FusionCharge Liquid-Cooled Ultra-fast Charging System

Quick Guide

Power unit models: DS720-720LEUA3 and DS720-720LEUA4 (240-360H2F4M4)
Self-developed charging dispenser models: DT500L1-EU series and DT500N2-EU series

Part number: 31500KPE
Issue: 02
Date: 2025-05-15

DS720-720LEUA3 DS720-720LEUA4

- **Before installing the equipment, read the user manual carefully to get familiar with product information and safety precautions. The product warranty does not cover equipment damage caused by failure to follow the storage, transportation, installation, and usage guidelines specified in this document and the user manual.**
- The information in this document is subject to change without notice due to version updates or other reasons. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
- The DANGER, WARNING, CAUTION, and NOTICE statements described in this document do not cover all the safety precautions. You also need to comply with relevant international, national, or regional standards and industry practices.
- Only qualified professionals or trained personnel are allowed to perform operations on the equipment. Operation personnel should understand the system, its working principles, and relevant national/regional standards.
- During operations, use dedicated insulated tools and wear personal protective equipment, such as protective clothing, insulated shoes, goggles, safety helmets, and insulated gloves.
- This document applies to the dispenser models of DT500L1-EU series and DT500N2-EU series. For details about how to install and connect cables to other models of dispensers (such as third-party dispensers), scan the QR code.
- This document provides only the typical networking diagrams. Before use, ensure that the selected wiring diagram is consistent with the actual installation scenario. If you do not find your installation scenario, scan the QR code to view the detailed wiring guide.

Preparing Installation Tools

CAUTION To avoid electric shocks, use dedicated insulated tools and auxiliary materials that can withstand a voltage of 3000 V AC or higher.

Protective tools and transportation tools

Installation tools and other tools

Preparing Cables

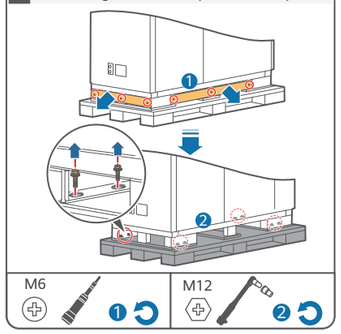
Cable[a]	Recommended Specifications		Cable Terminal
AC input power cable[b]	(Cable trenching mode) 4 x 120 mm² + 70 mm² copper cables or 4 x 185 mm² + 95 mm² aluminum alloy cables (Direct buried mode) 4 x 150 mm² + 70 mm² copper cables or 4 x 240 mm² + 120 mm² aluminum alloy cables		DT/OT terminal
AC power cable	Recommended 2 x 1.5 mm² Max. 2 x 4 mm²		Cord end terminal
DC power cable[c]	2 x 120 mm² + 70 mm² copper cables or 2 x 185 mm² + 95 mm² aluminum alloy cables		DT/OT terminal
Flat ground bar outside the cabinet	40 mm x 4 mm (Max. 50 mm x 5 mm)		-
Ring network communication	CAT 5E outdoor shielded network cable, internal resistance ≤ 1.5 Ω/10 m		RJ45 connector
Northbound communication	Ethernet connection	CAT 5E outdoor shielded network cable, internal resistance ≤ 1.5 Ω/10 m	RJ45 connector
	4G connection	SIM card[d]	-

a: You need to prepare the cables with the cable lengths based on the site requirements.
b: There are two inputs, one on the left and the other on the right. Each input must connect to two pairs of cables with the recommended cross-sectional areas.
c: If the charging connector of the boost dispenser is used as a fast charging connector (only one pair of cables needs to be connected to the charging connector), 2 x 120 mm² + 70 mm² copper cables are recommended. In this case, the charging connector can output the rated current of 250 A. If the charging connector is required to output the current of 300 A for a short term, you shall use 2 x 150 mm² + 70 mm² copper cables and set **Peak Current Control at Power Unit Port** to **Disable** in the Antohill app. Select the cable specifications based on the cable routing mode and local regulations.
d: If you choose 4G connection for northbound communication of the charging dispenser, prepare industrial M2M SIM cards (MP2) as required.

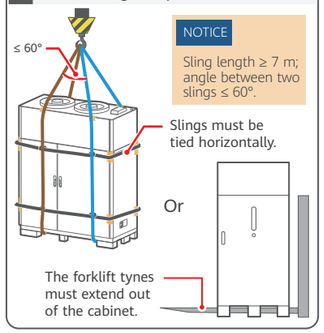
Installing the Power Unit

1. Remove the baffle plates and pallet from the bottom of the power unit.
2. Use a crane or forklift to place the power unit onto the base.
3. Find the four angle brackets in the fitting bag, place them in the installation positions at the bottom of the cabinet, and determine hole positions. Drill holes and install expansion sleeves (into a concrete base for example). Install the angle brackets and tighten the expansion screws. Ground the power unit.

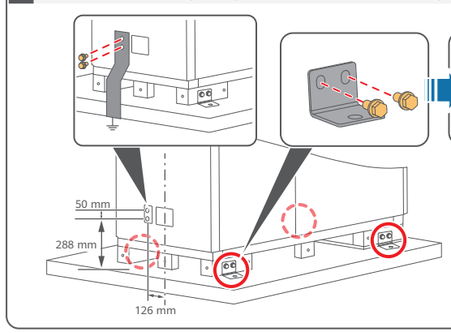
1 Removing the baffle plates and pallet



2 Placing the power unit



3 Securing the power unit and connecting to the ground bar

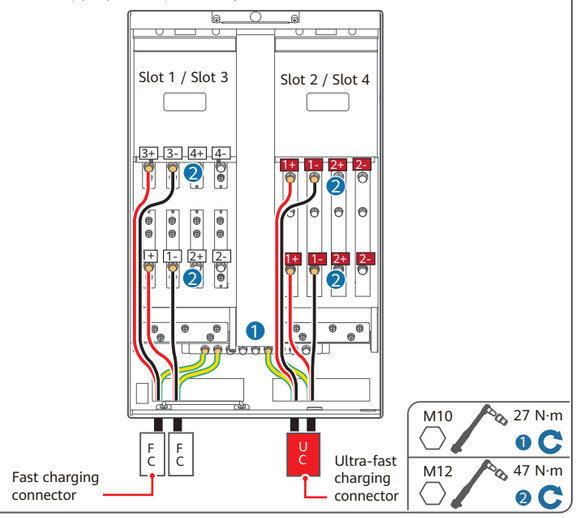


Note: Use dedicated screws (matte gray) to secure the angle brackets. Do not use cable screws (packed and stored under the power distribution module).

Installing Cables and Sealing Cable Holes of the Power Unit

Installing DC output power cables

Connect the DC output power cables to the power distribution modules.

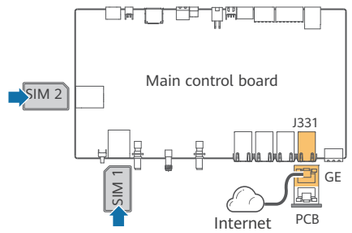


Northbound communication

- The northbound communication of the power unit supports Ethernet connection (network cable connection to the J331 upper network port) and 4G connection (SIM card installation). The SIM card is provided by the customer.
- The charging system can be connected to the power management system (PMS) only through the power unit.
- If northbound communication with the PMS and business platform through the power unit is required, you can adopt Ethernet connection and/or 4G connection. For details, see the power unit user manual.

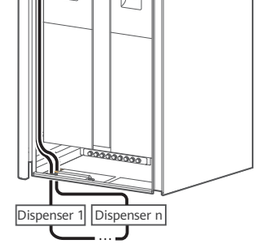
NOTE
The power unit supports the dual-SIM single-standby mode. Insert one or two SIM cards as required. When using a single SIM card, insert it into the SIM 2 card slot on the left.

Install the SIM cards or Ethernet cable on the main control board.



Installing network cables for ring network communication with dispensers

Route the two network cables through the bottom cable hole and connect the cables to the FE port on the main control board.

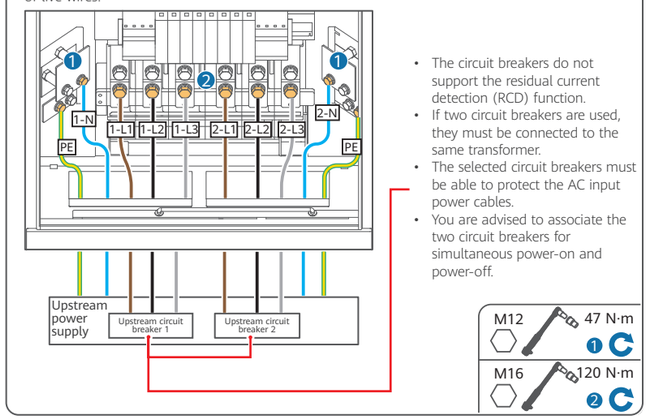


Installing AC input power cables

DANGER Before connecting AC input power cables, ensure that the upstream circuit breaker is off, and attach a "No switching on" sign.

CAUTION
- The power unit provides two groups of AC input ports, each of which has two groups of wiring screws.
- Two groups of AC input power cables must follow the same phase sequence.

Connect the PE and neutral wires first, then the lower row of live wires, and finally the upper row of live wires.



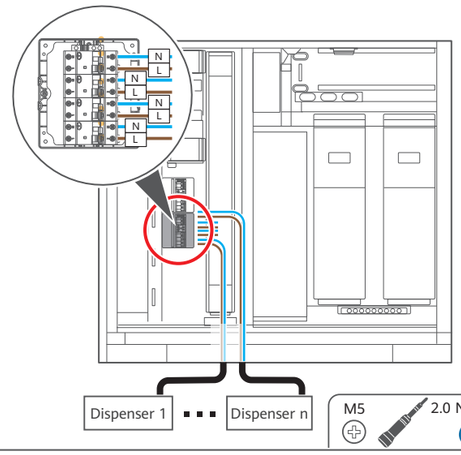
- The circuit breakers do not support the residual current detection (RCD) function.
- If two circuit breakers are used, they must be connected to the same transformer.
- The selected circuit breakers must be able to protect the AC input power cables.
- You are advised to associate the two circuit breakers for simultaneous power-on and power-off.

M12 47 N·m
M16 120 N·m

Installing AC output power cables

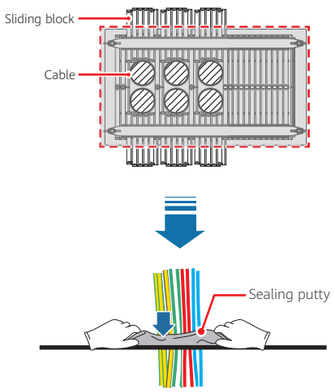
CAUTION
Connect cables according to the silkscreen on the power distribution box (PDB). Do not connect the live wire and neutral wire reversely.

Connect the AC output power cables to the AC PDB based on the actual configuration.



Sealing the cable hole for the power unit

After connecting cables, seal the cable holes with sealing putty in a timely manner to prevent moisture and other foreign matter from entering the power unit.
For details about how to seal cable holes, see **How to Use and Seal Cable Holes** delivered with the sealing putty.

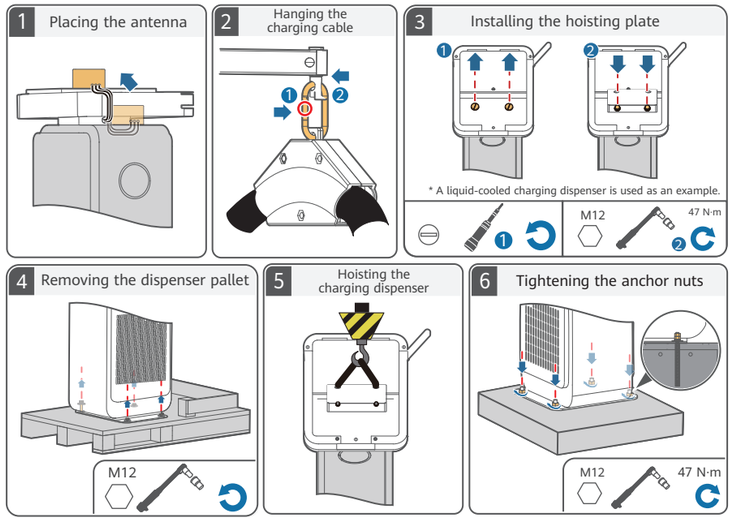


The appearance of the cable hole may vary by product batch. For details about how to seal the cable hole, see the user manual.

Installing Charging Dispensers

NOTICE

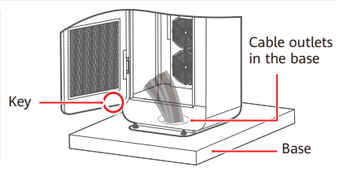
- Before hoisting, drill holes with a depth of 160 mm and a diameter of 15 mm based on the marking-off template. Inject adhesive (silicone sealant that can be used outdoors for a long time) into the holes, slowly rotate the fully threaded bars into the holes, and make the bars completely dipped with the adhesive.
- During hoisting, assign dedicated personnel to take care of the charging dispenser and prevent it from tilting or falling down due to loss of balance, which may cause personal injury or equipment damage.
- For safety, the ropes for hoisting a dispenser shall be able to withstand a weight more than three times the maximum weight of the dispenser.
- Before hoisting, take out a hoisting plate from the fitting bag and install it aligning the hoisting holes. After the hoisting is complete, reinstall the sealing screws.



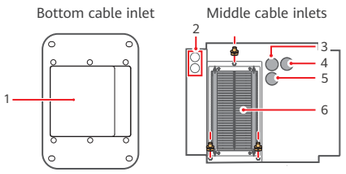
Routing Cables Through Charging Dispensers

NOTICE

- Move the dispenser with caution to prevent dispenser sliding or personal injury.
- When tilting the charging dispenser, place a protective pad (such as paper and foamed plastics) between the ground and the dispenser to avoid scratch on the dispenser enclosure, which may lead to metal rust.

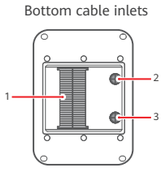


Liquid-cooled dispenser



1. Cable inlet	4. AC cable inlet
2. Liquid cooling pipe holes	5. Comm. cable inlet
3. LV cable inlet	6. DC cable inlet

Boost dispenser



1. DC cable inlet	
2. Comm. cable inlet	
3. AC cable inlet	

Routing DC power cables through a liquid-cooled/boost dispenser:

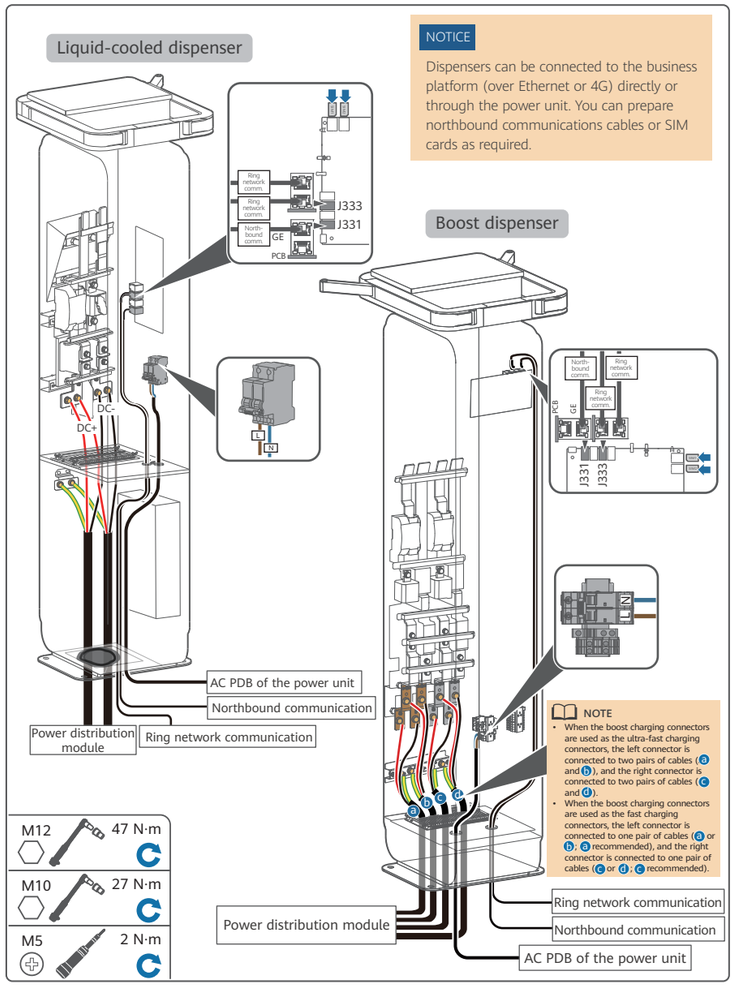
1. Remove the cabling module.
2. Pull the sliding plates of the cabling module outward and cut the rubber film open.
3. Route the cables through the cabling module and reinstall the module.

Installing Cables of Charging Dispensers

DANGER

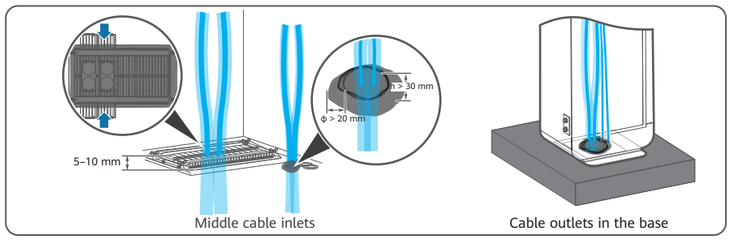
Before connecting cables, ensure that the AC input circuit breakers and AC PDB circuit breakers of the power unit are turned off and that the power unit is powered off. Attach a "No switching on" sign.

- Connect the ring network communications cable to the J333 network port.
- The northbound communication of the charging dispenser supports Ethernet connection (network cable connection to the J331 upper network port) and 4G connection (SIM card installation). The SIM card is provided by the customer.
- Only when the software version of a liquid-cooled charging dispenser is FusionCharge V100R024C10 or later, the dispenser can be directly connected to the business platform. Otherwise, it can be connected to the business platform only through the power unit. This requirement does not apply to boost charging dispensers. A dispenser can be directly connected to the business platform over Ethernet and/or 4G. For details, see the dispenser user manual. If direct connection is not required, there is no need to connect the dispenser to any network cable or install any SIM card in the dispenser.



Sealing Cable Inlets and Outlets

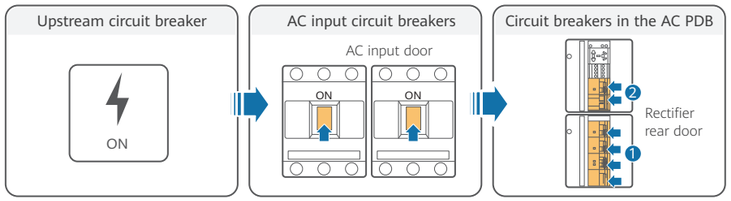
After connecting cables, seal the cable inlets and outlets with sealing putty in a timely manner to prevent moisture and other foreign matter from entering the device. The following figure uses a liquid-cooled dispenser as an example. For a boost dispenser, only bottom cable inlets need to be sealed. For details about the sealing method, see the sealing method of the middle cable inlets of the liquid-cooled dispenser.



System Power-On

DANGER Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.

1. Close the rectifier front door, main control front door, and main control rear doo. Ensure that the AC input circuit breakers and the circuit breakers in the AC PDB are OFF.
2. Turn on the upstream circuit breaker and remove the lower insulation baffle plate behind the AC input door. Measure the line voltages between L1, L2, and L3 on the AC input copper bar and ensure that the input voltages range from 360 V AC to 440 V AC.
3. Measure the line voltage between the same phase of the left and right routes (for example, between 1-L1 and 2-L1). Ensure that the phase sequences of the left and right routes are consistent (0 V AC). Reinstall the insulation baffle plate.
4. Ensure that the upper insulation baffle plate is in position and turn on the two AC input circuit breakers. Remove the upper insulation baffle plate. Measure the line voltages between the downstream wires (L1, L2, and L3) of the AC input circuit breakers and ensure that the values range from 360 V AC to 440 V AC. Reinstall the insulation baffle plate.
5. Measure the input voltage on the left side of the circuit breakers in the AC PDB behind the rectifier rear door. Ensure that the input voltage ranges from 207 V AC to 253 V AC.
6. Turn on the circuit breakers in the AC PDB from bottom to top and measure the output voltage on the right side. Ensure that the voltage ranges from 207 V AC to 253 V AC.
7. Turn on the AC input circuit breakers in all dispensers and close the dispenser doors.



System Commissioning

1 Deploying a charging station on the Antohill app

Use the Antohill app to deploy a charging station.

2 Test-charging

After the station deployment is complete, test-charge a vehicle by the charging startup/shutdown mode provided by the charge point operator (CPO).

- Test all charging connectors for a round and then test one of these charging connectors for a second round to ensure that all charging connectors work properly and that fees are calculated and billed properly on the business platform.
- If the CPO provides multiple charging startup/shutdown modes, each of them must be tested.

Follow-up Procedure

1. Reinstall all the baffle plates removed from the power unit and dispensers, and install the bottom baffle plate of the power unit.
2. Lock all doors and hand over the keys and fitting bags to the administrator for future use. You are advised to leave the male and female pipe connectors inside the power unit.
3. Check that the paint on the cabinet exterior is intact. If paint has flaked off, repaint the area to avoid corrosion.
4. Ensure that the key bound to the cabinet has been removed and stored properly.
5. Remove the protective bag of the charging cable starting from the connector head. Insert the charging connector into the holder.
6. Remove the transparent protective film from the surface of the display.

NOTICE

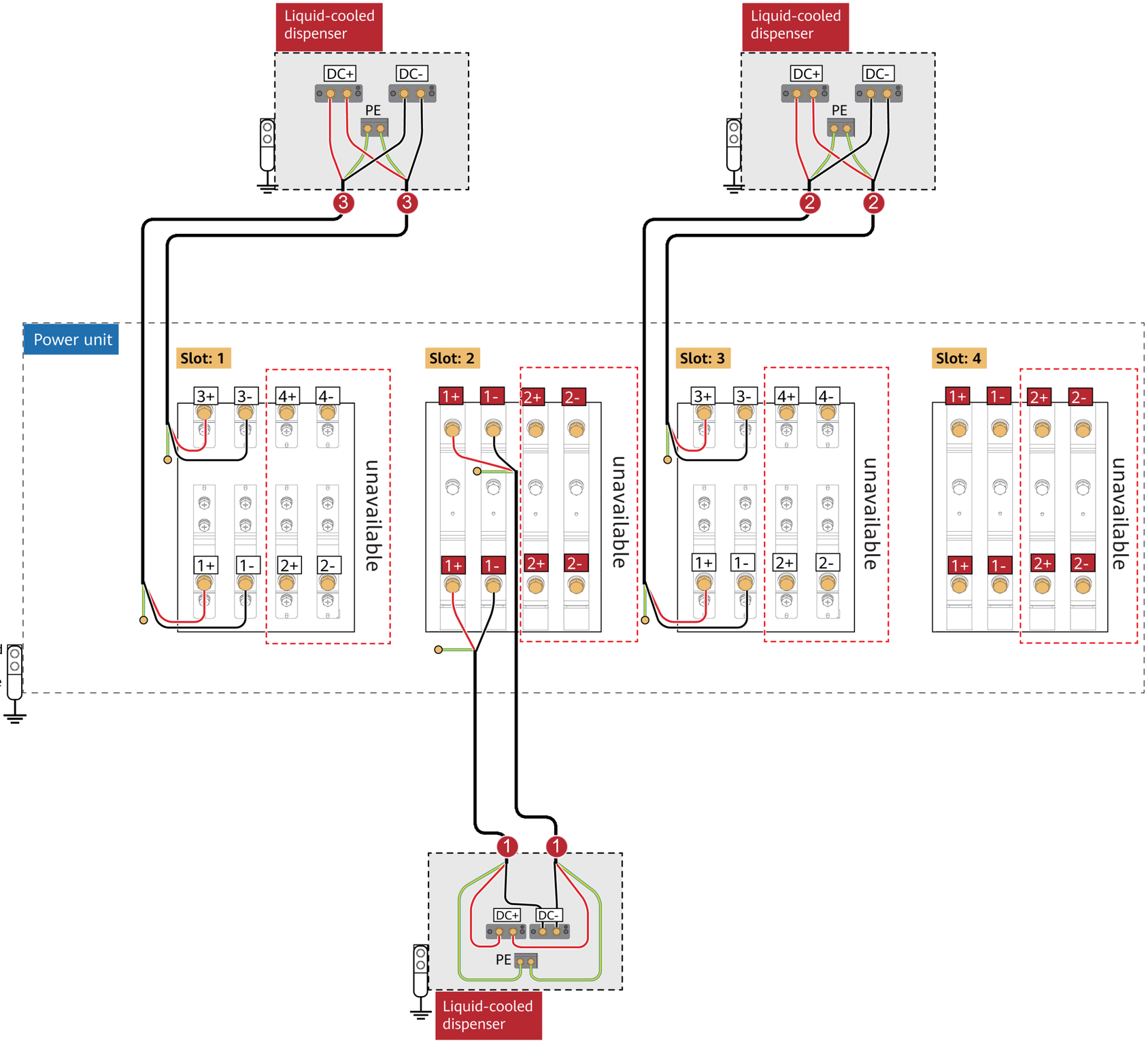
Do not use sharp objects to cut the bubble bag, protective film, and protective bag. Otherwise, it may cause damage to the connector and its cables.

Power Unit to Dispenser - DC Cables

1–3 x Ultra-fast charging connector (Liquid-cooled dispenser)

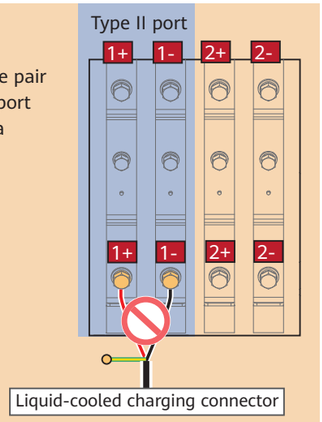
Note:
1. This wiring diagram shows the [3 ultra-fast] charging scenario and applies to scenarios with less than 4 charging connectors. ⓝ indicates the recommended sequence of ultra-fast charging connectors.
2. When the actual quantity of charging connectors is less than that in the diagram, connect their cables according to the cable numbers in ascending order. For example, if you need two ultra-fast charging connectors, connect them from ❶ to ❷.
3. DC cable insulation specifications: 1.8/3 kV or 0.6/1 kV. The 1.8/3 kV cables are recommended. If you use the 0.6/1 kV cables for a long time, the insulation performance may deteriorate due to aging. Charging may fail when the charging voltage exceeds 850 V.
4. When connecting cables, if the cable terminals contact the labels on the copper bars, remove the labels before cable connection.

Cable	Recommended Cross-Sectional Area	Screw & Torque
DC cable	2 x 120 mm² + 70 mm² (copper) 2 x 185 mm² + 95 mm² (aluminum alloy)	DC+/DC-: M12, 47 N·m PE: M10, 27 N·m
Outdoor ground steel plate	40 mm x 4 mm (Max. 50 mm x 5 mm)	M12, 47 N·m



⚠ WARNING

Do not connect only one pair of cables to the type II port (port 1 of slot 2/4) for a liquid-cooled charging connector.



Power Unit to Dispenser - DC Cables

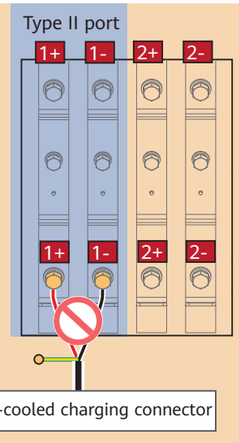
4 x Ultra-fast charging connector (Liquid-cooled dispenser)

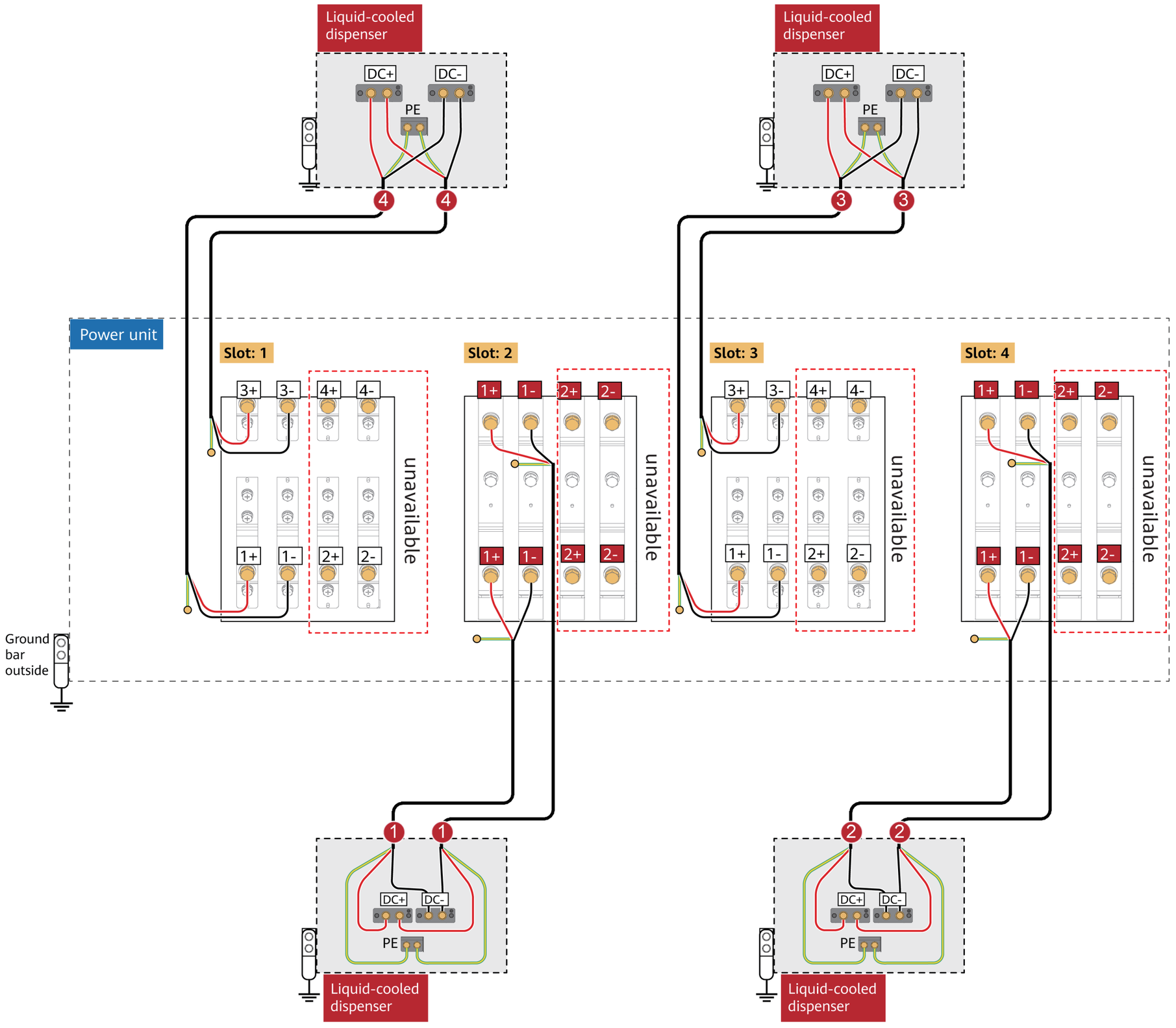
Note:
1. This wiring diagram shows the [4 ultra-fast] charging scenario and applies to scenarios with 4 charging connectors. ⓝ indicates the recommended sequence of ultra-fast charging connectors.
2. DC cable insulation specifications: 1.8/3 kV or 0.6/1 kV. The 1.8/3 kV cables are recommended. If you use the 0.6/1 kV cables for a long time, the insulation performance may deteriorate due to aging. Charging may fail when the charging voltage exceeds 850 V.
3. When connecting cables, if the cable terminals contact the labels on the copper bars, remove the labels before cable connection.

Cable	Recommended Cross-Sectional Area	Screw & Torque
DC cable	2 x 120 mm² + 70 mm² (copper) 2 x 185 mm² + 95 mm² (aluminum alloy)	DC+/DC-: M12, 47 N·m PE: M10, 27 N·m
Outdoor ground steel plate	40 mm x 4 mm (Max. 50 mm x 5 mm)	M12, 47 N·m

⚠ WARNING

Do not connect only one pair of cables to the type II port (port 1 of slot 2/4) for a liquid-cooled charging connector.



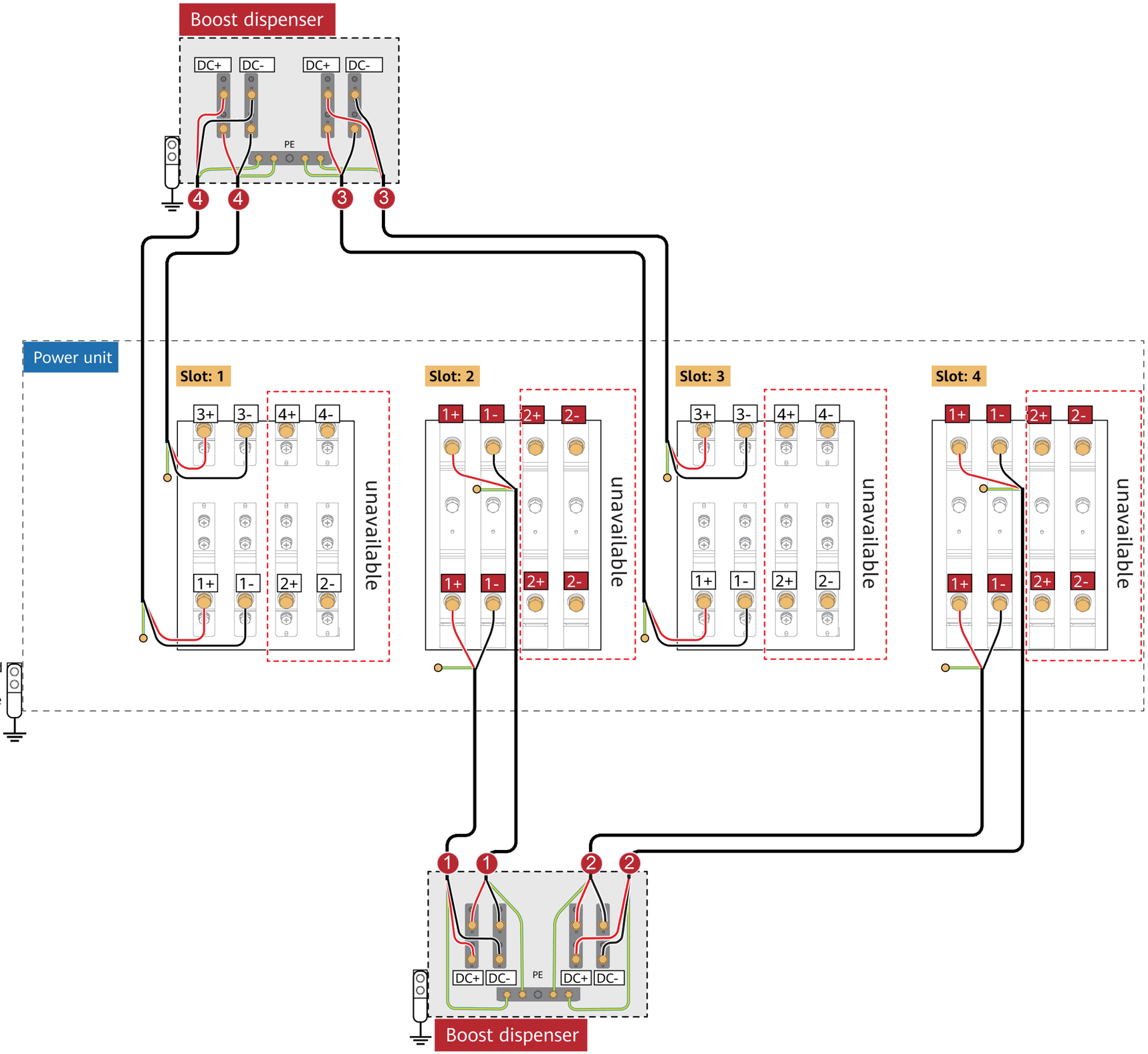


Power Unit to Dispenser - DC Cables

4 x Ultra-fast charging connector (Boost dispenser)

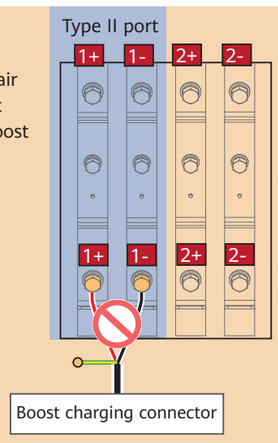
Note:
1. This wiring diagram shows the [4 ultra-fast] charging scenario and applies to scenarios with 4 charging connectors. (n) indicates the recommended sequence of ultra-fast charging connectors.
2. DC cable insulation specifications: 1.8/3 kV or 0.6/1 kV. The 1.8/3 kV cables are recommended. If you use the 0.6/1 kV cables for a long time, the insulation performance may deteriorate due to aging. Charging may fail when the charging voltage exceeds 850 V.
3. When connecting cables, if the cable terminals contact the labels on the copper bars, remove the labels before cable connection.

Cable	Recommended Cross-Sectional Area	Screw & Torque
DC cable	2 x 120 mm² + 70 mm² (copper) 2 x 185 mm² + 95 mm² (aluminum alloy)	DC+/DC-: M12, 47 N·m PE: M10, 27 N·m
Outdoor ground steel plate	40 mm x 4 mm (Max. 50 mm x 5 mm)	M12, 47 N·m



⚠ WARNING

Do not connect only one pair of cables to the type II port (port 1 of slot 2/4) for a Boost charging connector.



Power Unit to Dispenser - DC Cables

2 x Ultra-fast charging connector (Liquid-cooled dispenser)

4 x Fast charging connector (Single-connector boost dispenser; one pair of cables only)

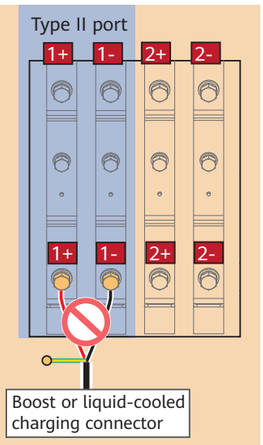
Note:
1. This wiring diagram shows the [2 ultra-fast + 4 fast] charging scenario.
2. ❶ indicates the recommended sequence of ultra-fast charging connectors. ❶ indicates the recommended sequence of fast charging connectors.
3. When the actual quantity of charging connectors is less than that in the diagram, connect their cables according to the cable numbers in ascending order. Reduce the quantity of charging connectors for boost charging dispensers by even numbers. For example, if you need one ultra-fast charging connector, connect it to ❶. If you need two fast charging connectors, connect them from ❶ to ❷.
4. DC cable insulation specifications: 1.8/3 kV or 0.6/1 kV. The 1.8/3 kV cables are recommended. If you use the 0.6/1 kV cables for a long time, the insulation performance may deteriorate due to aging. Charging may fail when the charging voltage exceeds 850 V.
5. When connecting cables, if the cable terminals contact the labels on the copper bars, remove the labels before cable connection.

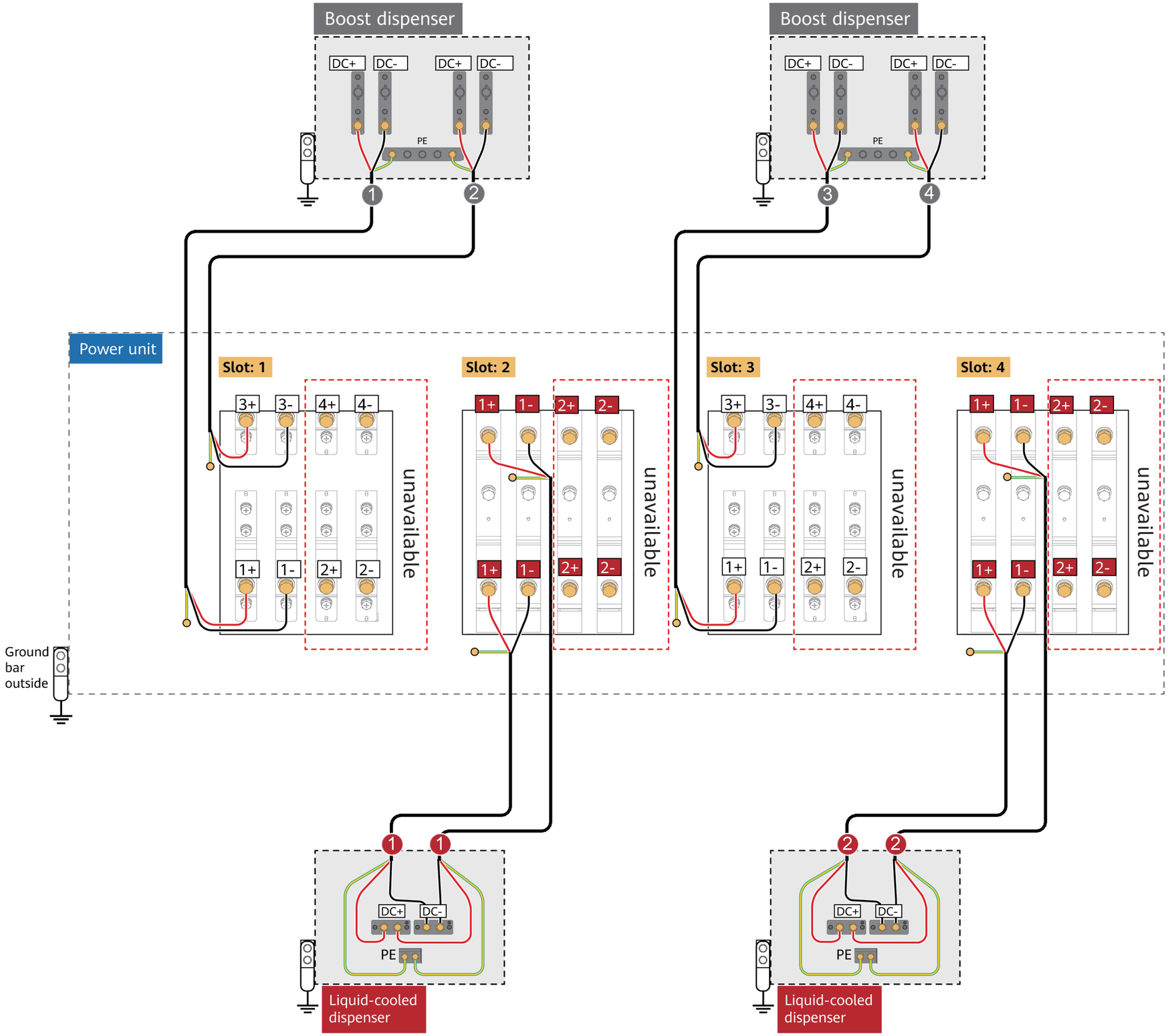
Cable	Recommended Cross-Sectional Area	Screw & Torque
DC cable	2 x 120 mm² + 70 mm² (copper) 2 x 185 mm² + 95 mm² (aluminum alloy)	DC+/DC-: M12, 47 N·m PE: M10, 27 N·m
Outdoor ground steel plate	40 mm x 4 mm (Max. 50 mm x 5 mm)	M12, 47 N·m

Note: If the charging connector of the boost dispenser is used as a fast charging connector (only one pair of cables needs to be connected to the charging connector), 2 x 120 mm² + 70 mm² copper cables are recommended. In this case, the charging connector can output the rated current of 250 A. If the charging connector is required to output the current of 300 A for a short term, you shall use 2 x 150 mm² + 70 mm² copper cables and set **Peak Current Control at Power Unit Port** to **Disable** in the Antohill app. Select the cable specifications based on the cable routing mode and local regulations.

⚠ WARNING

Do not connect only one pair of cables to the type II port (port 1 of slot 2/4) for a boost or liquid-cooled charging connector.





Power Unit to Dispenser - DC Cables

2 x Ultra-fast charging connector (Boost dispenser)

4 x Fast charging connector (Single-connector boost dispenser; one pair of cables only)

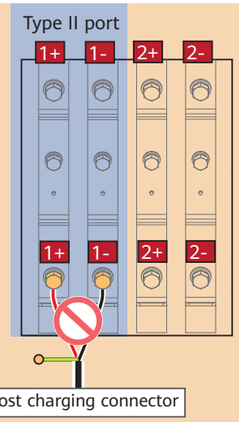
Note:
1. This wiring diagram shows the [2 ultra-fast + 4 fast] charging scenario.
2. ❶ indicates the recommended sequence of ultra-fast charging connectors. ❶ indicates the recommended sequence of fast charging connectors.
3. When the actual quantity of charging connectors is less than that in the diagram, connect their cables according to the cable numbers in ascending order. Reduce the quantity of charging connectors for boost charging dispensers by even numbers. For example, if you need two fast charging connectors, connect them from ❶ to ❷.
4. DC cable insulation specifications: 1.8/3 kV or 0.6/1 kV. The 1.8/3 kV cables are recommended. If you use the 0.6/1 kV cables for a long time, the insulation performance may deteriorate due to aging. Charging may fail when the charging voltage exceeds 850 V.
5. When connecting cables, if the cable terminals contact the labels on the copper bars, remove the labels before cable connection.

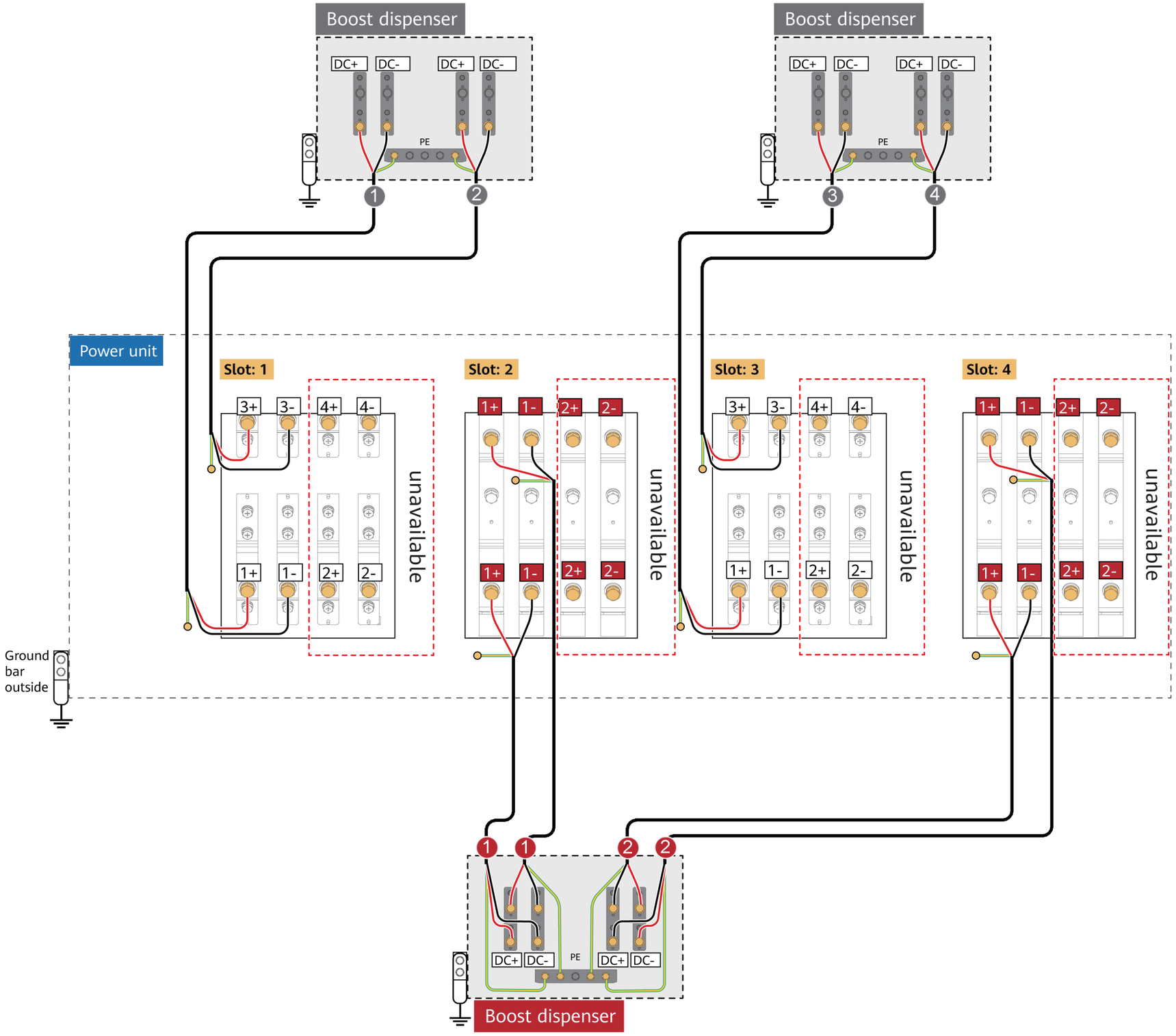
Cable	Recommended Cross-Sectional Area	Screw & Torque
DC cable	2 x 120 mm^2 + 70 mm^2 (copper) 2 x 185 mm^2 + 95 mm^2 (aluminum alloy)	DC+/DC-: M12, 47 N·m PE: M10, 27 N·m
Outdoor ground steel plate	40 mm x 4 mm (Max. 50 mm x 5 mm)	M12, 47 N·m

Note: If the charging connector of the boost dispenser is used as a fast charging connector (only one pair of cables needs to be connected to the charging connector), 2 x 120 mm^2 + 70 mm^2 copper cables are recommended. In this case, the charging connector can output the rated current of 250 A. If the charging connector is required to output the current of 300 A for a short term, you shall use 2 x 150 mm^2 + 70 mm^2 copper cables and set **Peak Current Control at Power Unit Port** to **Disable** in the Antohill app. Select the cable specifications based on the cable routing mode and local regulations.

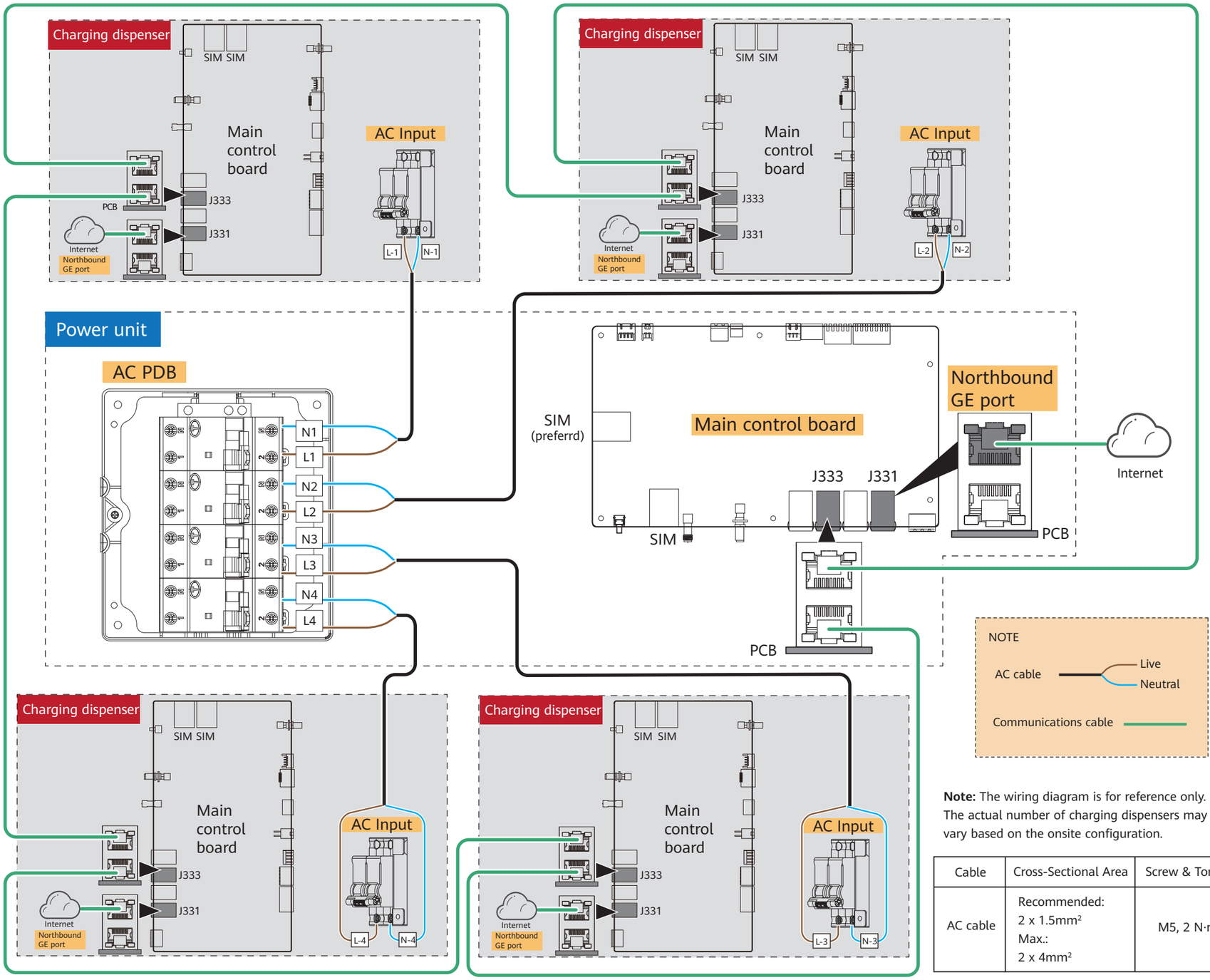
⚠ WARNING

Do not connect only one pair of cables to the type II port (port 1 of slot 2/4) for a boost charging connector.





Power Unit to Dispenser - AC Cables/Comm. Cables (Ring Network Communication)



NOTE

AC cable — Live / Neutral

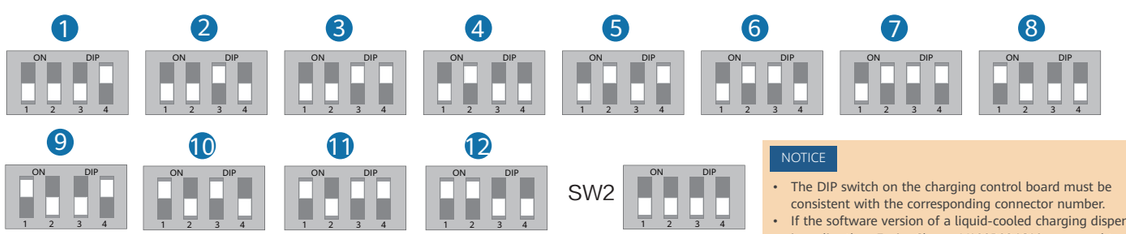
Communications cable

Note: The wiring diagram is for reference only. The actual number of charging dispensers may vary based on the onsite configuration.

Cable	Cross-Sectional Area	Screw & Torque
AC cable	Recommended: 2 x 1.5mm² Max.: 2 x 4mm²	M5, 2 N·m

DIP switch of a charging dispenser

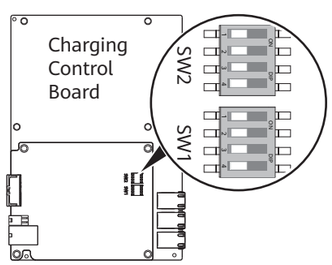
Connector No. / SW1



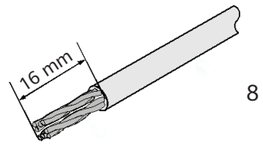
SW2

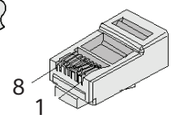
NOTICE

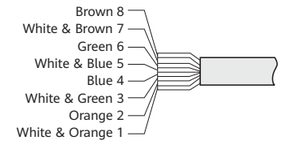
- The DIP switch on the charging control board must be consistent with the corresponding connector number.
- If the software version of a liquid-cooled charging dispenser is earlier than FusionCharge V100R024C10, you need to set the DIP switches of the charging connectors. This requirement does not apply to boost charging dispensers.



Preparing a network cable



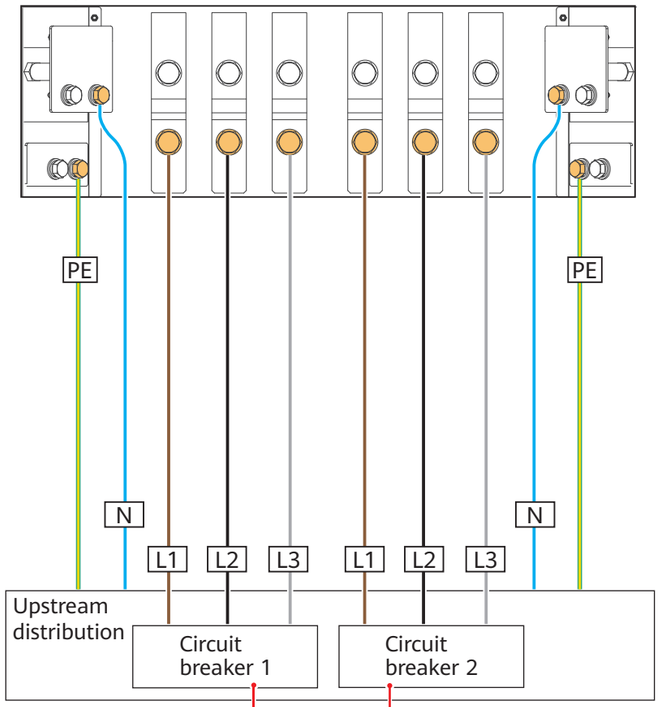




* Applicable to both ends of a cable.

AC input power cables for the power unit

AC input busbar



· Do not provide the residual current detection (RCD) function.
· Must be connected to the same transformer. · Must be able to protect AC input cables.
· (Recommended) Adopt the associate design to achieve simultaneous power-on or power-off.

Cable	Recommended Cross-Sectional Area	Screw & Torque
AC input*	Cable trenching mode: 4 x 120 mm² + 70 mm² (copper) 4 x 185 mm² + 95 mm² (aluminum alloy) Direct buried mode: 4 x 150 mm² + 70 mm² (copper) 4 x 240 mm² + 120 mm² (aluminum alloy)	L1/L2/L3: M16, 120 N·m N/PE: M12, 47 N·m

* There are two AC inputs, one on the left and the other on the right. Each input only needs to connect to one group of cables with the recommended cross-sectional areas.