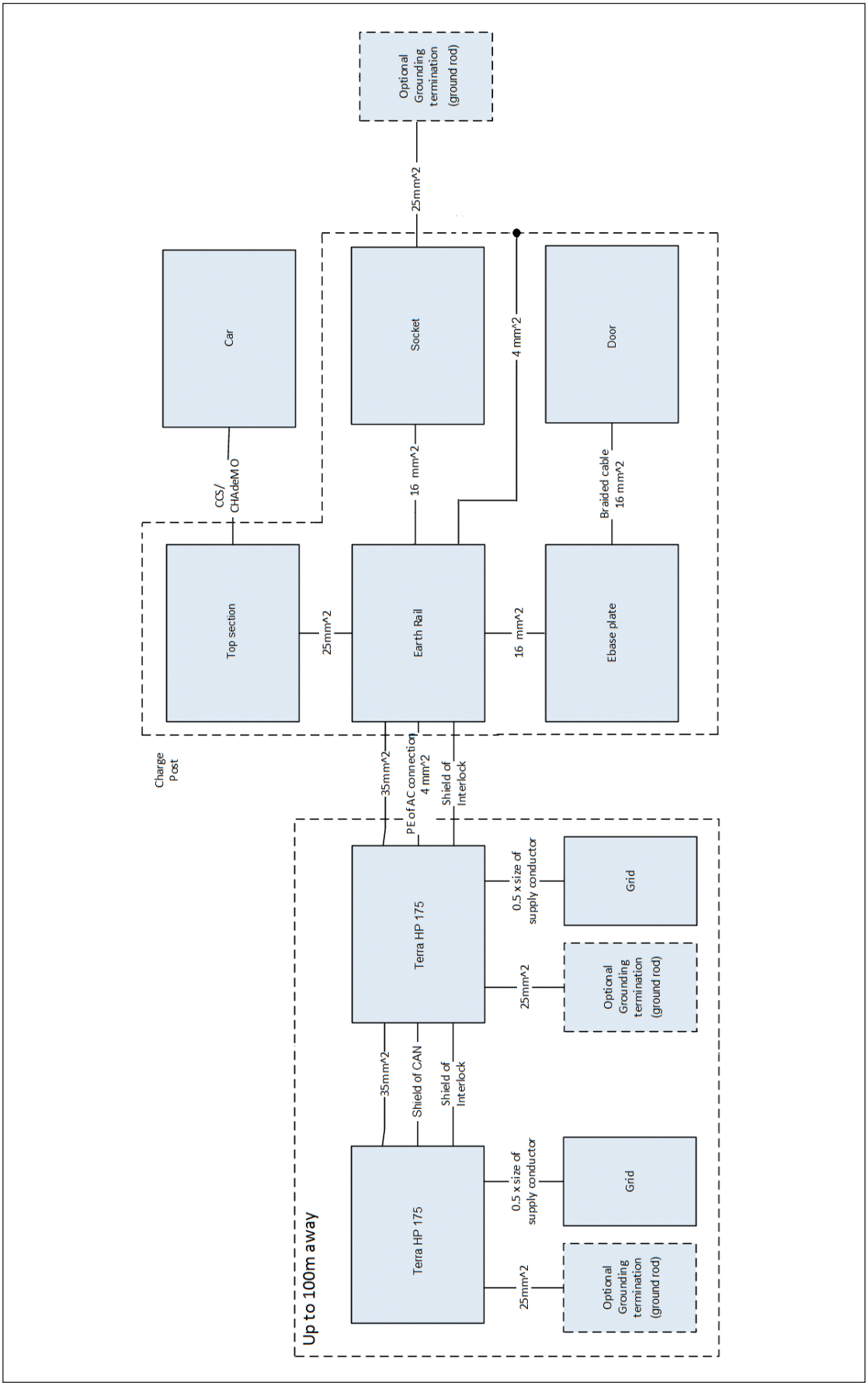
H. Signal connection diagram

For 350 kW Dynamic DC charge system



Terra HP 175 Dynamic DC (master)			Terra HP 175 Dynamic DC (slave)	Charger Post 1	Charger Post 2
X286		**CAN cable**	X286		
1		Brown	10		
2		White	11		
3		Shield	12		
X286		**Interlock cable**	X286	X22	X22
8		White		1	
7		Brown		2	
9		Shield		3	
		White	6		1
		Brown	4		2
		Shield	5		3
4		White	8		
6		Brown	7		
5		Shield	9		
D1		**CAN bus cable**		A100	A100
Tx		fiber		Rd	
Rx		fiber		Td	
		fiber	Tx		Rd
		fiber	Rx		Td

I. Ground overview of the system



ENGLISH

Electrical and electronic equipment to be separately collected in compliance with the Directive on waste electrical and electronic equipment (WEEE - 2012/19/EU)

The symbol (crossed out wheeled-bin) on your product indicates that the product shall not be mixed or disposed with your household waste, at their end of use.

This product shall be handed over to your local community waste collection point for the recycling of the product.

For more information, please contact your Government Waste-Disposal department in your country.

Inappropriate waste handling could possibly have a negative effect on the environment and human health due to potential hazardous substances. With your cooperation in the correct disposal of this product, you contribute to reuse, recycle and recover the product and our environment will be protected.

FRANÇAIS

Équipements électriques et électroniques collectés séparément conformément à la Directive relative aux déchets d'équipements électriques et électroniques (WEEE - 2012/19/EU)

Ce symbole (poubelle interdite) apposé sur le produit indique qu'en fin de vie ce produit ne doit pas être traité avec les déchets ménagers.

Il doit être remis à un point de collecte approprié pour le recyclage des appareils électriques et électroniques.

Pour de plus amples informations, veuillez contacter le service de collecte des déchets ménagers local.

Ce produit contient des substances potentiellement dangereuses qui peuvent avoir des effets néfastes sur l'environnement et la santé humaine. En veillant à la mise au rebut correcte de ce produit, vous contribuerez à assurer le traitement, la récupération et le recyclage de ce produit et à protéger l'environnement.

ESPAÑOL

Aparatos eléctricos y electrónicos recopilados de modo separado en conformidad con la Directiva sobre residuos de aparatos eléctricos y electrónicos (WEEE - 2012/19/EU)

Los productos identificados con este símbolo (papelera tachada) no deben eliminarse como residuos domésticos una vez finalizada su vida útil.

Este producto debe entregarse a un punto de recogida de la comunidad local para su recuperación y reciclado.

Para mayor información, sírvase ponerse en contacto con el Departamento de Disposición de Desechos de su Ayuntamiento.

El manejo inadecuado de los residuos supone riesgos para la salud humana o el medio ambiente. Con la reutilización, el reciclado de los materiales u otras formas de valorización de tales productos usted contribuye de manera importante a la protección de nuestro medio ambiente.

NEDERLASNDS

Elektrische en elektronische apparatuur worden afzonderlijk ingezameld in naleving van de vereisten van de Richtlijn betreffende afgedankte elektrische en elektronische apparatuur (WEEE - 2012/19/EU)

Het symbool (doorgekruisde afvalbak op wielen) op het product geeft aan dat het product aan het einde van haar levensduur niet samen met of in de vorm van huishoudafval mag worden weggegooid.

Het product moet naar een verzamelplaats (milieudepot) worden gebracht waar dergelijke producten worden gerecycled.

Neem voor meer informatie contact op met de relevante overheidsafdeling voor afval/vuilnis die in uw land bestaat.

Het kan nadelige gevolgen hebben op voor mens en milieu als afval op een verkeerde manier wordt behandeld waardoor potentieel schadelijke stoffen vrij komen. Door uw medewerking te verlenen en dit product op de juiste wijze wegwerpt, kunt u een bijdrage leveren aan het herstellen, hergebruiken en recyclen van dit product om zo ons milieu te beschermen.

DANSK

Elektrisk og elektronisk udstyr indsamles særskilt i overensstemmelse med direktiv om affald af elektrisk og elektronisk udstyr (WEEE - 2012/19/EU)

Symbolet (en overstreget affaldsspand med hjul) på produktet angiver, at produktet ikke må blandes med eller bortskaffes sammen med almindeligt husholdningsaffald, når det er udtjent.

Produktet skal afleveres til det lokale affaldsindleveringssted til genbrug.

Kontakt venligst afdelingen for bortskaffelse af affald i din kommune angående yderligere information.

Uhensigtsmæssig bortskaffelse af affald kan have en negativ virkning på miljøet og folks helbred, da det kan indeholde potentielle, farlige substanser. Med din medvirken i henseende til forskriftsmæssig bortskaffelse af dette produkt, kan du bidrage til genbruge, recirkulere og genindvinde produkterne og samtidigt medvirke til, at vores miljø vil blive beskyttet.

DEUTSCH

Elektro- und Elektronikgeräte sind getrennt zu sammeln in Einklang mit der Richtlinie über Elektro- und Elektronik-Altgeräte (WEEE - 2012/19/EU)

Dieses Symbol (ausgekreuzte Mülltonne) auf dem Produkt bezeichnet, dass Altgeräte usw.

nicht wie normaler Haushaltsabfall in den Müll gegeben werden dürfen, sondern zum Recycling an einer hierfür vorgesehenen Annahmestelle abzugeben ist.

Für nähere Informationen wenden Sie sich bitte an die für Müllentsorgung zuständigen örtlichen Behörden.

Bei unsachgemäßer Entsorgung besteht das Risiko nachteiliger Auswirkungen auf Umwelt und Gesundheit durch potentiell gefährliche Substanzen. Durch Ihre Kooperation zur ordnungsgemäßen Entsorgung fördern Sie die Wiederverwendung, das Recycling und die Rückgewinnung von Stoffen und tragen zum Umweltschutz bei.

ITALIANO

Apparecchiatura Elettrica ed Elettronica oggetto di raccolta differenziata in conformità alla Direttiva sui Rifiuti di apparecchiature Elettriche ed Elettroniche (WEEE - 2012/19/EU)

Il simbolo (un bidone sbarrato da una croce) indica che il prodotto non deve essere smaltito con i rifiuti domestici, alla fine della sua vita.

Questo prodotto deve essere consegnato al punto di raccolta rifiuti della propria comunità locale per il suo riciclaggio.

Per ulteriori informazioni, rivolgersi all'organo statale preposto allo smaltimento dei rifiuti nel proprio paese.

Uno smaltimento dei rifiuti inappropriato può avere effetti negativi sull'ambiente e sulla salute umana a causa di sostanze potenzialmente pericolose. Collaborando allo smaltimento corretto di questo prodotto, si contribuisce al riutilizzo, al riciclaggio e al recupero del prodotto, e alla protezione del nostro ambiente.

PORTUGUÊS

Equipamentos Eléctricos e Electrónicos recolhidos seletivamente de acordo com a Diretiva relativa aos resíduos de equipamentos elétricos e eletrónicos (WEEE - 2012/19/EU)

O símbolo (caixote de lixo de rodas com uma linha cruzada) em seu produto indica que o produto, no fim da sua vida útil, não deve ser misturado ou eliminado com o lixo doméstico comum.

Este produto deverá ser entregue a uma estação de recolha de lixo da comunidade local para a reciclagem do produto.

Para mais informações, entre em contacto com o Departamento de Tratamento de Lixo do Governo do seu país.

O tratamento de lixo incorrecto poderia provocar um efeito negativo no meio ambiente e saúde humana devido a substâncias potencialmente perigosas. Com a sua cooperação para a eliminação correcta deste produto, contribuirá para a reutilização, reciclagem e recuperação do produto, e nosso meio ambiente será protegido.

SVENSKA

Elektriska och elektroniska produkter ska samlas in separat i enlighet med direktivet om avfall som utgörs av eller innehåller elektrisk eller elektronisk utrustning (WEEE - 2012/19/EU)

Denna symbol (en överkorsad soptunna) på produkten innebär att produkten ej ska blandas eller slängas med ditt hushållsavfall när den är förbrukad.

Produkten ska lämnas till en lokal insamlingsplats för denna slags produkter för återvinning.Kontakta kommunkontoret för närmare detaljer om var du finner sådana insamlingsplatser.

Olämplig avfallshantering kan få negativa effekter på miljön och på mänsklig hälsa då en produkt kan innehålla farliga ämnen.

Vi ber om ditt samarbeta i bortskaffningen av denna produkt för att bidra till återvinning, återanvändning och en hälsosammare miljö.

SUOMI

Sähkö- ja elektroniikkalaitteet on kierrätettävä erikseen sähkö- ja elektroniikkalaiteromusta annetun direktiivin (WEEE - 2012/19/EU) mukaisesti

Tuotteeseen merkitty symboli (ylitse ruksattu jätesäiliö) osoittaa, että tuotetta ei saa sekoittaa eikä hävittää talousjätteiden kanssa.

Tuote on luovutettava sopivaan tällaisten laitteiden kierrätyksestä huolehtivaan keräyspisteeseen.

Pyydä lisätietoja jäteasioista vastaavilta paikallisilta viranomaisilta.

Tämän tuotteen asianmukaisen hävittämisen varmistamisella autetaan estämään sen mahdolliset ympäristöön ja terveyteen kohdistuvat haittavaikutukset, joita voi aiheutua muussa tapauksessa tämän tuotteen epäasianmukaisesta käsittelystä. Hävittämällä tuotteen asianmukaisesti autat varmistamaan, että tuote uudelleenkäytetään, kierrätetään ja kerätään ja ympäristöä suojellaan.

NOTES

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5600 PT Eindhoven
The Netherlands
daf.com

ISO14001
Environmental
Management System

IATF16949
Quality
Management System

EN-0322

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