Ingeteam

INGETEAM RAPID 60

Installation and Operation Manual

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Ingeteam Power Technology, S.A. - Energy

Avda. Ciudad de la Innovación, 13
31621 SARRIGUREN (Navarra) - Spain
Tel.: +34 948 28 80 00
Fax.: +34 948 28 80 01
e-mail: electricmobility.energy@ingeteam.com

Service Call Center: +34 948 698 715

Important safety instructions

This section describes the safety warnings and the personal protective equipment and symbols used in the unit.

Safety conditions

General warnings

⚠ DANGER

Opening the enclosure does not imply there is no voltage inside.

The risk of electric shock exists even after disconnecting from the grid.

Only qualified personnel may open it, following the instructions in this manual.

It is strictly forbidden to gain access to the inside of the electrical panel through any other point than the access cover provided for this purpose. Always gain access when the unit is voltage-free.

⚠ CAUTION

The operations described in the manual may be performed only by qualified personnel.

The status of qualified personnel referred to in this manual will be, as a minimum, that which meets all the standards, regulations and laws regarding safety applicable to the tasks of installing and operating this unit.

The responsibility for designating qualified personnel will always fall to the company to which the personnel belong. It is necessary to decide which workers are suitable or not for carrying out specific work to preserve their safety at the same time as complying with occupational safety legislation.

These companies are responsible for providing appropriate training in electrical equipment to their personnel and for familiarizing them with the contents of this manual.

All applicable safety-related legislation for electrical work must be complied with. Danger of electric shock.

Compliance with the safety instructions set out in this manual or in the suggested legislation does not imply exemption from other specific standards for the installation, place, country or other circumstances that affect the unit.

You must consider the set of conditions listed throughout this document as minimum requirements. It is always preferable to shut off the main power supply. There may be faults in the installation that cause the unwanted return of voltage. Danger of electric shock.

According to basic safety standards, the complete unit must be suitable to protect exposed workers against the risk of direct and indirect contact. In any case the electrical parts of the work equipment must comply with the provisions of the corresponding specific regulations.

According to basic safety standards, the electrical installation shall not entail a fire or explosion risk. Workers must be duly protected against the risk of accidents caused by direct or indirect contact. The electrical installation and protection devices must take into account the voltage, the external conditions and the competence of persons who have access to parts of the installation.

To check the absence of voltage, it is compulsory to use measurement devices with category III-1100 V.

ⓘ INFO

These instructions must be easily accessible close to the unit and located within reach of all users.

Before installation and start-up, please read these safety instructions and warnings carefully as well as all the warning notices located on the unit. Ensure that all the warnings signs are perfectly legible and that those which are damaged or have disappeared are restored.

Protection against direct contact is by means of the enclosure.

The unit has been tested according to the applicable regulations to comply with the safety requirements, the values for insulation clearances and leakage paths for the voltages used.

Potential hazards for people

⚠ DANGER
Electric shock. The equipment may remain charged after disconnecting the grid power. Carefully follow the mandatory steps in the manual for removing the voltage.
Explosion. There is a very low risk of explosion in very specific cases of malfunction. The casing will protect people and property from the explosion only if it is correctly closed.
Crushing and joint injuries. Always follow the indications in the manual on moving and placing the unit. The weight of this unit can cause serious injury and even death if not handled correctly.
High temperature. The flow of outlet air can reach high temperatures which can cause injury to anybody exposed to it.

Potential hazards for the equipment

⚠ DANGER
Cooling. The unit requires particle-free air flow while it is operating. Keeping the unit in the upright position and the inlets free of obstacles is essential for this air flow to reach the inside.
Do not touch boards or electronic components. The more sensitive components can be damaged or destroyed by static electricity.
Do not disconnect or connect any terminal while the unit is operating. Disconnect and check for absence of voltage first.
With the aim of avoiding premature wear of the screwed joints on the unit's housing panels, removal and installation of the screws must be done manually.

Personal Protective Equipment (PPE)

When working on the unit, use the following safety equipment recommended by Ingeteam as a minimum.

Name	Description
Safety footwear	In compliance with standard *UNE-EN-ISO 20345:2012 ANSI Z41.1-1991*
Helmet with face shield	In compliance with standard *UNE-EN 397:1995, ANSI Z89.1-2014*, provided there are elements with voltage directly accessible.
Working clothes	Close-fitting, non-flammable, 100% cotton
Dielectric gloves	In compliance with standard *EN 60903:2005 ASTM D 120-87*

Tools and / or equipment used in live work must have at least Category III-1100 Volts insulation.

Should the country's regulations demand another kind of personal protection, you should appropriately supplement the equipment recommended by Ingeteam.

Symbols

In the equipment, the following symbols are included.

Electrical danger

Warning of dangerous voltage: this warns of high voltage which could cause serious or fatal injuries and / or damage to the equipment.

Caution, hot surface: this warns of hot surfaces which could cause serious burns.

It is mandatory to read the instruction manual.

Electrical and electronic equipment should not be discarbed in the household waste container.

Contents

1. About this manual

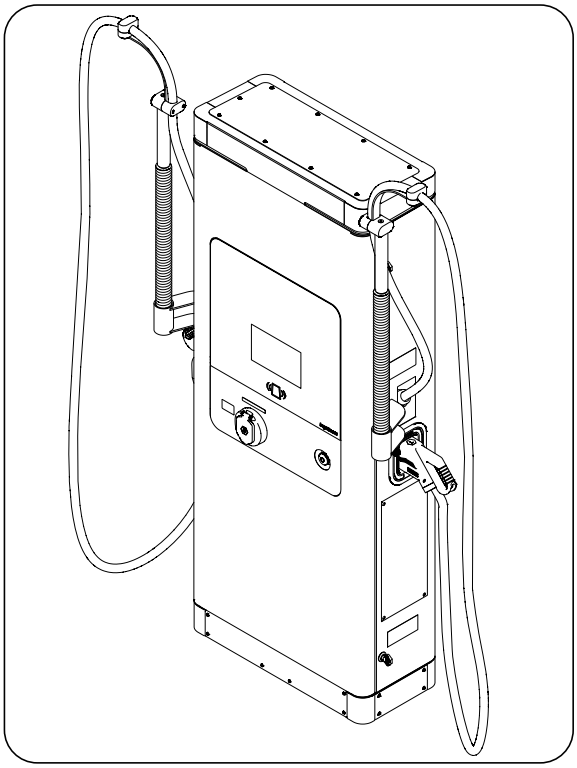
The purpose of this manual is to describe the INGETEAM RAPID 60 units, providing appropriate information for their correct reception, installation, start-up, maintenance and operation.

This manual contains important information that should be taken into account during the installation, operation and maintenance of the unit. Keep this manual throughout the unit's useful life.

1.1. Scope and nomenclature

This manual is applicable to the following units:

Complete name	Abbreviation
INGETEAM RAPID 60 Trio CCS+CCS+T2S	Trio CCS
INGETEAM RAPID 60 Trio CCS+CHA+T2S	Trio CCS+CHA
INGETEAM RAPID 60 Duo CCS+CCS	Duo CCS
INGETEAM RAPID 60 Duo CCS+CHA	Duo CCS+CHA
INGETEAM RAPID 60 One CCS	One
INGETEAM RAPID 60 One+ CCS+T2S	One+



Exterior view of the unit

1.2. Recipients

This document is intended for qualified personnel.

The status of qualified personnel referred to in this manual will be, as a minimum, that which meets all the standards, regulations and laws regarding safety applicable to the tasks of installing and operating this unit.

The responsibility for designating qualified personnel will always fall to the company to which the personnel belong. It is necessary to decide which workers are suitable or not for carrying out specific work to preserve their safety at the same time as complying with occupational safety legislation.

These companies are responsible for providing appropriate training in electrical equipment to their personnel and for familiarizing them with the contents of this manual.

1.3. Symbols

Throughout this manual we include warnings to highlight certain information. Relative to the nature of the text, there are three types of warnings:

⚠ DANGER	This indicates a hazard to personnel or the charger.
⚠ CAUTION	Indicates importance.
i INFO	Additional information or references to other parts of the document or documents.

2. Unit description

2.1. Overview

INGETEAM RAPID chargers are a multi-standard fast charging model designed for the fast charging requirements of the latest electric vehicles, allowing up to 100 km of range to be recovered in no more than 15 minutes.

The different models of INGETEAM RAPID are compatible with mode 4 with standards CHAdeMO and CCS1/CCS2 in DC and with mode 3 with AC Type 2 in AC.

They have been designed for use outdoors and may be installed in locations with unrestricted access. Given its nature, this is a fixed, freestanding unit classified as Class I equipment.

2.2. Models

The INGETEAM RAPID chargers have several models with the following connector types available:

	Connector type		
	DC		AC
	CCS1/CCS2	CHAdeMO	AC Type 2
INGETEAM RAPID 60 Trio CCS+CCS+T2S	●	○	●
INGETEAM RAPID 60 Trio CCS+CHA+T2S	●	●	●
INGETEAM RAPID 60 Duo CCS+CCS	●	○	○
INGETEAM RAPID 60 Duo CCS+CHA	●	●	○
INGETEAM RAPID 60 One CCS	●	○	○
INGETEAM RAPID 60 One+ CCS+T2S	●	○	●

● Equipped // ○ Not equipped

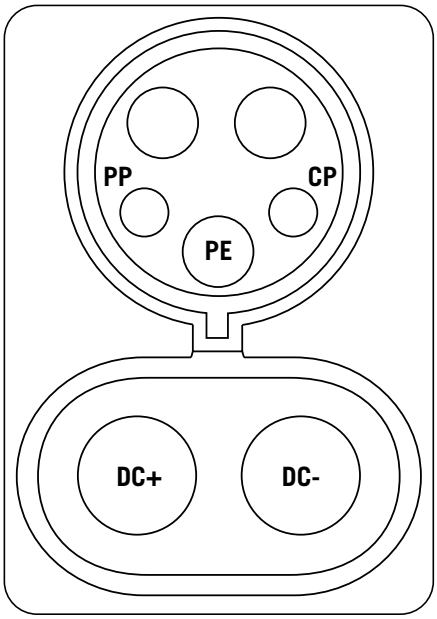
These models are designed to remain connected to the public AC grid. They all generate DC current and the Trio models also allow charging with AC current.

2.3. Connectors

2.3.1. Connectors for DC charging

The following connectors are based on DC fast charging standards for electric vehicles.

CCS1



PP: Proximity Pilot, pre-insertion signal

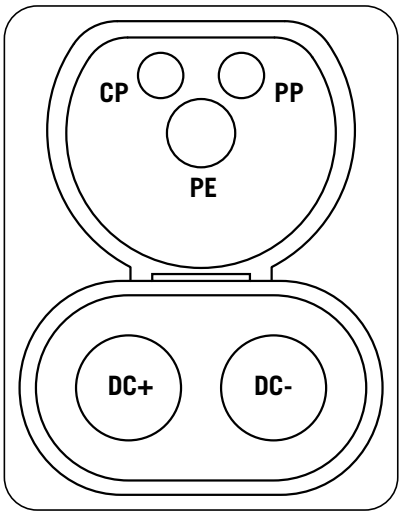
CP: Control Pilot, post-insertion signal

PE: Protective Earth

DC+

DC-

CCS2



PP: Proximity Pilot, pre-insertion signal

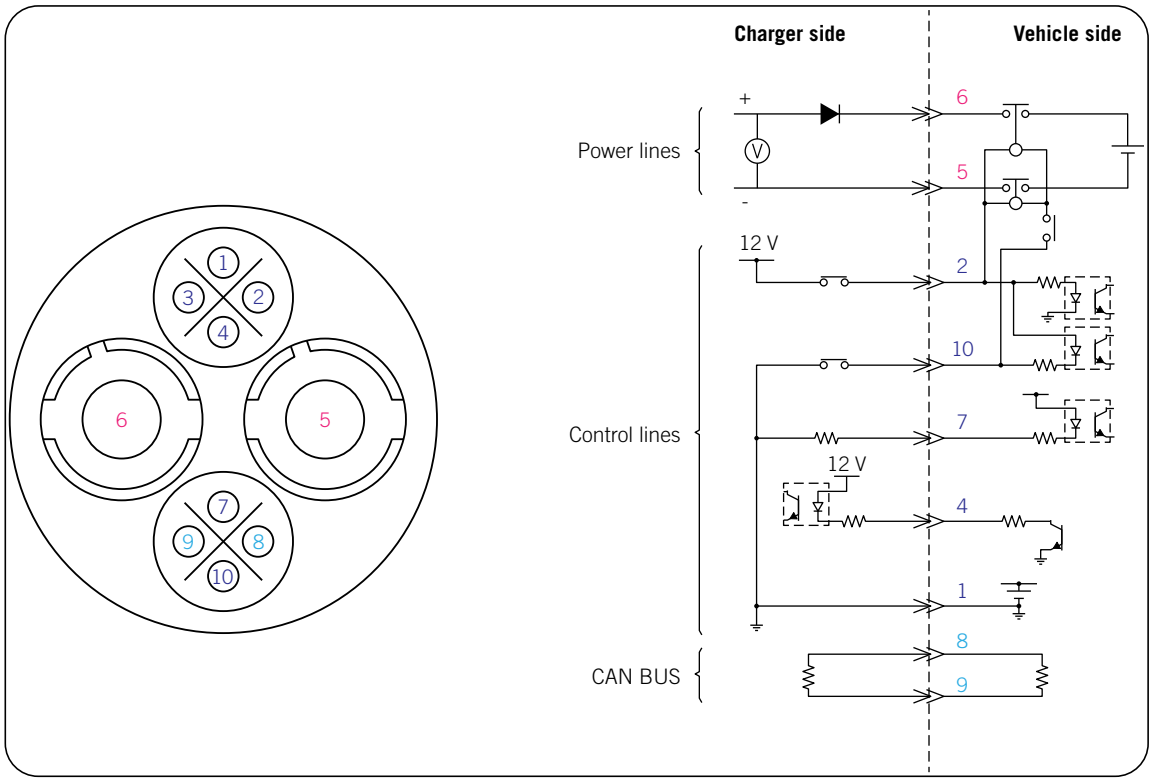
CP: Control Pilot, post-insertion signal

PE: Protective Earth

DC+

DC-

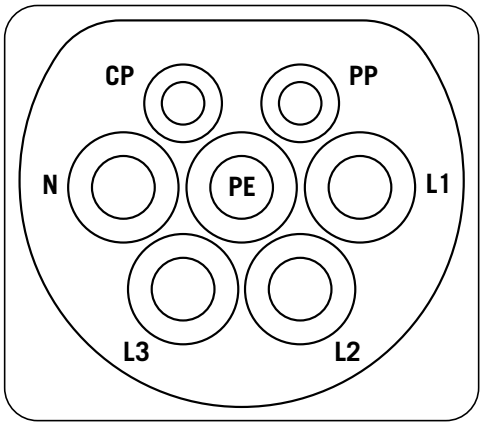
CHAdeMO



2.3.2. Connectors for AC charging

The following connector is based on AC charging standards for electric vehicles.

IEC 62196-2 AC Type 2 socket



PP: Proximity Pilot, pre-insertion signal

CP: Control Pilot, post-insertion signal

PE: Protective Earth

N: Neutral

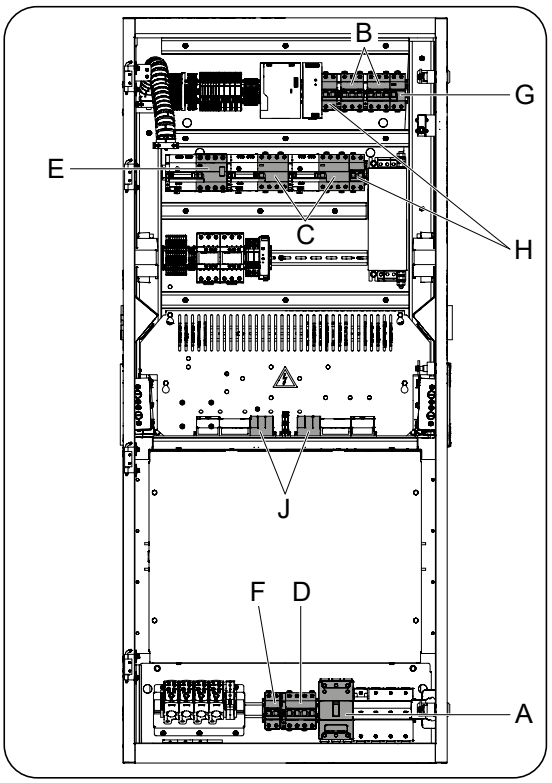
L1: Phase 1

L2: Phase 2

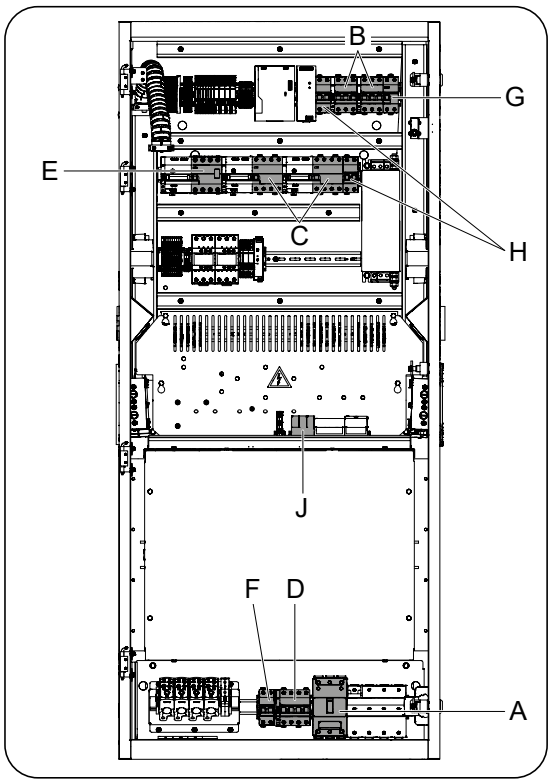
L3: Phase 3

2.4. Protection

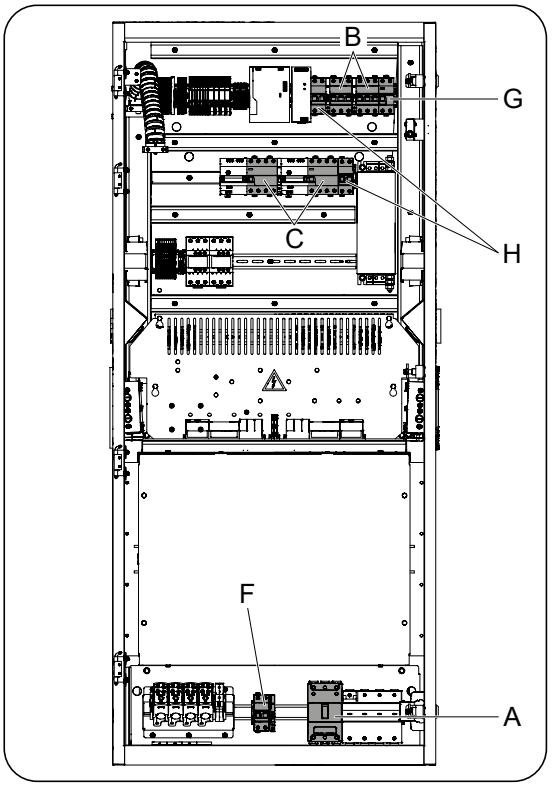
This charging station has several protections, as described below:



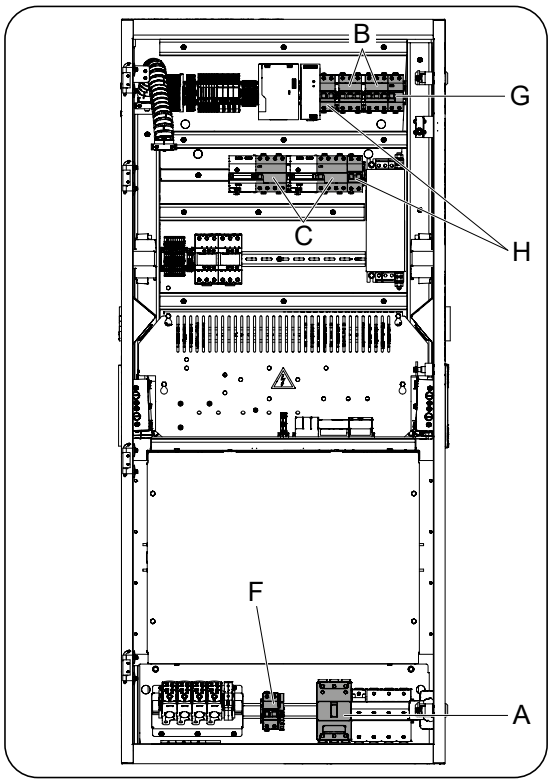
Arrangement of protection elements for TRIO units



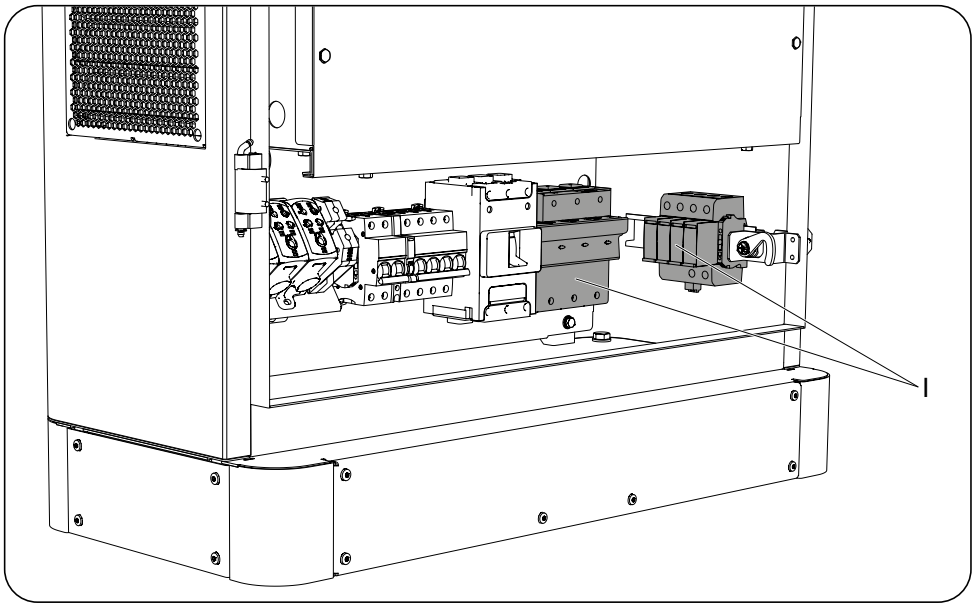
Arrangement of protection elements for ONE+ units



Arrangement of protection elements for DUO units



Arrangement of protection elements for ONE units



Overvoltage protection

A. Main DC charging switch. 125 A, 25 kA.

B. Power module protections. 63 A, 10 kA.

C. DC charging differential protection. 63 A, 30 mA, Type A SI or Type B depending on the model.

D. Main protection for AC charging. 40 A, 20 kA.

E. AC charging differential protection. 40 A, 30 mA, Type B

F. Auxiliary services main protection. 10 A, 25 kA.

G. Differential protection of auxiliary services. 25 A, 30 mA, Type A.

H. Auxiliary services protections. 6 A, 15 kA.

I. Grid overvoltage protection type 2.

J. Vehicle overvoltage protection.

2.5. Accessories equipped as standard

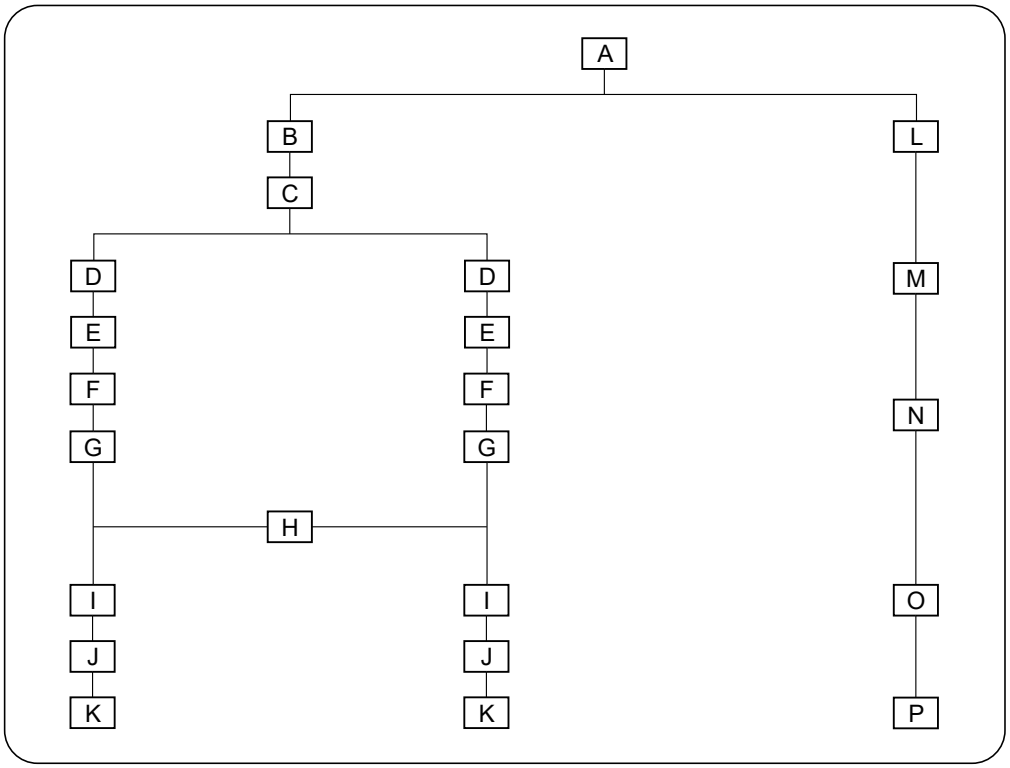
- Retractable cable management system.
- RGB status LEDs on supports and 360 degree ring.
- RFID reader.
- 10.1” color touchscreen, multi-language.
- Dual Ethernet port with switch mode.
- OCPP, Autocharge, Plug&Charge.
- DLM, static and dynamic power management with other Ingeteam DC and AC units.
- Web Manager.

2.6. Additional options

- Contactless bank card reader.
- Interconnection of the communication of various chargers (switch).
- Vehicle detector.
- GPRS-2G/3G/4G communication.

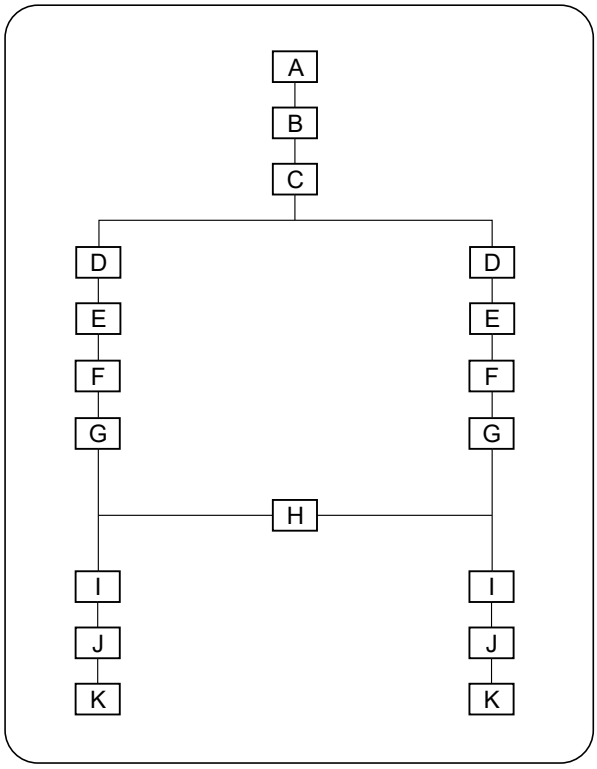
2.7. Electrical diagram of the system

INGETEAM RAPID TRIO CCS1/CCS2/CHADEMO



A. Supply
B. DC charging circuit breaker
C. EMC Filter
D. Protection differentials
E. Module power contactors
F. Module thermal magnetic protections
G. Power modules
H. Parallelization contactors
I. Cable contactors
J. DC wattmeters
K. DC connectors type CCS1/CCS2/CHADEMO (right cable always CCS type)
L. AC charging circuit breaker
M. Residual current device
N. AC wattmeter
O. AC charging contactor
P. AC charging station

INGETEAM RAPID DUO CCS1/CCS2/CHADEMO



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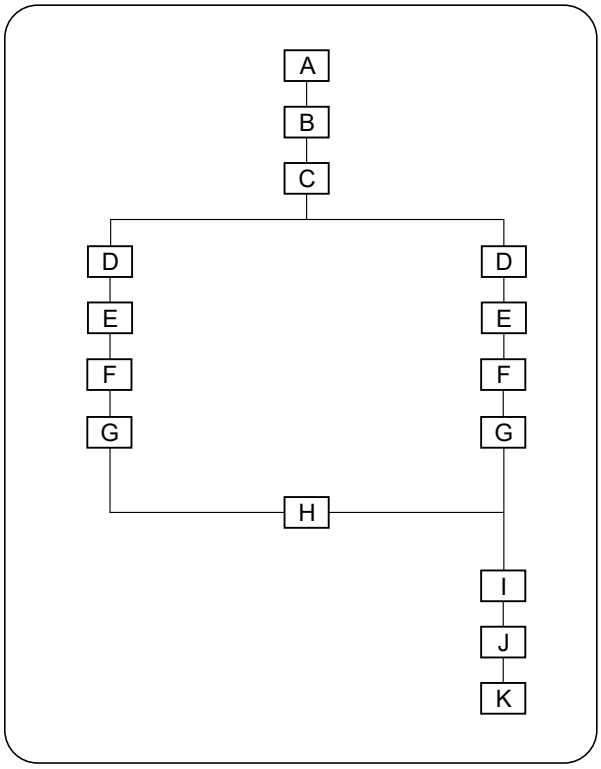
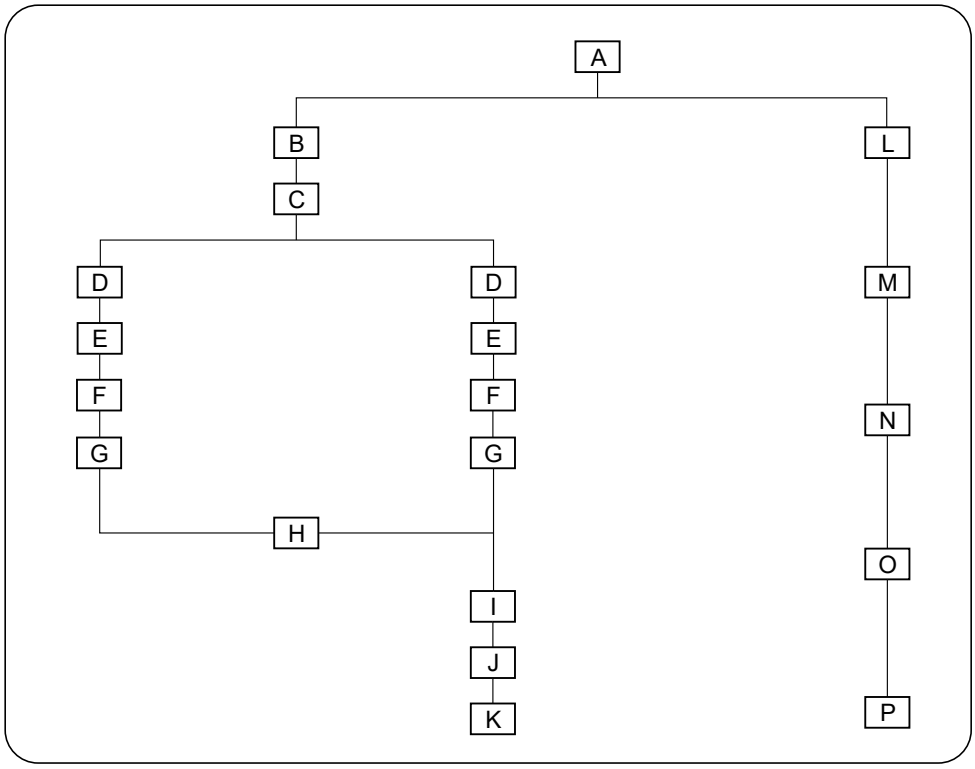
J. DC wattmeters
K. DC connectors type CCS1/CCS2/CHADEMO (right cable always CCS type)

INGETEAM RAPID ONE CCS



A. Supply
B. DC charging circuit breaker
C. EMC filter
D. Protection differentials
E. Module power contactors
F. Module thermal magnetic protections
G. Power modules
H. Parallelization contactors
I. Cable contactors
J. DC wattmeters
K. DC connectors type CCS1/CCS2

INGETEAM RAPID ONE+ CCS



A. Supply
B. DC charging circuit breaker
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E. Module power contactors
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G. Power modules
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J. DC wattmeters
K. DC connectors type CCS1/CCS2/CHADEMO (right cable always CCS type)
L. AC charging circuit breaker
M. Residual current device
N. AC wattmeter
O. AC charging contactor
P. AC charging station

2.8. Specification table

	RAPID 60 One	RAPID 60 One+	RAPID 60 Duo	RAPID 60 Trio
AC inputs	3 phases + N + PE			
Voltage	380/400 Vac ±15%			
Frequency	50/60 Hz ±5%			
Rated current	96 A	128 A (96 A + 32 A)	96 A	128 A (96 A + 32 A)
Rated power	60 kW	82 kW (60 kW + 22 kW)	60 kW	82 kW (60 kW + 22 kW)
DC output				
Voltage range	150 ~ 1000 V			
Maximum current	150 A		200 A (100 A + 100 A)	
Maximum power	60 kW		60 kW (30 kW + 30 kW)	
Charging connectors	CCS		CCS + CCS CCS + CHAdeMO	
AC output (optional)				
Voltage	-	230/400 Vac ±15%	-	230/400 Vac ±15%
Maximum current	-	32 A	-	32 A
Maximum power	-	22 kW	-	22 kW
Charging connectors	-	Type 2 socket with shutters	-	Type 2 socket with shutters
Regulations and safety				
Standards	IEC 61851-1, IEC 61851-21-2, IEC 61851-23, IEC 61851-24 IEC 62196-2, IEC 62196-3, IEC 61000: DIN70121, ISO15118			
Overcurrent	Curve C circuit breaker protections (20 kA)			
Indirect contacts [1]	30 mA differential protections [2]			30 mA differential protections (DC) [2] Type B 30 mA differential protection (AC)
Overvoltages	Type 2 protection against permanent and transient overvoltages, both on DC inputs and outputs			
Functionalities and accessories				
Communication interfaces	Ethernet (switch mode), RS485, GPRS - 2G/3G/4G (optional), dual SIM (optional)			
Communication protocols	OCPP 1.6, 2.0.1, Modbus RTU, Modbus TCP, MQTT			
HMI	10.1" color touchscreen, multi-language RFID reader (Mifare Classic 1K&4K, Mifare DesFire EV1, NFC) 360º RGB status LEDs Contactless bank card reader (optional)			
Plug & Charge (ISO15118)	Yes			
General information				
Stand-by consumption	< 100 W			
Efficiency and power factor	> 95% at rated power; > 0.98			
Energy measurement	DC meter			AC (MID) and DC meter
Hose length	5 m (4.4 m usable length) with retractable system included			
Operating temperature	-25°C to 55°C (derating from 40°C) I Low temperature kit at -35°C (optional)			
Humidity	< 95%			
Maximum altitude	2,000 m (for higher altitudes, consult Ingeteam)			
Weight	140 kg		160 kg	165 kg
Dimensions (h x w x d)	1950 x 760 x 335 mm			
Enclosure	Galvanized steel (stainless steel optional) I RAL 9003			
Protection class	IP54 / IK10 / C5H			
Ventilation system	Side air ventilation			
Sound level	< 55 dB			
Markings	CE			
Directives	Low Voltage Directive: 2014/35/EU I EMC Directive: 2014/30/EU I RED Directive 2014/53/EU			

[1] Optionally, the differentials can be resettable. [2] Protection type A or type B depending on the model.

3. Receipt of the unit and storage

3.1. Reception

Keep the unit in its packaging until immediately before installation.

3.2. Unit identification

The serial number of the unit is its unique identifier. You must quote this number in any communication with Ingeteam.

The unit's serial number is marked on the specifications plate.

3.3. Transport damage

If the unit has been damaged during transport, proceed as follows:

1. Do not proceed with the installation.
2. Notify the distributor immediately within five days of receipt of the unit.

If ultimately the unit has to be returned to the manufacturer, the original packaging must be used.

3.4. Storage

⚠ CAUTION

Failure to follow the instructions in this section may lead to damage to the unit.

Ingeteam accepts no liability for damage resulting from the failure to follow these instructions.

If the unit is not installed immediately after reception, the following points should be taken into account in order to avoid damage:

- The unit must be stored in its original packaging.
- Keep the unit free of dirt (dust, shavings, grease, etc.) and away from rodents.
- Keep it away from water splashes, welding sparks, etc.
- Cover the unit with a breathable protective material in order to prevent condensation due to ambient humidity.
- Units in storage must not be subjected to weather conditions other than those indicated in section *„2.8. Specification table“*.
- It is very important to protect the unit from chemical products which can cause corrosion, as well as from salty atmospheres.
- Do not store the unit outdoors.

3.5. Conservation

In order to permit correct conservation of the units, they must not be removed from their original packaging until it is time to install them.

In case of prolonged storage, use dry places, avoiding, as far as possible, sharp changes in temperature.

Deterioration of the packaging (tears, holes, etc.) prevents the units from being kept in optimum conditions before installation. Ingeteam accepts no liability in the case of failing to observe this condition.

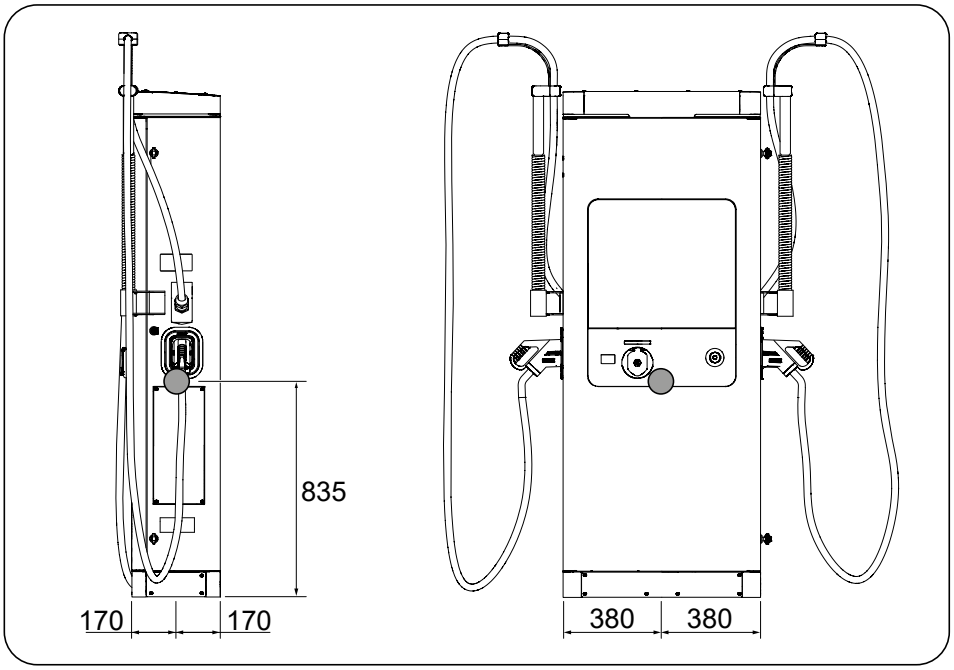
4. Transporting and handling the unit

You must protect the unit, during transport, from mechanical knocks, vibrations and any other product or situation which may damage it or alter its behavior.

Failure to observe these instructions may lead to loss of warranty on the product.

4.1. Center of gravity

Bear in mind the center of gravity of the unit whenever it is moved. The approximate location of center of gravity is specified below.



4.2. Unpacking

Correct handling of the units is vitally important in order to:

- Prevent damage to the packaging which enables them to be kept in optimum condition from shipping until they are installed.
- Avoid knocks and/or falls which may harm the mechanical features of the units, e.g. cause incorrect closure of doors, loss of IP rating, etc.
- Avoid, as far as possible, vibrations which may cause subsequent malfunction.

If you observe any anomaly, please contact Ingeteam immediately.

Separating the packaging

You can deliver all the packaging to an authorized non-hazardous waste management company.

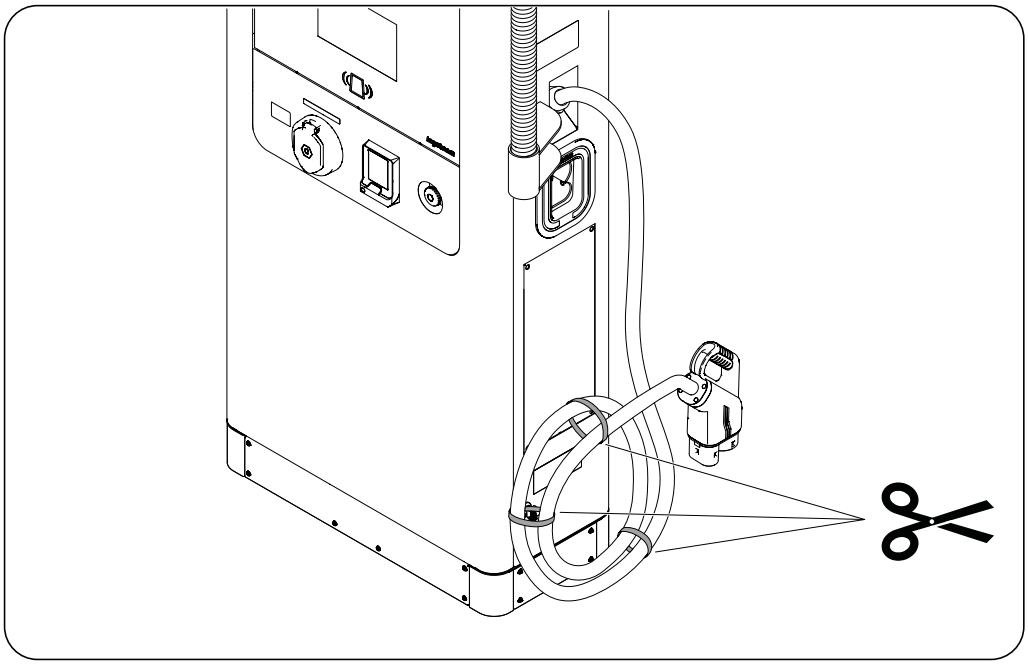
In any event, each part of the packaging may be recycled as follows:

- Plastic (polystyrene, bag and bubble wrap): the appropriate container.
- Cardboard: the appropriate container.

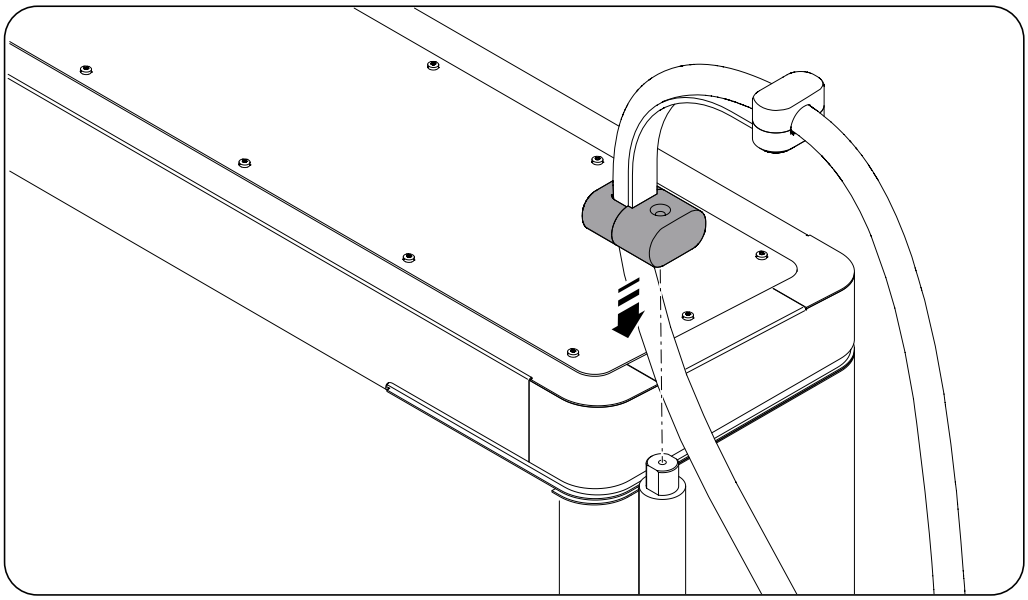
4.3. Assembly of the charging hoses

Once the unit has been unpacked, mount the charging hoses following these steps:

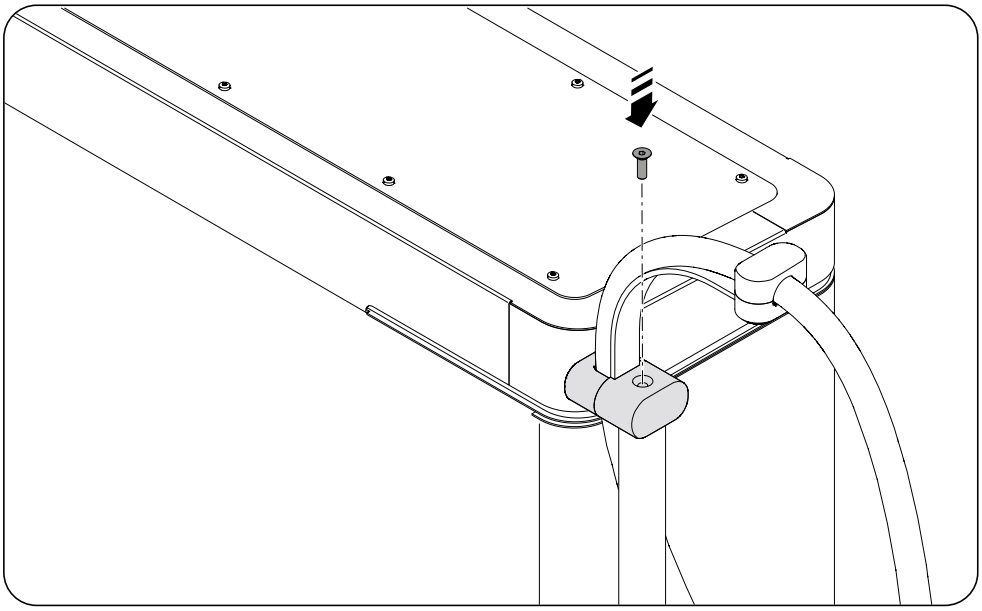
1. Cut the ties securing the hose.

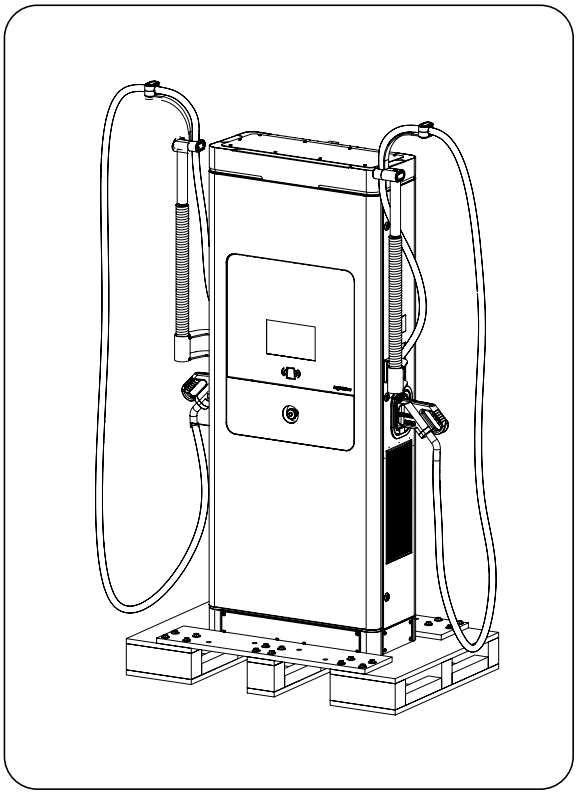


2. Mount the charging hose support.



3. Attach the hose support using the 25 mm M8 screw.



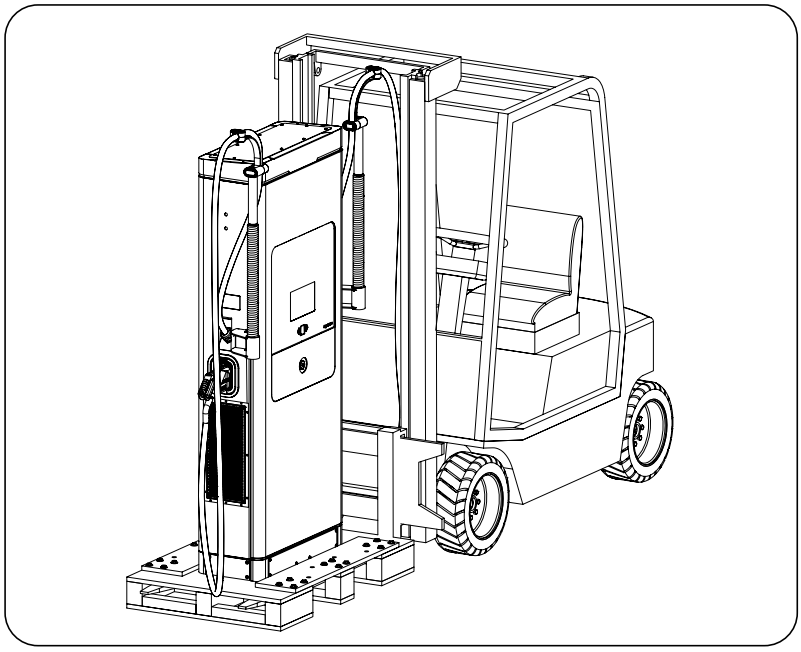


4.4. Handling the unit

The charging stations from the RAPID 60 family have been designed for transport and installation using a forklift or pallet truck, as well as for handling from the top, allowing the unit to be lifted.

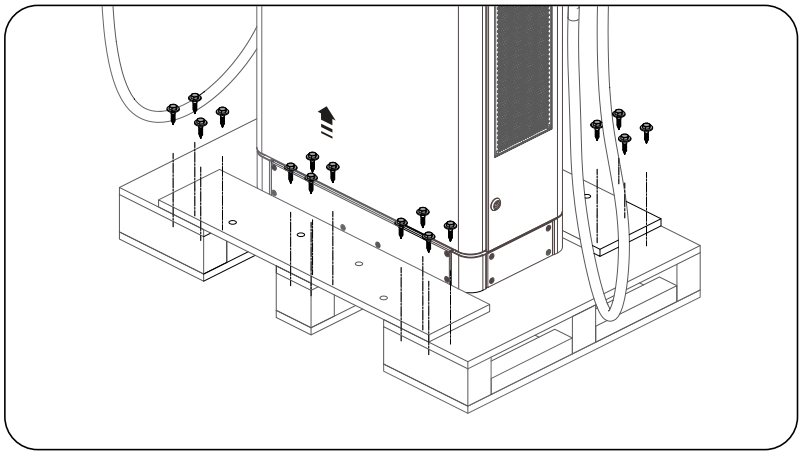
4.4.1. Transport and installation using a pallet truck or forklift

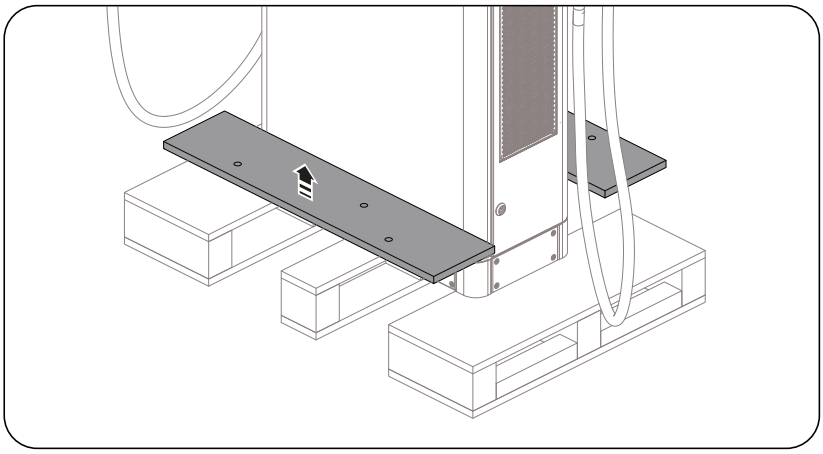
The unit is designed for transport using a pallet truck or forklift.



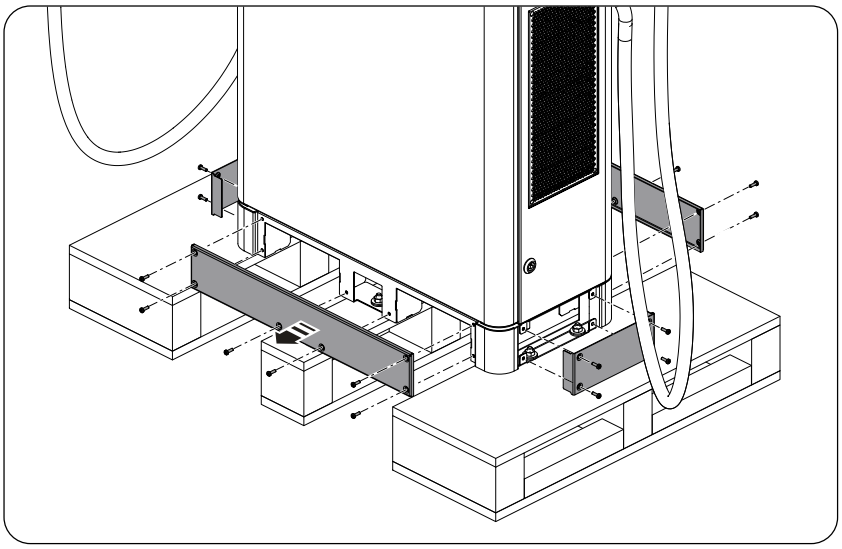
To install the unit, the following requirements must be observed as a minimum.

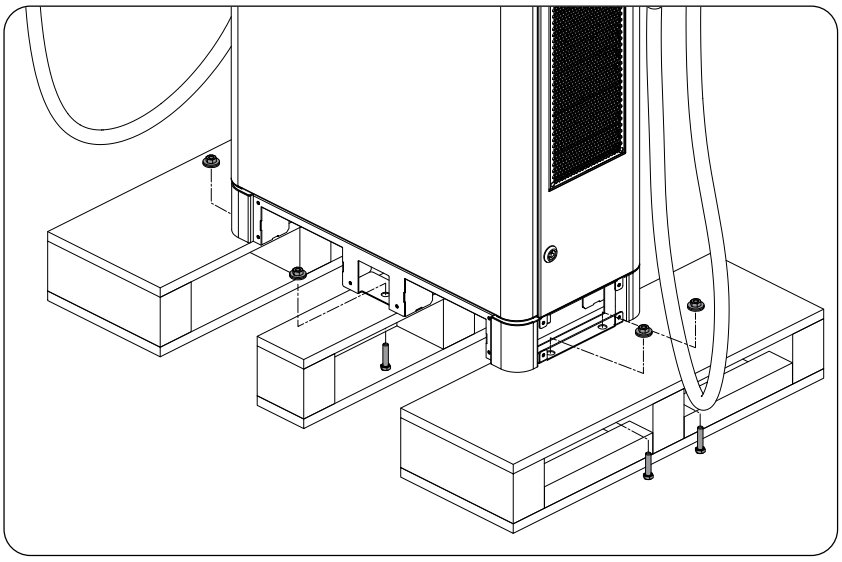
1. Remove the upper reinforcement bars screwed to the pallet and the lower covers from the unit.



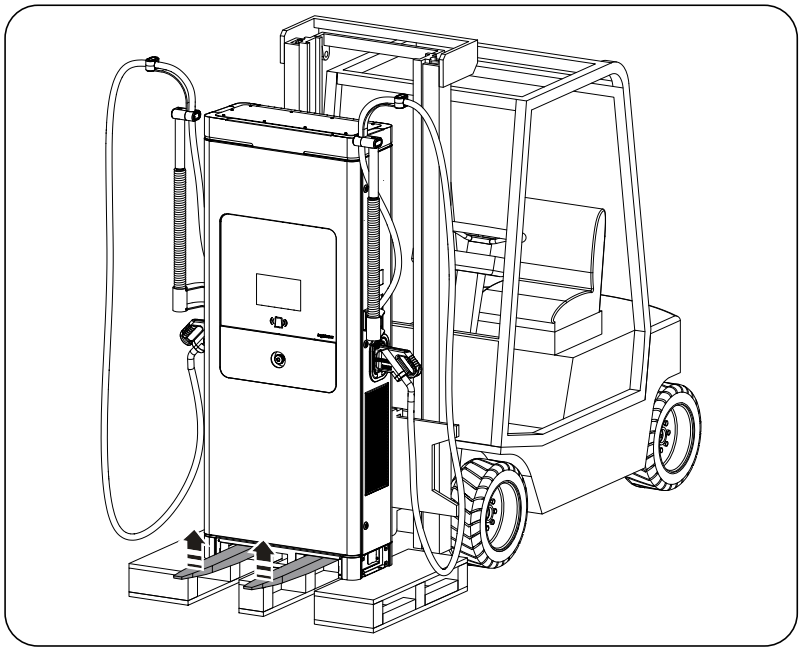


2. Remove the screws that secure the unit to the pallet and the lower reinforcement boards from the pallet.

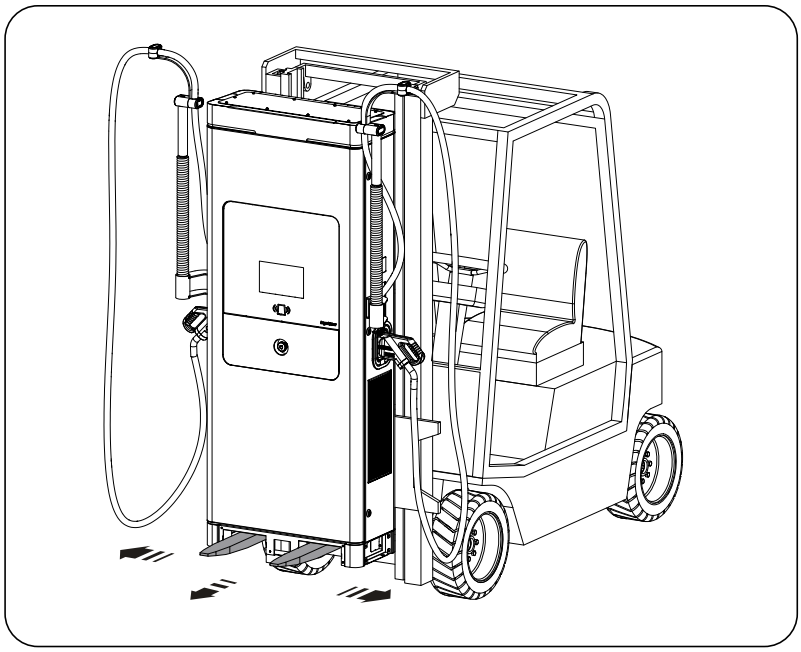




3. Lift the unit centered to the forks of the pallet truck and remove the pallet.



4. Move and position the unit with the pallet truck or forklift.



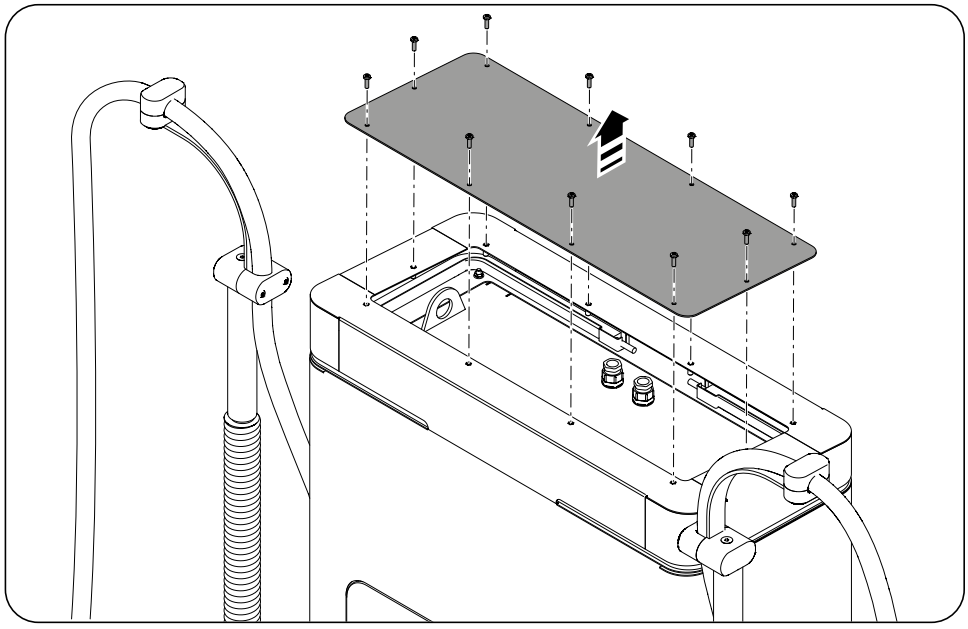
5. Ensure that the forks are perfectly level to avoid overturning the unit. Do not transport the unit at an inclination greater than 18°.
6. In all cases, observe the instructions in the forklift or pallet truck user manual.

4.4.2. Lifting

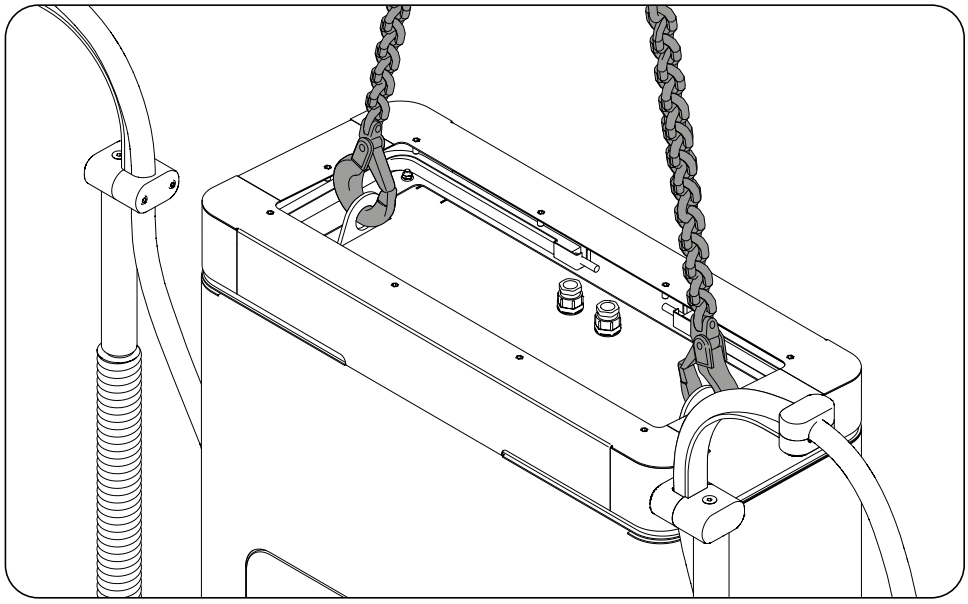
The RAPID family of charging stations have been designed to be handled from the top.

Carry out the following steps:

1. Remove the top cover by loosening the 10 screws that secure it, exposing the two lifting hooks.

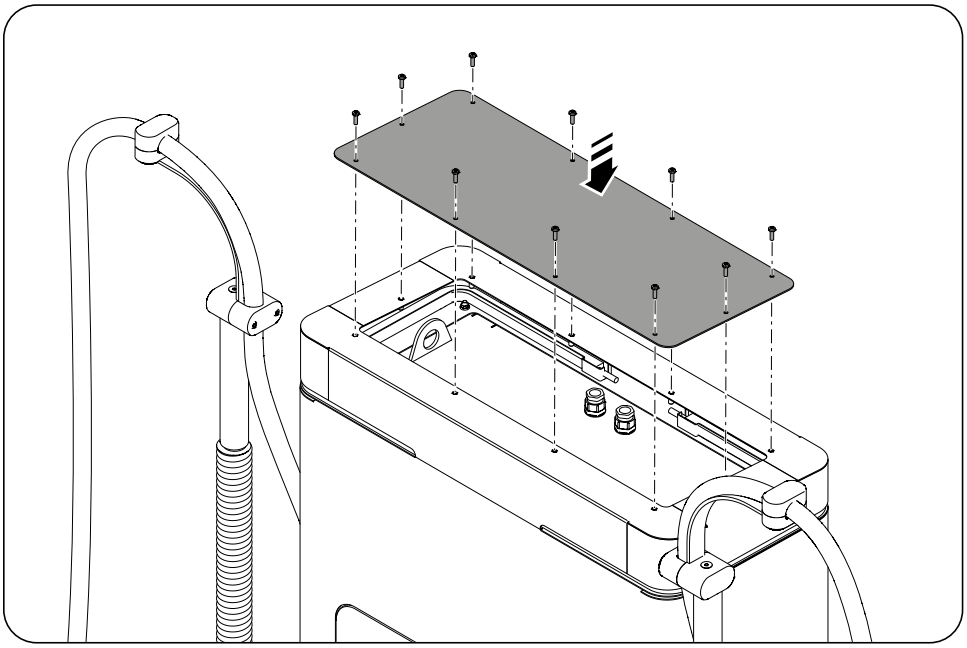


2. Place the shackles on the lifting hooks and lift the unit.



3. Position the unit and screw it in.

4. Remove the shackles from the top part and fit the cover, making sure that it is correctly tightened at all points.



⚠ WARNING

Take care when loading and transporting the unit.

Before subjecting cables, ropes, slings, etc. to traction force, you must inspect them, as well as the fastening and attachment points.

Never exceed the maximum payload of the lifting elements.

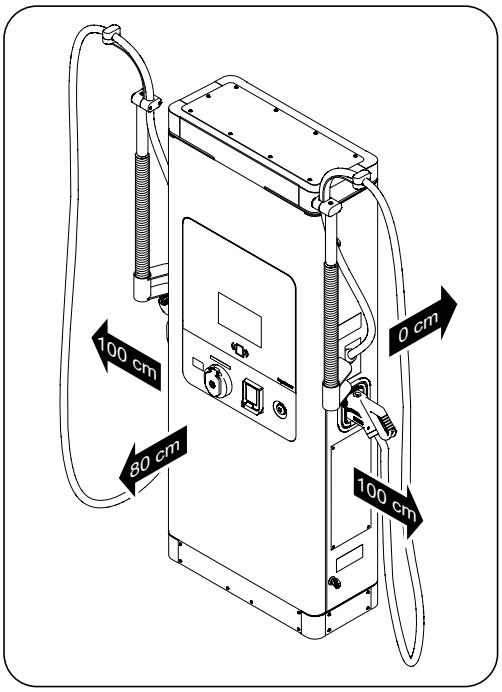
Before lifting the unit, lift it slightly to check its stability. In the event of tilted loads, descend and carry out a sling operation to ensure a stable load.

5. Preparation for installing the unit

When deciding the location of the unit and planning your installation, you must follow a set of guidelines based on the specifications of the unit. These guidelines are summarized in this chapter.

5.1. Environment

- Place the units in a place that is accessible for installation and maintenance work and which allows operating through the TFT display.
- The air vents and part of the power module can reach high temperatures. Do not place any material nearby which is sensitive to high air temperatures.
- Avoid corrosive environments that may affect its proper operation. Do not install the unit in areas classified as ATEX.
- Never place any object on top of the unit.
- It is recommended to place the units under a cover that protects them from direct radiation, placing the front part facing north in the Northern Hemisphere and facing south in the Southern Hemisphere.
- Keep the following minimum distances free of obstacles.



Minimum clearance distances

5.2. Environmental conditions

Environmental conditions must be taken into account when choosing the location of the unit.

Environmental conditions	
Minimum temperature	-35ºC [1]
Minimum surrounding air temperature	-35ºC [1]
Maximum operating temperature	55ºC [2]
Maximum relative humidity without condensation	95 %
Altitude	2000 m [3]

[1] Ask Ingeteam. Low temperature kit.
[2] The operation of the unit at temperatures greater than 40ºC should only occur occasionally and not permanently. The unit can enter reduced performance mode (derating).
Ingeteam is not responsible for the consequences to the unit resulting from operating it at temperatures higher than 40ºC.
[3] At altitudes higher than 2,000m, please contact Ingeteam.

It should be borne in mind that moderate condensation may occasionally occur as a consequence of temperature variations. For this reason, apart from the unit's own protection, it is necessary to monitor these units once they have been started up on sites where the conditions described above are not expected to be present.

In the event of condensation, never apply voltage to the unit. To remove condensation, apply a flow of hot air at a maximum temperature of 55ºC.

INFO

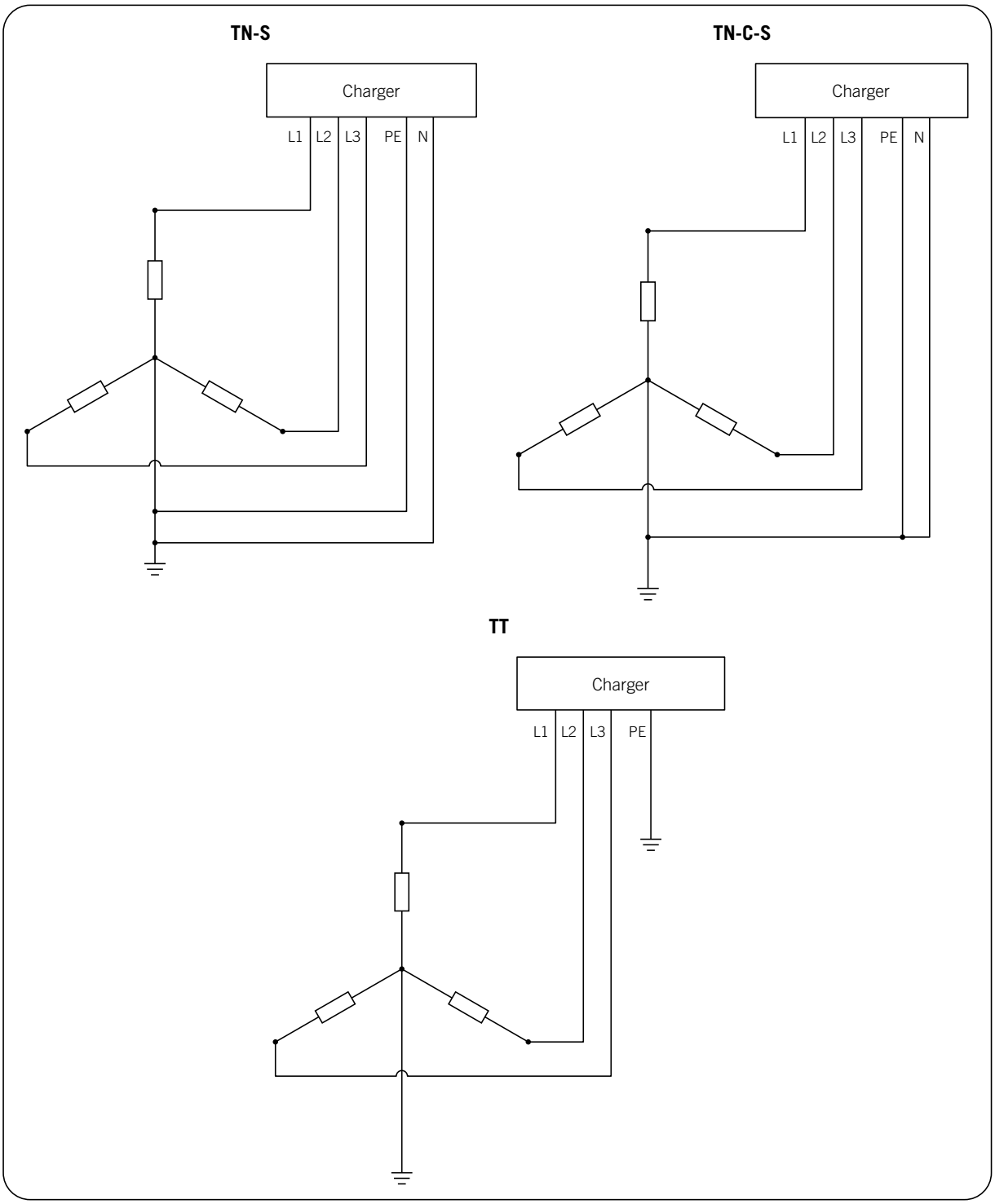
Ingeteam does not guarantee the proper operation of the equipment if the operation conditions for which it has been designed are not fulfilled.

5.3. Type of grid

These units must be connected to a three-phase grid with a star formation with grounded neutral. Therefore, admissible grounding systems are TT, TN-S and TN-C-S.

They cannot be connected to IT, TN-C grids or delta grids with one of their lines grounded.

The connections from the three-phase grid (L1, L2, L3 and N) and its ground (PE) must go to the unit.



5.4. External disconnection device

The AC supply must be shut off for equipment inspection work. To do this, the installer must fit an external disconnection device.

The switching component must be dimensioned for the DC input voltage and current of the charging terminal (see section *„2.8. Specification table“*).

6. Installing the unit

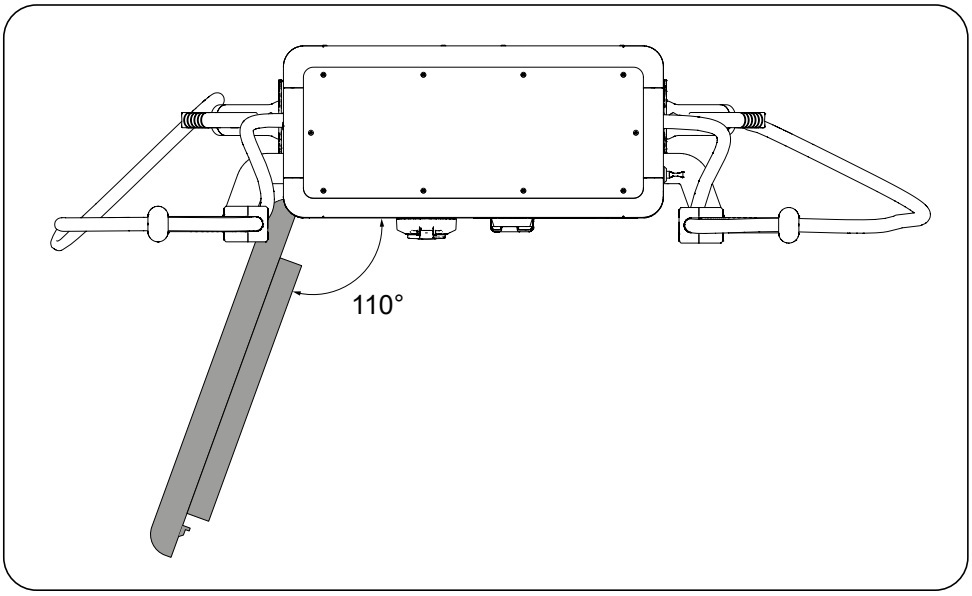
Before installing the unit, the packaging must be removed, taking special care not to damage the housing (see section *„4.2. Unpacking“*).

Check that there is no condensation inside the packaging. If there are signs of condensation, the unit must not be installed until you are sure it is completely dry.

⚠ CAUTION
All installation operations must comply with current regulations.
All operations involving moving heavy weights must be carried out using the required mechanical means (crane, hoist, etc.).

6.1. General requirements for installation

The environment of the unit must be appropriate, meeting the guidelines described in the *„5.1. Environment“* section so that it is possible to open the doors and perform maintenance work.

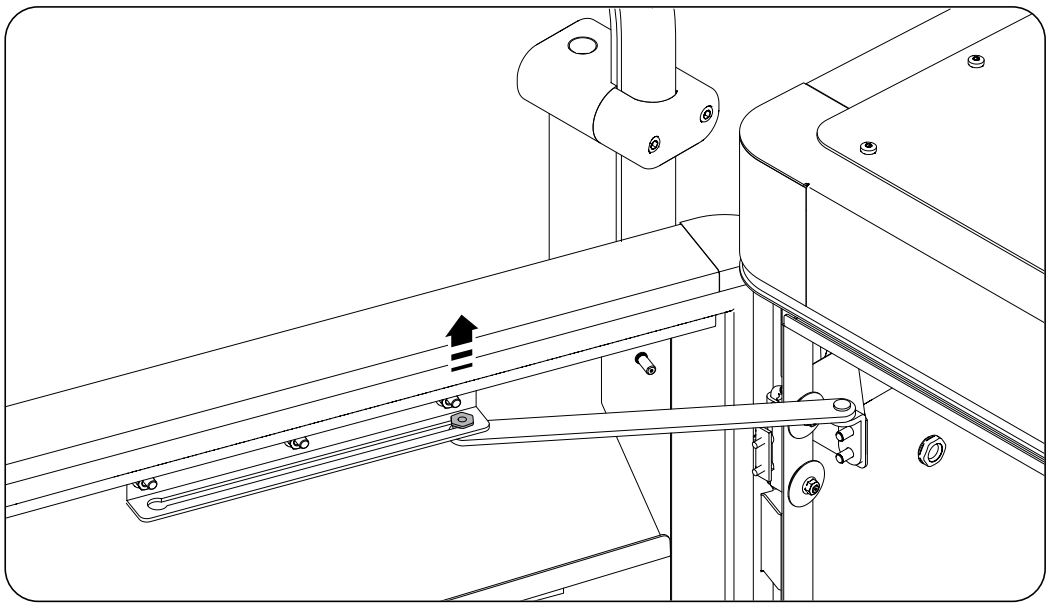


The image shows the opening of the front door.

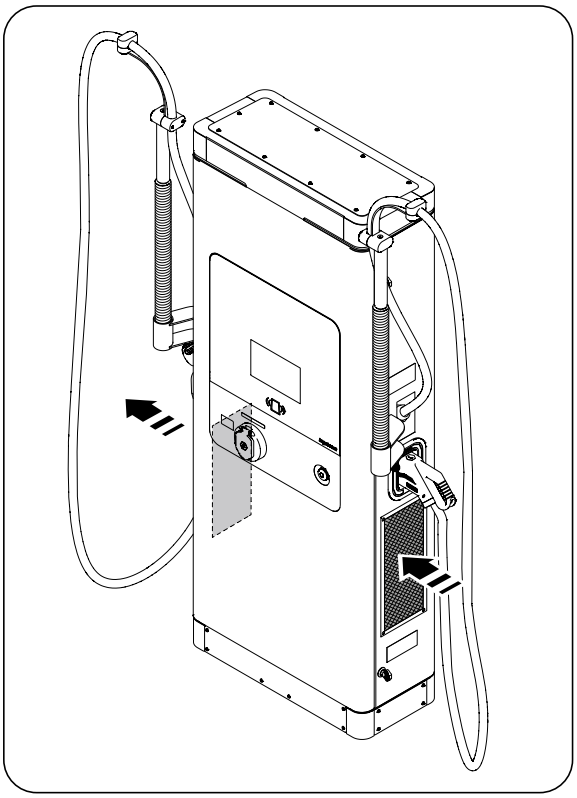
The opening angle of the door is up to 110º. However, a lower opening angle is permitted. At least 90º for maintenance work.

The charger has a system that locks the door in the fully open position, preventing it from closing involuntarily while work is being carried out inside the unit.

To close the door, lift the piston and begin to close it, as indicated in the following image. This point only applies to equipments with mechanical locking as shown in the picture. No precautions are necessary for equipment with gas piston.

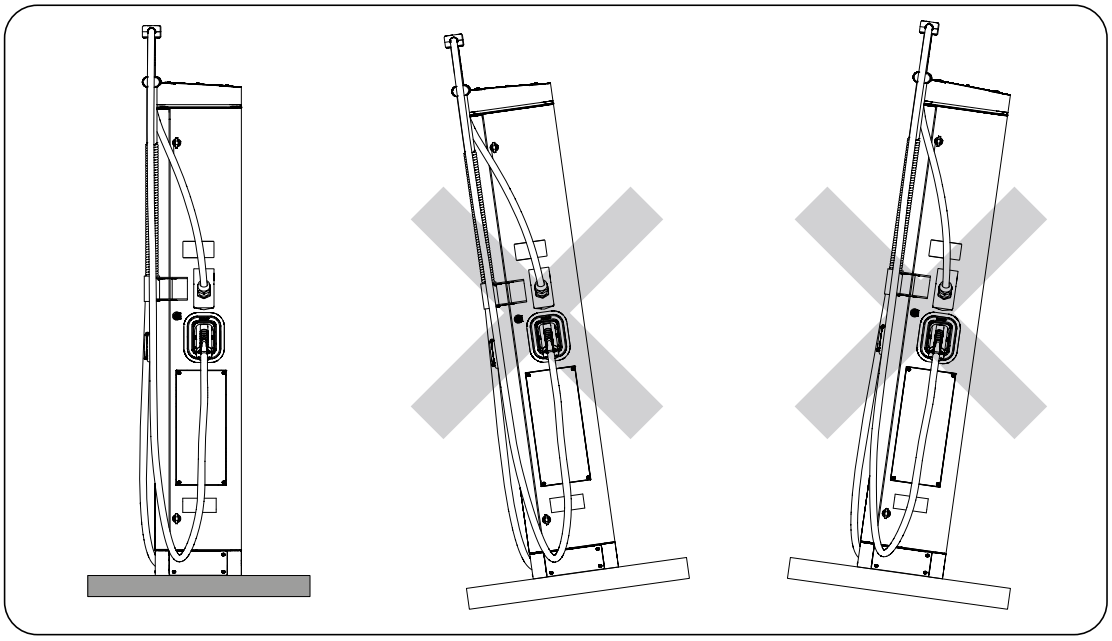


Special care must be taken to ensure that there are no external elements near the air inlets and outlets that obstruct proper cooling of the unit.



The connection cables must be appropriately sized for the maximum current and service voltage.

The units must be attached to an even and solid surface, and must be placed in a perfectly vertical position.

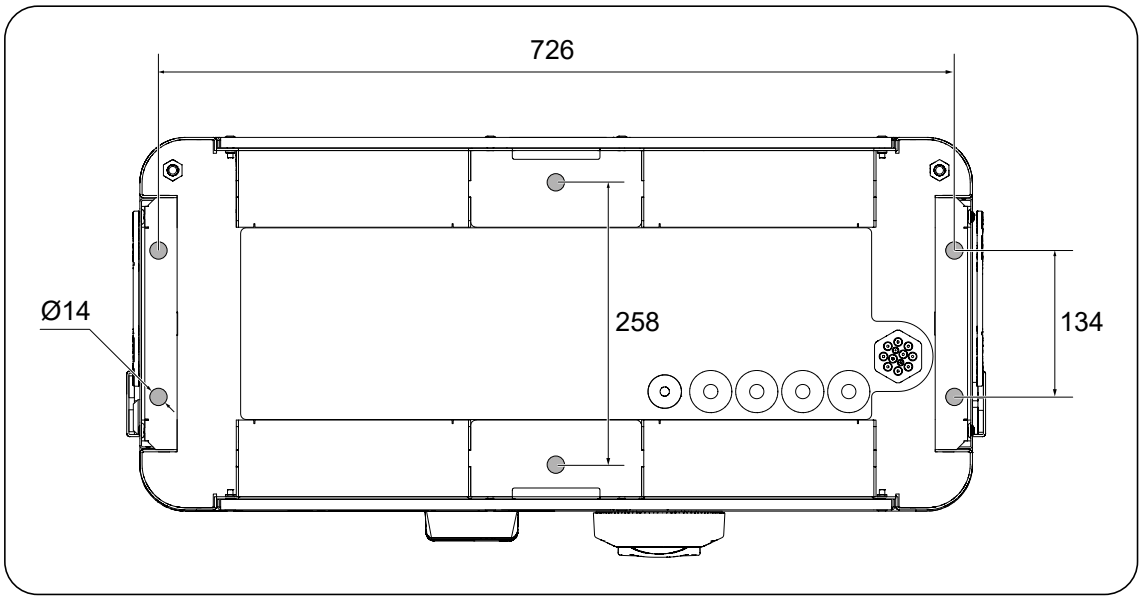


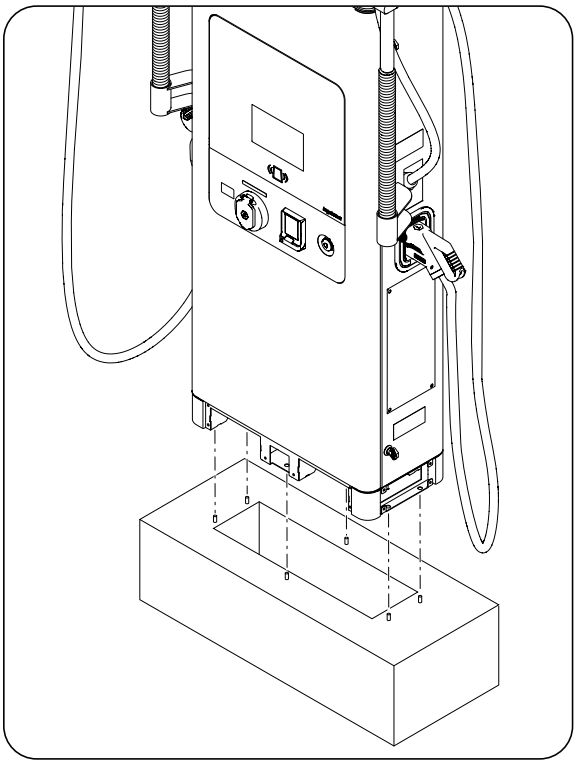
6.2. Fastening the unit

The fixing points are designed for the use of threaded rods or M12 screws. If using a threaded rod, its length above the ground must be 25 to 35 mm.

Other similar anchoring systems can be used.

The separation of the fastening system selected must be adjusted to the measurements shown below in a detail of the lower part of the charger.

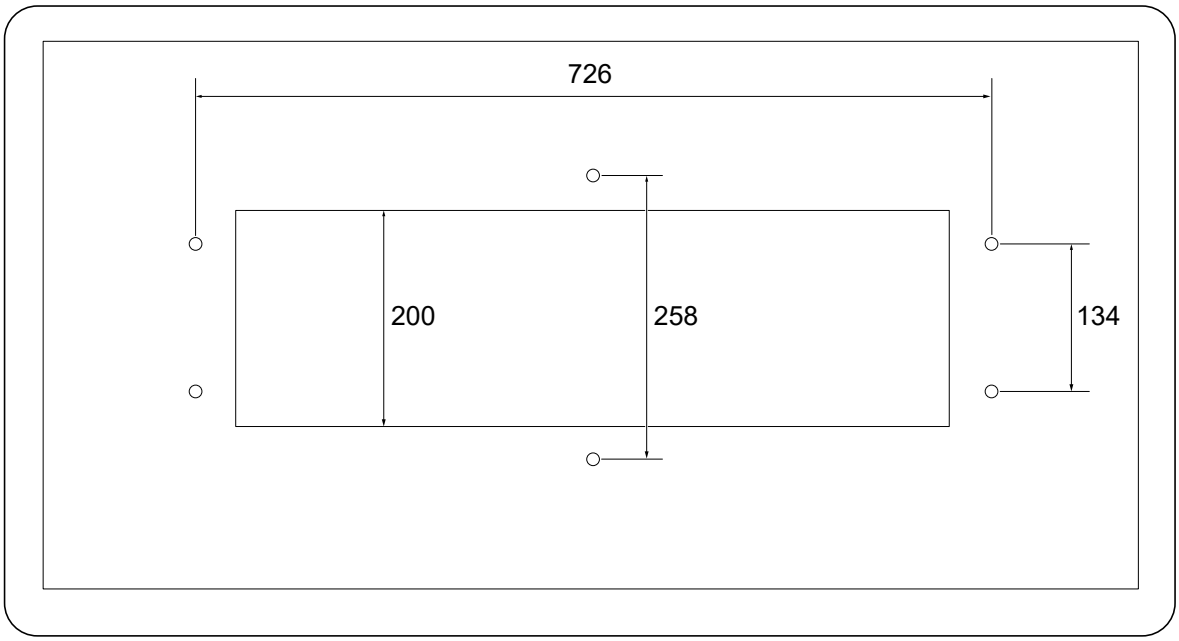




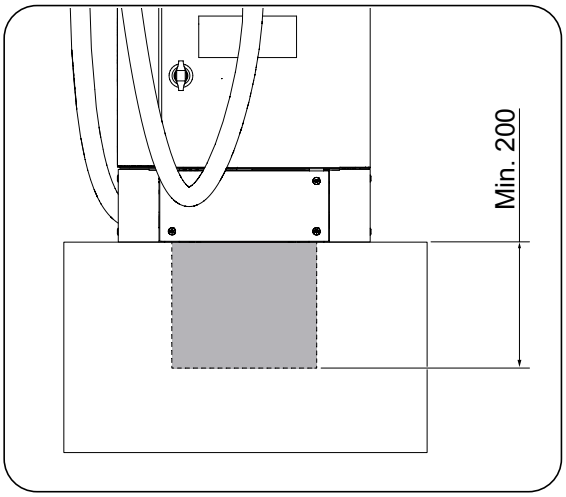
You must follow the following stipulations when choosing the place where the unit is to be bolted in:

- Minimum distance from the center of the bore to the outer edge of the concrete pad: 75 mm.
- The distance from the center of the bore to the inner edges must be 39 mm.

- If you use a different anchoring system, check that the solution provided complies with the conditions initially defined in this document.
- Minimum thickness of the concrete pad: 300 mm.
- The dimensions of the inspection chamber of the pad are shown in the following figure.

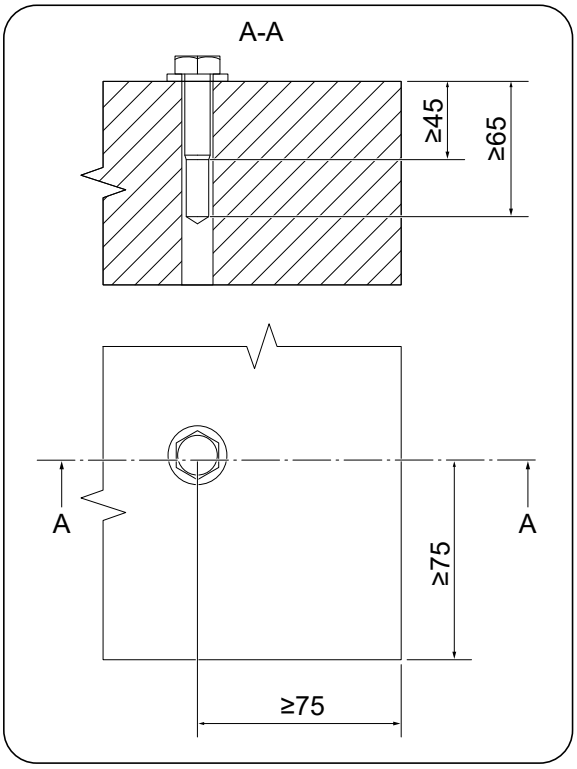


- Minimum depth of the inspection chamber of the pad of 200 mm. This allows a standard cable of 240 mm^2 with a turning radius of 135 mm (e.g. EXZHELLENT XXI 1,000 V RZ1-K (AS) 0.6-1 kV).



- If the radius of curvature of the selected cable is greater than the radius of curvature of 135 mm, the depth of the inspection chamber must be greater.
- The minimum depth of the anchoring system must be inserted a minimum of 45 mm into the concrete. This anchoring system must comply with the following parameters:
    - Minimum tensile strength: 7.7 kN. Security coefficient 1.5.

- Minimum shear strength: 9.3 kN. Security coefficient 1.25.



7. Connection of accessories

This chapter explains the process for wiring the standard and optional accessories to the unit.

Read carefully before starting the connection process.

7.1. Safety instructions for connecting accessories

⚠ DANGER
There must not be any active charge in the charger.
The charger must not be connected to any vehicle.
Make sure there is no voltage present on the unit before starting the connection.
Lock and tagout any possible external feedback from the unit.
Mark the external power system with a Personnel Working Warning.
Open the unit using the personal protective equipment defined in this manual.
Confirm the absence of voltage in the connection to the unit.
Confirm the absence of voltage when dismounting any protection against direct contact.

⚠ CAUTION
Ingeteam accepts no liability for any damages caused by an incorrect connection.

7.2. VISA kit

Download the manual corresponding to each payment terminal from the INGETEAM EVC Training platform.

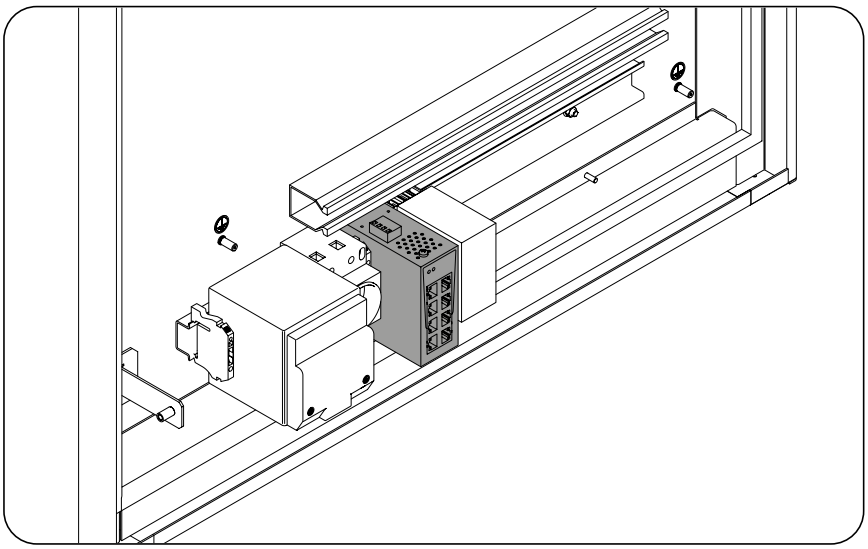
https://www.ingeteamevctraining.com/

7.3. External communication interconnection kit

This kit contains an 8-port switch which permits the interconnection of up to 8 Ingeteam charging points in an installation.

7.3.1. Mechanical installation

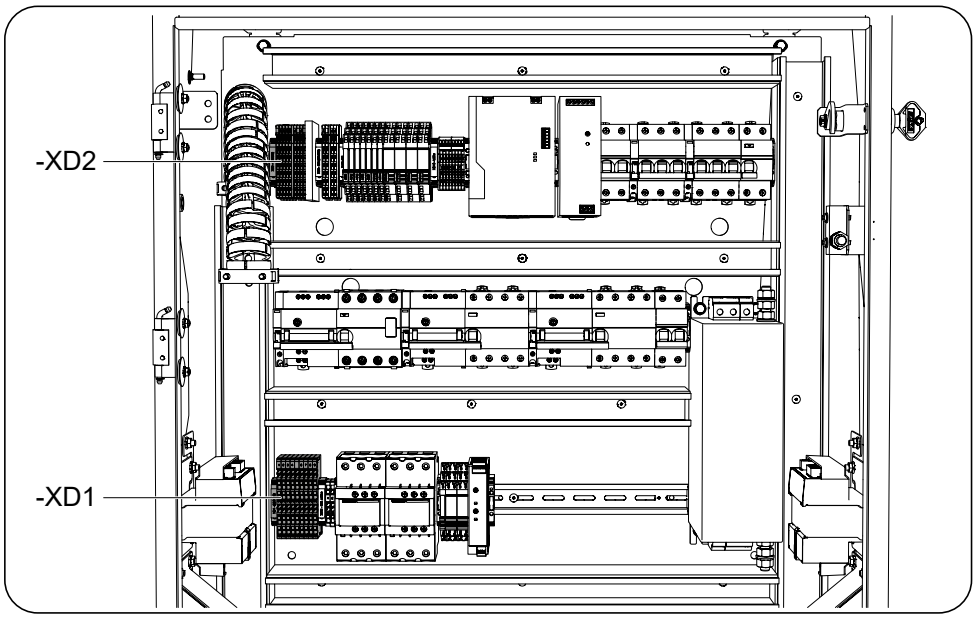
The Ethernet switch must be installed on the DIN rail located at the bottom of the door in the position shown in the figure.



7.3.2. Electrical connection

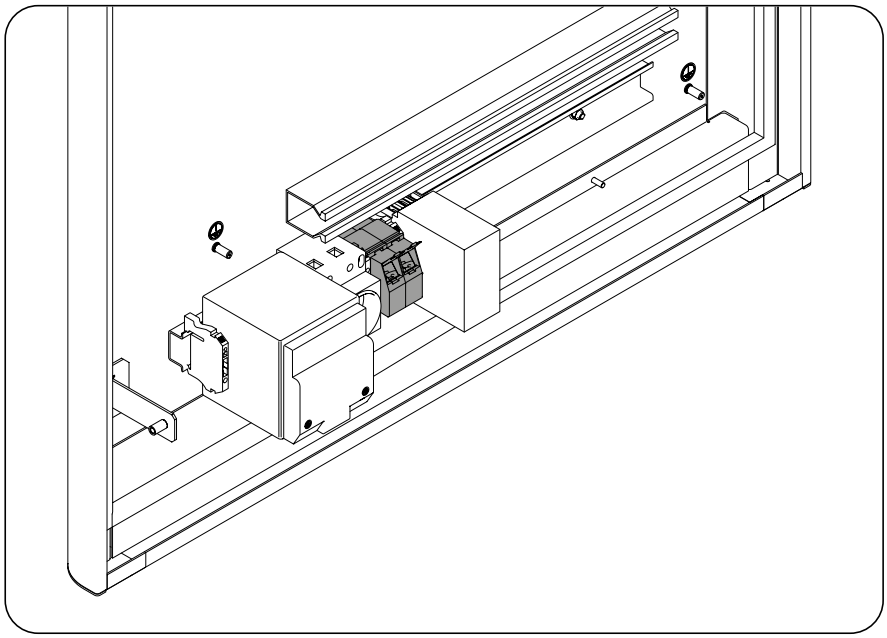
Switch power supply:

1. The Ethernet switch kit includes two blue cables which must be connected to the switch connector in the + and – positions, in accordance with the printing on the cables.
2. Next, the cables must be routed through the ducts to the –XD2 distribution terminal block. Connect the other end of the cables in accordance with the printing on the cables to points 5+:1 and 1-:4.

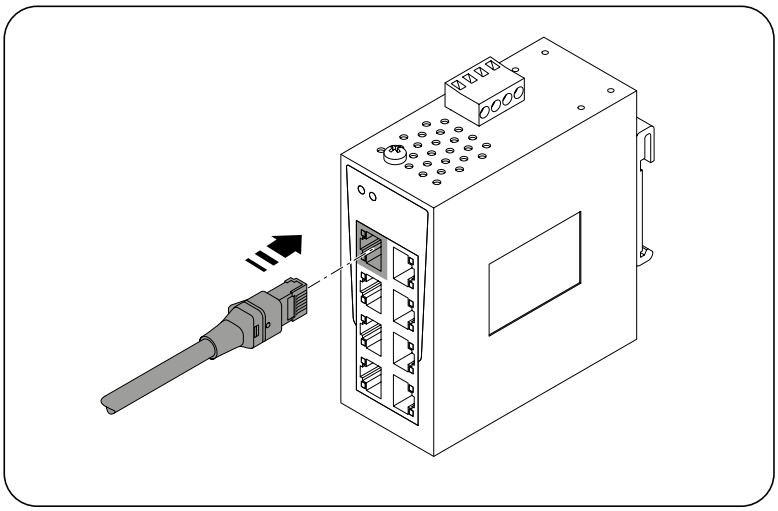


Terminal communications:

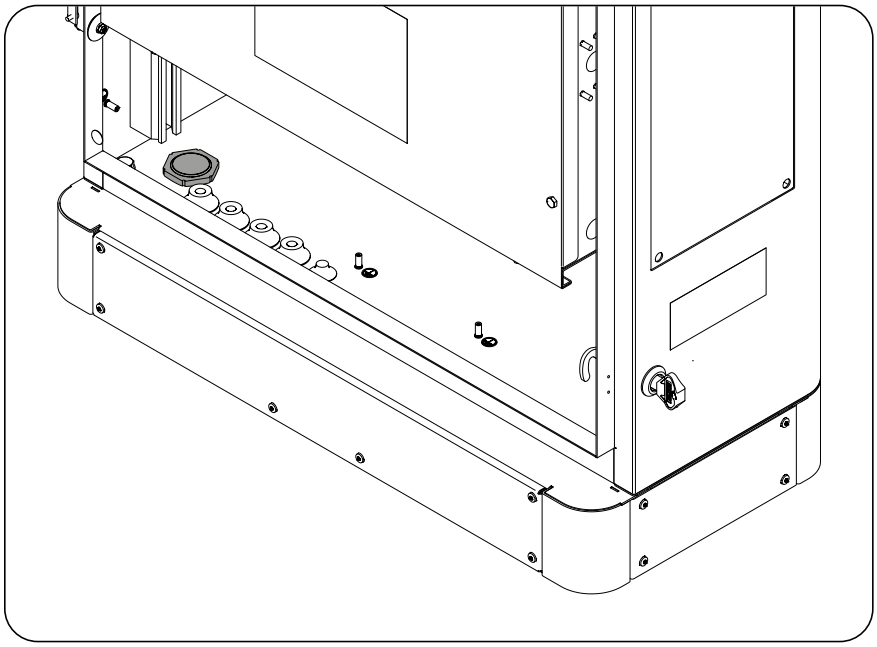
1. Disconnect one of the Ethernet cables from the connection terminal shown in the figure below.



2. Connect that end of the Ethernet cable to port number 1 on the switch.



3. The remaining Ethernet cables from the other chargers of the installation should be inserted through the underground conduits and should go through the cable input system defined to this effect. To make the installation easier, the wall bushings may be released. On completion of the work, the bushings must be re-installed to ensure the unit is sealed.

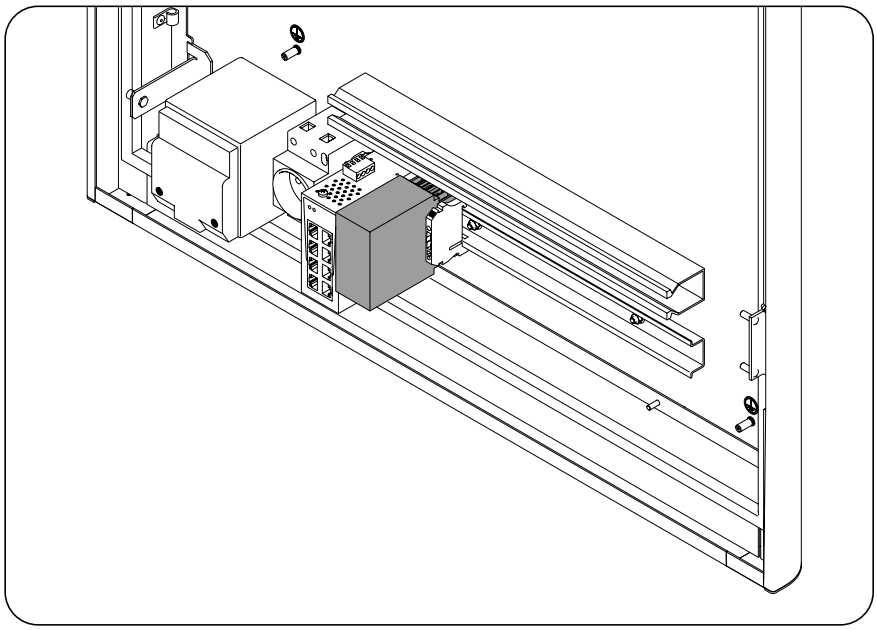


7.4. Electric vehicle detector

⚠ CAUTION

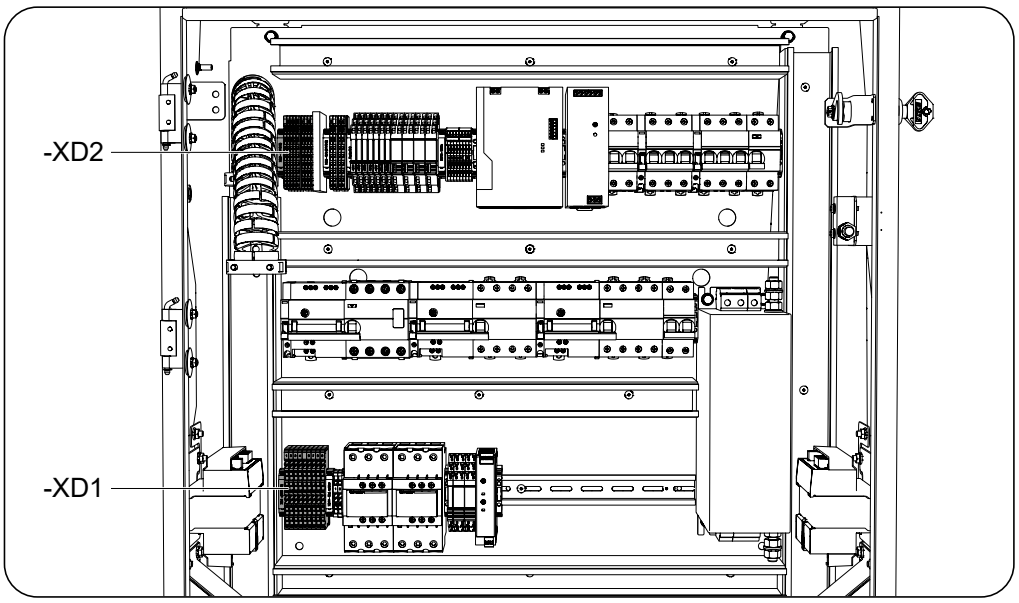
To install the kit it is necessary to access the unit, following the safety instructions given in this manual. The unit must not be powered.

1. Mount the electric vehicle detector in the position shown in the figure.

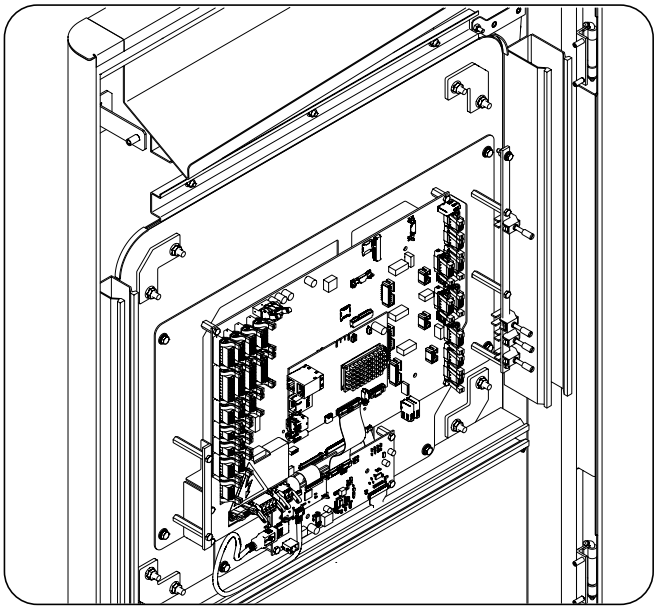


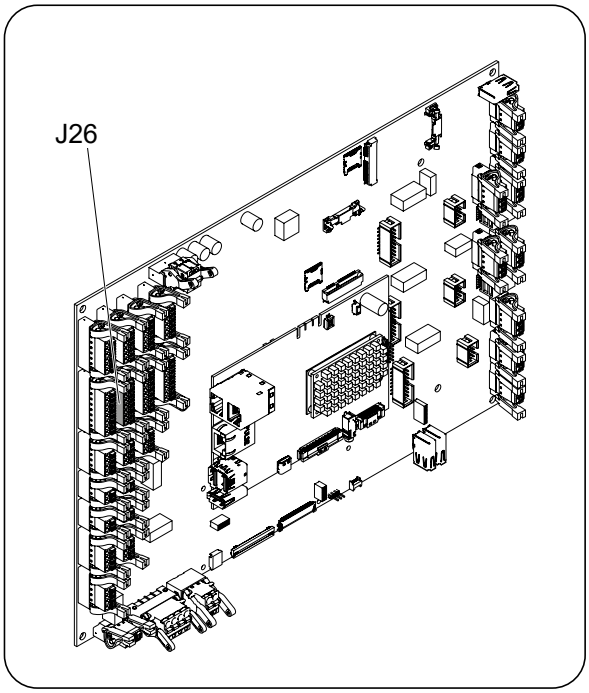
2. Connect the detector to the wiring kit included in this kit. The start and end points are marked on each cable. This helps to connect each one. Route all the cables through the ducts installed for this purpose.
3. The identifier of the detector is –BG7. It is marked in this way on the cables and the following cable connection points are as follows.

   a. The distribution terminal blocks are –XD1 and –XD2.

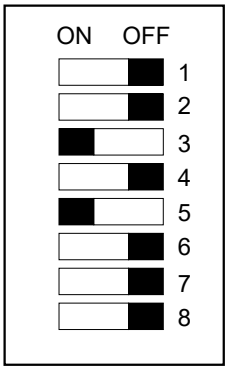


b. The electronic card is identified by the name –KZ1. The J26 connector is in the zone marked in the figure.





c. The detector must be tared with the standard parameters which are defined in the figure below. If the special features of the installation require a different taring, please refer to the appliance user manual.



Detector configuration

4. Follow the detector manufacturer's instructions to connect the vehicle detection coils.

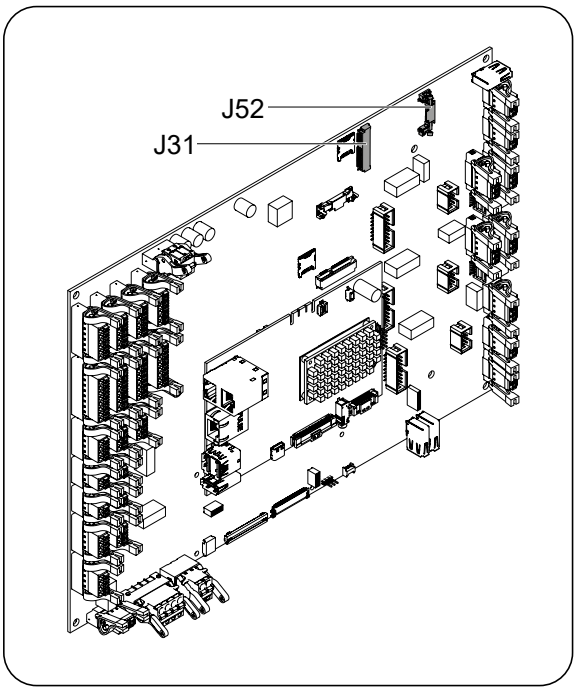
7.5. 4G communications kit

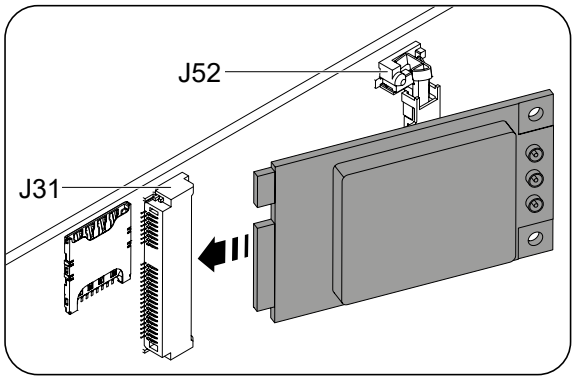
⚠ CAUTION

To install the kit it is necessary to access the unit, following the safety instructions given in this manual. The unit must not be powered.

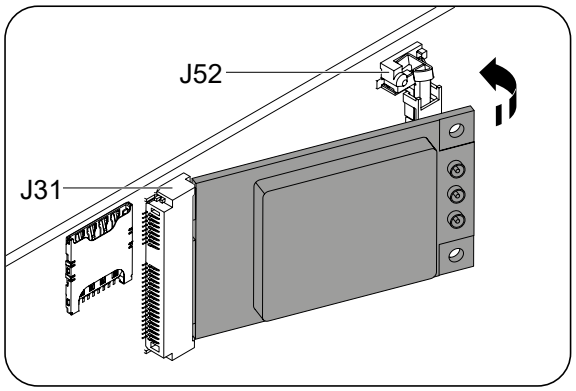
Follow the connection process below to enable 4G communication in the charging station.

1. Firstly, insert the 4G card into the J31 port on the electronic card –KZ1 (ABX0011).

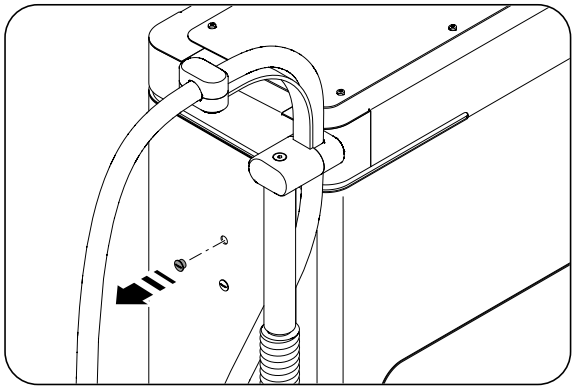




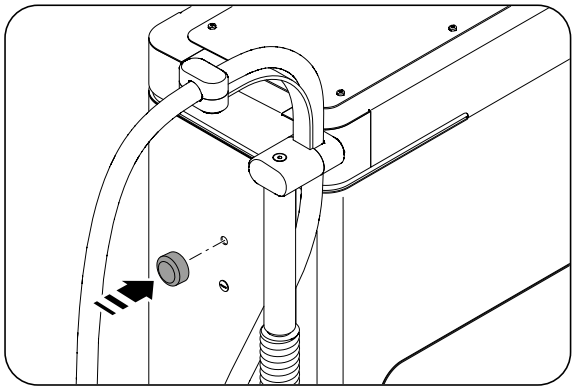
2. Then lower the other end of the card until it is locked in port J52.



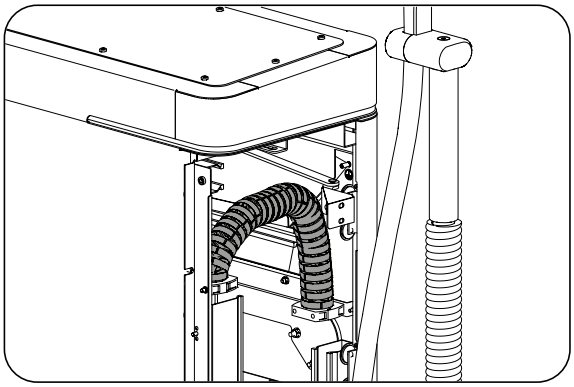
3. On the left side of the station, remove the material highlighted in gray in the figure below.



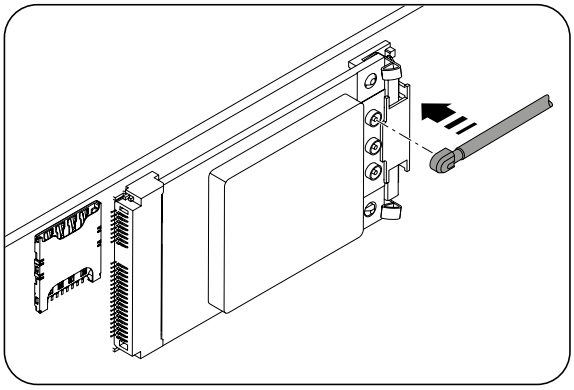
4. Install the 4G antenna.



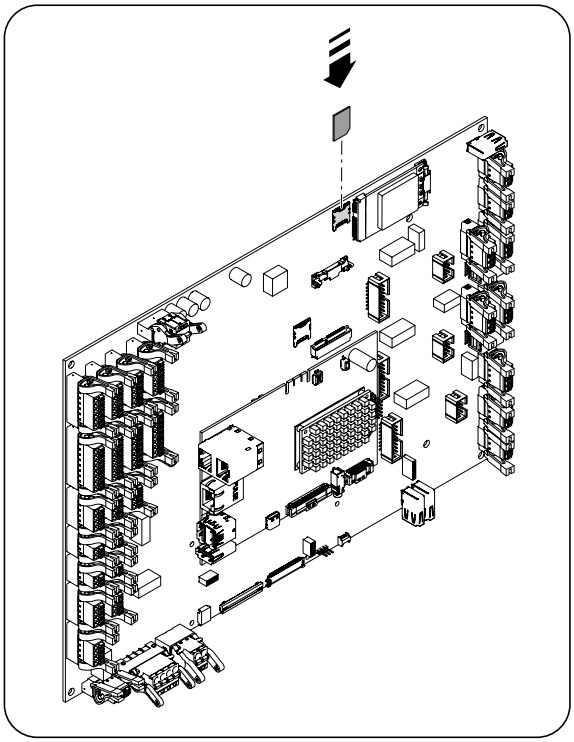
5. Pass the antenna cable through the cable conduit shown in the figure below.



6. Subsequently, the 4G antenna cable must be connected to the card. The connection point is identified with the text “MAIN” or “M”.



7. Finally, insert the MicroSim card into the housing defined for this purpose.



8. Charger power supply connection

This chapter explains the requirements and process for connecting the power supply cabling to the unit. The circuits for DC and AC (if available) charging and the auxiliary services power supply are derived internally from this connection. Read carefully before starting the connection process.

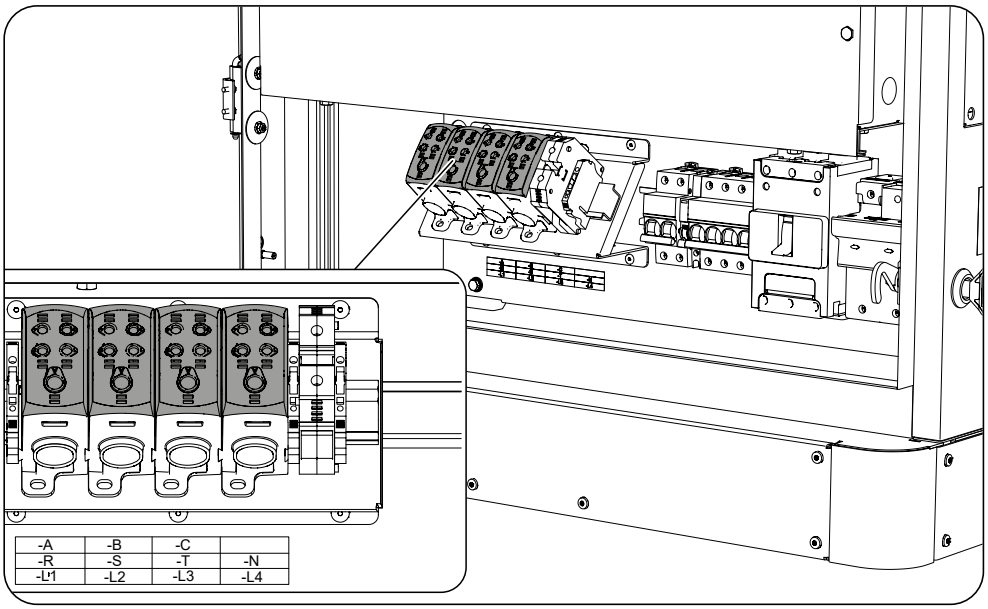
INFO

Consult section *„Important safety instructions“* and the following instructions before working on the unit.

8.1. Safety instructions for the AC connection

DANGER

Make sure there is no voltage present on the unit before starting the AC connection.
Do not switch on the power to the unit until you have successfully made the rest of the connections and it is closed.
Use the Personal Protective Equipment specified in section *„Personal Protective Equipment (PPE)“*.
During the connection, ensure the correct connection of the cables to the corresponding connection terminals.
It is essential to correctly replace the IP2X protections once the AC connections have been made.



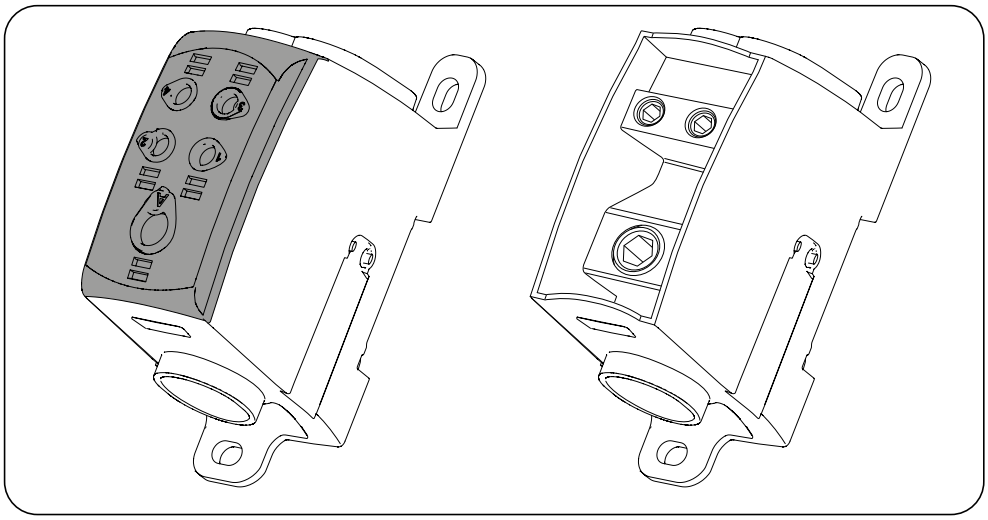


Image of the IP2X protection of the connection

8.2. Cabling requirements

To guarantee the safety of persons, for the unit to function correctly and comply with the applicable standards, the unit must be connected to the ground of the installation.

The AC connection must comply with section 8.3. The installation must use single-pole cables with a copper or aluminum conductor.

⚠ CAUTION

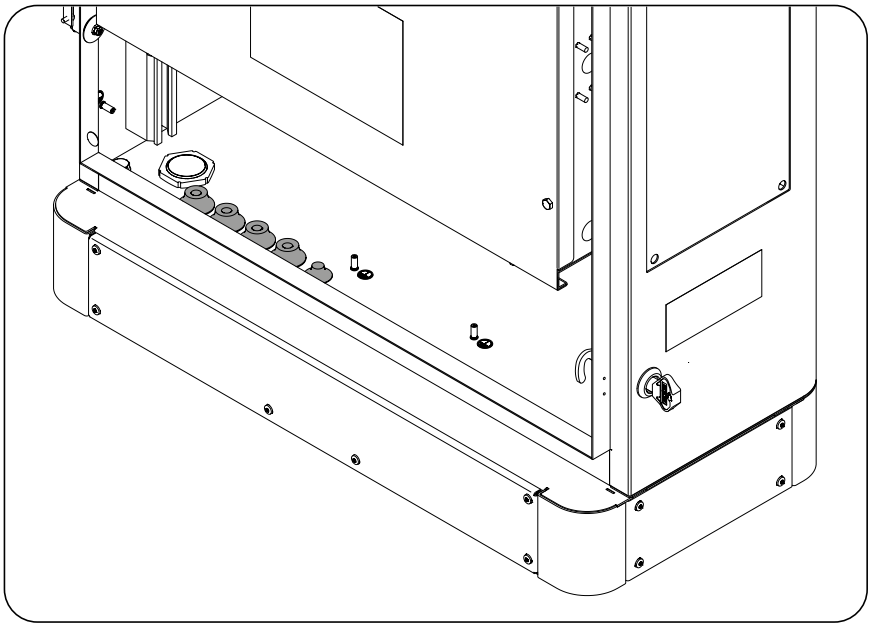
If using aluminum cables, the installer must provide the necessary means to prevent galvanic coupling (bipolar terminals, bimetallic interfaces, etc.).

The dimensioning of the ground wiring will be the responsibility of the installer and must meet applicable regulatory requirements in the installation.

The connection allows a cable section of between 35 mm^2 and 95 mm^2 and between 25 mm^2 and 70 mm^2 for the ground connection. The range of admissible diameters for the input cables is between 15 and 20 mm. The cable should be passed through the cable gland before mounting the terminal.

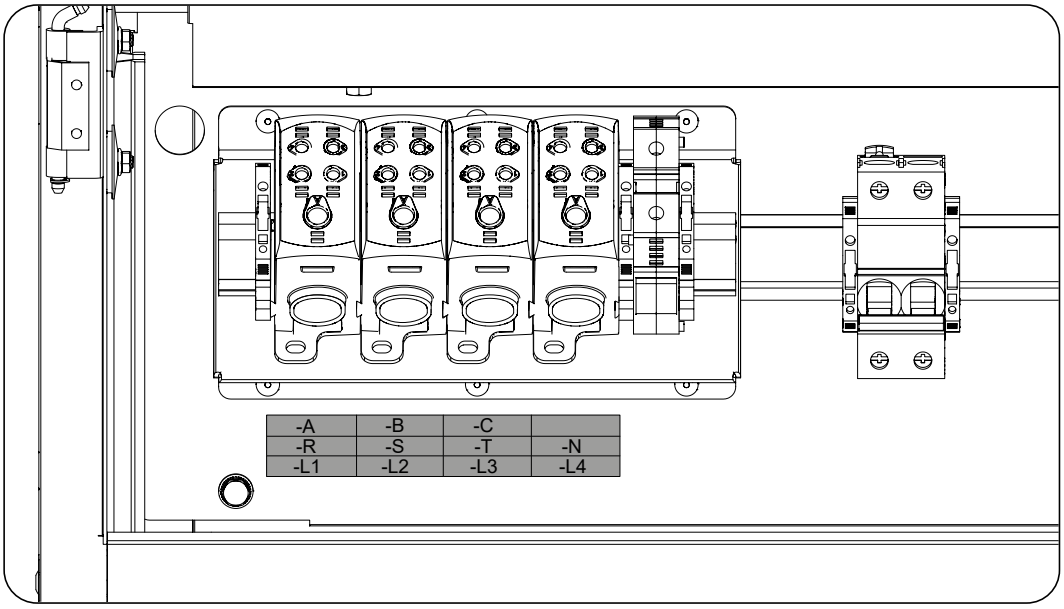
8.3. Connection process

1. Insert the cable grommets from the bottom upwards, making sure that they fit correctly into the equipment. Insert the wiring through the cable grommets by making a small tear in their membrane.

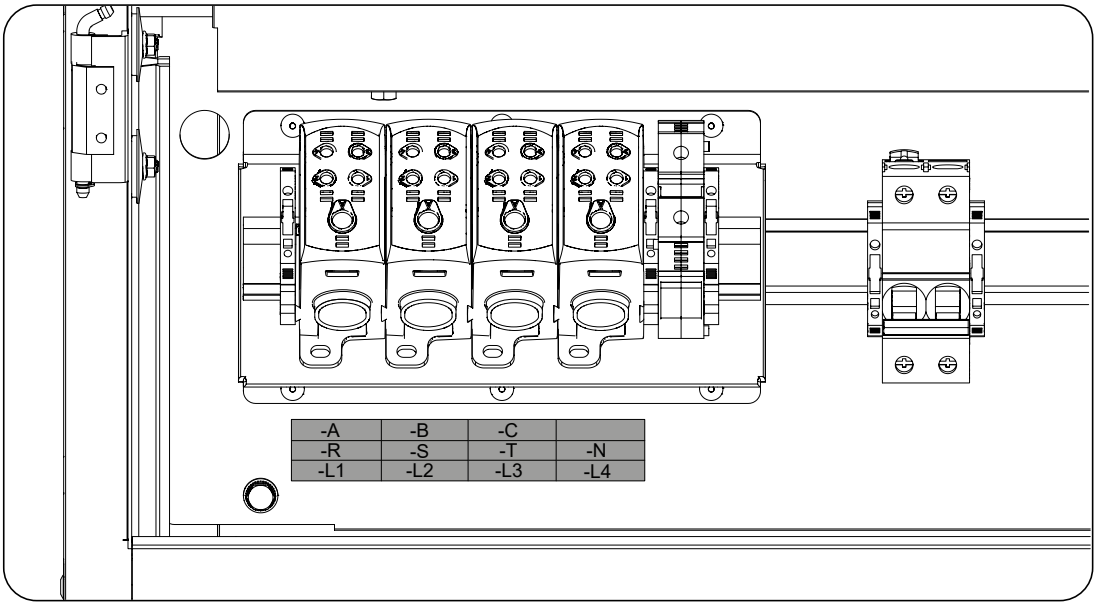


2. Connect the three phases, neutral and ground to the terminal strip, respecting the polarities. The connection points are identified with various classifications, according to the systems of different countries. Follow the installation system of the corresponding country.

   Leave between the cable grommets and the supply terminal strip the minimum cable length required for connection. The excess cable must be placed inside the lower baseboard of the equipment, never inside the equipment.



The tightening torque for the connection points of the phases and neutral is 14 Nm, and 6 Nm for the ground connection.



9. First connection to the electric grid

This chapter details the process for the charger's first connection to the grid.

First review the unit.

9.1. Unit inspection

You must check the correct condition of the installation before start-up.

Each installation is different, depending on its characteristics, the country in which it is located or other special conditions which may apply. In all cases, before starting up, it is necessary to ensure that the installation complies with the applicable legislation and regulations and that at least the part to be started up is complete.

9.1.1. Inspection

Before connecting the charger to the grid for the first time you must carry out a general inspection, which mainly consists of:

Wiring inspection

- Check that the cables are correctly joined to their connectors.
- Check that these cables are in a good condition and that there are no hazards in their environment which damage them, such as sources of intense heat, objects which could cut them or arrangements which put them at risk of impacts or pulling.

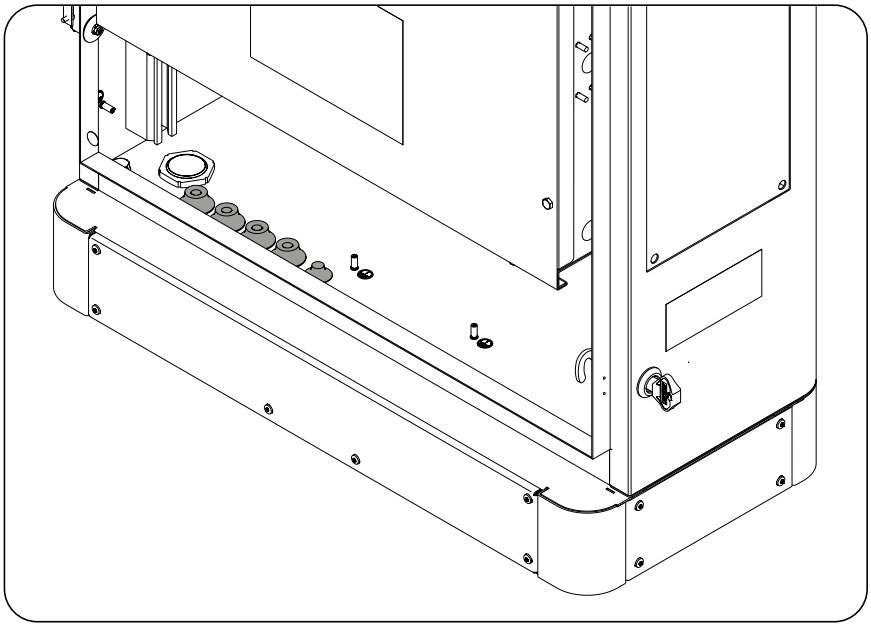
Review the unit's fastening

Check that the unit is secured firmly and is not at risk of falling.

9.1.2. Hermetic sealing of the unit

Ensure during installation operations that the unit's level of sealing has not been altered during connection operations.

Check the correct adjustment of the connectors and that any cable grommets are well sealed.



10. Unit configuration

A local connection is required to configure the unit for the first time. Once this first configuration has been carried out, a remote connection can also be established. The processes for both cases are described below.

The configuration is done through the INGETEAM WEB Manager application.

10.1. Local connection

To establish a local connection the charger and computer must be connected to the same communication network.

The local connection can be done through an Ethernet or Wi-Fi network.

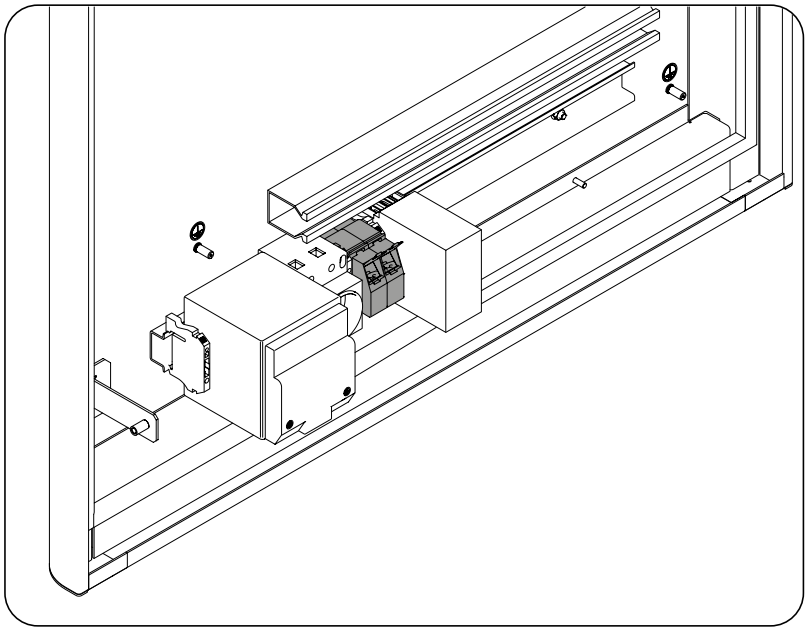
10.1.1. Local connection via Ethernet

⚠ CAUTION

The Ethernet cabling must be category 5E or higher.

To make the connection, follow these steps:

1. Connect the computer to the unit using one of the available Ethernet connectors at the bottom of the charger.



2. On the laptop, open the browser and go to http://192.168.1.33:8080.
3. Enter the username and password. The username and password are specified on the documentation delivered with the unit.
4. Follow the instructions given by INGETEAM WEB Manager.

⚠ CAUTION

If it does not have a public IP, the computer and the charging point will need to be in the same network or APN.

10.2. Remote connection

The purpose of remote connection is to have access to the charger when the charger and the computer are connected to the Internet from different communication networks. The charger must be connected to the Internet via Wi-Fi, Ethernet or 4G.

To make the connection, follow these steps:

1. With the charger and the computer connected to Internet, open the web browser and go to http://ipChargingStation:8080/ where ipChargingStation is the IP of the charger. Therefore, you will need the IP of the charger.
2. Enter the username and password. The username and password are specified on the documentation delivered with the unit.

11. Operation

The main function of the charging station is to supply and measure electrical energy for users that have prior authorization with an RFID card reader system, except in stations configured without authentication.

This section describes the operation of the charging station in detail.

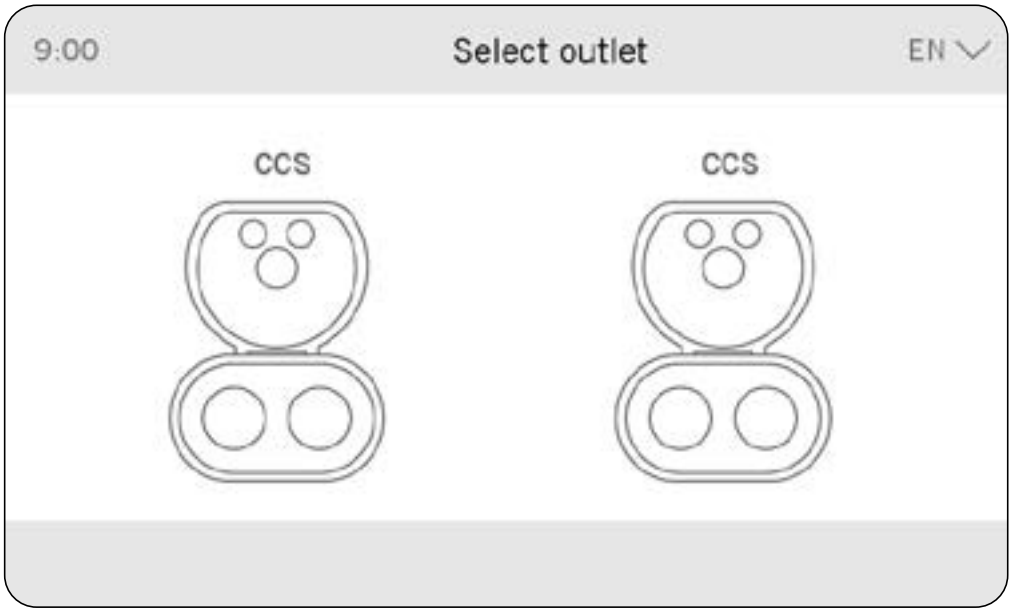
11.1. Status indication

The charging station indicates its current status by means of light signals. It has independent indicators for each power socket.

Status	Lighting	Description
Available	Continuous green	The charger is operative waiting to be used
Awaiting vehicle connection	Flashing green	The charging station is waiting for a vehicle to be connected in order to proceed with charging
Charging preparation	Flashing blue	The charger is running checks prior to charging with the vehicle connected
Charge	Continuous blue	A vehicle has been connected to the charging station
Ending charge	Flashing blue	The charger is ending the charge
Incident	Continuous red	There is an error in the station or the charging process is not being performed correctly.
Standby	None	The charging station has been disabled/is not operative
Awaiting vehicle disconnection	Flashing green	The charging station is waiting for the vehicle to be disconnected
Software update	Continuous yellow	The unit is updating the software

11.2. User interface

The display screen shows the available stations for selecting the charge.



The interface guides the user's charging process.

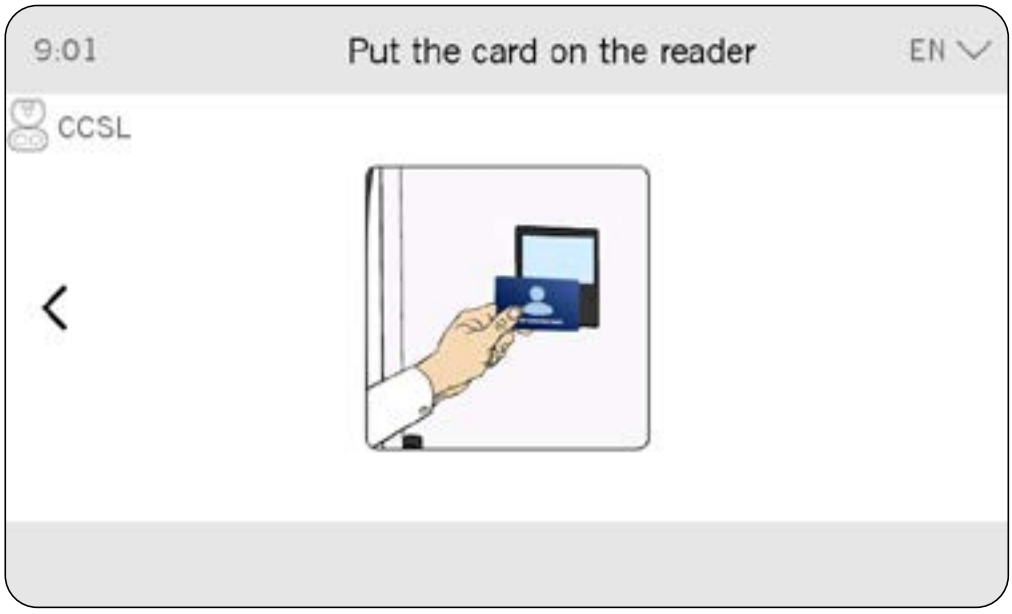
11.3. Charging process

Depending on the client's requirements, the charging process will start with or without authentication. The process for both cases is described below.

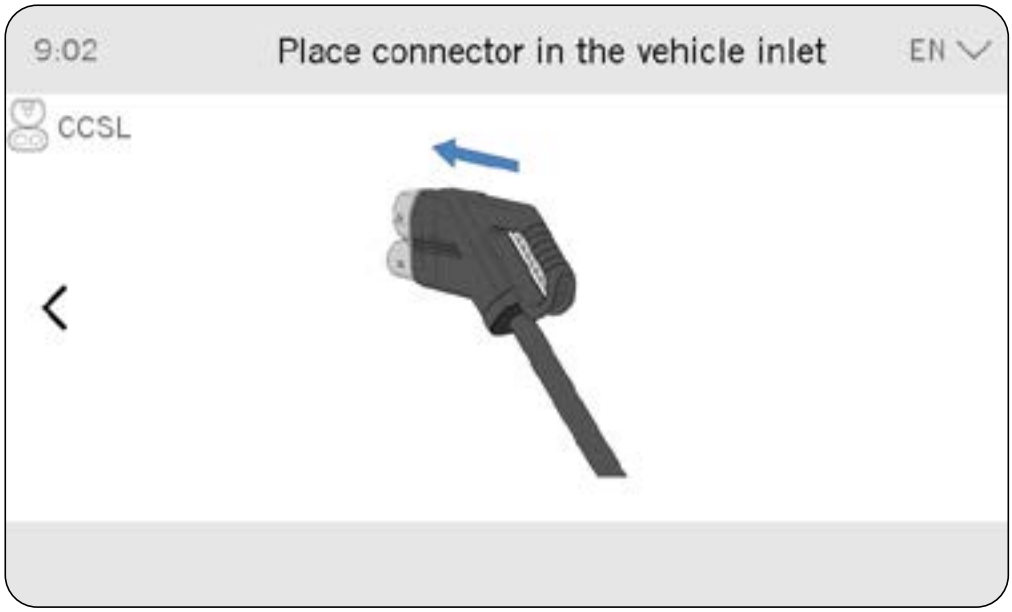
11.3.1. Charging process with authentication

Starting the charge process

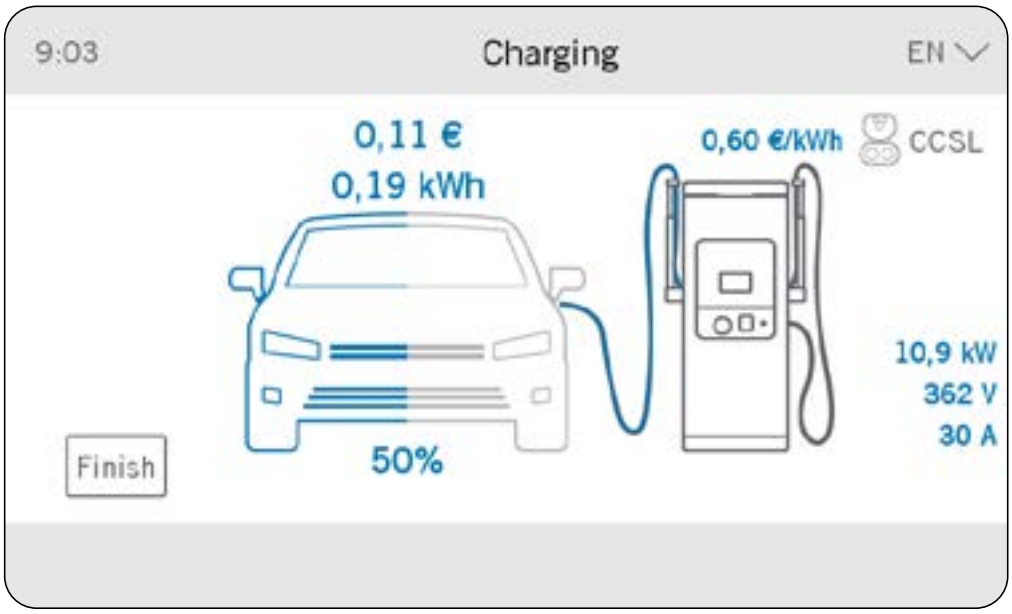
1. Check that the charging station is in awaiting vehicle status with the green light on.
2. If you have an ID card, place the card next to the reader located on the area below the display. In the case of a correct reading, the station switches to awaiting charge status. If the charging manager uses an app to manage the charge, follow the instructions on the app to start the process.



3. Connect the vehicle to the station.

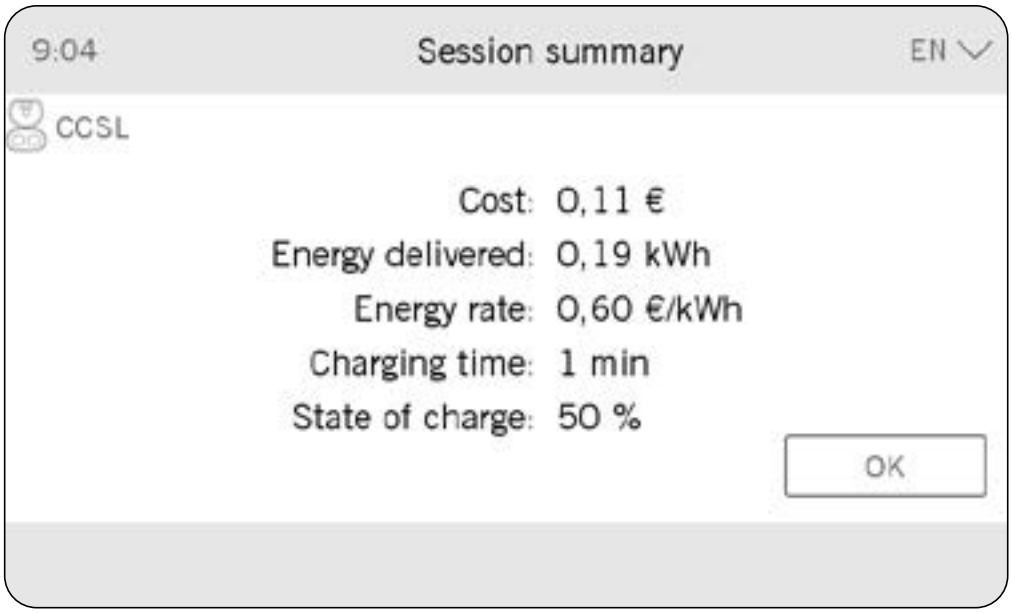


4. The charging starts. The lighting remains blue, fixed if there is consumption and flashing if there is not.



Ending the charge process

1. To end the charging cycle, if you have an ID card, place it against the reader. If the charging is managed through the app, follow the instructions.



2. Disconnect the vehicle.
3. The charging process stops.

11.3.2. Charging process without authentication

Starting the charge process

1. Connect the vehicle to the recharging station.
2. The charging starts. The lighting remains blue, fixed if there is consumption and flashing if there is not.

Ending the charge process

1. Disconnect the connector from the vehicle side.
2. The charging process stops.

11.4. Downloading the receipt (Eichrecht certified units)

Charging point operators will permit the receipts stored in their system to be downloaded. For further information, contact the charging point operator.

There may be small differences between the energy data shown on the wattmeter display, visible from the exterior of the charging point, and the energy data registered on the receipt. These differences are due to the fact that, on the display, the accumulated energy value is displayed to two decimal places (10Wh), and the value given for invoicing is only to one decimal place, 1Wh.

12. Shutting down the unit

This section describes the procedure to shut down the unit. If you wish to work inside the unit, you must carry out these instructions in the order shown here to remove the power.

1. If there is an active charge process, finalize the charge session.
2. Press the emergency stop button if the charger has one.
3. Remove AC voltage from a means of disconnection outside the unit.
4. Wait 10 minutes for the internal capacitances to discharge, the hot parts which may cause burns to cool and the fan blades to stop turning.
5. Open the unit and, using the appropriate PPE, check the absence of voltage in the AC input.
6. Signal cut-off point with a sign reading “Caution no switching…”. If necessary, rope off the work area.

13. Maintenance

The maintenance described below lists a series of minimum measures necessary to maintain the charger in good working condition. Please consult Ingeteam preventive and predictive general maintenance if you wish to extend the service life of the charger.

⚠ CAUTION
The recommended maintenance tasks must be carried out at least annually, except where otherwise stated.

13.1. Safety conditions

⚠ DANGER
All work must be carried out without voltage. If you need to carry out work close to directly accessible live elements, you must do so according to the specifications in a work instruction or similar document.
Keep the doors closed when you are not working in the cubicle.
Keep polycarbonate guards and grilles (protections) in place at all times for elements with directly accessible live parts.
Pay special attention to any parts that may protrude from the unit, such as rods and/or metal edges.
Do not wear rings, chains, watches, baggy clothes, loose hair or any element that may become trapped. Take care when using gloves or cleaning cloths.
In the event of poor lighting, use auxiliary lighting devices.

⚠ CAUTION
The entire manual must be read and understood in full prior to manipulating, installing or operating the unit.
Any work carried out that implies a modification of the original electrical arrangements must be proposed and accepted in advance by INGETEAM.

13.2. Condition of hoses and charging connectors

Check the condition of the hoses and connectors. They should not have dents or cuts. Check the proper operation of the connectors.

Check the correct operation of the retractable system. Check the hoses are in good condition and the springs bend smoothly.

Check the condition of the hose holder. Check that the polycarbonate guards are attached and that there is no dirt or damp.

13.3. Condition of the housing

You must carry out a periodical inspection of the condition of the enclosure, verifying the condition of the locks and doors, as well as the anchoring of the units to the ground. In addition, you must check the condition of the housing and the absence of dents or scratches that might degrade the housing or cause it to lose its protection classification. If these types of defect are noticed, the affected parts must be repaired or replaced.

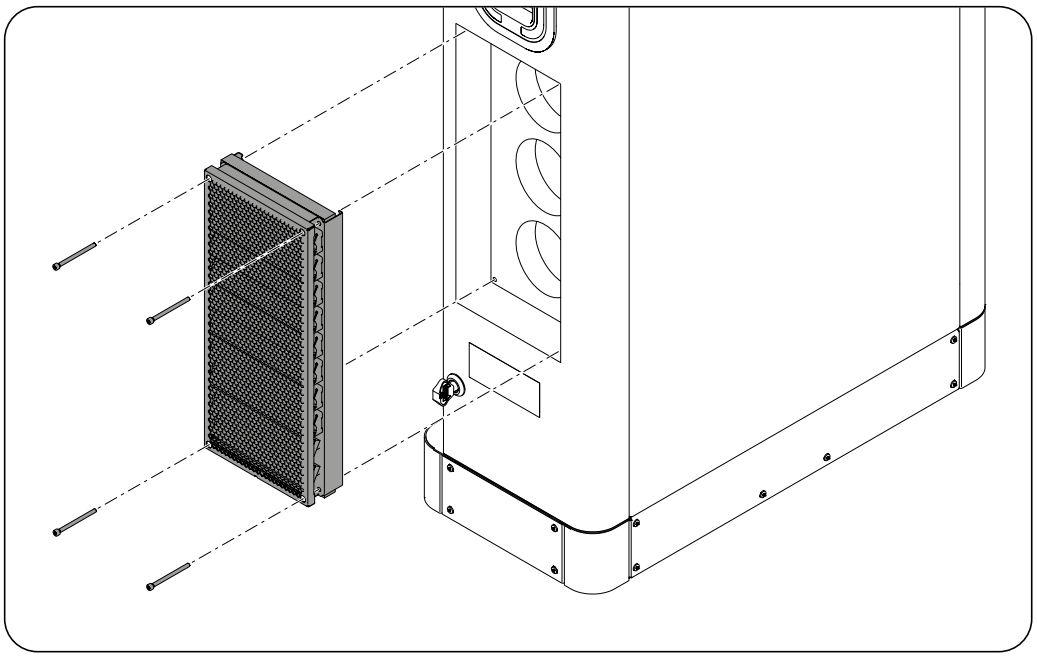
13.4. Condition of cables and terminals

Check that the power circuit connections have the correct tightening torque.

Check that the power cables look in good condition and there are no signs of wear or overheating.

13.5. Cleaning or replacing filters

Remove and clean the filters on the unit ventilation grilles. In the case of damage, replace with new filters.



Air intakes

There are filters in all of the air intakes (both inlets and outlets). These intakes are located on both sides of the charger.

14. Waste handling

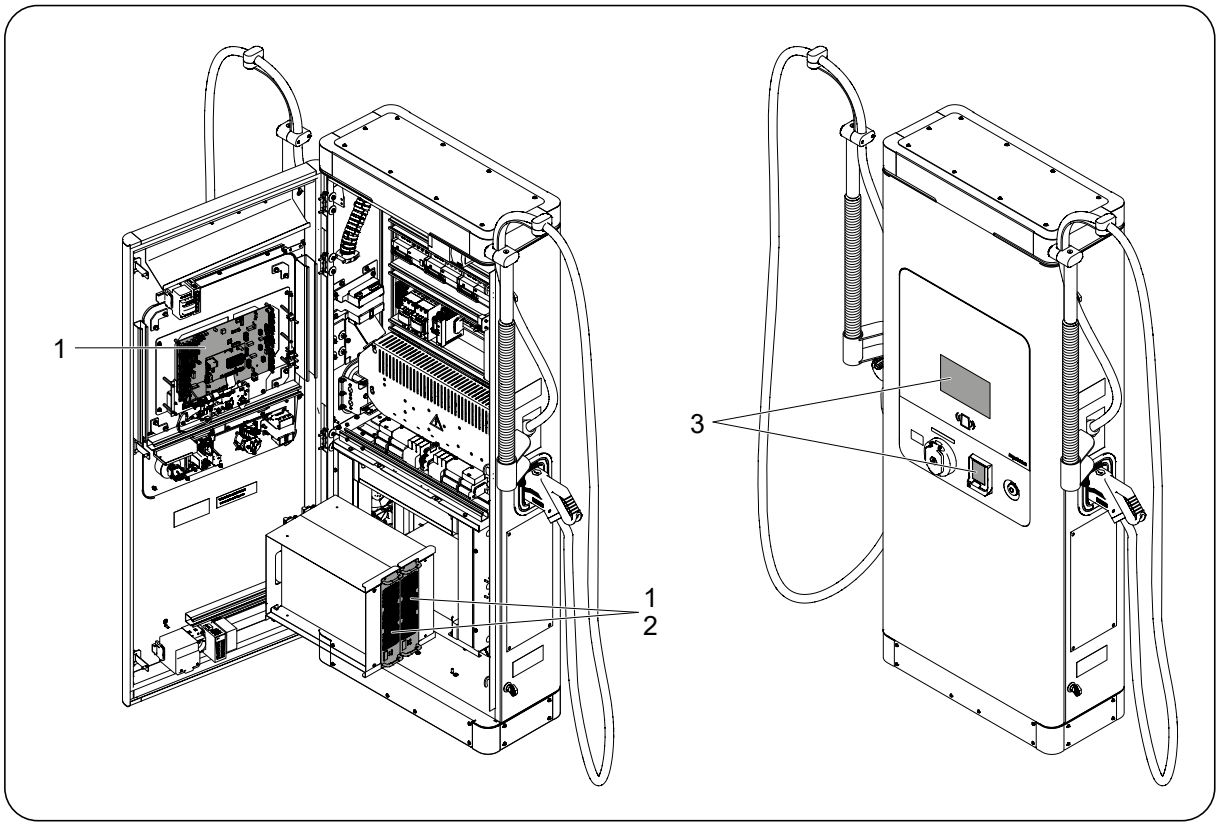
Remove and clean the filters on the unit ventilation grilles. In the case of damage, replace with new filters.

At the end of the unit's life, the waste must be correctly processed by an authorized hazardous waste management company.

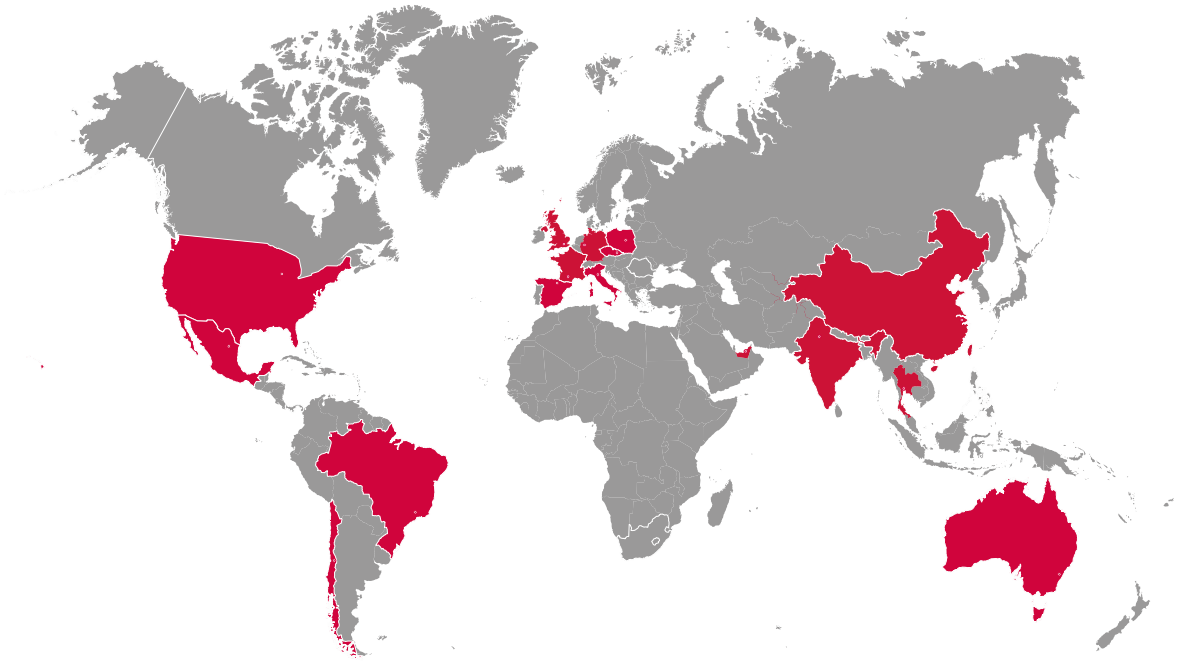
Ingeteam, in accordance with its policy of respect for the environment, will inform the authorized manager, via this section, of the location of components to be decontaminated.

The elements within the unit that must be handled individually are:

1. Printed circuit board cards.
2. Electrolytic condensers or condensers containing PCB.
3. Display.



Notes - Notas - Remarques - Note - Anm.



EUROPE

Ingeteam Power Technology, S.A.
Avda. Ciudad de la Innovación, 13
31621 Sarriguren (Navarra) - Spain
Tel.: +34 948 288 000
Fax: +34 948 288 001
e-mail: evc.energy@ingeteam.com

Ingeteam S.r.l.
Via Emilia Ponente, 232
48014 Castel Bolognese (RA) - Italy
Tel.: +39 0546 651 490
Fax: +39 054 665 5391
e-mail: emobility.italia@ingeteam.com

Ingeteam SAS
140 Rue Carmin - Le Naurouze B
31670 Labège - France
Tel.: +33 (0)5 61 25 00 00
Fax: +33 (0)5 61 25 00 11
e-mail: france@ingeteam.com

Ingeteam, a.s.
Technologická 371/1
70800 Ostrava - Pustkovec
Czech Republic
Tel.: +420 59 747 6800
Fax: +420 59 732 6899
e-mail: czech@ingeteam.com

Ingeteam GmbH
Grand Bateau – Zollhof 6
D-40221 – Düsseldorf, Germany
Tel.: +49 (0) 211 78177950
e-mail: deutschland@ingeteam.com

Ingeteam Poland Spzoo
Ul. Koszykowa 60/62 m 39
00-673, Warsaw, Poland
Tel.: (+48) 22 821 99 30
e-mail: polska@ingeteam.com

Ingeteam LTD.
Unit 10 Gordano 19, Garanor Way, Portbury
Bristol, BS20 TXE - United Kingdom
Tel.: +44 (0) 331 630 0305

NORTH AMERICA

Ingeteam Inc.
3550 W. Canal St.
Milwaukee, WI 53208 - USA
Tel.: +1 (414) 934 4100 / +1 (855) 821 7190
Fax: +1 (414) 342 0736
e-mail: usa@ingeteam.com

Ingeteam Power Technology México S de RL de CV
Av. Ejército Nacional Mexicano 351,
Chapultepec Morales, Granada,
Miguel Hidalgo,
CP: 11520
Ciudad de México, CDMX
Tel.: (+52) 55 6586 9930
e-mail: northamerica@ingeteam.com

SOUTH AMERICA

Ingeteam Ltda.
Rua Estácio de Sá, 560
Santa Genebra
Campinas - SP
CEP: 13080-010; São Paulo - Brazil
Tel.: (+55) 19 30 37 37 73
e-mail: brazil@ingeteam.com

Ingeteam Chile SpA
Balmoral n.º 309, Piso 10º, Oficina 1008,
7561282 Las Condes
Santiago, Chile
Tel.: (+56) 229 253 825
e-mail: chile@ingeteam.com

ASIA

Ingeteam Power Technology Shanghai, Co. Ltd.
Room 2606-F, No.360 South Pudong Road
China (Shanghai) pilot free trade zone
C.P 200120
Tel.: +86 139 1622 4886
e-mail: liu.yimin@ingeteam.com

Ingeteam India Pvt. Ltd.
Survey No. 111/1-111/3 & 111/5-111/7,
Village No.155, Mambakkam Village,
Chennai - Bangalore Main Road,
Sriperumbudur Taluk,
Kancheepuram District - 602106,
Tamilnadu, India

Ingeteam Power Technology S.A. UAE Branch
Al Bateen tower c6 Bainunah 1st floor
Street 34
Abu Dhabi - UAE
Tel.: +971 2 207 6666

Ingeteam Power Technology S.A.
Thailand representative office
100/67 Vongvanij B Building, 22nd floor,
Rama IX Road., HuayKwang,
10320 Bangkok
Te.: +66 22461798
e-mail: Thailand.pga@ingetem.com

AUSTRALIA

Ingeteam Australia Pty Ltd.
Iaccelerate Centre, Building 239
Innovation Campus, Squires Way
North Wollongong, NSW 2500 - Australia
Tel.: +61 429 111 190
e-mail: australia@ingeteam.com

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Ingeteam

Ingeteam Power Technology, S.A.
www.ingeteam.com