5.1.13. Installing the charging cable to Satellite

NOTICE
Install the charging cables a s soon as possible to prevent dust or water getting inside the Satellite.

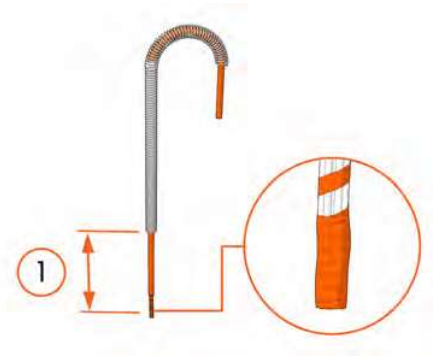
NOTICE
Do not remove the packaging of the vehicle connector before installation. It protects the vehicle connector from damages.

NOTICE
When you install charging equipment in environments that have large temperature variations, schedule a site visit to examine and adjust the tightening torques of the terminal blocks when the temperature is significantly higher or lower than at the time of installation. Ambient temperature variations cause wires to expand and contract.

NOTE
See also 12: Control signal wires of the charging cable.

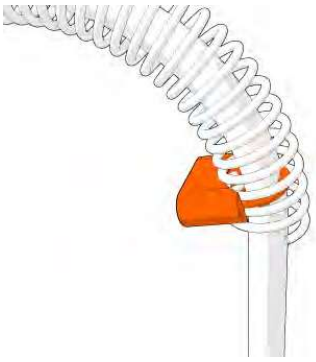
1. Tape the wire ends of the charging cable to avoid fraying.

2. Pull the charging cable through its support spring until approximately 400–600 mm (1) of the charging cable remains outside of the support spring.



NOTE
If necessary, use the draw tape and lubricant to pull the cable.

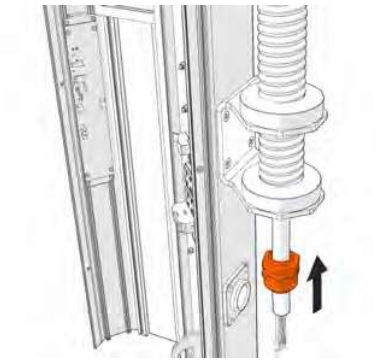
3. To make the handling of the charging cable and support spring easier during installation, you can temporarily lock the charging cable inside its support spring. The size of the cable clamp's nuts is M10.



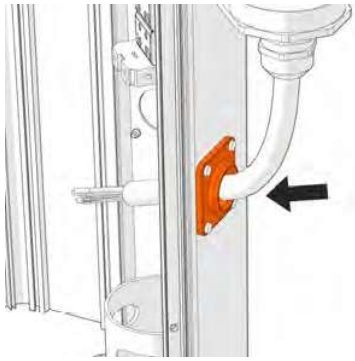
4. Remove the cable bushing from the spring holder.

5. Lift the support spring with the charging cable into the spring holder.

6. First install the cable bushing and then the hose clamp on the charging cable.

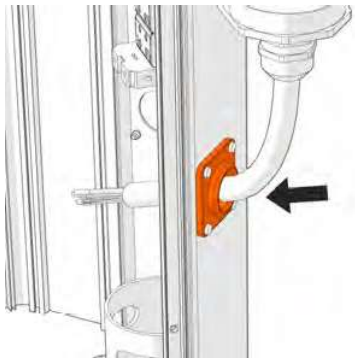


7. Route the charging cable inside the unit through the rubber grommet. Make sure that the part of the charging cable inside the unit has:
   - Approximately 50 mm of insulation
   - Approximately 350–550 mm of stripped wire



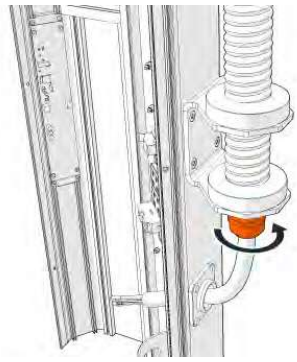
8. Make sure that the wires reach the terminals.

9. Make sure that the rubber grommet's seal sets correctly on the charging cable:
   - Push the charging cable slightly inside the unit so that the seal goes inside the unit.
   - Tighten the seal in place with the hose clamp.



10. Tighten the cable bushing of the charging cable below the spring holder.

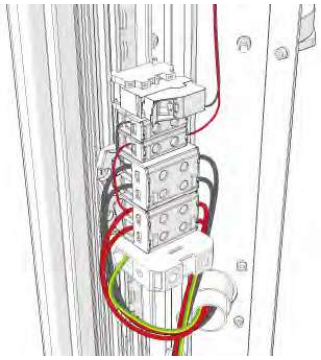
    - Depending on the charging cable, the size of the cable bushing is 55–68 mm



11. Connect the wires to the terminals.

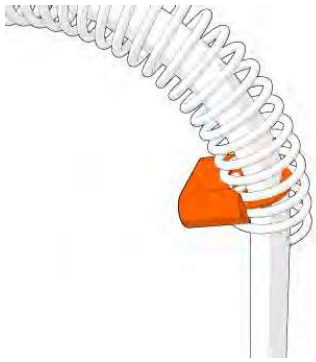
> **NOTE**
> Tighten each screw terminal to the correct torque. The tightening torque is marked on the terminal block.

> **NOTE**
> For the control signal wire colors of different charging cables, see 12: Control signal wires of the charging cable.

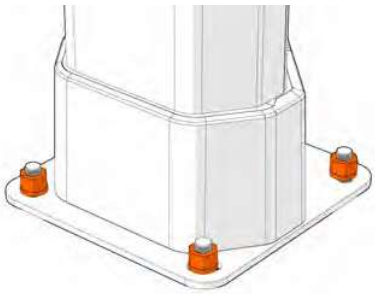


12. Lock the charging cable in place inside its support spring. See 5.1.13.1: Locking the charging cable inside its support spring.

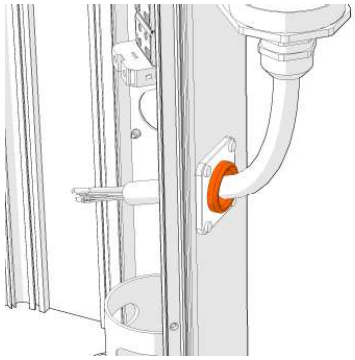
> **NOTICE**
> Do not overtighten the cable clamp. Overtightening damages the charging cable.



13. Make sure that the Satellite is firmly secured to the installation surface.



14. Examine the seal of the charging cable in the rubber grommet. If necessary, apply flexible polyurethane sealant to waterproof the opening.



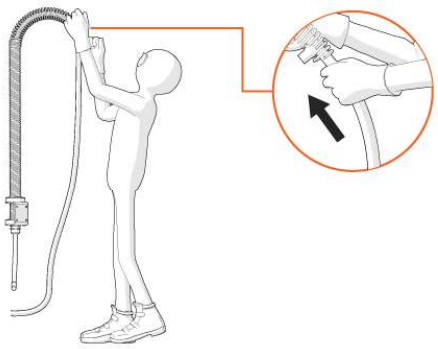
5.1.13.1. Locking the charging cable inside its support spring

> **NOTE**
> Use method A or method B to lock the charging cable in place inside its support spring.

1. **Method A**

   Make sure that the cable bushing below the spring holder is correctly tightened.

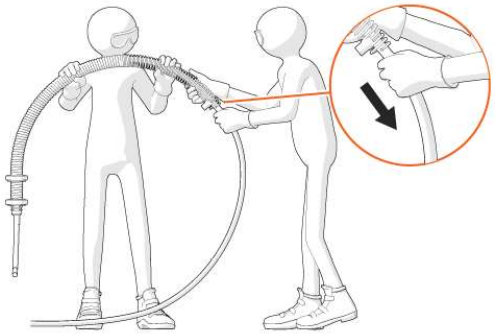
   Push the charging cable into its support spring so that it touches the top side of the support spring



Method B

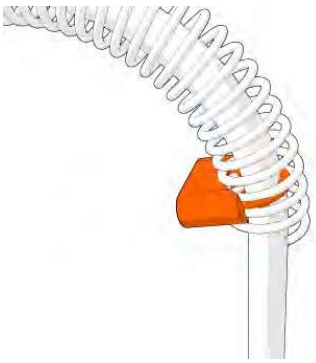
Make sure that the cable bushing below the spring holder is correctly tightened.

Have another person hold the support spring in an extended position. Pull the charging cable from the support spring.



2. Tighten the cable clamp to lock the charging cable in place inside its support spring.

   The size of the cable clamp's nuts is M10.



> **NOTICE**
> Have the cable clamp's locking part face toward the inside bend of the charging cable to avoid it hitting the vehicle during charging.

> **NOTICE**
> Do not overtighten the cable clamp. Overtightening damages the charging cable.

3. Make sure that the charging cable is in contact with the top part of its support spring when it is not in use.

   This protects the charging cable from chafing against its support spring or the cable gland when it is extended.

5.2. Electrical installation

DANGER
High-voltage installation. Make sure that the units are correctly isolated and the lockout-tagout (LOTO) procedure completed when necessary during installation, service or maintenance work. Know and obey general and local safety regulations and procedures. Use adequate personal protection equipment (PPE).

NOTICE
Prevent the AC and DC power cables from crossing to minimize electro-magnetic compatibility (EMC) disturbances.

NOTICE
Do not exceed the bending radius of the cable given by the cable manufacturer.

NOTICE
When you install charging equipment in environments that have large temperature variations, schedule a site visit to examine and adjust the tightening torques of the terminal blocks when the temperature is significantly higher or lower than at the time of installation. Ambient temperature variations cause wires to expand and contract.

NOTE
Route the cables to all units from below the unit.

NOTE
Tighten each screw terminal to the correct torque. The tightening torque is marked on the terminal block.

5.2.1. Preparing for the installation

NOTICE
Make sure that you have the necessary electrical design documentation before you start the installation.

NOTICE
The electrical installation must be done in dry conditions. If necessary, weatherproof the installation area before you start the installation.

NOTICE
Two persons are needed for this task.

NOTE
The power module weighs approximately 43 kg.

NOTE
The power distribution module weighs approximately 32 kg.

If they are inside the unit, remove the control module, the power distribution module, the bottom power module, and the front panel of the mains module to make space for installing the cables. Keep the modules clean and dry.

Keep the AC mains supply disconnected and the main switch in the OFF position until:

- All cables are connected to the terminals in the charging power unit.
- All electrical safety measurements required by local laws and regulations are done.

5.2.2. Terminal blocks (charging power units manufactured before 6/2023)

NOTICE
If the Station Charger has an optional AC charging output, it requires a neutral wire (TN-C-S network).

The terminal blocks for the AC mains power cables and protective earth (PE) are located in the front of the cabinet, next to the main switch.

The neutral wire is only used in the Station Charger if it has an optional AC charging output (TN-C-S network). Connect the neutral wire to the cabinet's neutral wire terminal block (N) that is located on a DIN rail behind the terminal blocks for the AC supply power cables.

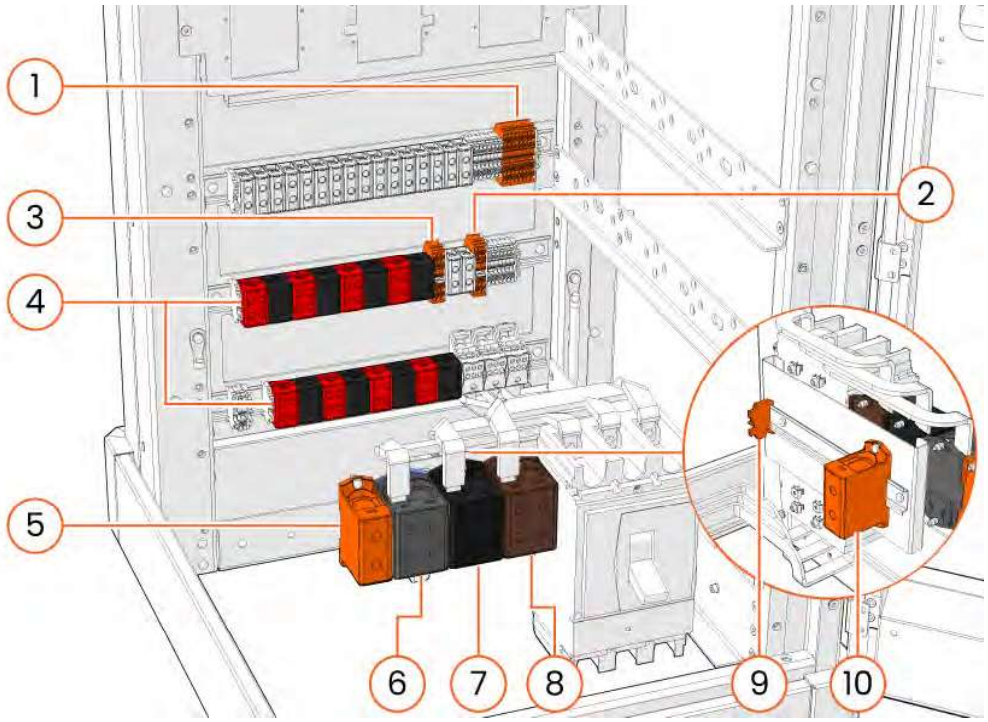
If your network cable has a neutral wire but the Station Charger does not have an AC charging output (TN-C network), connect the neutral wire to the cabinet's neutral wire terminal block (N) to keep the wire securely in place. Do not connect the neutral wire to earth in the cabinet.

The neutral wire is not used in the Power Unit (TN-C network). If your network cable has a neutral wire, connect it to the cabinet's neutral wire terminal block (N) to keep the wire securely in place. Do not connect the neutral wire to earth in the cabinet.

The fasteners for the Ethernet terminals are located on a DIN rail next to the neutral wire terminal block behind the terminal blocks for the AC supply power cables.

The terminal blocks for the DC output power cables (max. 50 mm^2) and control cable wires are located on DIN rails at the back of the cabinet.

Figure 41. Terminal blocks in the charging power unit (max. DC output 50 mm²)



1	Control cable signal wires	6	AC supply power cable phase 1 (L1)
2	Control cable ground wires (0 V)	7	AC supply power cable phase 2 (L2)
3	Control cable auxiliary power wires (+24 V)	8	AC supply power cable phase 3 (L3)
4	DC output power cables (red +, black -)	9	Fasteners for Ethernet terminal blocks
5	Protective earth (PE)	10	Neutral (N)

5.2.3. Terminal blocks (charging power units manufactured after 6/2023)

NOTICE
If the Station Charger has an optional AC charging output, it requires a neutral wire (TN-C-S network).

The terminal blocks for the AC mains power cables and protective earth (PE) are located in the front of the cabinet, next to the main switch.

The neutral wire is only used in the Station Charger if it has an optional AC charging output (TN-C-S network). Connect the neutral wire to the cabinet's neutral wire terminal block (N) that is located on a DIN rail behind the terminal blocks for the AC supply power cables.

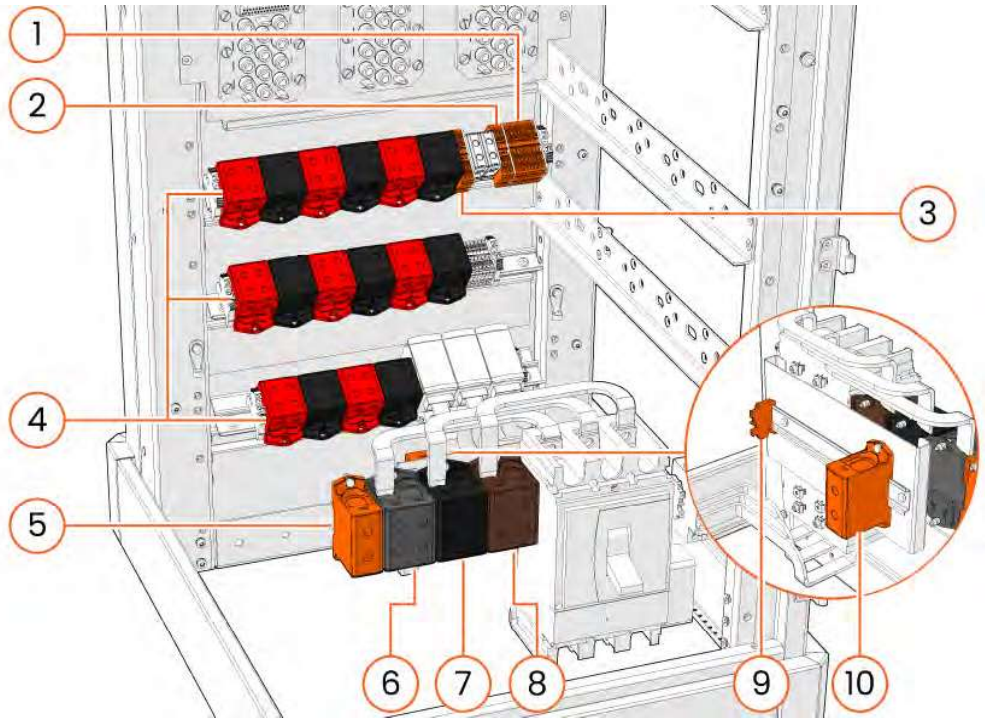
If your network cable has a neutral wire but the Station Charger does not have an AC charging output (TN-C network), connect the neutral wire to the cabinet's neutral wire terminal block (N) to keep the wire securely in place. Do not connect the neutral wire to earth in the cabinet.

The neutral wire is not used in the Power Unit (TN-C network). If your network cable has a neutral wire, connect it to the cabinet's neutral wire terminal block (N) to keep the wire securely in place. Do not connect the neutral wire to earth in the cabinet.

The fasteners for the Ethernet terminals are located on a DIN rail next to the neutral wire terminal block behind the terminal blocks for the AC supply power cables.

The terminal blocks for the DC output power cables (max. 150 mm^2) and control cable wires are located on DIN rails at the back of the cabinet.

Figure 42. Terminal blocks in the charging power unit (max. DC output 150 mm²)

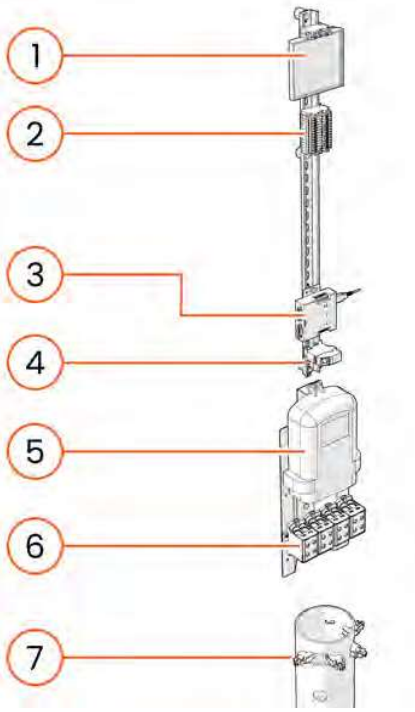


1	Control cable signal wires	6	AC supply power cable phase 1 (L1)
2	Control cable ground wires (0 V)	7	AC supply power cable phase 2 (L2)
3	Control cable auxiliary power wires (+24 V)	8	AC supply power cable phase 3 (L3)
4	DC output power cables (red +, black -)	9	Fasteners for Ethernet terminal blocks
5	Protective earth (PE)	10	Neutral (N)

5.2.4. Terminal blocks (Satellite Version 2)

See also 10: Examples of connecting output and control cables to charging points and 11: Examples of connecting cables to the Satellites.

Figure 43. Terminal blocks in the single Satellite Version 2



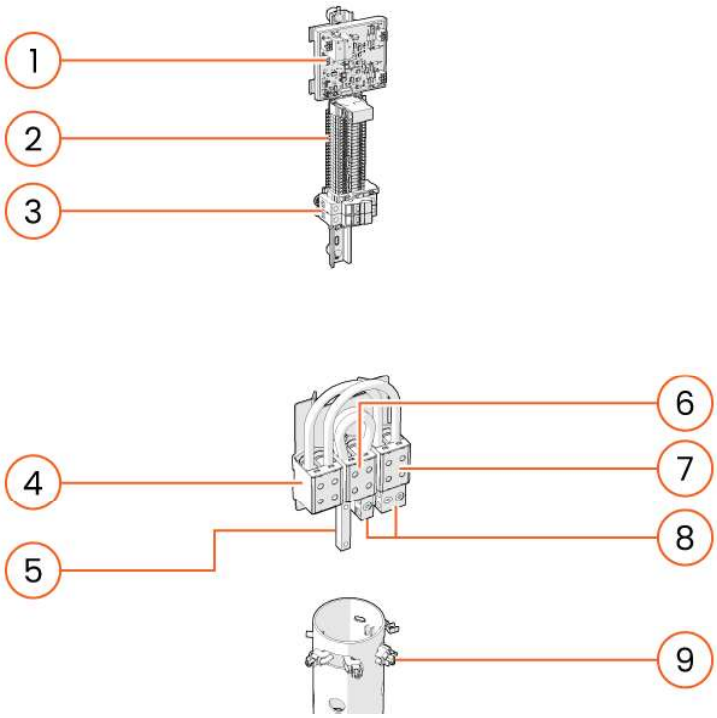
1	Voltage and insulation monitor	5	kWh meter
2	Terminal blocks for control cable	6	Terminal blocks for DC power cables (2 x 150 mm^2 screw terminal)[a]
3	USB converter	7	Protective earth (PE) clamps
4	Terminal block RJ45		

[a] *Input left, output right*

5.2.5. Terminal blocks (Liquid Cooled Satellite)

See also 10: Examples of connecting output and control cables to charging points and 11: Examples of connecting cables to the Satellites.

Figure 44. Terminal blocks in the single Liquid Cooled Satellite

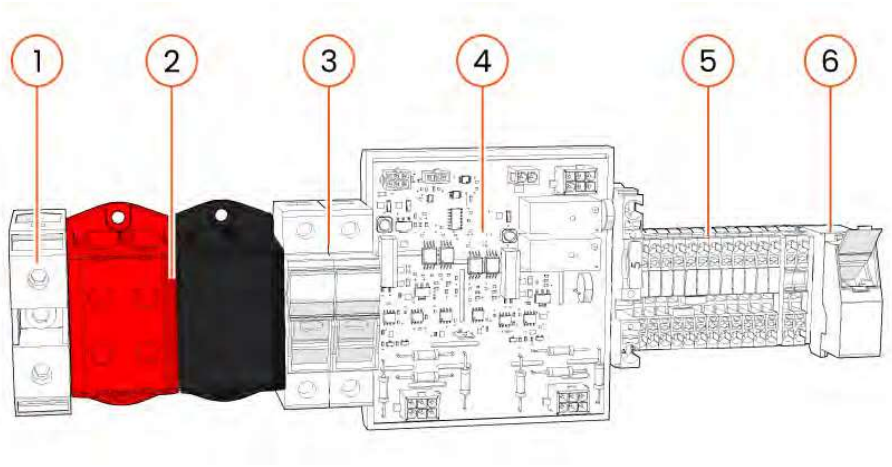


1	Voltage and insulation monitor	6	DC- IN and DC- OUT for charging cable
2	Terminal blocks for control cable	7	DC+ OUT for charging cable
3	Charging voltage measurement fuse block (1000 VDC)	8	Connection wiring cooling blocks
4	DC+ IN from Power Unit (2 x 240 mm^2 screw terminal)	9	Protective earth (PE) clamps
5	DC- IN from Power Unit (copper terminal bar with D10 mm holes)		

5.2.6. Terminal blocks (Control Unit 200 A)

See also 10: Examples of connecting output and control cables to charging points and 11: Examples of connecting cables to the Satellites.

Figure 45. Terminal blocks in the Control Unit 200 A with CCS cables



1	Terminal block for (power cable) PE wires	4	Voltage and insulation monitor
2	Terminal blocks for DC power cable (2 x 95 mm^2 screw terminal)	5	Terminal blocks for control cable
3	DC voltage measurement fuses	6	Terminal block RJ45

5.2.7. Installing Station Charger cables

NOTE
The neutral wire (N) is required if Station Charger has an AC charging output (TN-C-S network). The terminal for the neutral wire (N) is located behind the AC supply terminals. The neutral wire can be aluminum or copper.

Station Charger is delivered with the charging cables installed.

Installing the AC supply cables, see 5.2.8: Installing the AC mains power cables to the charging power unit.

If you are connecting additional charging points to the Station Charger, see:

- 5.2.9: Installing the DC output power cables
- 5.2.10: Installing the control cables

5.2.8. Installing the AC mains power cables to the charging power unit

DANGER
Before you install any of the cables of the charging equipment, make sure that the main AC supply power is not connected. Risk of electric shock.

CAUTION
To keep the isolation of the cables intact, make sure that each individual phase cable is at a sufficient distance from the cabinet's frame.

NOTICE
Use ferrules for terminating fine-stranded wires (IEC 60228 class 5 and 6 or equivalent).

NOTICE
If the Station Charger has an optional AC charging output, it requires a neutral wire (TN-C-S network).

NOTE
Tighten each screw terminal to the correct torque. The tightening torque is marked on the terminal block.

All terminals are labeled for identification.

There are two screw terminals for each phase. The maximum wire size of the terminal is 240 mm^2.

Phases 1–3 (L1, L2, L3) and neutral (N) can be aluminum or copper wires. We recommend using copper wire for protective earth (PE).

5.2.8.1. Units manufactured after 3/2023

NOTE
In double and triple cabinet units manufactured after 3/2023, the AC supply terminal blocks of the cabinets are not jumpered together at the factory. If you install jumpers, one cabinet's main switch does not shut off the power in the other cabinet(s) of the unit. You must mark the units clearly to indicate the danger.

When the AC supply terminal blocks of the cabinets are not jumpered together:

- In single cabinet units, connect at maximum two AC mains power cables to one cabinet.
- In double and triple cabinet units, connect one AC mains power cable to each cabinet.

- If you install jumpers, obey the specifications for units manufactured before 3/2023.

5.2.8.2. Units manufactured before 3/2023

NOTE
In double and triple cabinet units manufactured after 3/2023, the AC supply terminal blocks of the cabinets are not jumpered together at the factory. If you install jumpers, one cabinet's main switch does not shut off the power in the other cabinet(s) of the unit. You must mark the units clearly to indicate the danger.

- You can remove the jumpers on site. In this case obey the specifications for units manufactured after 3/2023.
- When the AC supply terminal blocks of double cabinets are jumpered together, connect one AC mains power cable to one of the cabinets.
- When the AC supply terminal blocks of triple cabinets are jumpered together, connect one AC mains power cable to each of the end cabinets. Do not connect an AC mains power cable to the middle cabinet.

5.2.9. Installing the DC output power cables

NOTICE
Prevent the AC and DC power cables from crossing to minimize electro-magnetic compatibility (EMC) disturbances.

NOTICE
Use ferrules for terminating fine-stranded wires (IEC 60228 class 5 and 6 or equivalent).

NOTE
Label the cables clearly at both ends. Documenting which output supplies which charging point helps with later troubleshooting.

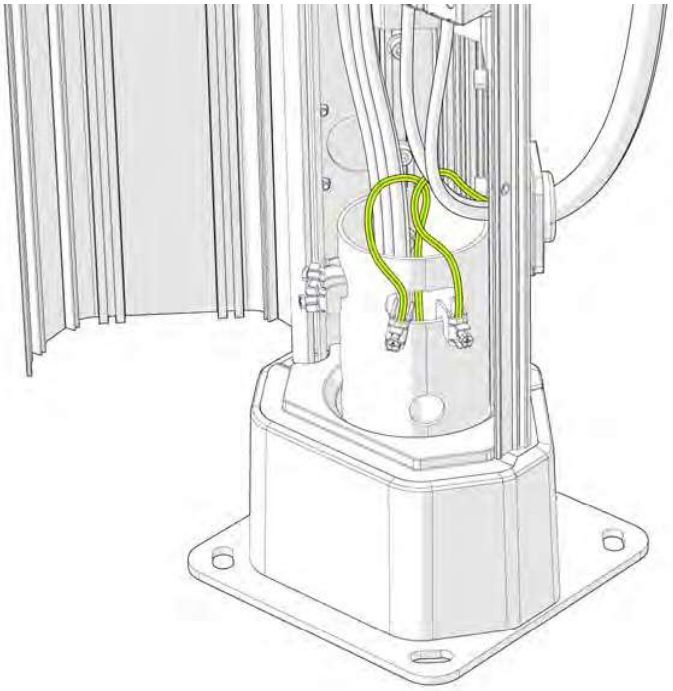
NOTE
Tighten each screw terminal to the correct torque. The tightening torque is marked on the terminal block.

NOTE
After you connect the cables to the screw terminals, make sure that the voltage measurement wires are still correctly connected.

The DC output power cable can be shielded or non-shielded. Non-shielded cables must have 5 wires (2 x DC+, 2 x DC-, PE).

Connect the PE wires in the Satellite to the installation flange using the PE clamps. The PE clamps are included in the delivery, in a plastic bag.

Figure 46. Connecting the PE wires to the installation flange using PE clamps



The terminals are numbered and labeled. Start from terminal 1 in the cabinet and continue in ascending order. If there are more terminals than cables, leave the last ones empty.

See also 10: Examples of connecting output and control cables to charging points and 11: Examples of connecting cables to the Satellites.

5.2.10. Installing the control cables

> **NOTE**
> Label the cables clearly at both ends. Documenting which output supplies which charging point helps with later troubleshooting.

The control cable between the charging power unit and the charging point consists of the following:

- Signal line (CT)
  - Single Satellite (one vehicle connector): terminal block CT A (CT A and CT B are jumpered together)
  - Double Satellite Version 2 (two vehicle connectors): terminal blocks CT A and CT B

- DC auxiliary power wire for the user interface of the Satellite (+24 V)
  - If the distance between the charging power unit and the charging point is more than 50 m, use two parallel auxiliary power wires to compensate for voltage drop.
  - Ground the cable shield at the charging power unit end.
- Ground wire (0 V)

See also 10: Examples of connecting output and control cables to charging points and 11: Examples of connecting cables to the Satellites.

5.2.11. Installing the communication cables

NOTICE
Do not make holes or openings in the cabinet structure for the cables. Do not route the cables through the connectors or cooling outlets behind the modules. Changes or modifications, unless specifically agreed upon with Kempower, will void the warranty.

NOTE
Each Satellite must have its own communication cable.

NOTE
Ground the Ethernet shield at one end only, either at the charging point or near the Ethernet switch of the charging power unit.

Included in the delivery (inside the Satellite)

- Clip-type Ethernet terminal blocks for the charging power unit and the charging point
- RJ45 connectors
- Extension Ethernet cable between the Ethernet terminal block and the Ethernet switch in the control module

Not included in the delivery

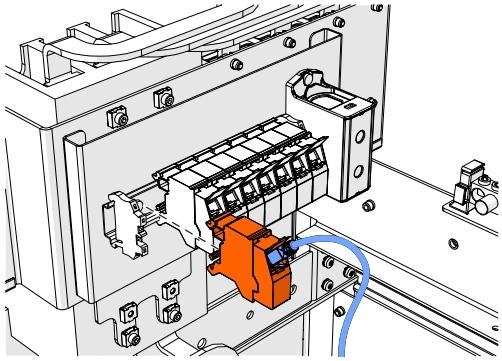
- Ethernet SuperCAT 6 cable, shielded

5.2.11.1. Charging power unit

1. Terminate the Ethernet cable wires with the RJ45 connectors.
   - The connector wiring scheme is standard T-568B.

> **NOTE**
> The Ethernet cable is not included in the delivery.

2. Install the Ethernet terminal block(s) on the DIN rail behind the charging power unit's main switch.



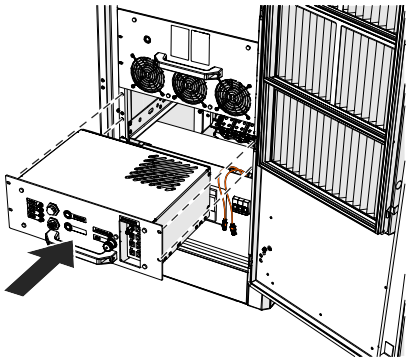
3. Connect the Ethernet cable from each Satellite to the Ethernet terminal block of the charging power unit using the RJ45 connector.

> **NOTE**
> Make sure that the cables are clearly labelled. This helps with later troubleshooting.

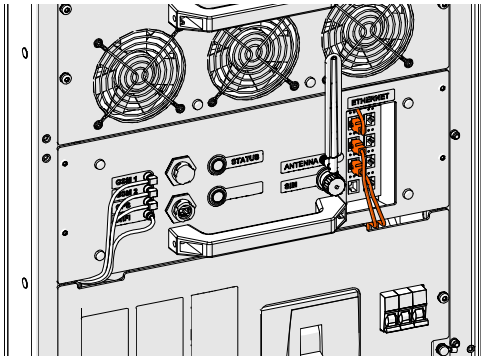
4. Install the extension Ethernet cable to the Ethernet terminal block.

5. Install the control module back in the charging power unit.

> **NOTE**
> Route the cables through the openings between the mains module and the control module.



6. Connect the extension Ethernet cable from the Ethernet terminal block on the DIN rail to any port of the Ethernet switch in the front face of the control module.

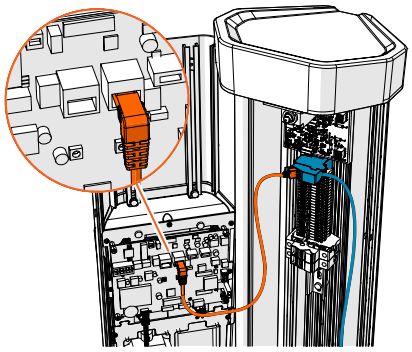


5.2.11.2. Satellite

1. Terminate the Ethernet cable wires with the RJ45 connectors.
   - The connector wiring scheme is standard T-568B.

> **NOTE**
> The Ethernet cable is not included in the delivery.

2. Install the Ethernet terminal block on the DIN rail in the Satellite. Remove the label from the terminal block.



3. Connect the Ethernet cable to the Ethernet terminal block using the RJ45 connector.

4. Install the extension Ethernet cable to the Ethernet terminal block.

5. Install the extension Ethernet cable to the INT port of the control board.

6. Close the front panel of the unit. Make sure that the extension Ethernet cable does not push against other components.