Ingeteam

# INGEREV RAPID 50

## Trio - Duo - One - One+

Installation and Operation Manual

ABT2013IQM01_B
04/2024

**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.<br>The equipment may remain charged after disconnecting the grid power.<br>Carefully follow the mandatory steps in the manual for removing the voltage. |
| Explosion.<br>There is a very low risk of explosion in very specific cases of malfunction.<br>The casing will protect people and property from the explosion only if it is correctly closed. |
| Crushing and joint injuries.<br>Always follow the indications in the manual on moving and placing the unit.<br>The weight of this unit can cause serious injury and even death if not handled correctly. |
| High temperature.<br>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.<br>The unit requires particle-free air flow while it is operating.<br>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 INGEREV RAPID 50 units and to provide appropriate information for their correct reception, installation, start-up, maintenance and operation.

## 1.1. Scope and nomenclature

This manual is applicable to the following units:

| Complete name | Abbreviation |
|---|---|
| INGEREV RAPID 50 Trio | Trio |
| INGEREV RAPID 50 Duo | Duo |
| INGEREV RAPID 50 One | One |
| INGEREV RAPID 50 One+ | One+ |

## 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

INGEREV RAPID 50 chargers are a multi-standard fast charging model designed for the fast charging requirements of the latest electric vehicles, allowing to recover up to 100 km of range in no more than 20 minutes.

The different models of the INGEREV RAPID 50 are compatible with mode 4 with standards CHAdeMO and CCS 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 INGEREV RAPID 50 chargers have several models with the following connector types available:

| | Connector type | | |
|---|---|---|---|
| | DC | | AC |
| | CCS | CHAdeMO | AC Type 2 |
| INGEREV RAPID 50 Trio | ● | ● | ● |
| INGEREV RAPID 50 Duo | ● | ● | ○ |
| INGEREV RAPID 50 One | ● | ○ | ○ |
| INGEREV RAPID 50 One+ | ● | ○ | ● |

● Equipped // ○ Not equipped

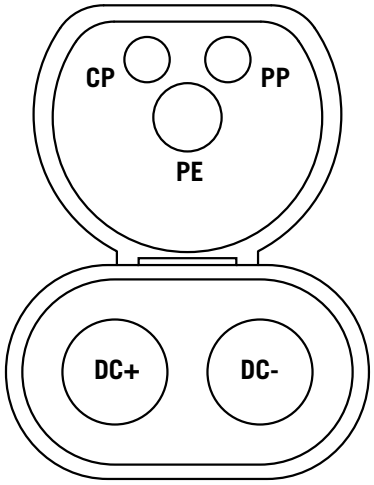
These models are designed to remain connected to the public AC grid. They all generate DC current and the INGEREV RAPID 50 Trio also generates AC current.

## 2.3. Connectors

### 2.3.1. Connectors for DC charging

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

**CCS**




PP: *Proximity Pilot*

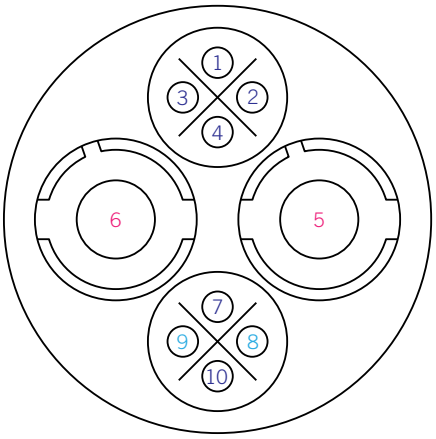
CP: *Control Pilot*

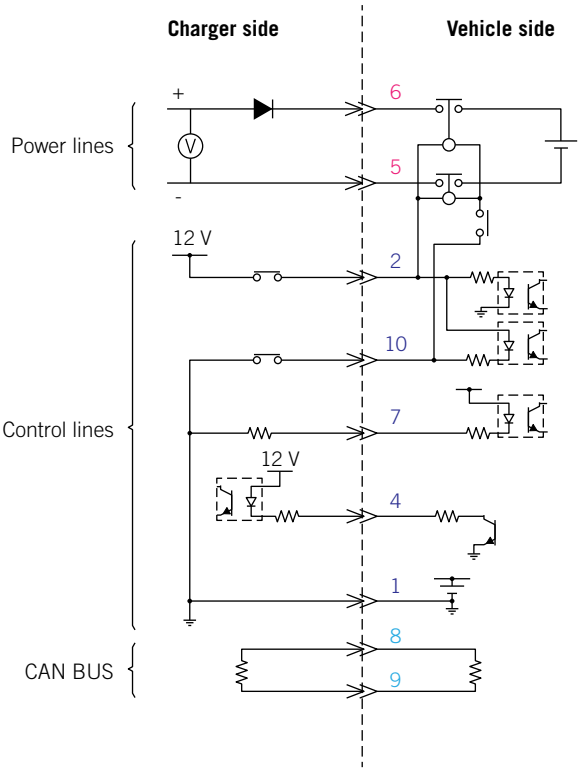
PE: *Protective Earth*

DC+

DC-

### CHAdeMO

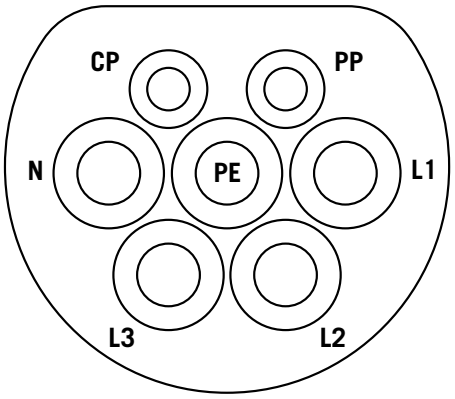



## 2.3.2. Connectors for AC charging

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

### IEC 62196-2 AC Type 2




PP: *Proximity Pilot*

CP: *Control Pilot*

PE: *Protective Earth*

N: Neutral

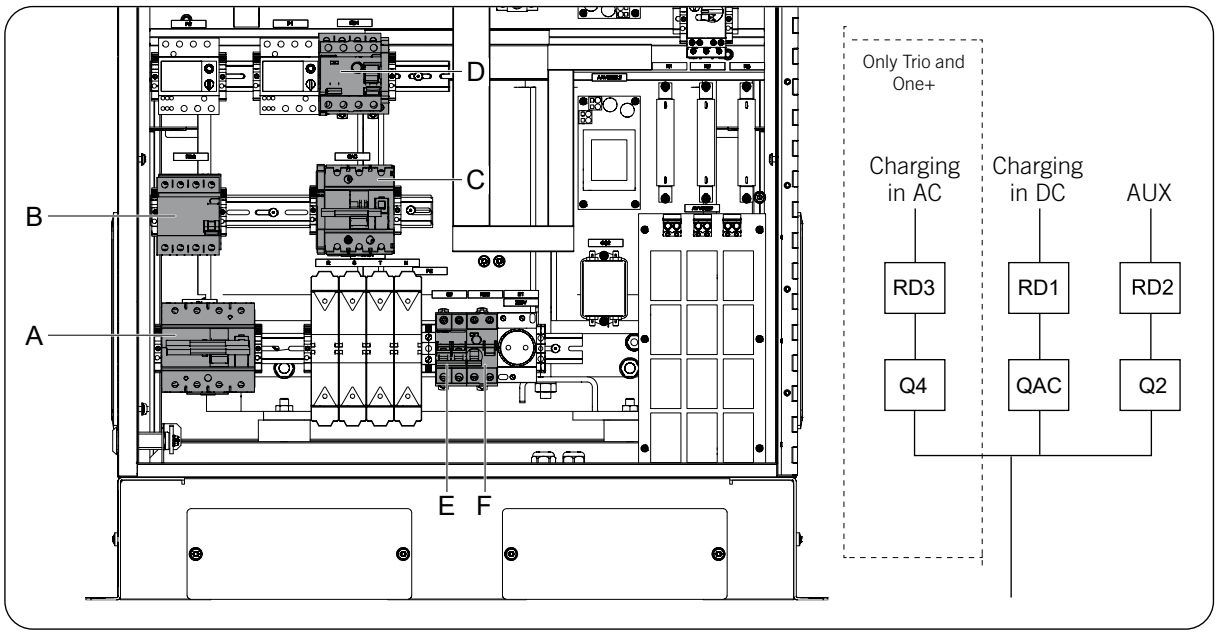
L1: Phase 1

L2: Phase 2

L3: Phase 3

# 2.4. Protection

This charging station has several protections, as described below.




A. Q4 (AC). 63 A Curve C thermal magnetic circuit breaker (only Trio and One+)

B. RD3 (AC). 30 mA/300 mA* 63 A Type B residual current circuit breaker (only Trio and One+)

C. QAC (DC). 100 A Curve C thermal magnetic circuit breaker

D. RD1 (DC). 30 mA 100 A Type A residual current circuit breaker

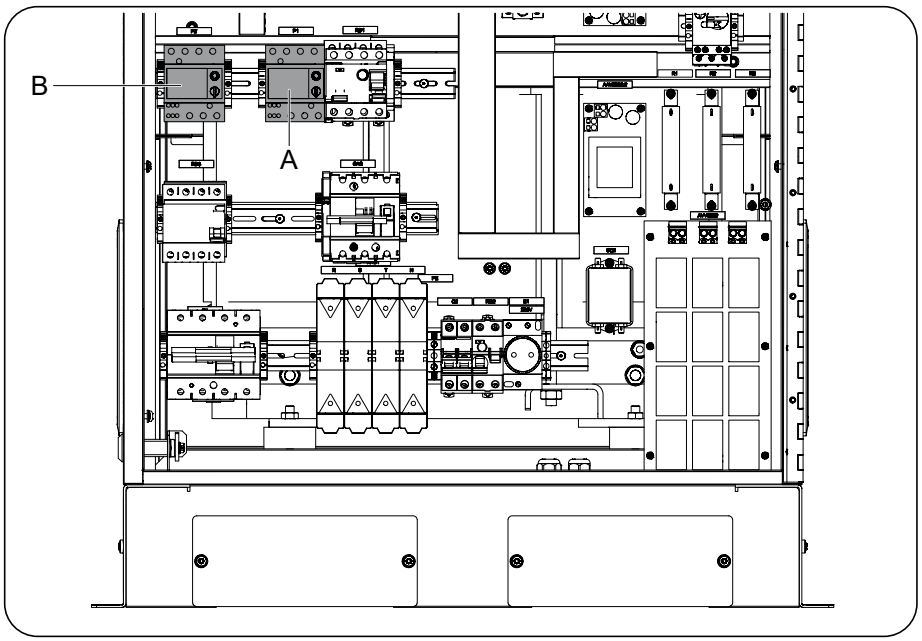
E. Q2 (auxiliaries). 6 A Curve C thermal magnetic circuit breaker

F. RD2 (auxiliaries). 30 mA 25 A Type AC residual current circuit breaker

*30 mA or 300 mA according to the regulations of the destination country.

## 2.5. Wattmeters

The charging station has MID wattmeters, as described below.




A. P1 (DC). MID wattmeter for calculating the energy in DC charging

B. P2 (AC). MID wattmeter for calculating the energy in AC charging (only Trio and One+)

## 2.6. Accessories equipped as standard

- Ethernet communication.
- Local communication with other INGEREV stations.
- Compatible with OCPP.
- Authentication via RFID / NFC cards.
- Interface via display.
- Steel enclosure highly resistant against adverse weather conditions.

## 2.7. Optional accessories

These units may include the following optional accessories:

- 3G Communication.
- Wi-Fi communication.

## 2.8. Electrical safety

The design values for electrical safety can be found below.

### 2.8.1. Overvoltage category (OVC)

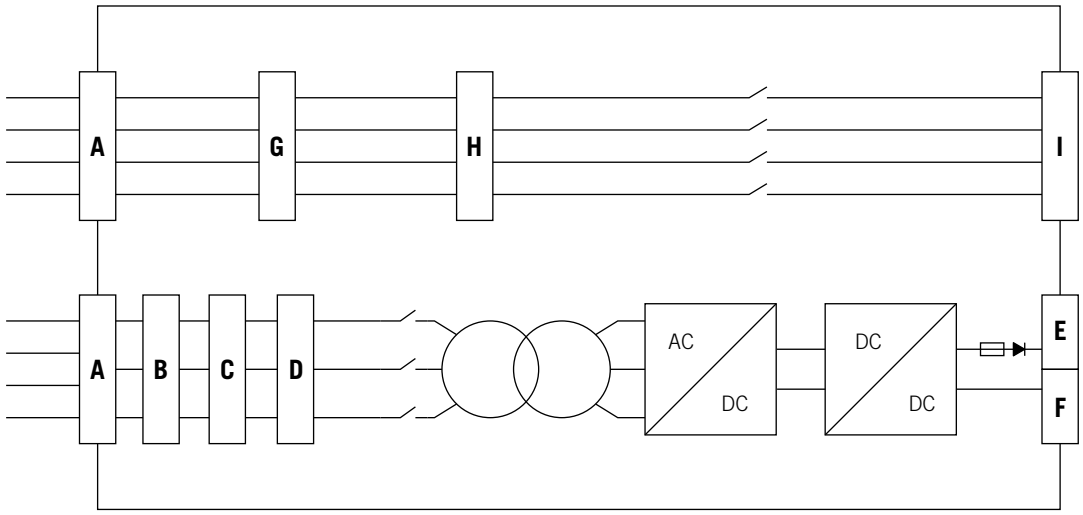
These units have been designed with OVC III in AC.

## 2.9. Acoustic contamination

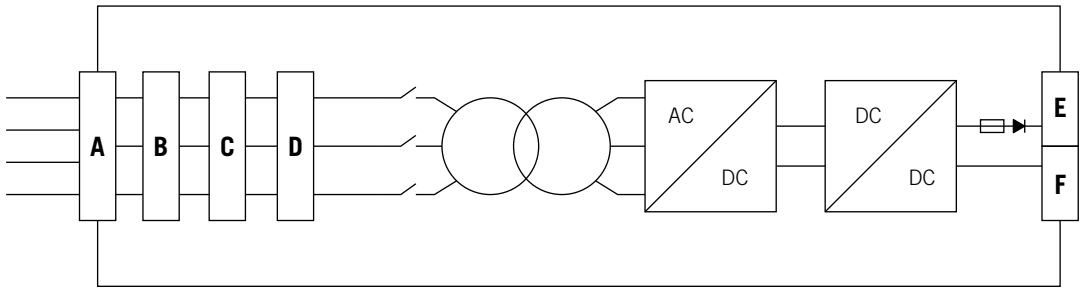
The unit produces a buzz when in operation. Do not place it in an occupied room, or on light supports which might amplify this buzz. The mounting surface must be firm and appropriate for the weight of the unit.

# 2.10. Electrical diagram of the system

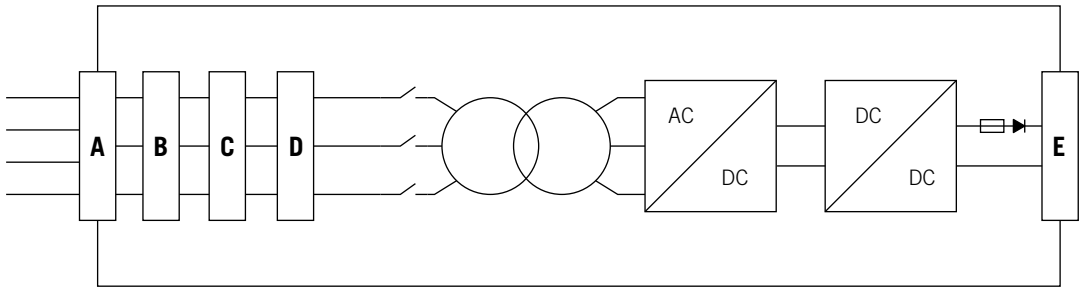
**INGEREV RAPID 50 Trio**



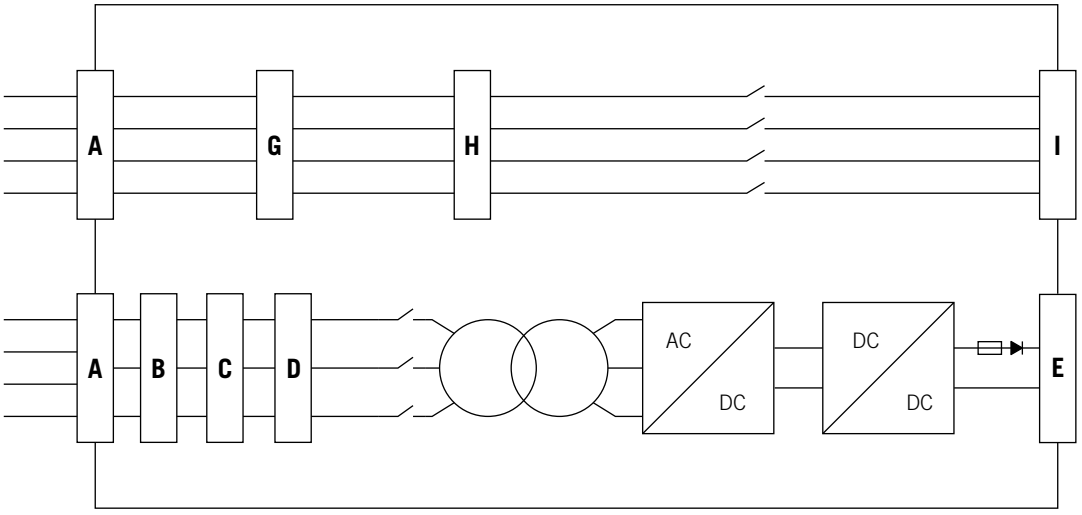

**INGEREV RAPID 50 Duo**




**INGEREV RAPID 50 One**



## INGEREV RAPID 50 One+



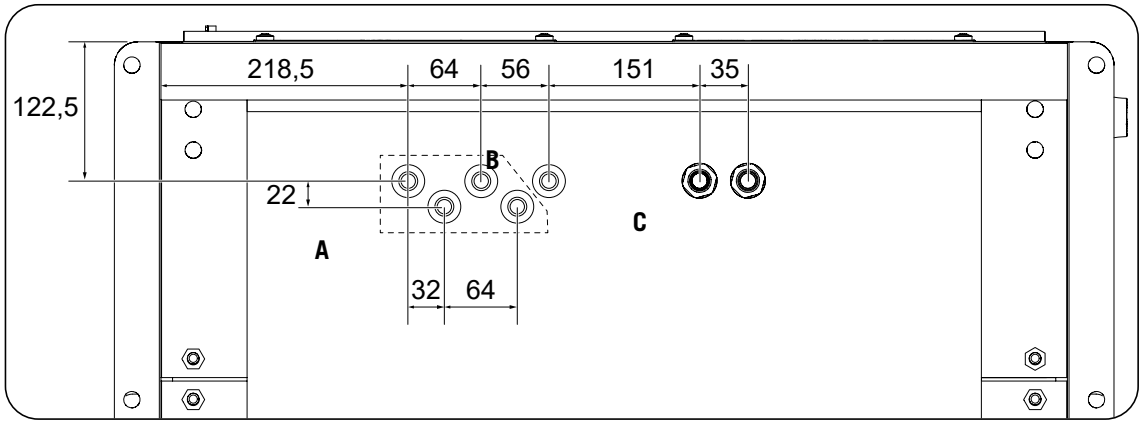

A. Supply
B. Thermal magnetic circuit breaker and residual current device
C. EMI filter
D. Wattmeter
E. CCS connector
F. CHAdeMO connector
G. Thermal magnetic circuit breaker and residual current device
H. Wattmeter
I. Type 2 AC connector

# 2.11. Specification table

| | INGEREV RAPID 50 Trio / Duo / One / One+ |
|---|---|
| **AC input (for DC output)** | |
| Voltage | Three phases + neutral + earth; 400 Vac ± 15% |
| Frequency | 50 Hz |
| Rated current | 77 A |
| Rated power | 53 kVA |
| Efficiency | > 94% |
| Power factor | > 0.98 |
| **AC input (for AC output)[1]** | |
| Voltage | Three phases + neutral + earth; 400 Vac ± 15% |
| Frequency | 50 Hz |
| Rated current | 63 A |
| Rated power | 43,5 kVA |
| Charging connectors | AC Mode 3 Type 2 |
| **Output (DC)** | |
| Voltage range | 50 ~ 500 V |
| Maximum current | 125 A |
| Maximum power | 50 kW |
| Charging connectors | CCS Type 2 / CHAdeMO [2] |
| **Regulations and safety compliance** | |
| Standards | IEC 61851-1, IEC 61851-23, IEC 61851-24, CHAdeMO 1.0.0, DIN 70121, ISO 15118, IEC 61000 |
| Overcurrent protection | 63 A Curve C thermal magnetic circuit breaker for charging in AC<br>100 A Curve C thermal magnetic circuit breaker for charging in DC |
| Protection against indirect contacts | 63 A 30 mA / 300 mA Type B residual current circuit breaker for charging in AC [2][3]<br>100 A 30 mA Type A residual current circuit breaker for charging in DC |
| Overvoltage protection | Type III surge arrester |
| **General information** | |
| Cooling system | Forced ventilation |
| Stand-by consumption | < 100 W |
| Cabling length | 3.8m |
| Operating temperature | -25 ºC ~ 60 ºC |
| Humidity | 0 ~ 95% (without condensation) |
| Weight | 620 kg |
| Dimensions | 785 x 700 x 1900 mm |
| Protection class | IP54 / IK10 (IK08 display and ventilation grilles) |
| Markings | CE |
| Maximum altitude | Up to 2000 m |

[1] only for Trio and One+
[2] only for Trio and Duo
[3] 30 mA or 300 mA according to the country's regulations.

# 2.12. Description of cable inlets




A. AC supply. Admissible hose range 6 ~ 20 mm.

B. Earth connection for AC supply. Admissible hose range 6 ~ 20 mm.

C. Ethernet cabling and other uses. M20 cable gland. Admissible hose range 6 ~ 13 mm.

# 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 *"2.11. 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.

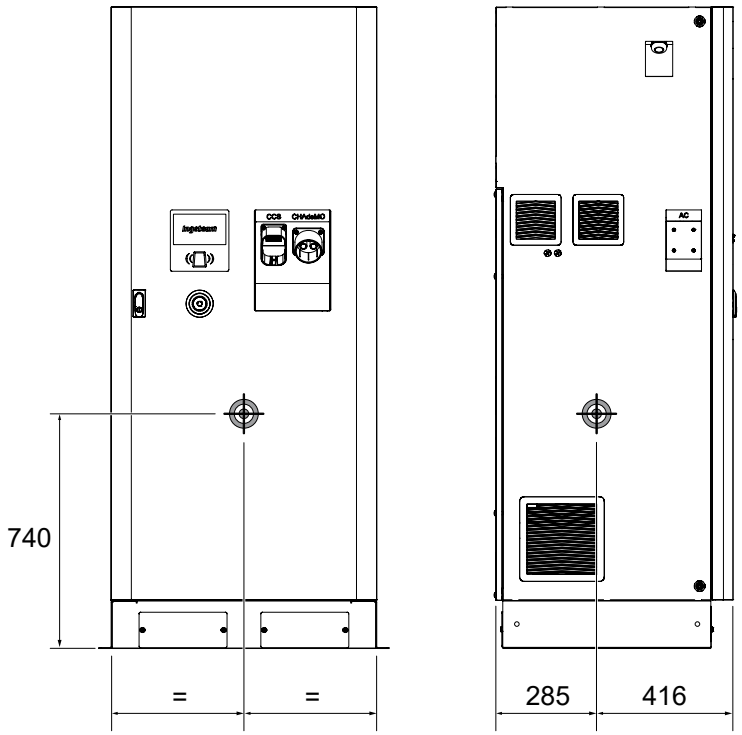
# 4. Equipment transport

You must protect the unit, during transport, from mechanical knocks, vibrations, water splashes (rain) 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, for which Ingeteam is not responsible.

## 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:

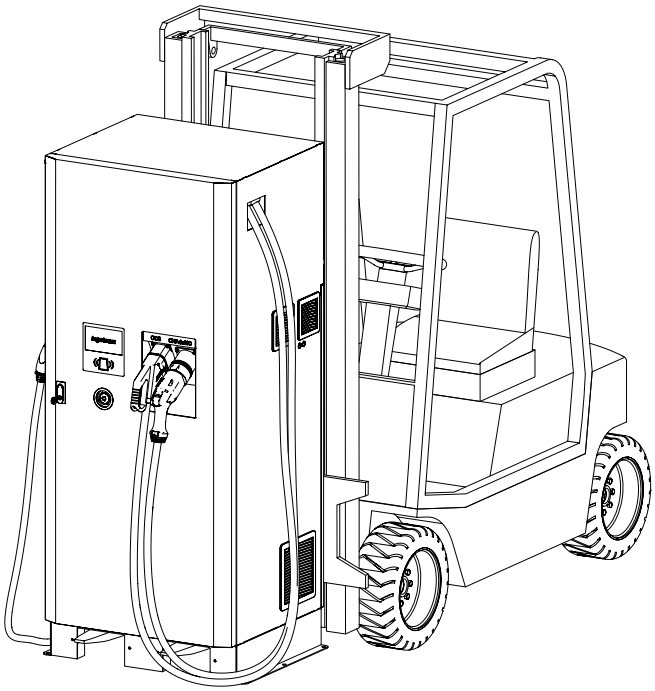
- Plastic (polystyrene, bag and bubble wrap): the appropriate container.
- Cardboard: the appropriate container.

# 4.3. Transport

### Transport using a forklift or pallet truck

At least the following requirements should be observed:

1. Place the units centered with respect to the forks. Where possible, transport the unit using the forklift or pallet truck operating from the rear, as the unit's center of mass is displaced slightly to the rear.



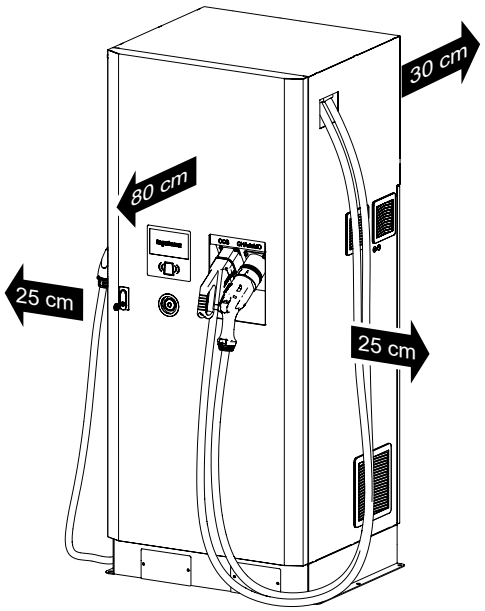
2. Try to locate them as close as possible to the part where the forks and the steering unit meet.
3. Ensure that the forks are perfectly level to avoid overturning the unit. Do not transport the unit at an inclination greater than 18°.
4. In all cases, observe the instructions in the forklift or pallet truck user manual.

# 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

- These units can be installed indoors and outdoors.
- Situate the units in a place that is accessible for installation and maintenance work and which allows access to the control panel.
- Avoid corrosive environments that may affect the proper operation of the unit.
- Do not leave objects on top of the unit or its sides, as they may block the ventilation and cause high temperatures.
- Do not expose it to direct sunlight.
- Do not install the units in inhabited rooms, due to the noise produced during operation.
- If they are installed inside a closed space (room, hut, etc.), provide adequate ventilation. The operating range of the units depends on the environmental temperature, therefore a lack of ventilation may limit their capacity.
- If more than one unit is installed, make sure the hot air extraction of one does not interfere with the correct ventilation of another, leaving a lateral separation of at least 2 meters.
- Keep the following minimum distances free of obstacles.



## 5.2. 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.

## 5.3. Environmental conditions

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

| Environmental conditions | |
|---|---|
| Minimum temperature | -20 ºC |
| Minimum surrounding air temperature | -20 ºC |
| Maximum operating temperature | 60 ºC [1] |
| Maximum relative humidity without condensation | 95% |
| Altitude | 2000 m [2] |

[1] The operation of the unit at temperatures greater than 50 ºC should only occur occasionally and not permanently. Ingeteam is not responsible for the consequences to the unit resulting from operating it at temperatures higher than 50 ºC.
[2] At altitudes higher than 1000 m, 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 60 ºC.

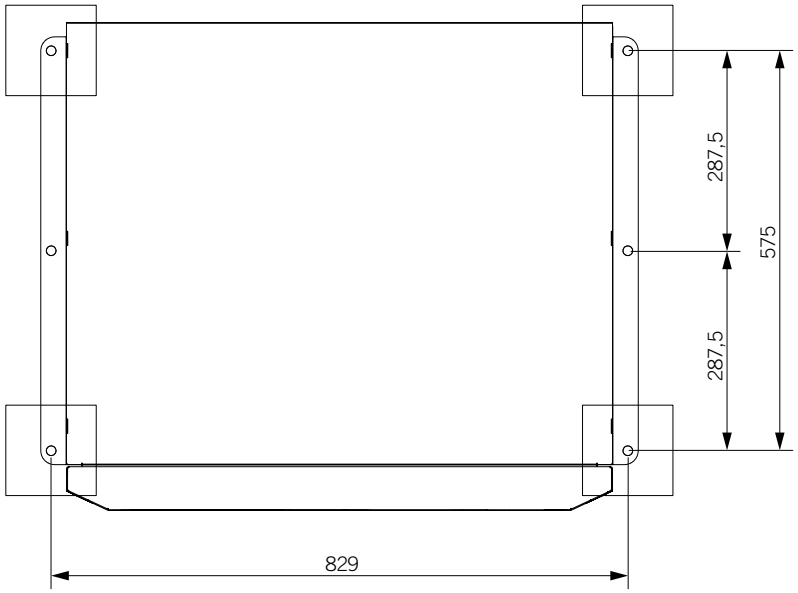
*INFO*

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

# 5.4. Supporting Surface and Fastening

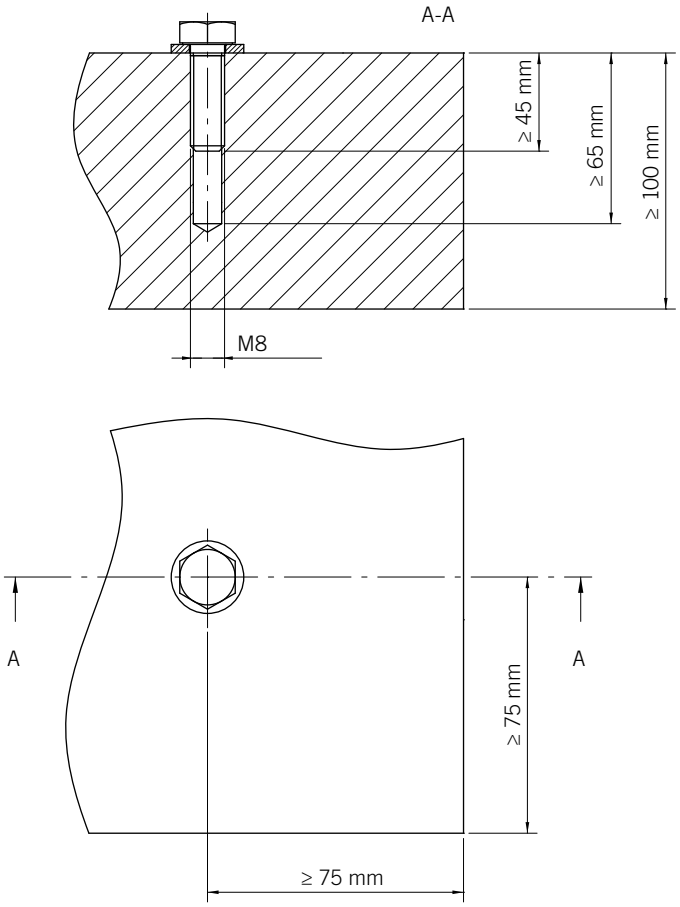
The unit's weight requires a firm base for support, completely horizontal and leveled, assuring proper water drainage and avoiding water accumulation.

To perform the installation calculations it is necessary to take into account the loads that affect the environment conditions, according to the country's regulations, as well as the center of gravity specified in section *"4.1. Center of gravity"*. Below are the four minimum required supports.




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 edge of the concrete pad: 75 mm.
- Diameter of the hole drilled in the concrete pad: 8 mm.
- Minimum depth of the hole drilled in the concrete pad: 65 mm.
- Minimum thickness of the concrete pad: 100 mm.
- Minimum depth of anchoring bolt: 45 mm.
- Minimum tensile strength: 7.7 kN. Security coefficient 1.5.
- Minimum shear strength: 9.3 kN. Security coefficient 1.25.




## 5.5. Fuse requirements

**⚠ CAUTION**

Ingeteam uses the Littelfuse L50QS175.V fuse of 500 Vdc / 175 A / 50 kA and the Littelfuse LSCR001 fuse holder. If replacing the fuse for another one, take into account the specifications of the installed fuse and fuse holder when choosing, and adopt the protection values of the standard fuse as a minimum.

Ingeteam accepts no responsibility for the incorrect choice of fuse in case of replacing the original.

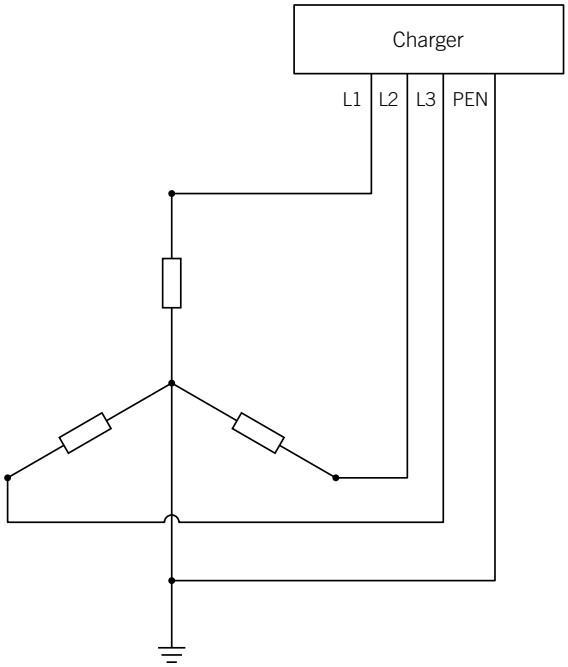
## 5.6. Type of grid

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

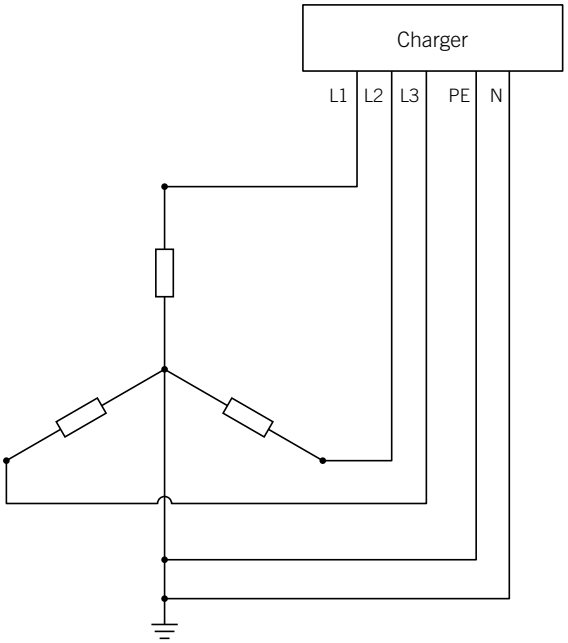
They cannot be connected to IT grids or delta grids with one of their lines grounded.

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

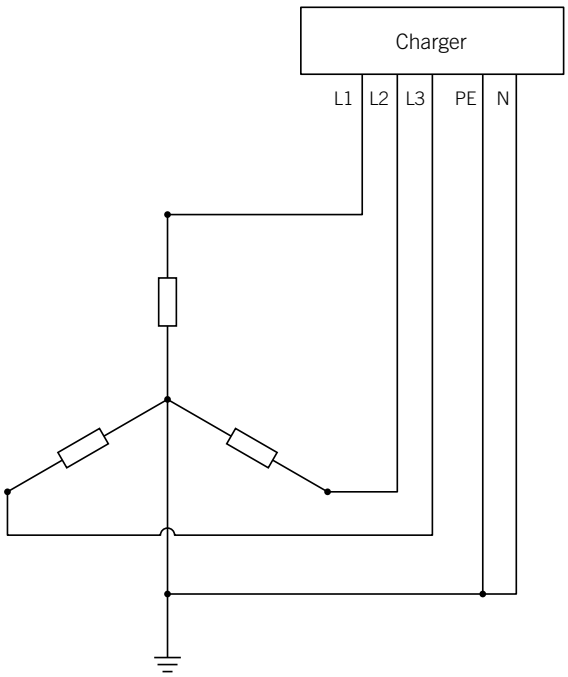
**TN-C**



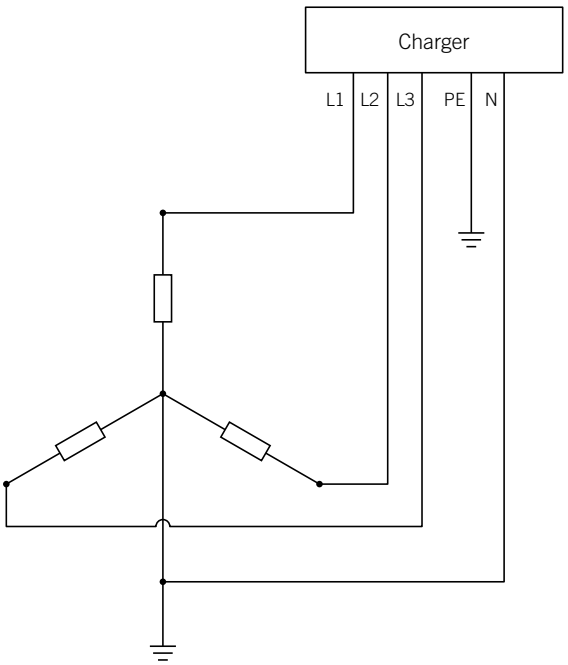

**TN-S**




**TN-C-S**




**TT**



## 5.7. Cabling length

The charger measures the voltage in its connection terminals. For this reason, the installer must use an AC cable with a sufficiently low impedance so that increasing the voltage in the cable (between the distribution transformers and the unit) does not cause the unit to be disconnected due to low voltage.

## 5.8. 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.

## 5.9. Medium voltage transformer

In installations where the use of a medium voltage transformer dedicated to the chargers is required, this transformer must meet the following requirements:

- The transformer must have a rated power equal to or greater than the sum of the power of the chargers installed downstream.
- The transformer must have a star configuration in the low-voltage side and a delta configuration in the high-voltage side.
- In the low-voltage side, the neutral terminal must be accessible and connected to ground.
- It is recommended to use transformers with Ucc <6%.
- It is recommended to use transformers equipped with five-point voltage regulators (0, ±2.5, ±5%).
- The transformer low-voltage side must withstand an earth fault current at three times the grid frequency in the range of 10 Arms/MVA.
- The dimensioning of the transformer must take into account:
    - The voltage and frequency characteristics (and their tolerances) of the connection point.
    - The regulations of the country where it is to be installed.
    - The environmental factors of the installation location (temperature, humidity, altitude, etc.).
- The transformer is an essential part of the installation; its features must be taken into account when designing the necessary downstream protections.

# 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.

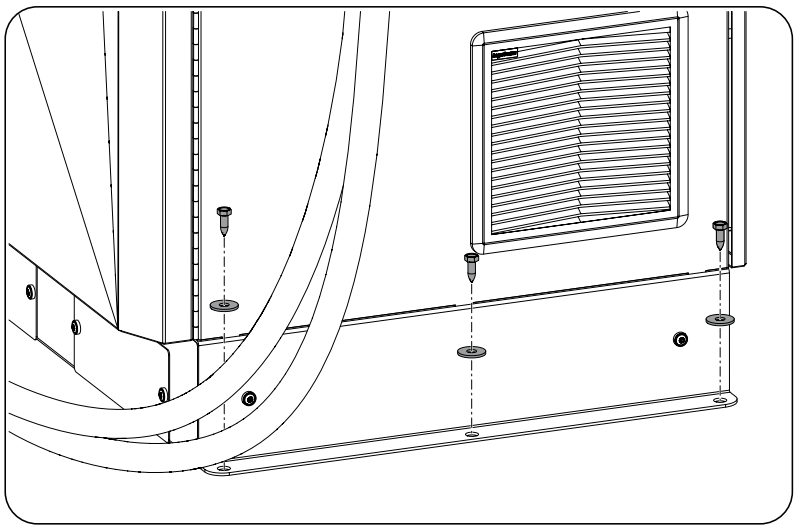
| ⚠ CAUTION |
| --- |
| All installation operations must comply with current regulations. |
| All operations involving moving heavy weights must be carried out using the required mechanical means (crane, hoist, etc.). |

## 6.1. General requirements for installation

- The environment of the unit must be appropriate and meet the guidelines described in chapter *"5. Preparation for installing the unit"*. Additionally, the parts used in the rest of the installation must be compatible with the unit and comply with the applicable legislation.
- The ventilation and workspace must be suitable for maintenance tasks according to the applicable regulations in force.
- The external connection devices, which must be suitable and sufficiently close as set forth in current regulations.
- The feed cables must be of the appropriate gage for the maximum current.
- 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, respecting the distances indicated in section *"5.1. Environment"*.

## 6.2. Fastening the unit

To fasten the unit, bolt a series of bolts to the ground via the dedicated holes on the sides of the lower base.



Follow these steps:

1. Mark the fixing points on the floor.
2. Drill the ground with a proper bit.
3. Bolt through the base's holes.
4. Check that the unit properly secured.

Once the unit has been installed correctly, the connection process will begin.

Make the connections in the following order:

1. Connection of accessories (optional).
2. AC connection.

**⚠ CAUTION**

It is mandatory to follow the order described above. Do not switch on the power until you have made all the connections and closed the unit.

# 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 |
| --- |
| Make sure there is no voltage present on the unit before starting the connection. |
| **Do not switch on the power** to the unit until you have successfully made the rest of the connections and the unit is closed. |
| Use the Personal Protective Equipment specified in section *"Personal Protective Equipment (PPE)"*. |

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

## 7.2. Ethernet communication

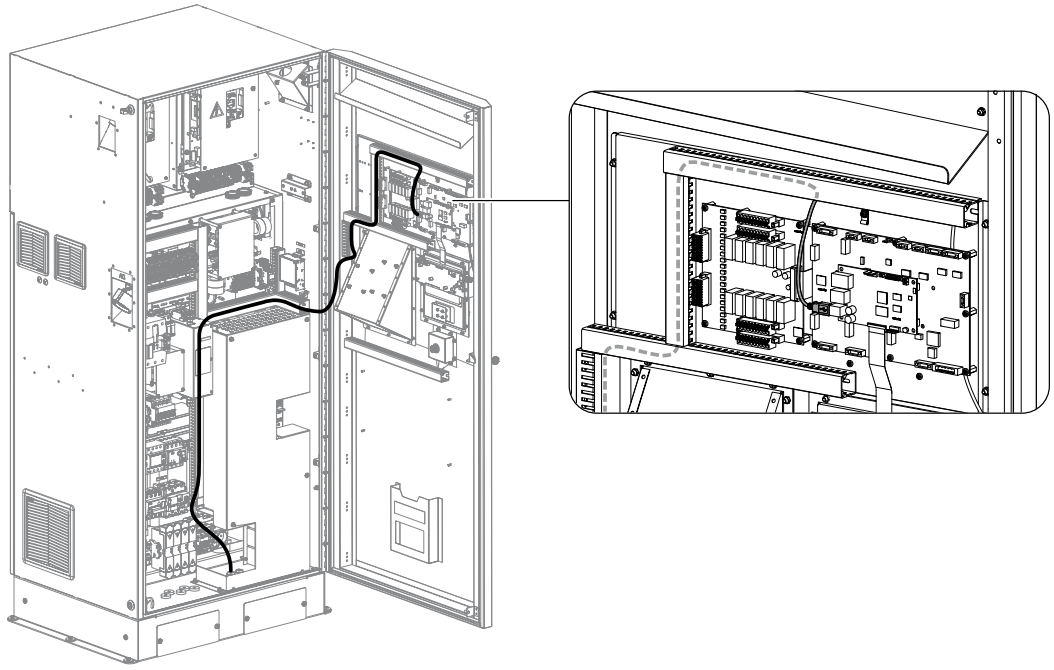
### 7.2.1. Cabling requirements

For Ethernet communication, use a cable with a diameter of 4 to 6 mm.

### 7.2.2. Connection process

To make the connection, follow this order:

1. Introduce the Ethernet cabling through the corresponding gland in the lower cable access area.
2. Guide the cabling through the ducts as shown in the following figure.



3. Insert the RJ45 connector in the card.
4. Press the cable gland to ensure it is sealed, making sure that the cabling is not taut.

# 8. AC connection

This chapter explains the requirements and process for connecting the AC wiring to the unit.

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 the unit is closed. |
| Use the Personal Protective Equipment specified in section *"Personal Protective Equipment (PPE)"*. |
| During the connection, make sure of the proper installation of the cables on the unit's terminals so that parts of accessible wires do not remain live. |
| Respect the polarity of the AC wiring. |

**CAUTION**

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

## 8.2. Wiring requirements for the AC connection

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.

If the charger and the grid connection point are far enough apart to require the use of cables with a larger gage, an external distribution box should be used close to the charger to make this connection.

The AC connection must be made using single-pole cables. A total of five cables are used: three phases, neutral and ground. The conductor material may be copper or aluminum.

**CAUTION**

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

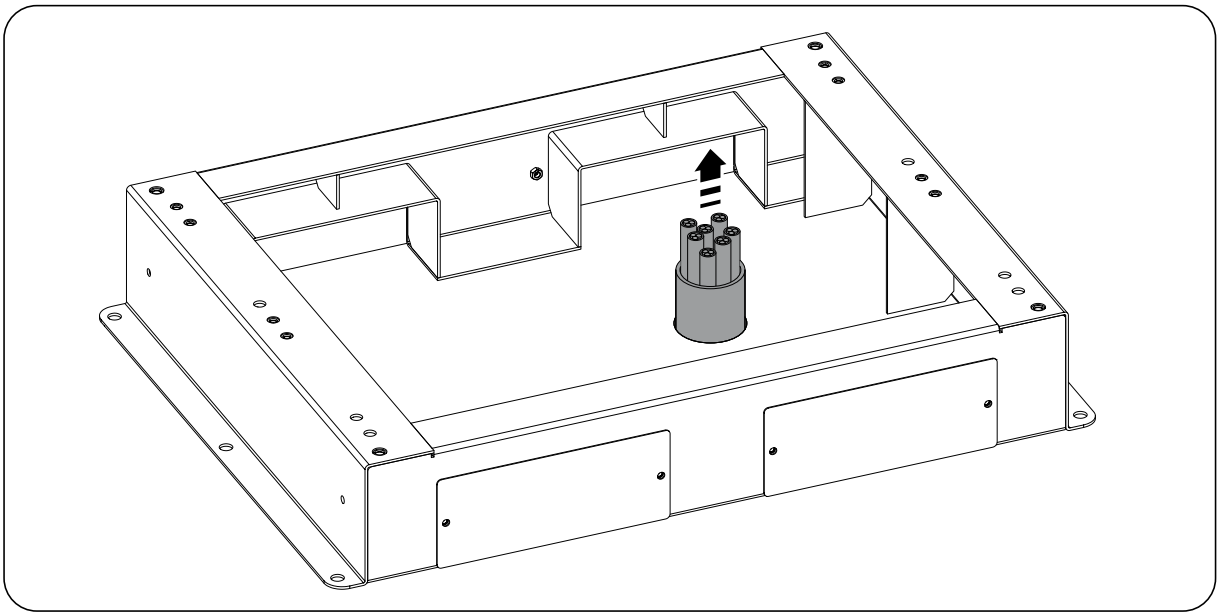
The dimensioning of the ground wiring will be the responsibility of the installer and must meet applicable regulatory requirements in the installation.

The AC input admits a cable section of between 10 $mm^2$ and 70 $mm^2$. The minimum and maximum input cable diameter is 6 to 20 mm. The cables must finish in an M8 spade terminal. The maximum width of the spade must not exceed 28 mm.

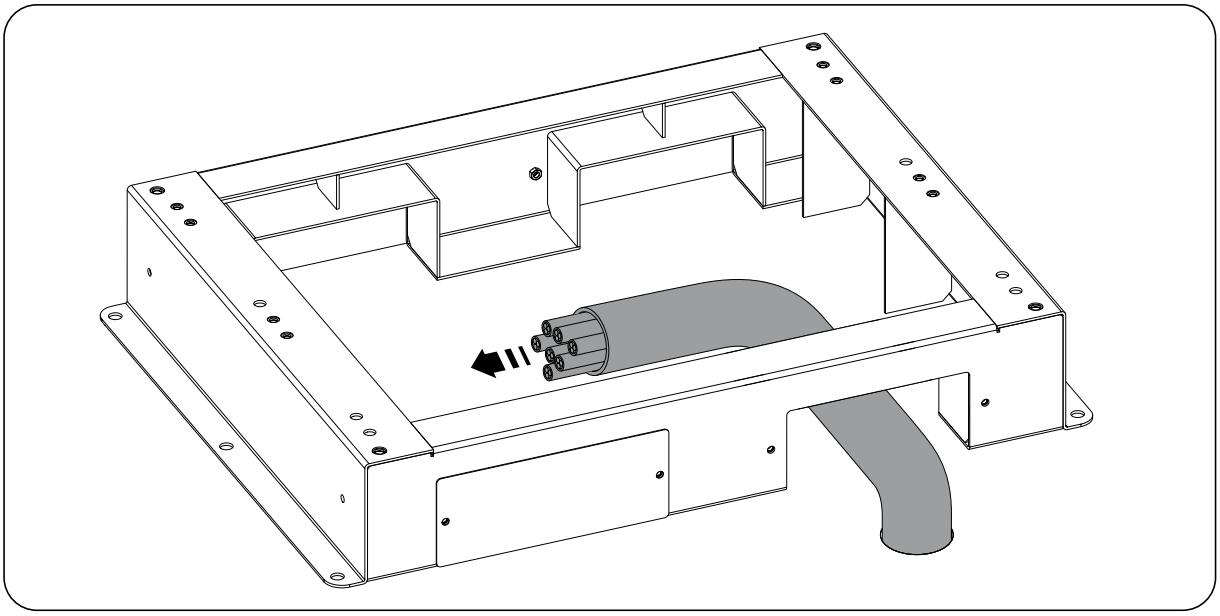
## 8.3. Cabling entrances for the AC connection

The charger is designed so that the cabling is inserted from the bottom. This can be done in the following ways:

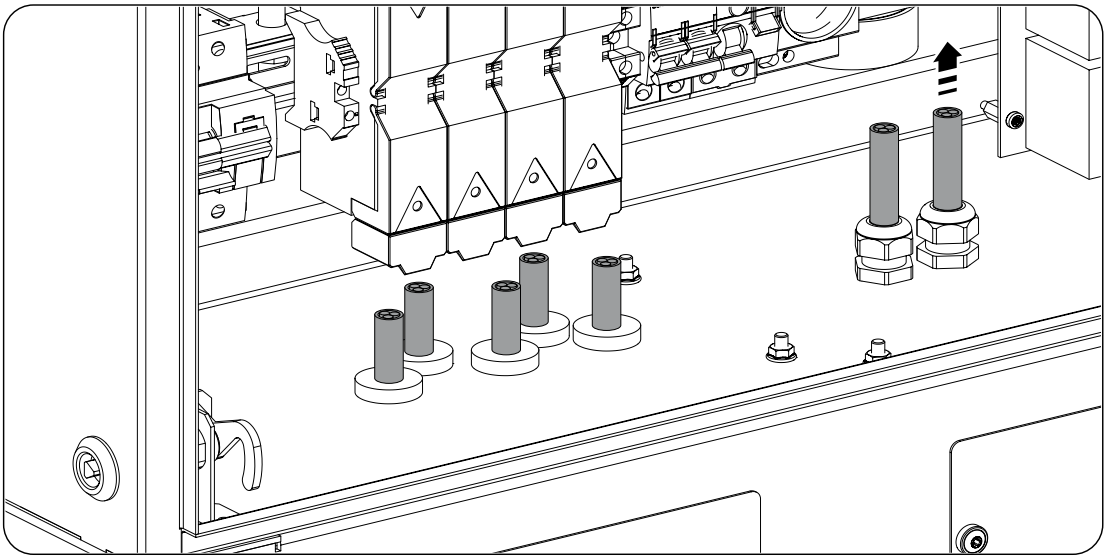
1. Through a conduit on the bottom of the charger



2. Through one of the removable mounting plates



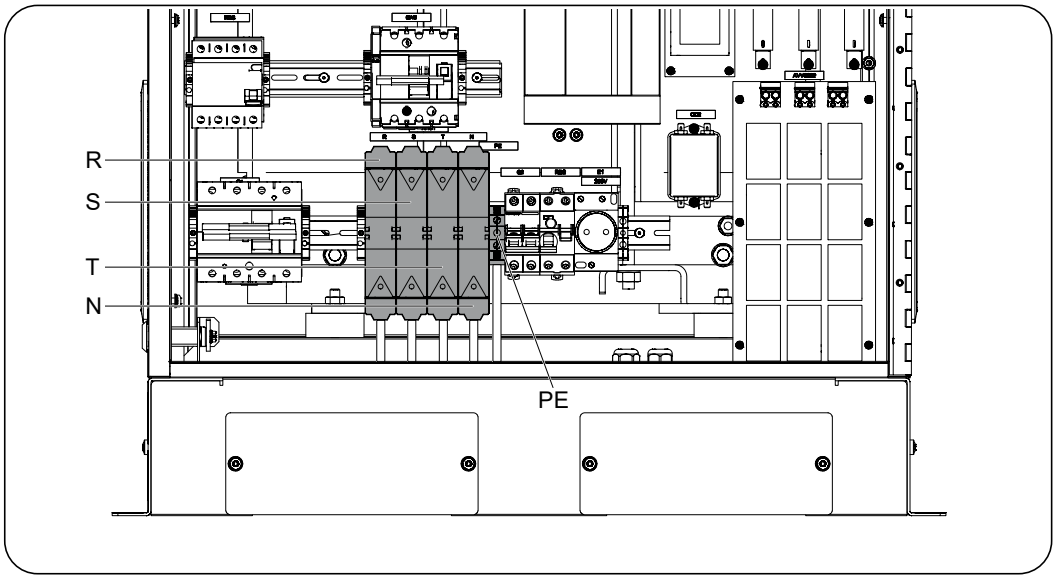
Once the cabling is inside the base, the cables must be passed one by one through the cable glands used for that purpose.



The correct installation of the cable glands must be checked and ensured in order to guarantee the charger's IP protection.

## 8.4. AC connection process

1. Insert the wiring through the cable inlets provided in the lower part of the charger.
2. Connect the three phases, neutral and ground to the terminals marked R, S, T and N and to the grounding bar PE.




The following table includes the tightening torques to be applied to the connection.

| Tightening torques to apply | |
|---|---|
| **Connection** | **Tightening torque** |
| Terminals R, S, T, N | 5 Nm |
| Grounding bar PE | 10 Nm |

3. Check the correct position of the cable grommet membrane and ensure the cabling is not taut.

# 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

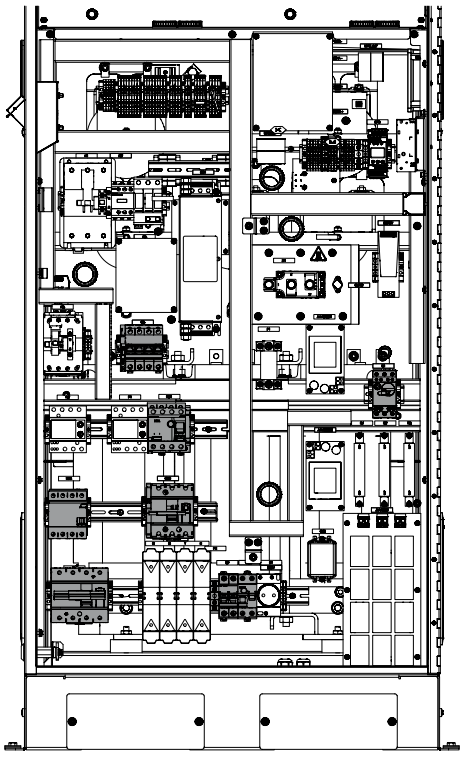
Check that the unit is secured firmly and is not at risk of falling.

#### Review the connection of the AC wiring

Check that the polarities of the three phases (R, S and T), neutral (N) and ground (PE) have been respected.

#### Review the protections

Check that all of the unit's protections are activated.



## 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. Software update

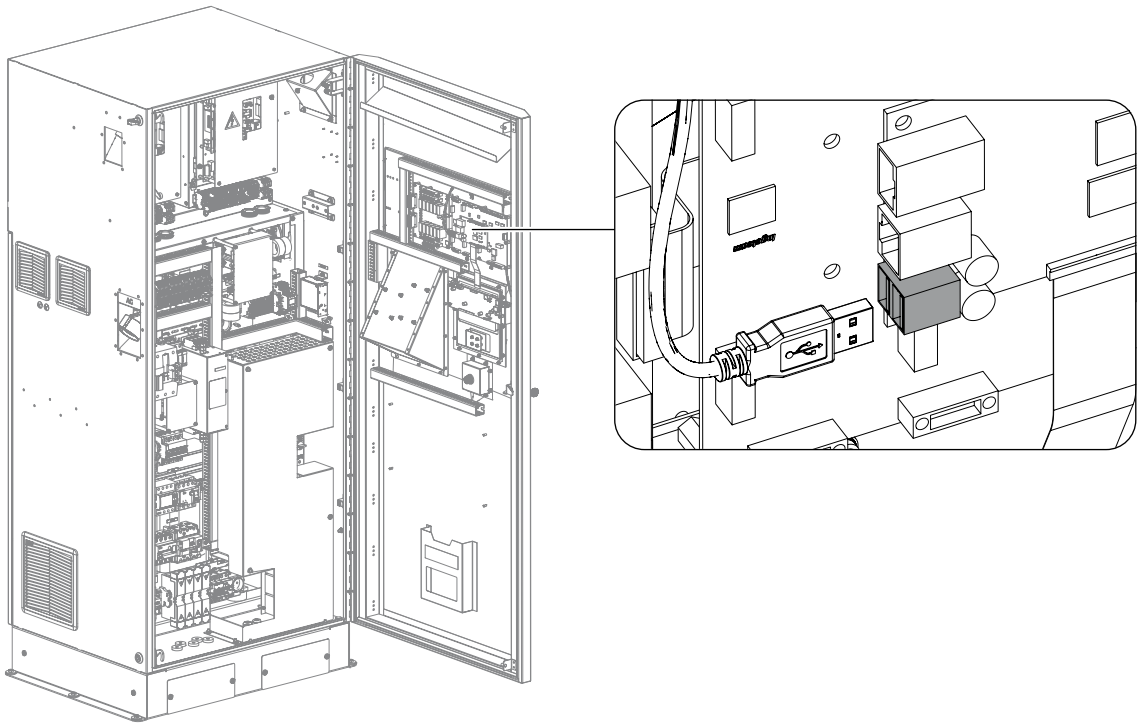
## 10.1. Update via USB

The INGEREV RAPID 50 charging stations can be updated via a USB drive. You can subscribe to the distribution of update files by completing the registration form on the website www.ingerevtraining.com.

Any USB drive formatted as FAT32 should work. However, due to the large variety of USB drives on the market, we cannot guarantee that they will all work. If your unit does not respond, try with a different USB drive model.

To perform the update, proceed as follows:

- Create a folder named rapid on the root of the USB and copy the downloaded tar.bz2 file. The folder must only contain one tar.bz2 file.
- With the unit on, insert the USB into any of the connectors available on the unit's control card.



- The update process will be shown on the unit's screen.

You can check the software version of an INGEREV RAPID 50 charging point in the INGEREV WEB Manager.

If you try to update it to the same version as the unit, it will be indicated on the screen that it already has the latest version and the update will not be performed. This check may take around five minutes.

## 10.2. Automatic software update

INGEREV RAPID 50 units can be configured so that they can be updated automatically. For this, the following conditions are required:

- The unit is connected to the internet. You can check via the INGEREV WEB Manager, as described in the corresponding video on the website www.ingerevtraining.com.
- The unit has access to an FTP server on the network in which it is integrated. In this case, proceed as follows:
  - Unzip the software in a folder on the FTP server on the network.
  - Configure the unit so that it updates automatically from that server.

There is a video on the website *www.ingerevtraining.com* that provides step-by-step instructions on how to configure automatic updates on INGEREV charging stations.

## 10.3. Software update via the INGEREV WEB Manager

You can subscribe to the distribution of update files by completing the registration form on the website *www.ingerevtraining.com*.

The steps to follow are described in the corresponding video on the website *www.ingerevtraining.com*.

# 11. 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 each case are described below.

The configuration is done through the INGEREV WEB Manager application.

## 11.1. Local connection

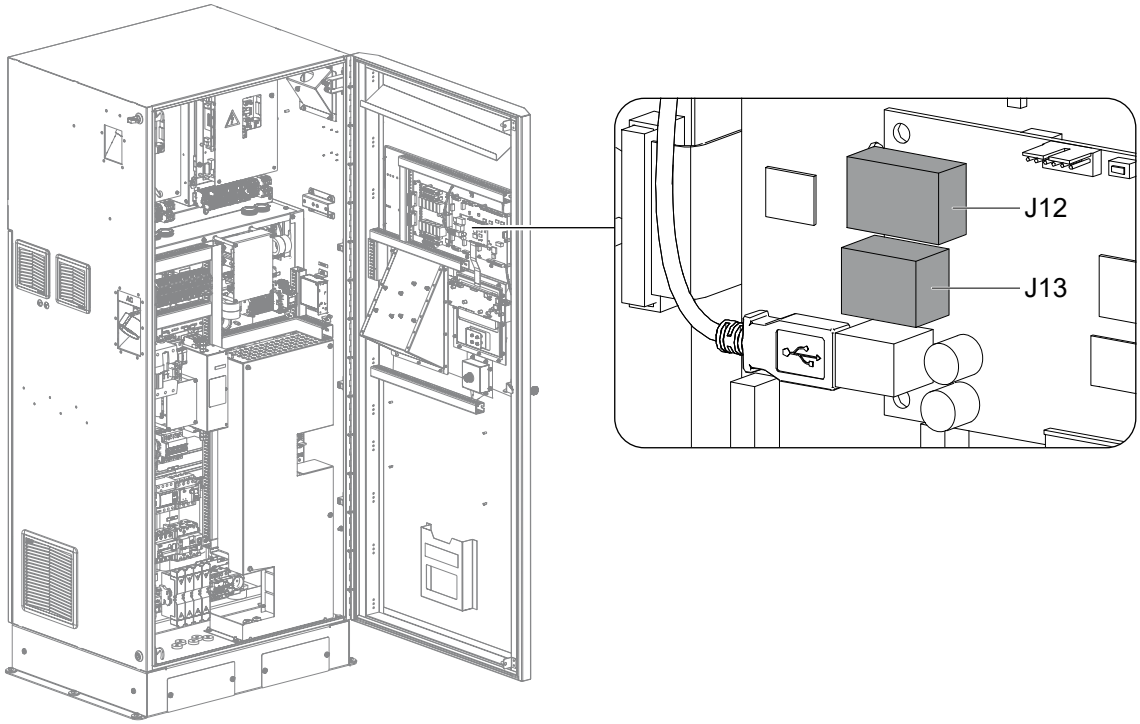
To establish a local connection the charger and computer must be connected to the same communication network.

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

### 11.1.1. Local connection via Ethernet

To make the connection, follow these steps:

1. Connect the computer to the unit using one of the available Ethernet connectors (J12 or J13).




2. On the laptop computer, open the web browser and open *http://SerialNum:8080*, where *SerialNum* corresponds to the unit's serial number (for example, *http://6H0576543210:8080*). The serial number is the unit's unique identification and is located on the specifications plate.
3. Enter the username and password. The username and password are specified on the green card delivered with the unit.
4. Follow the instructions given by INGEREV WEB Manager.

**⚠ CAUTION**

Certain operating systems may reject the above URL due to their settings. In these cases, proceed as follows:

1. Connect the laptop computer to the unit's J12 connector using an Ethernet cable. The J13 connector does not allow this access method.
2. In a web browser access http://192.168.1.33:8080.
3. Follow the steps given in the browser to carry out the configuration process.

### 11.1.2. Local connection via Wi-Fi

By default the unit is configured in *Access Point* mode. This means that it creates as Wi-Fi network that allows connections from devices such as laptop computers, tablets or smartphones.

To make the connection, follow these steps:

1. Connect the device to the network created by the charger. The network name will be the same as the unit's serial number.
2. On the device, open the browser and open http://192.168.2.1:8080.
3. Enter the username and password. The username and password are specified on the green card delivered with the unit.
4. Follow the instructions given by INGEREV WEB Manager.

## 11.2. 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 3G.

To make the connection, follow these steps:

1. With the charger and the computer connected to the Internet, open the web browser and open *http://www.ingerev.com/SerialNum*, where *SerialNum* corresponds to the unit's serial number (for example, *http://www.ingerev.com/6H0576543210*). The serial number is the unit's unique identification and is located on the specifications plate.
2. Enter the username and password. The username and password are specified on the green card delivered with the unit.

# 12. Using the unit

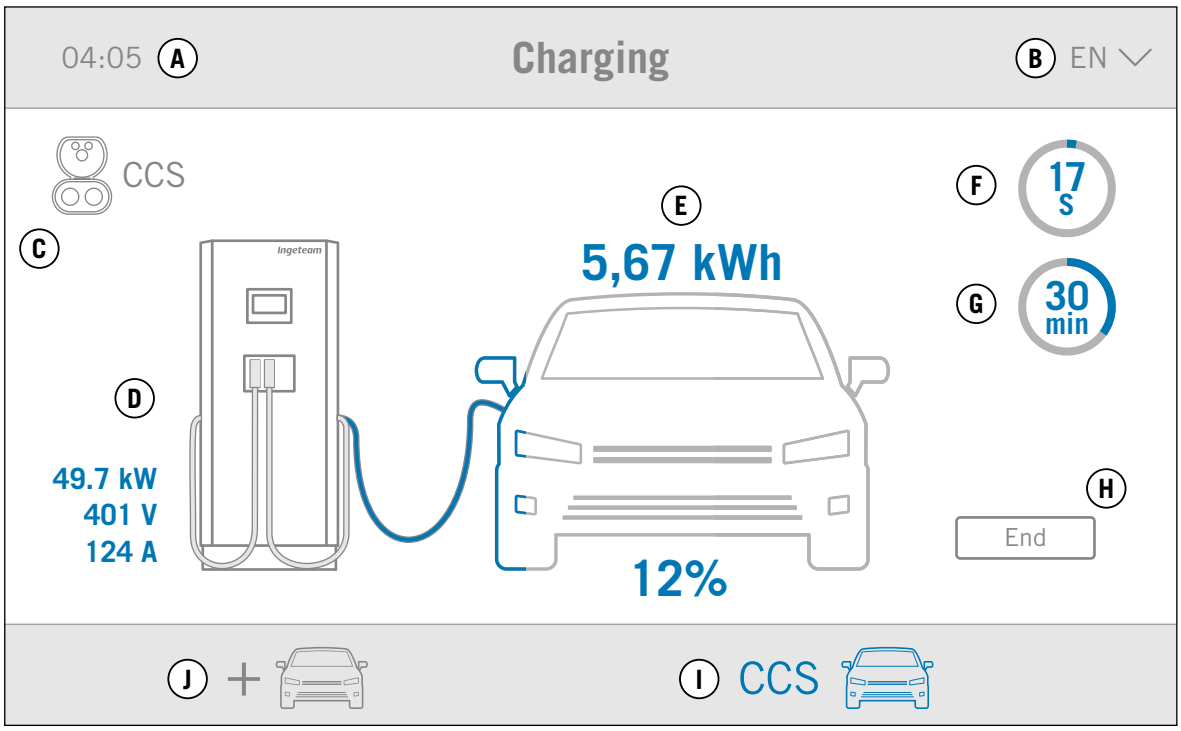
The charger's operation is managed through the display.

With the INGEREV RAPID 50 Trio and One+ it is possible to charge two vehicles at the same time. Both charging sessions can be viewed on the display independently.

In order to manage the charging process, follow the instructions shown on the display.

## 12.1. Charging screen

The charging screen displays the following information:




A. Time

B. Language selection

C. Selected socket

D. Power, energy used, voltage and charging current

E. Charge status

F. Time since the start of the charge

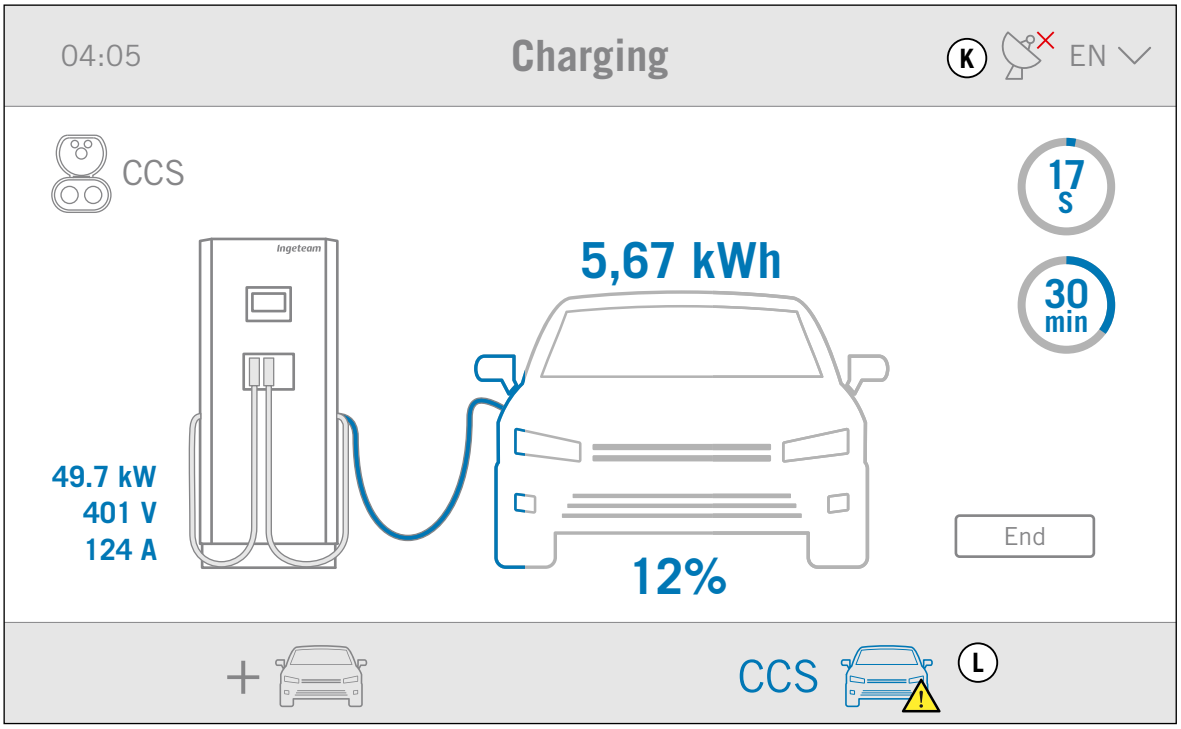
G. Time remaining to complete the charge

H. End charge button

I. Charge session selection

J. Button for adding a charge session where possible. If two charge sessions are open, one or the other can be selected from the bottom bar.

If there is a warning it will be displayed as follows:




K. Communication error. The station has lost the connection with the Internet or with the central manager.

L. Exception in the indicated charge session. In this case it is indicating an incident in charge session number 2.

## 12.2. Charging process

The charging process is described below.

1. Where charging is already taking place at the station, the first step consists of adding a vehicle using the display (otherwise, this step is not necessary). The charging station can perform two charging processes at once: AC and CCS or AC and CHAdeMO. Simultaneous CCS and CHAdeMO charging is not possible. Press the following icon:

2. Select the socket required according to the equipment characteristics. The available sockets will be displayed on the screen.
3. User identification by card is then requested. Place the card near the reader located at the bottom of the display.
4. Details of the applicable rates are shown.
5. Connect the vehicle to the charging station.
6. The charging process starts.
7. Once charging is complete, press *End* and follow the process indicated on the display.

# 13. Troubleshooting

**⚠ CAUTION**

Station troubleshooting must be performed by qualified personnel in compliance with the general safety instructions in this manual.

## 13.1. Alarms

| Alarm | Description | Solution |
|---|---|---|
| Emergency push-button | The emergency stop button is pressed | Release the emergency stop button |
| Connector lock fault | Fault in the connector lock | Disconnect the connector and check its functionality and integrity. If the problem persists, contact Ingeteam. |
| EV communication error | Error in the charging station-electric vehicle communication | Restart the charge process. If the problem persists, contact Ingeteam. |
| Insulation fault | Insulation impedance below limits | Disconnect the connector from the vehicle. Check if the insulation fault has disappeared. If this is the case, the fault is caused in the vehicle, therefore it must be inspected at your regular workshop.<br>If the insulation fault persists, contact Ingeteam. |
| Temperature out of range | The charging station temperature is out of operating range | Check that the radiators are clean and that the fans function correctly.<br>Protect the unit from direct exposure to sunlight.<br>Ensure the ambient temperature is within the operating range. |
| RFID reader error | Fault in card reader | Hold the card near the RFID reader.<br>If the problem persists, contact Ingeteam. |
| Network out of range | AC grid voltage or frequency out of the defined range | Verify that the wiring is correct. Check connections.<br>Check that the voltage or frequency of the electric grid is within range. |
| Device fault | A parameter in the charger is outside the operating range | If the fault is temporary, it will disappear automatically.<br>If it persists, write down the code displayed and contact Ingeteam. |

# 14. 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.
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.

# 15. Maintenance

**⚠ CAUTION**

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

## 15.1. Safety conditions

**⚠ DANGER**

All the maintenance checks included here must be carried out with the machine stopped, under safe conditions for handling, including those specified by the client for these types of operation.

An open housing never implies an absence of voltage in the unit, so only qualified personnel may access the unit, following the safe operation guidelines stipulated in this document.

Before opening the unit, you must remove the power (see section *"14. Shutting down the unit"*).

Make sure there is no voltage present on the unit before starting maintenance operations.

When carrying out maintenance work on the unit, you must wear the personal protective equipment specified in section *"Personal Protective Equipment (PPE)"* of this document.

**⚠ CAUTION**

You must consider the set of conditions listed below as minimum requirements.

Ingeteam accepts no liability for any damages caused by improper use of the equipment. You must propose in advance to Ingeteam any work carried out on any equipment which implies a modification of the original electrical arrangements. These must be studied and approved by Ingeteam.

**ⓘ INFO**

The wiring must be routed inside the unit via a conduit, which is inserted through a coupling in order to maintain the unit's protection class.

## 15.2. 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.

## 15.3. Condition of the housing

You must carry out a periodical inspection of the condition of the enclosure, verifying the condition of the locks and the door, 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.

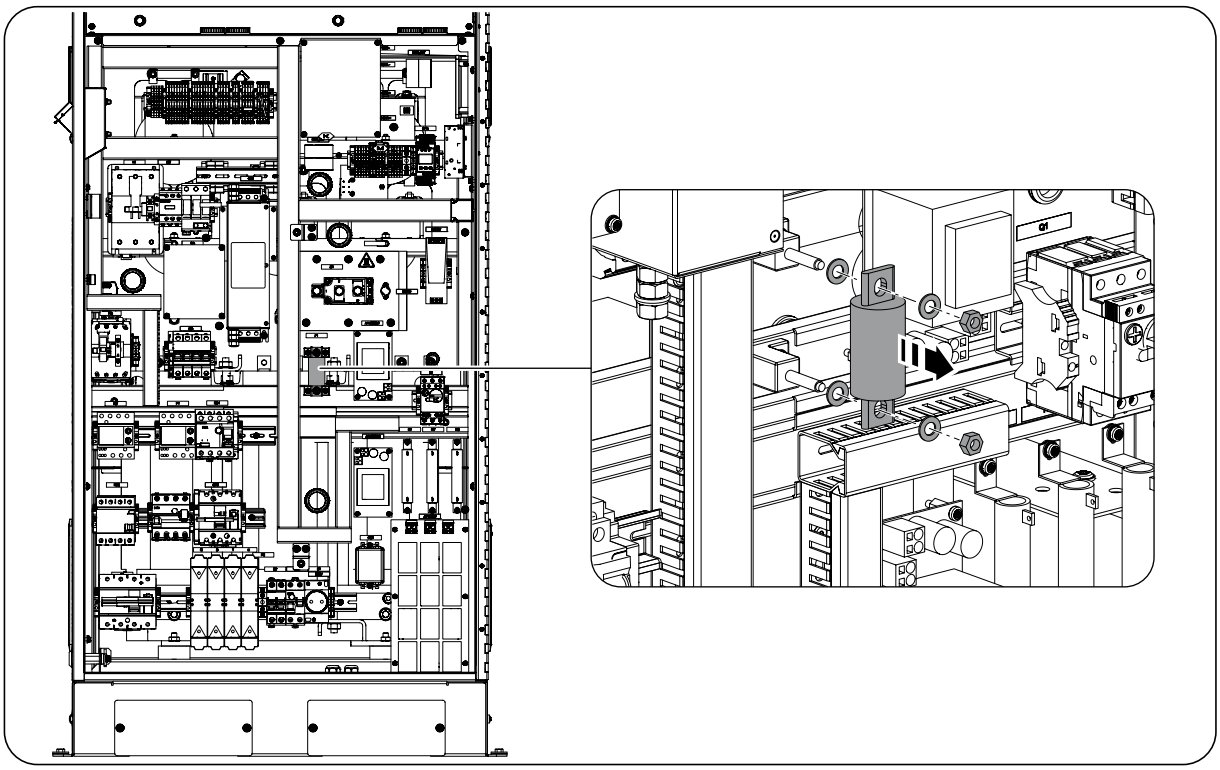
## 15.4. Condition of cables and terminals

You must perform an annual inspection of the cable and terminals conditions:

- Check the correct path of the cables so they do not come into contact with live parts.
- Check the insulation deficiencies and hot spots by checking the color of the insulation and terminals.
- Check that the connections have the correct tightening torque.

# 15.5. Changing the fuse

If the fuse needs to be changed, follow the order below:



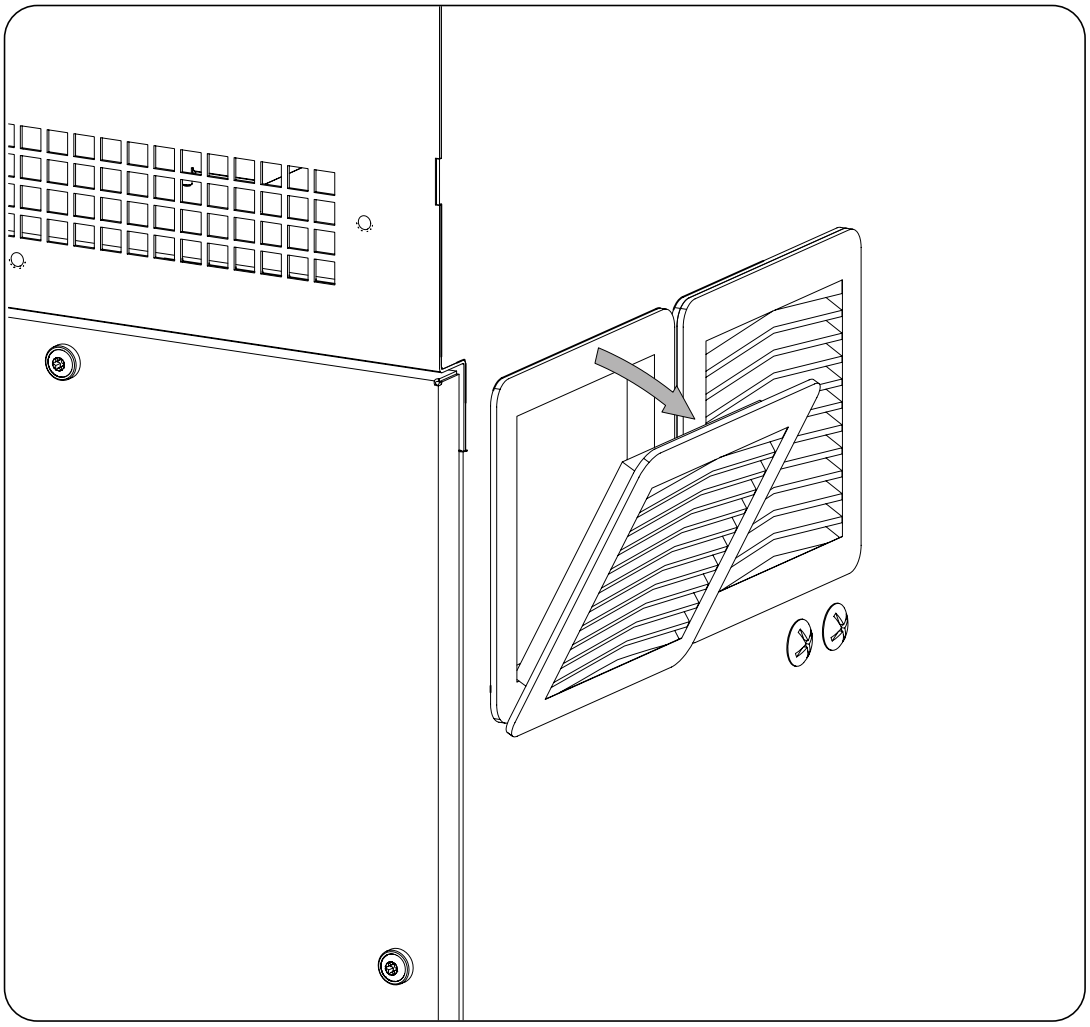
1. Loosen the M6 nuts that secure the fuse.
2. Remove the washers
3. Remove the fuse
4. Install the new fuse
5. Install the washers
6. Firmly tighten the M6 nuts to secure the fuse.

**⚠ DANGER**

The unit may be damaged if the fuse is installed incorrectly in the fuse holder.

## 15.6. Cleaning or replacing filters

Remove and clean the filters on the unit ventilation grilles. In the case of damage, replace with equivalent new filters, class G4 IP55.



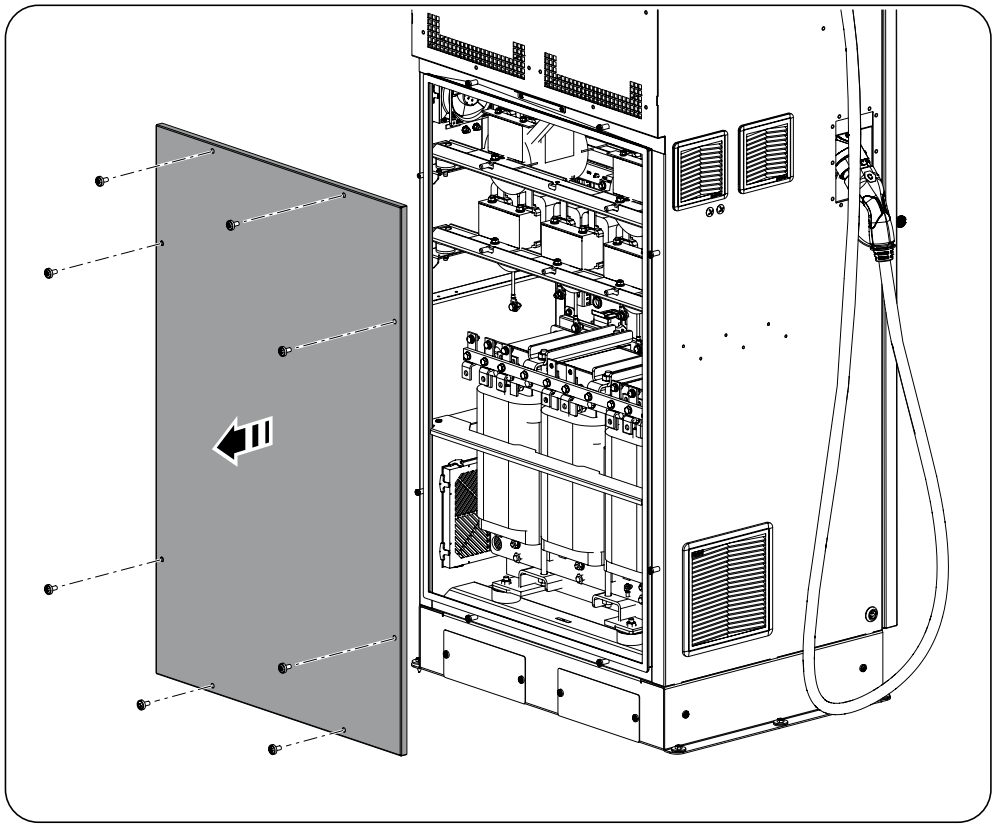
# 15.7. Changing the fans

This charger is equipped with four fans on the sides, which are necessary for its proper cooling.

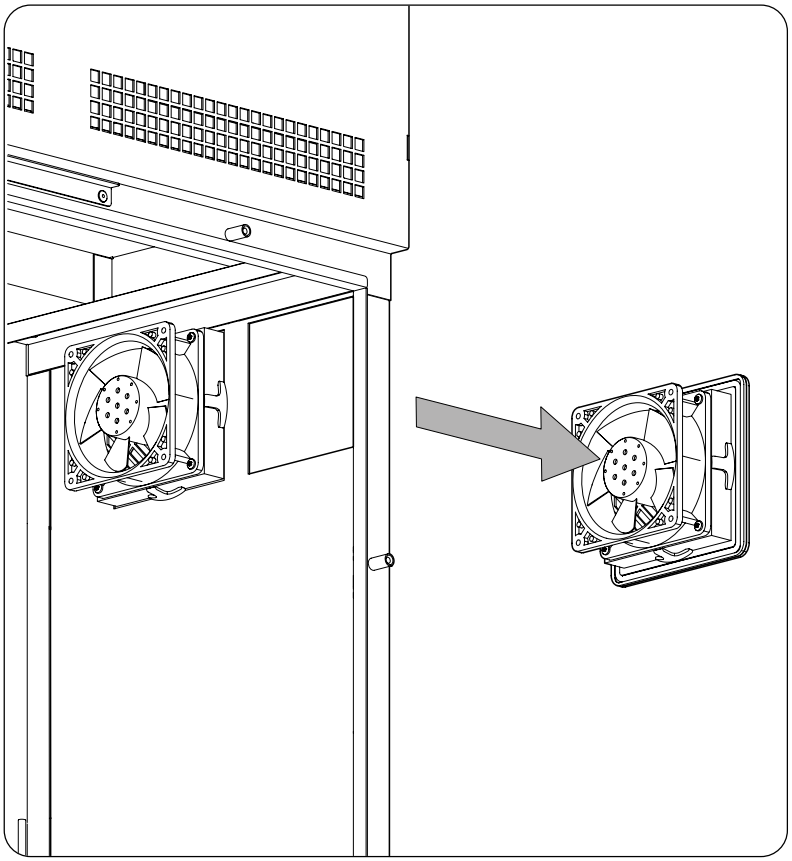
The estimated life of these fans depends mainly on the ambient temperature conditions. In average operating conditions it is estimated that they could last 10 years.

It is recommended to replace the fans after this time. To do this, take the following steps:

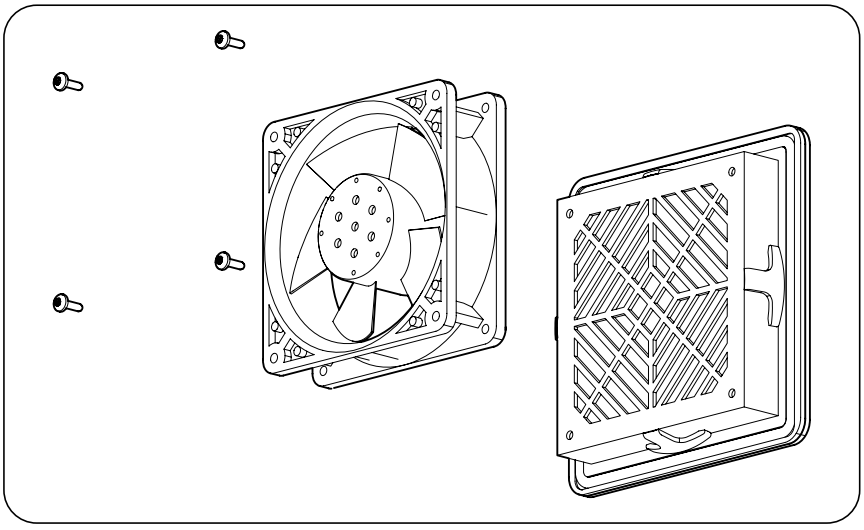
1. Remove the rear cover from the charging station.



2. Unlock the fan-filter holder assembly from inside the station. Take care with the fan wiring.



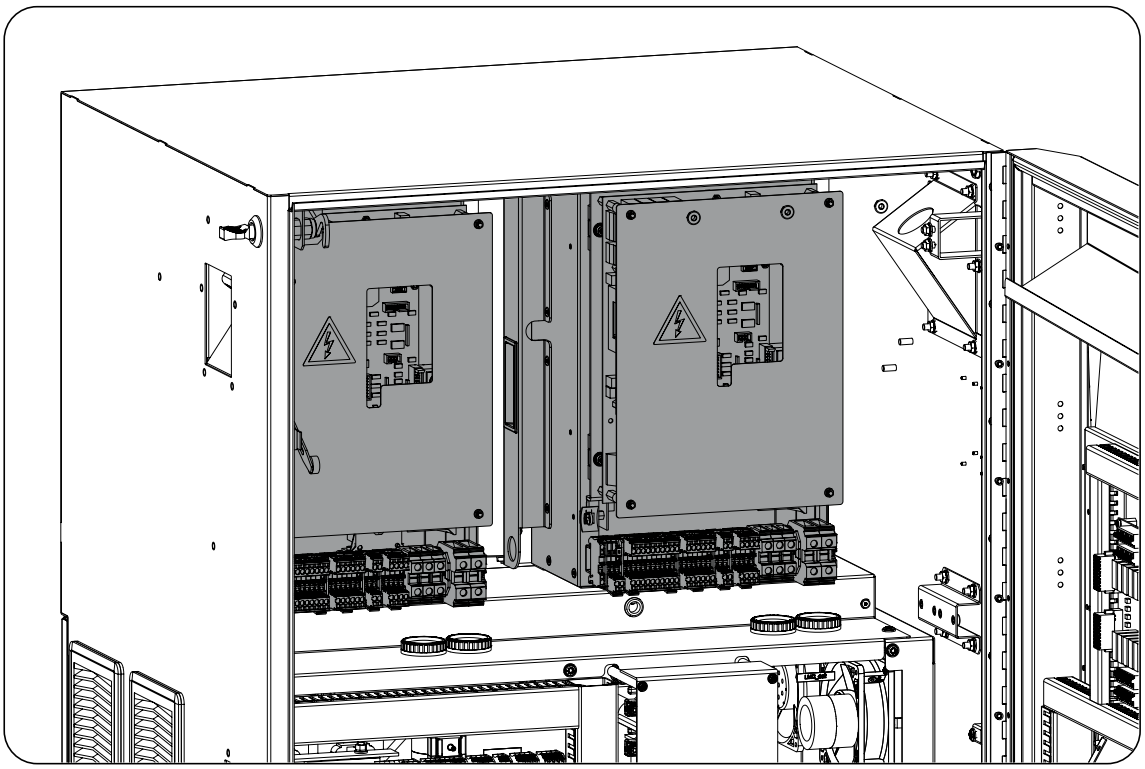
3. Remove the fastening bolts from the fan.



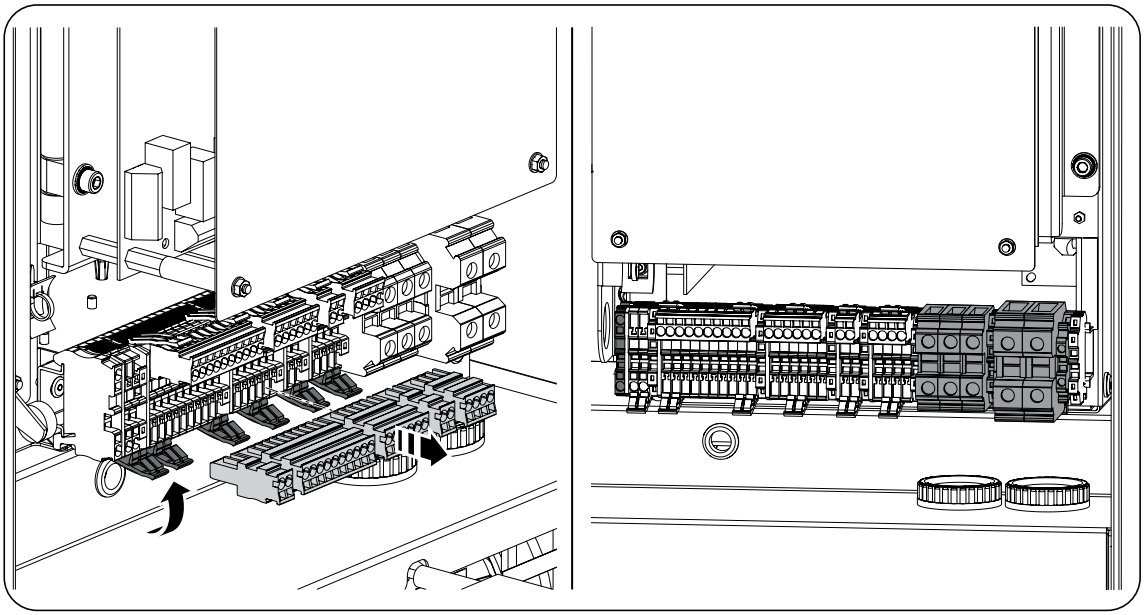
4. Disconnect the fan wiring.
5. Replace with the new fan and follow the instructions in reverse order to complete the installation.

# 15.8. Changing the power blocks

To change the power blocks:

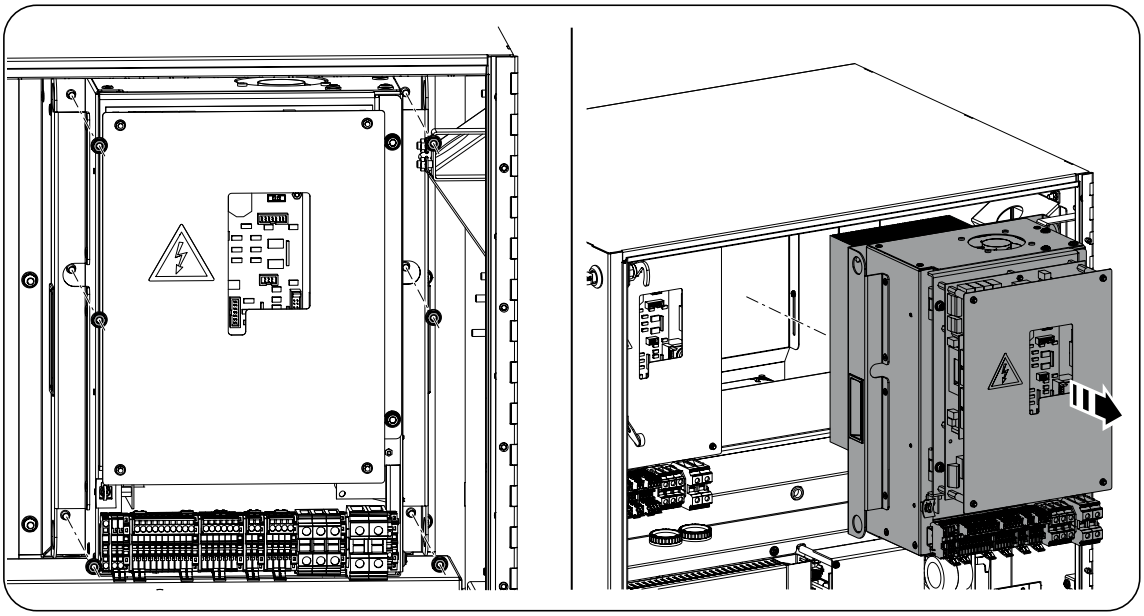


1. Switch the charger off and wait 10 minutes for the unit's capacities to discharge.
2. Remove the lower aerial connectors from the terminal block.
3. Release the lower power cables and the ground cable.



4. Loosen the six screws that secure the frequency changer.

5. Remove the power block.



Proceed in the reverse order to insert the new power block.

# 16. Waste handling

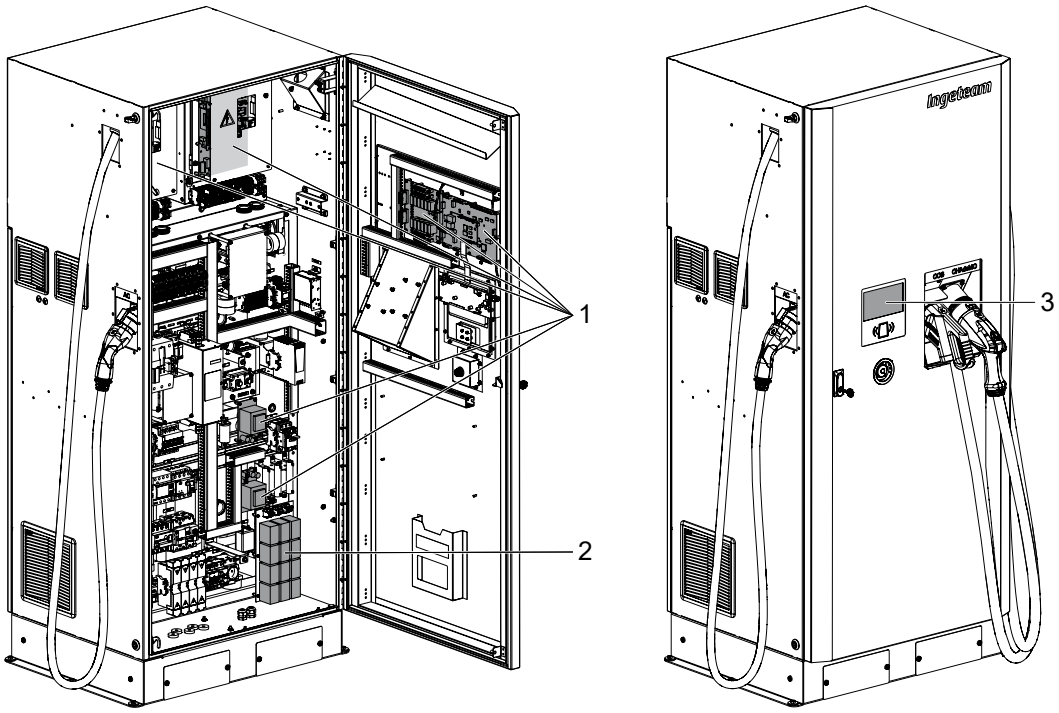
These units use components that are harmful to the environment (electronic cards, batteries or cells, etc.).

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.



# 17. Fire procedure

INGEREV RAPID 50 electric vehicle charging stations are designed to prevent, as far as possible, any type of fire. However, in an anomalous situation, a fire could occur. In such cases, the fire procedure is similar to the common electrical panel procedure.

To put the fire out, proceed as follows:

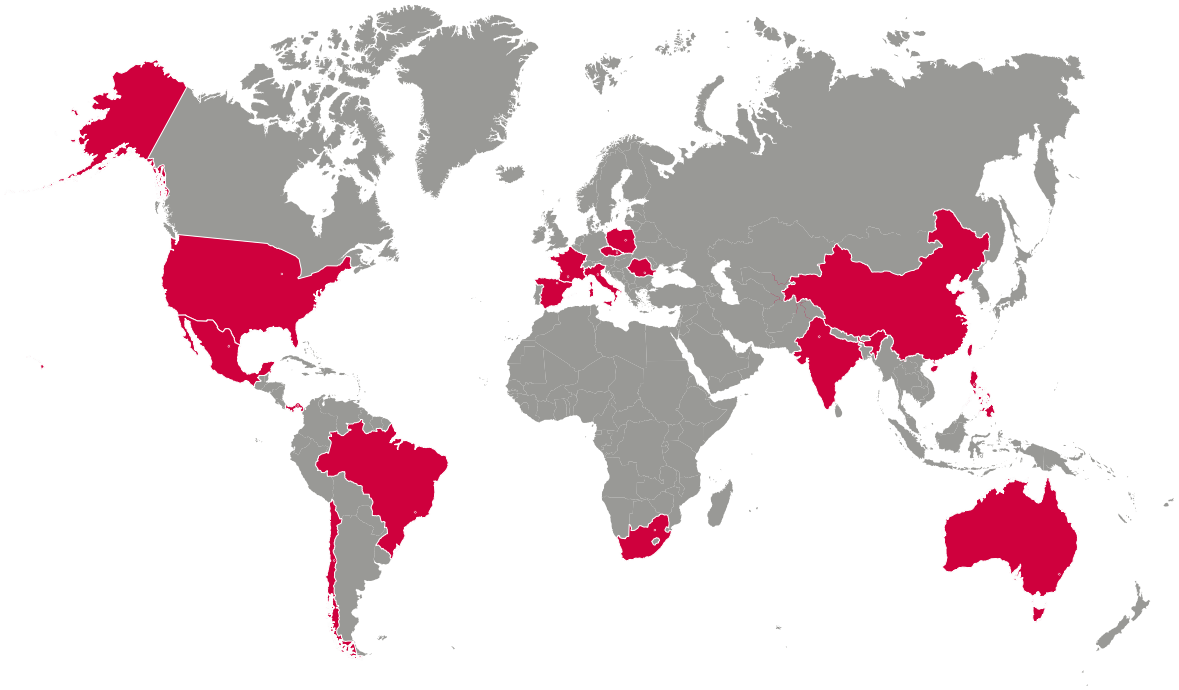
1. Press the emergency stop button if the charging station has one and if it is possible to do so.
2. Cut off the power supply by triggering the internal protections of the charging station. If it is not possible to do so safely, cut off the power supply by triggering the protections upstream of the charging station.
3. Use the $CO_2$ (class C) extinguisher.

It is very important to note that:

- The use of water is prohibited, unless expressly indicated by fire-fighters and after making sure the power is cut off.
- There is a risk of inhaling toxic substances. Beware of vapors that may be generated.
- There is a risk of burns. Be careful when touching the charging station once the fire has been put out. It must be left to cool down.
- Ensure waste is disposed of properly.

## Notes - Notas - Remarques - Note - Notas

## Notes - Notas - Remarques - Note - Notas



## Europe

**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
email: solar.energy@ingeteam.com

**Ingeteam SAS**
Le Naurouze B - 140 Rue Carmin
31676 Labège - France
Tel: +33 (0)5 61 25 00 00
Fax: +33 (0)5 61 25 00 11
email: france@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
email: italia.energy@ingeteam.com

**Ingeteam, a.s.**
Technologická 371/1
70800 OSTRAVA - PUSTKOVEC
Czech Republic
Tel: +420 59 732 6800
Fax: +420 59 732 6899
email: czech@ingeteam.com

**Ingeteam Sp. z o.o.**
Ul. Koszykowa 60/62 m 39
00-673 Warszawa - Poland
Tel: +48 22 821 9930
Fax: +48 22 821 9931
email: polska@ingeteam.com

**Ingeteam Service S.R.L.**
Bucuresti, Sector 2, Bulevardul Dimitrie Pompeiu Nr 5-7
Cladirea Hermes Business Campus 1, Birou 236, Etaj 2
Romania
Tel.: +40 728 993 202

## America

**Ingeteam INC**.
3550 W. Canal St.
Milwaukee, WI 53208 - USA
Tel: +1 (414) 934 4100
Fax: +1 (414) 342 0736
email: solar.us@ingeteam.com

**Ingeteam, S.A. de C.V.**
Ave. Revolución, nº 643, Local 9
Colonia Jardín Español - MONTERREY
64820 - NUEVO LEÓN - México
Tel: +52 81 8311 4858
Fax: +52 81 8311 4859
email: northamerica@ingeteam.com

**Ingeteam Ltda.**
RuaEstácio de Sá, 560
Jd. Santa Genebra
13080-010 Campinas/SP - Brazill
Tel: +55 19 3037 3773
email: brazil@ingeteam.com

**Ingeteam SpA**
Los militares 5890, Torre A, oficina 401
7560742 - Las Condes
Santiago de Chile - Chile
Tel: +56 2 29574531
email: chile@ingeteam.com

**Ingeteam Panama S.A.**
Av. Manuel Espinosa Batista, Ed. Torre Internacional
Business Center, Apto./Local 407 Urb.C45 Bella Vista
Bella Vista - Panama
Tel.: +50 761 329 467

## Africa

**Ingeteam Pty Ltd.**
Unit 2 Alphen Square South
16th Road, Randjiespark,
Midrand 1682 - South Africa
Tel: +2711 314 3190
Fax: +2711 314 2420
email: southafrica@ingeteam.com

## Asia

**Ingeteam Shanghai, Co. Ltd.**
Shanghai Trade Square, 1105
188 Si Ping Road
200086 SHANGHAI - P.R. China
Tel: +86 21 65 07 76 36
Fax: +86 21 65 07 76 38
email: shanghai@ingeteam.com

**Ingeteam Power Technology India Pvt. Ltd.**
2nd floor, 431
Udyog Vihar, Phase III
122016 Gurgaon (Haryana) - India
Tel: +91 124 420 6491-5
Fax: +91 124 420 6493
email: india@ingeteam.com

**Ingeteam Philippines Inc.**
Office 2, Unit 330, Milelong Bldg.
Amorsolo corner Rufin St.
1230 Makati
Gran Manila - Philippines
Tel.: +63 0917 677 6039

## Australia

**Ingeteam Australia Pty Ltd.**
iAccelerate Centre, Building 239
Innovation Campus, Squires Way
NORTH WOLLONGONG, NSW 2500 - Australia
Tel.: +61 499 988 022
email: australia@ingeteam.com

ABT2013IQM01_A
07/2022

Ingeteam