5.2.12. Connecting the DC input power cables to Liquid Cooled Satellite

The Liquid Cooled Satellite is delivered with the charging cable already installed.

Connect the DC input power cables from the Power Unit to the copper terminal bars of the Liquid Cooled Satellite with cable lugs and M10 screws. Leave a minimum of 8 mm between the cable lugs. Connect the protective earth wire to the Liquid Cooled Satellite's installation flange with a wire clamp. For details, see 11.7: Liquid Cooled Satellite with one CCS vehicle connector.

Be careful not to damage the coolant hoses when you connect the power cables. The coolant hoses are routed to the frame with the liquid cooling unit from below the power cable terminal blocks.

The frame with the liquid cooling unit does not need any installation work. Make sure that there are no leaks and that the expansion tank in the liquid cooling unit is approximately 1/3 full before you start operation. The coolant system has a liquid level sensor that will give an alarm on the user interface screen when the system is powered on if the level of coolant is below the limit.

5.2.13. Configuring the main switch of the charging power unit

DANGER
High-voltage installation. Make sure that the units are correctly isolated from the main power supply before you do this task. Know and obey general and local safety regulations and procedures. Use adequate personal protection equipment (PPE).

CAUTION
Make sure that selectivity requirements are fulfilled in accordance with local laws and regulations.

Configure the settings for the main switch of each cabinet on the site:

1. Set the unit's main switch and the miniature circuit breaker (MCB) to OFF position (down).
2. If the front panel of the mains module is in place, remove it.
3. Identify the manufacturer of the main switch and see the respective instructions:
   - 5.2.13.1: ABB circuit breaker
   - 5.2.13.2: Chint circuit breaker
   - 5.2.13.3: Schneider circuit breaker
4. When you finish configuring the main switch, push the circuit breaker's test button and make sure that the unit trips.
5. Make sure that the rating of the supply side circuit breaker is higher than that of the cabinet's main switch.

5.2.13.1. ABB circuit breaker

NOTE
Adjust the switches according to the number of power modules in the cabinet.

NOTE
Use the appropriate factor to include the short circuit value in the selected settings.

NOTICE
Adjust the DIP switches carefully to avoid damaging them.

Select the correct values on the DIP switch panel marked *L* at the bottom of the circuit breaker.

Table 2. ABB circuit breaker (product code ABB 1SDH002011A1002_XT5S)

Number of power modules	Value	DIP switch setting (L)			
		0.04	**0.08**	**0.16**	**0.32**
4	368 A	ON	OFF	ON	ON
3	272 A	ON	ON	ON	OFF
2	192 A	OFF	ON	OFF	OFF
1	160 A	OFF	OFF	OFF	OFF
ON = up, OFF = down					

5.2.13.2. Chint circuit breaker

NOTE
Adjust the switches according to the number of power modules in the cabinet.

NOTE
Use the appropriate factor to include the short circuit value in the selected settings.

NOTICE
Adjust the DIP switches carefully to avoid damaging them.

Select the correct values on the DIP switch panel marked *Ir* at the bottom of the circuit breaker.

Table 3. Chint circuit breaker (product code NM8N-400QEN4003P)

Number of power modules	Value	DIP switch setting (Ir)		
		Left	**Middle**	**Right**
4	360 A	ON	OFF	ON
3	280 A	OFF	ON	ON
2	200 A	OFF	OFF	ON
1	160 A	OFF	OFF	OFF
ON = up, OFF = down				

5.2.13.3. Schneider circuit breaker

NOTE
Adjust the switches according to the number of power modules in the cabinet.

NOTE
Use the appropriate factor to include the short circuit value in the selected settings.

NOTE
Turn the rotary switch carefully with a flat screwdriver. Do not rotate the switch 360 degrees.

Select the correct values on the left-hand side rotary switch at the bottom of the circuit breaker. You should feel when the switch engages on the setting.

Table 4. Schneider circuit breaker (product code NLJF36400U31XTW)

Number of power modules	Rotary switch setting (left-hand side)
4	400 A
3	300 A
2	200 A
1	125 A

5.2.14. Installing AC Satellite cables

DANGER
Make sure that AC Satellite is correctly isolated 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
Do not connect the Ethernet cable of AC Satellite to the charging power unit. Doing so will stop the operation of both units.

NOTE
AC Satellite is not connected to a charging power unit. It is connected directly to the main power supply.

NOTE
An Ethernet cable between AC Satellite and the local area network (LAN) is optional but not required.

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

Connect L1, L2, L3, N and PE to the correct terminal blocks:

- Connection to charging socket/vehicle connector 1 to the terminal blocks labelled L1, L2, ...
- Connection to charging socket/vehicle connector 2 to the terminal blocks labelled L1.2, L2.2, ...
- PE wire to the terminal block on the DIN rail. Do not connect the PE wire to the front panel of the unit.

If the site has multiple AC Satellites, we recommend shifting the phase order L1→L2.2 | L2→L3.2 | L3→1.2 to balance the power consumption in the grid.

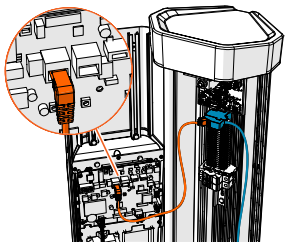
In the AC Satellite with charging cables:

- Route each charging cable through the residual current monitor (RCM) before you connect it to the contactor (K4, K5).
- Connect only the white CP signal wire of the charging cable to the unit connector (X4 right, X5 left).

If the optional Ethernet cable is used:

1. Install the Ethernet terminal block to the top of the DIN rail.
2. Connect the Ethernet cable between the control board and the terminal block.
3. Connect the site network Ethernet cable to the other side of the terminal block.

Figure 47. Connecting the AC Satellite Ethernet cable

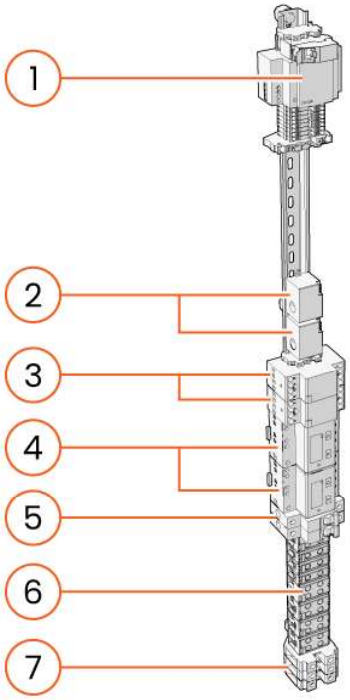


See also 11.11: AC Satellite Version 2 with two vehicle connectors and 5.2.14.1: Terminal blocks (AC Satellite with charging cables).

5.2.14.1. Terminal blocks (AC Satellite with charging cables)

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

Figure 48. Terminal blocks in the double AC Satellite with charging cables



1	Power supply	5	Circuit breaker
2	Residual current monitor (RCM)	6	Terminal blocks for AC supply power cables (2 x 50 mm^2 screw terminal)
3	Contactor	7	Terminal blocks for PE wires
4	kWh meter		

6. INSTALLING THE EQUIPMENT STOP CIRCUIT (OPTION)

WARNING
You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks. Installation, commissioning, service or maintenance tasks done by an unapproved partner will void the warranty.

WARNING
You must be authorized to do electrical work. The instructions are for persons who know electrical work and the applicable electrical safety requirements.

WARNING
After you disconnect the power supply, wait a minimum of two minutes for the capacitors of the power modules to discharge before you continue. Before you start work, measure the voltage of the electrical circuits to make sure that no dangerous voltage remains.

CAUTION
Know and obey the general and local safety regulations and procedures.

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.

6.1. Needed for the task

This installation requires software configuration. Only Kempower personnel can do the software configuration. Contact Kempower Technical Support and make sure that they are available for remote support while you are on site. Give the serial number of your charging unit in the support request.

Estimated time of labor 0.5 h.

Tools and equipment

- Equipment stop push button or contactor circuit (NC, normally closed)
- Protective gloves
- Protective eyewear
- Power unit door key
- Access to the main AC power supply
- Screwdriver T30
- Digital camera or mobile phone with camera
- Clean and dry compressed air (max. 4 bar)
- Vacuum cleaner (optional)
- Contact cleaner spray (optional)

6.2. Task

CAUTION
If you have a double or triple cabinet, only install the equipment stop circuit in the master cabinet (first cabinet on the left).

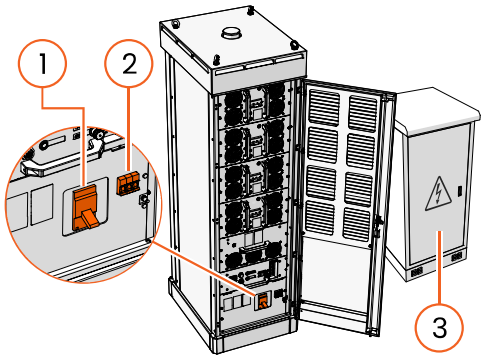
NOTE
Remove the lowest power module, the power distribution module, the control module, and the front panel of the mains module to make room for the installation.

1. Unlock and open the door(s) of the charging power unit.

   In each cabinet, set the miniature circuit breaker (MCB) for control voltage (2) and main switch (1) to OFF position.

   Disconnect the AC power supply to the unit from the main supply point (3).

   Complete the lockout-tagout (LOTO) procedure.



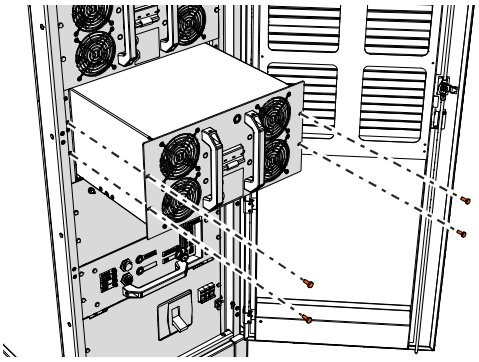
WARNING
After you disconnect the power supply, wait a minimum of two minutes for the capacitors of the power modules to discharge before you continue. Before you start work, measure the voltage of the electrical circuits to make sure that no dangerous voltage remains.

2. Remove the power module.

   Set the power module's circuit breakers in OFF position (down).

   Remove the four T30 fixing screws on the edges of the module's front panel.

   The module moves on its rollers on the rack. Use the handles to carefully pull out the module.

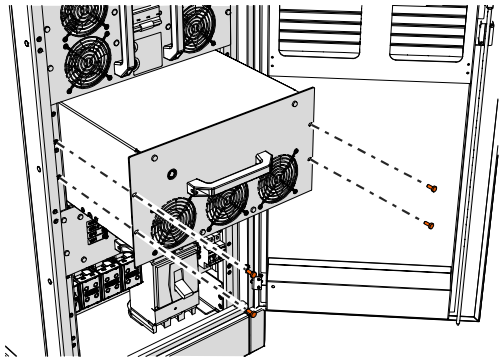


NOTICE
Protect the components that are installed back into the unit from dirt.

3. Remove the power distribution module.

   Remove the four T30 fixing screws on the edges of the module's front panel.

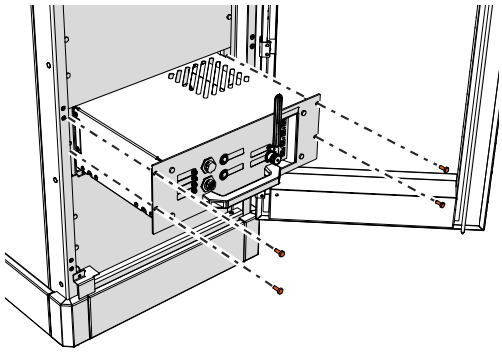
   The module moves on its rollers on the rack. Use the handle to carefully pull out the module.



> **NOTICE**
> Protect the components that are installed back into the unit from dirt.

4. Remove the control module.

> **NOTE**
> Before you detach wires, cables, or connectors, take a photograph of them.



   Detach all cables or wires connected to the control module's front panel.

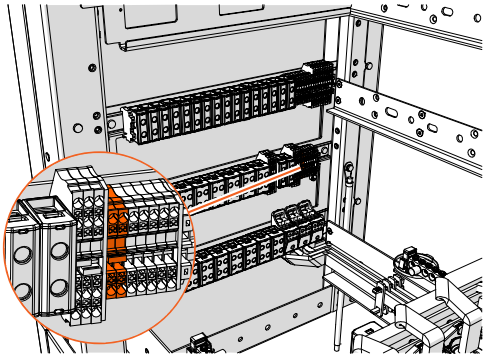
   Remove the four T30 fixing screws on the edges of the module's front panel.

   The module moves on its rollers on the rack. Use the handle to carefully pull out the module.

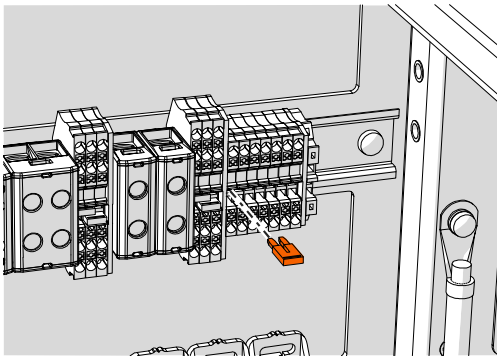
> **NOTICE**
> Protect the components that are installed back into the unit from dirt.

5. Only install the equipment stop circuit in the master cabinet (first cabinet on the left).

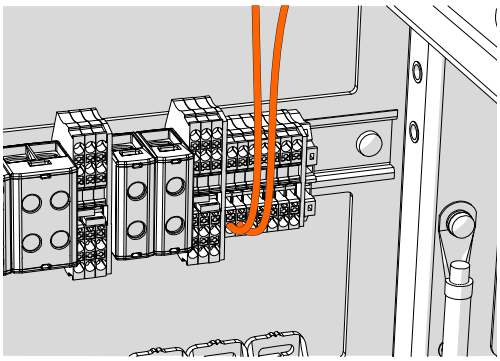
   Locate the ES terminal blocks on the right side of the middle DIN rail.



6. Remove the red jumper piece between the ES terminal blocks.



7. Connect the equipment stop button or wire the contactor circuit to the ES terminal blocks. Make sure that the circuit type is normally closed (NC).

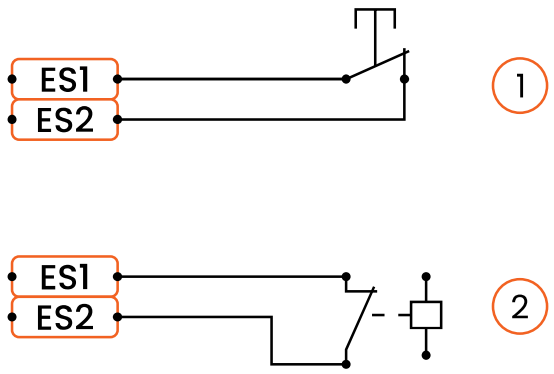


WARNING
Never connect main AC power to the equipment stop circuit. Risk of fire and permanent damage to the control module.

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
Route the cables to all units from below the unit.

Figure 49. Equipment stop circuit



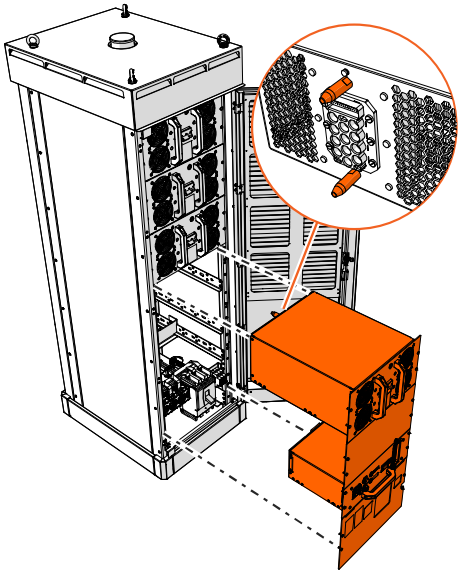
1 Equipment stop (NC)

2 Contactor (NC)

8. Push the power module, power distribution module, and control module into the unit. Make sure that you do not damage the modules.

   Install the fixing screws to the edges of the modules' front panels.

   Set the power module's circuit breakers in ON position (up).



NOTICE
Do not lift the power module from its guide pins.

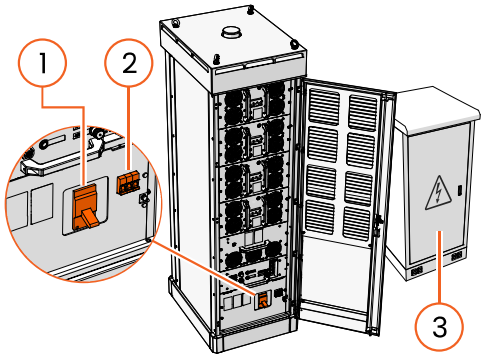
NOTE
Make sure that the module's connectors and connector pins are in good operating condition. When you push the module into the unit, be very careful not to damage the connector pins.

If necessary, clean the connectors with compressed air and/or spray the connectors with contact cleaner spray.

9. Connect the AC power supply to the unit from the main supply point (3).

   In each cabinet, set the miniature circuit breaker (MCB) for control voltage (2) and main switch (1) to ON position.

   Lock the door(s) of the unit.



10. Kempower Technical Support remotely enables the equipment stop function. Give the serial number of your charging unit in the support request.

> **CAUTION**
> The system must be rebooted to complete the software configuration. Stop any ongoing charging session before you continue. You can disable charging units from ChargEye. Kempower recommends that you also visibly notify users that the charging unit is not in use.

11. Do a functional test:

    - Start charging a suitable electric vehicle or an EV simulator/ charger tester for a minimum of 1 minute per vehicle connector.
    - During charging, push the equipment stop button. Make sure that each charging unit in the system goes into service mode.
    - Release the equipment stop button.
    - Reboot the system to reset it.

12. Complete the Kempower field visit report. Submit the completed document to ChargEye. For additional information, contact Kempower Technical Support.

7. FINISHING THE INSTALLATION

CAUTION
When you have connected all cables correctly, make sure that the fuse rating setting is correct in the charging power unit.

NOTE
Make sure that the expansion tank in the liquid cooling unit is approximately 1/3 full before you start operation. See 5.1.7: Moving and lifting Liquid Cooled Satellite.

NOTE
Upload all available site documentation to ChargEye to help with future troubleshooting.

The electrical installation is done when:

- A qualified electrician who has completed the Kempower certification training has installed and connected all cables and electrical components as specified in the electrical design documentation.
- The main switch of the charging power unit has been correctly configured.
- The control module and mains fuse settings obey the electrical design.
- The electrician has done all required electrical safety tests according to local regulations, and stored the test reports on-site.
- The electrical installation contractor has done the required inspections for all site units, and delivered the checklist to the commissioner of the charging site:
  - 7.1.1: Sensory inspection
  - 7.1.2: Electrical installation and safety inspection

7.1. Inspecting the installation

CAUTION
Know and obey the local laws, regulations, and requirements.

CAUTION
Keep the AC main power supply disconnected during the inspection.

Do the installation inspection when the electrical installation is done. See 7: Finishing the installation.

The commissioning checklist is a separate document provided by Kempower. This is an overview of the items to be

inspected. The complete commissioning checklist, is available at mediabank.kempower.com.

- Clearly document all observations and possible deviations you find during the inspection.
- Take pictures of the installation site:
  - Layout of the charging power unit and charging points
  - Distribution/transformer cabinet that supplies the charging power unit
  - Cable connections in and between the charging power unit and charging points

7.1.1. Sensory inspection

The electrical contractor does the sensory inspection. Its purpose is to verify that the installation obeys the local laws, regulations, and requirements. Make sure that:

- Fire safety is inspected and approved.
- The voltage-carrying conductors are correctly touch-protected.
- The bending of cables does not exceed the minimum bending radius specified by the cable manufacturer.
- All components and cables are in place, correctly installed, and protected.
- All units are in operating condition and have no visible damages.
- All charging cables, vehicle connectors, and possible charging sockets are in operating condition and have no visible damages.
- All units are firmly secured to their installation surface.
- All labels on the units are clear and obey the electrical design documentation.
- If the configuration has an equipment stop button (option), it is in place and operates correctly.
- If the configuration requires an emergency stop circuit, it is in place and operates correctly.

7.1.2. Electrical installation and safety inspection

CAUTION
Make sure that the electrical safety tests have been done according to local laws and regulations.

CAUTION
If you remove touch protection for the inspection, install it back again.

NOTE
Note the name, number and revision of the electrical design documentation.

The electrical contractor does the electrical installation and safety inspection. Its purpose is to verify that the installation obeys the local laws, regulations, and requirements.

Item to inspect	Power Units	Station Charger	Satellite	Satellite Version 2	Liquid Cooled Satellite	Control Unit	AC Satellite	AC Satellite with charging cables
Phase order of AC supply power cable connections correct	•	•					•	•
Tightening torques of AC supply power cable connections correct	•	•					•	•
DC output power cables correctly labeled at both ends	•	•	•	•	•	•		
Tightening torques of DC output power cable connections correct	•	•	•	•	•	•		
Control cables correctly labeled at both ends	•	•	•	•	•	•		
Charging cable wires connected to correct terminals		•	•	•	•	•	•	•
Cable bushings of charging cables correctly tightened		•	•	•	•	•	•	•
Ethernet cables tested with LAN tester	•	•	•	•	•	•	•	•

Item to inspect	Power Units	Station Charger	Satellite	Satellite Version 2	Liquid Cooled Satellite	Control Unit	AC Satellite	AC Satellite with charging cables
AC supply wires correctly labeled (L1–L2–L3)							•	•
AC supply phases correctly reordered (multiple AC satellites)							•	•
Ethernet cable connected to EXT port of control board (option)							•	•

8. COMMISSIONING

NOTICE
Commissioning done by an unapproved partner will void the warranty.

During commissioning the charging site is connected to the ChargEye backend system and the charging site's set-up and functions are configured. As a general rule, approximately one hour is needed to configure a charging site with one charging power unit and four Satellites.

You do not have to be a licensed electrician to do the commissioning but you must have extensive knowledge of electrical installations and have completed the Kempower certification training. We recommend that you have a licensed electrician on site during commissioning to repair possible electrical installation errors.

Before you start the commissioning make sure that:

- The installation has been inspected and approved.
- You have received the electrical safety test report.
- The site is online.
- If necessary, remote commissioning support has been booked in advance from Kempower Technical Support.
- All necessary OCPP information is available (option).

The charging site is configured with the Commissioning Tool software. The set-up of the charging site in ChargEye consists of the following steps:

- Adding the new charging site to the backend system.
- Adding the general information of the charging site to the backend system (location, owner, etc.).
- Specifying the settings (technical values, authorization).
- Specifying the access rights for different user groups and roles.
    - Request new users or change of access rights from Kempower Technical Support.

When the charging site is configured, the following tasks can be done through ChargEye (depending on the user's access rights):

- Reading data and troubleshooting logs
- Updating software
- Restarting chargers
- Monitoring connection status
- Monitoring energy consumption

8.1. Commissioning checklist

Task	Power Units	Station Charger	Satellite	Satellite Version 2	Liquid Cooled Satellite	Control Unit	AC Satellite	AC Satellite with charging cables
Site configuration is completed using the Commissioning Tool	•	•					•	•
Connection to ChargEye operates correctly	•	•					•	•
Connection to customer's backend system operates correctly (if applicable)	•	•					•	•
All user interface screens operate correctly		•	•	•	•		•	•
All user interface screens have correct identification and maximum power information		•	•	•	•		•	•
No error messages on user interface screens		•	•	•	•		•	•
All charging points tested and operate correctly		•	•	•	•	•	•	•
User interface's STOP button tested and stops the charging session		•	•	•	•	•	•	•
Electric vehicle's STOP function tested and stops charging session		•	•	•	•	•	•	•
Equipment's stop button tested and stops charging session (option)		•	•	•	•	•	•	•
Charging status LED indicators operate correctly and for correct charging outlet		•	•			•		