# User Manual

## Keywatt 50 Cube CE

DUM1017795-EN_V001b

Beyond Charging

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither IES Synergy nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use IES Synergy software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

# Table of content

# 1. Safety notes

## Notice

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger hazard statements indicates that an electrical hazard exists, wich result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personnal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

| ⚠ DANGER |
| --- |
| **DANGER** indicates an imminently hazardous situation which, if not avoided, **will result** in death or serious injury. |

| ⚠ WARNING |
| --- |
| **WARNING** indicates a potentially hazardous situation which, if not avoided, **can result** in death or serious injury. |

| ⚠ CAUTION |
| --- |
| **CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result** in minor or moderate injury. |

| NOTICE |
| --- |
| **NOTICE** is used to address practices not related to physical injury. |

## Please note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by IES Synergy for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

# 2. About this manual

## Purpose of this manual

Technical documentation is an integral part of a product. Until it is disposed of, always keep the technical documentation close to the unit at hand, as it contains important information. Provide technical documentation to the person concerned if you sell, assign or lend the product.

This guide aims to provide informations needed for installation, use and end-of life of the Keywatt 50 Cube. This guide must be read with other related documents. This guide is intended for users of the charger.

## Document scope

This guide concerns the following charger:

- P/N : PFCU1017795

## Related documents

| Document title | Reference |
|---|---|
| User Manual | DUM1017795-EN |
| Service Manual | DMM1017795-EN |

## User comments

We invite you to write to us to communicate any inaccuracies or omissions, or to make general comments or suggestions regarding the quality of this manual.

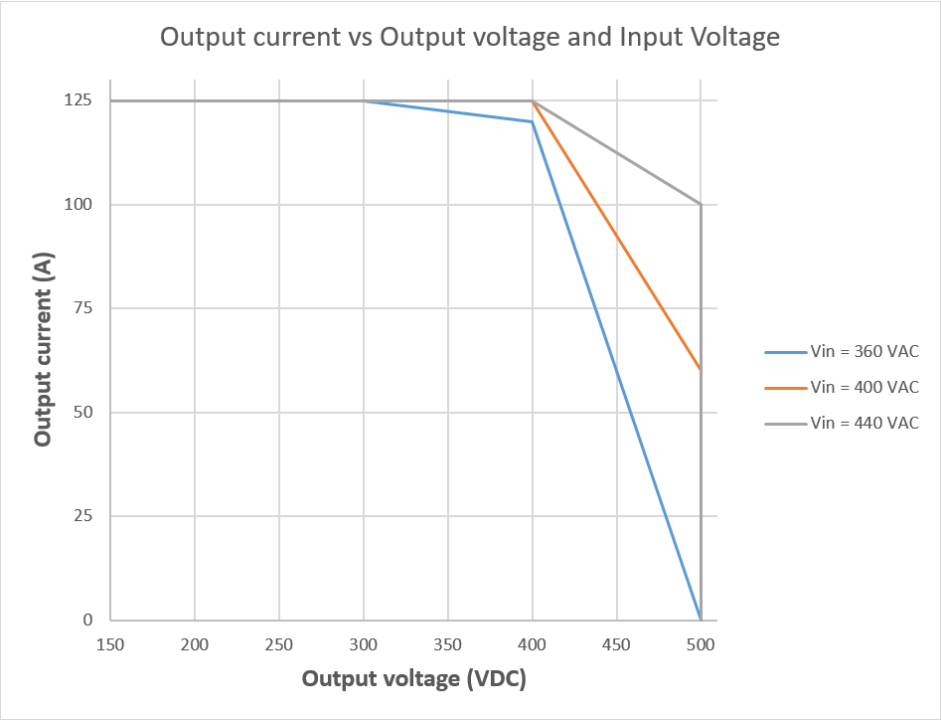
## Compliance

## Symbol

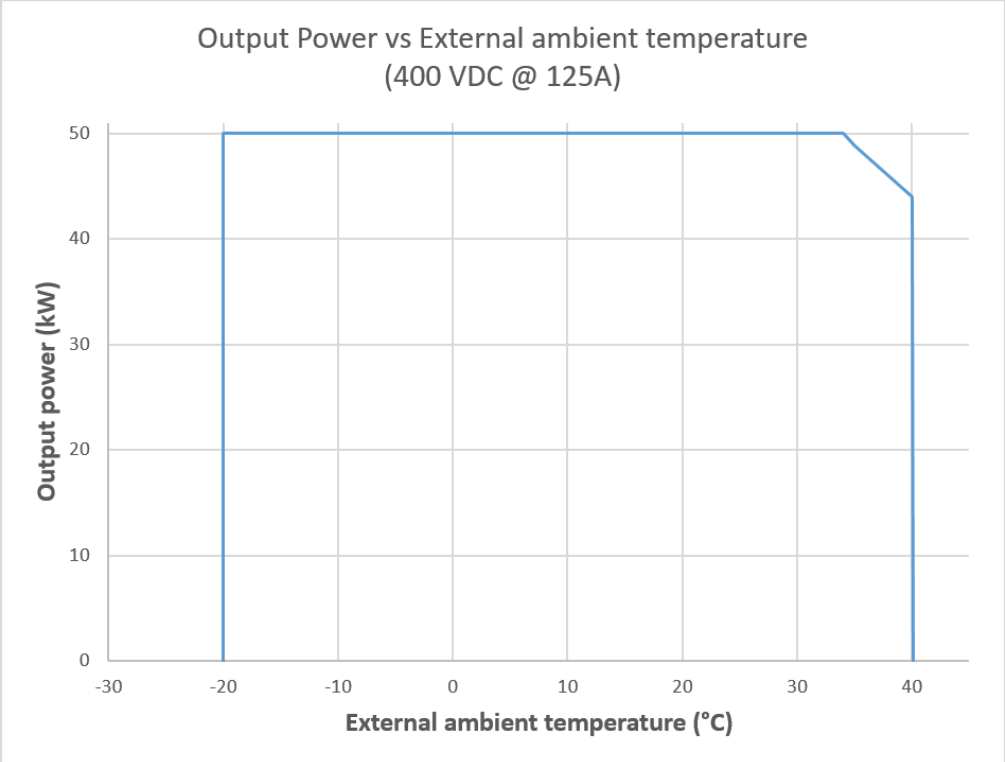
The presence of this symbol on a label indicates that the charger is designed for indoor use only.

# Derating

Derating curve in current according to the mains voltage




Derating curve in power according to the temperature



# 3. General safety instructions

**⚠ WARNING**

**SAVE THIS MANUAL**

- To ensure proper and safe operation, please read these user instructions carefully and keep them for future reference.
- This manual contains important instructions for the DC quick charger that shall be followed during installation, operation and maintenance of the unit.
- This equipment shall be installed, adjusted, and serviced by qualified electrical personnel familiar with the construction and operation of this type of equipment and associated hazards.

**Failure to follow these instructions may result in death, serious injury or equipment damage.**

**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, INJURY, AND/OR BURNING**

- **This equipment is for professional use only.**
- Only qualified, trained and authorized people will repair, replace or adjust this equipment.
- Do not use the charger as a storage area.
- Do not let a child play near the product.
- This charger may only be used on a non-flammable surface such as concrete or similar.
- The use of the device must be restricted to indoor use.
- Keep the charger away from water or water vapor.
- Be sure to mechanically lock the connectors before connecting the charger to the mains.
- The vehicle cable must be disconnected from the vehicle before any intervention on the charger.
- Do not attempt to open the unit or remove any of its components (covers, shutters, doors, etc.) except by qualified personnel.
- Do not open the door at any time while input power is present.
- Wait 15 minutes before opening the door. Residual voltage remains present after the power failure.
- Do not use this product if the cables (input or output) are frayed, have damaged insulation or any other signs of damage.
- Do not use this product if the enclosure or the EV connectors are broken, cracked, opened or show any other indication of damage.
- Replace the damaged cables by same caracteristics cables.
- Do not use a cord extension set, second cable assembly or adaptors in addition to the cable assembly for the connection of the EV to the EVSE.
- Do not obstruct the ventilation openings on the front and back of the charger.
- Leave a minimum space of 300mm around the charger.

**Failure to follow these instructions can result in death or serious injury**

**⚠ WARNING**

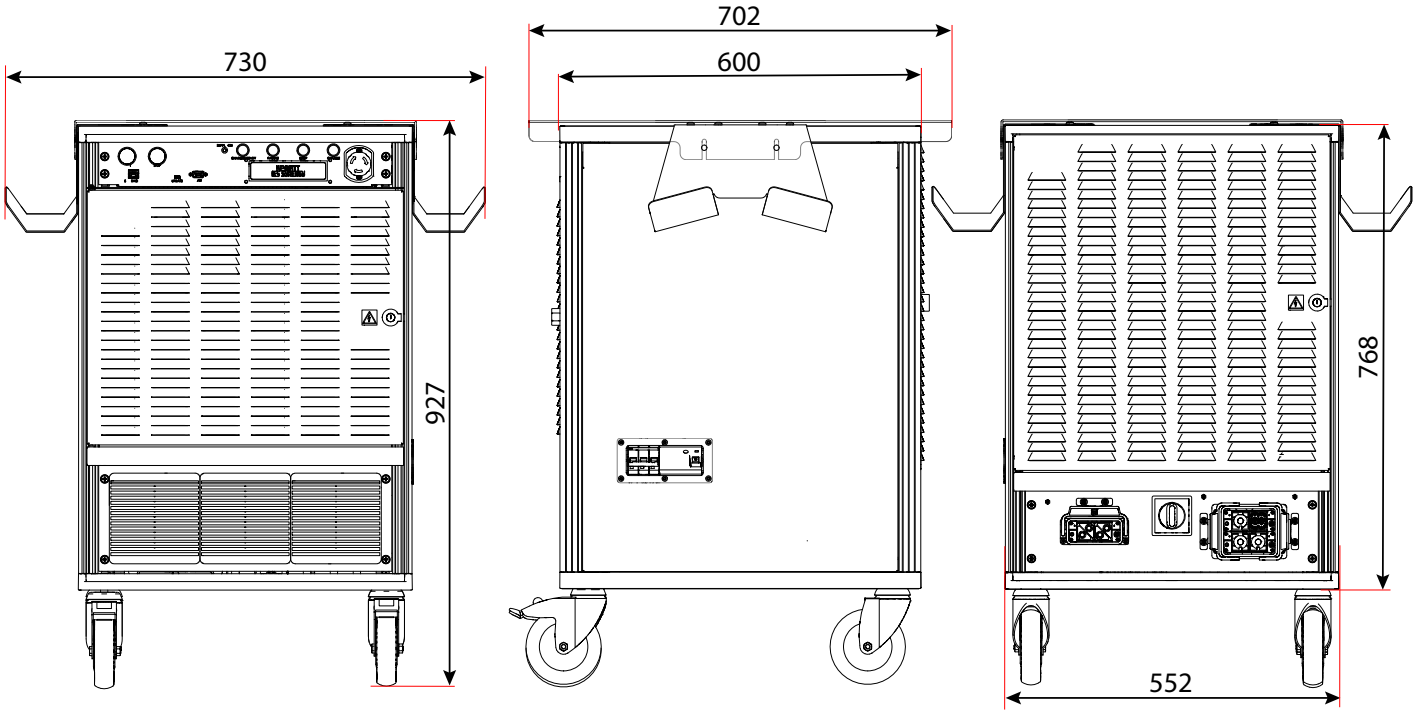
**WARNING** : the enclosure of this equipment is rated IP21. You should take care to avoid the use of small parts next to the equipment.

# 4. Overview

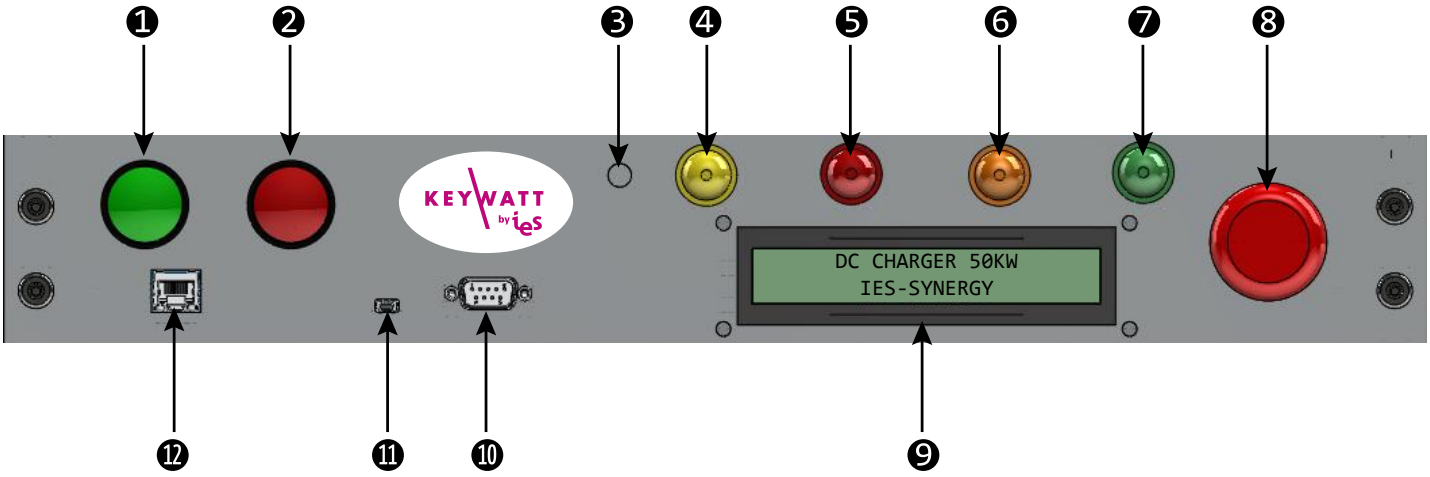
## General overview

The charger IES Cube 50kW is a mobile charging solution for the electric vehicles.
Easy to move and connect, IES mobile charging solutions facilitate fast charging in changing environments.
Thanks to its « Harting » connector, its protocol cable can be changed in a few minutes, in Combo, CHAdeMO or GB.
Based on many years of experience, IES mobile chargers provide a robust solution to facilitate the development of new vehicles by manufacturers.
Solid and reliable, they are also used to charge the batteries of new vehicles at the end of the production line.
Easily connectable to the mains without resorting to a heavy installation, they are also useful in concession or repair shops.

## Dimensions



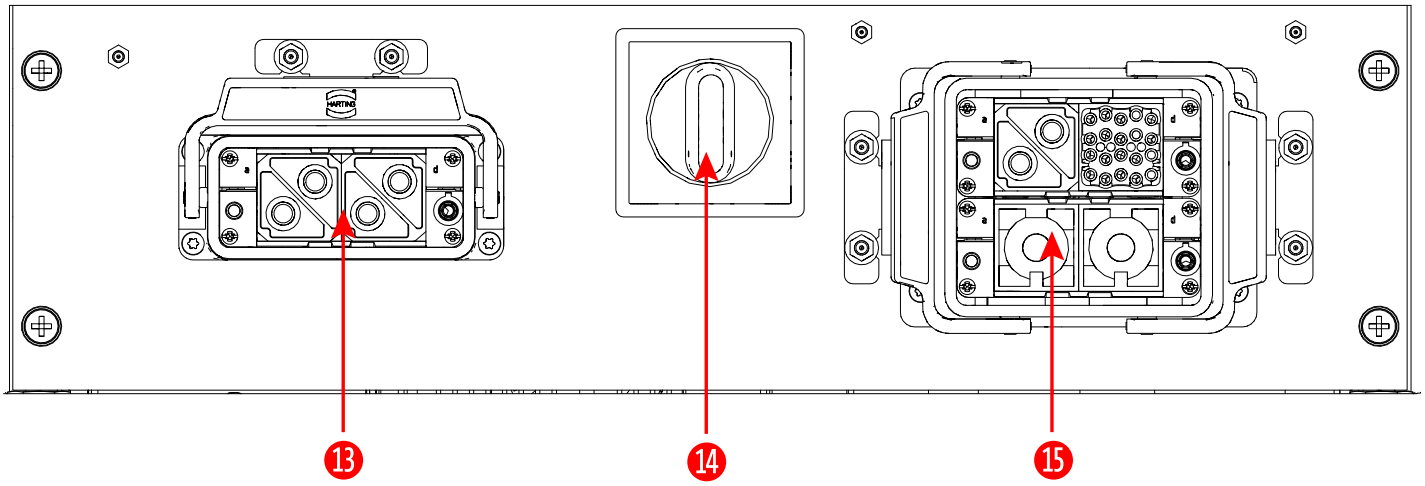
## Control panel




| Position | Description |
|---|---|
| 1 | “START” button to launch a charge |
| 2 | “STOP” button to stop the charge |
| 3 | Voltage presence indicator light |
| 4 | “Charger ready” |
| 5 | “Failure” indicator light |
| 6 | “Auxiliary function” indicator light |
| 7 | “Charge” indicator light |
| 8 | Emergency stop button |
| 9 | Control display |
| 10 | CAN bus connection on SUB-D9 port |
| 11 | USB port |
| 12 | Ethernet network connection |

**Note:** May change depending on version or technical modification

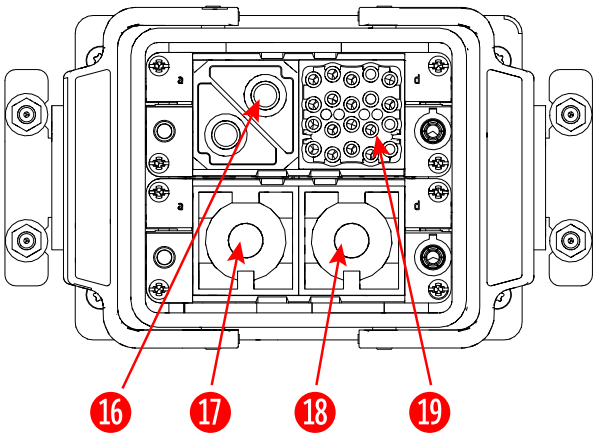
## Connection panel




| Position | Description |
|---|---|
| 13 | 3P + GND mains input Harting connector |
| 14 | Charger disconnection device |
| 15 | Battery harness Harting connector |

**Note:** May change depending on version or technical modification

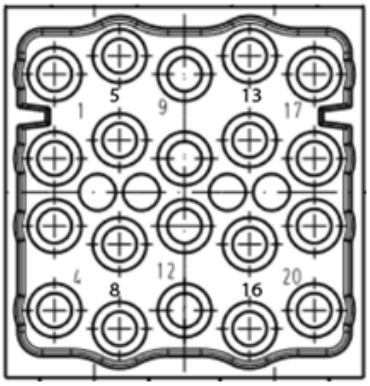
## Battery harness harting connector




| Position | Description |
|---|---|
| 16 | GND module |
| 17 | + BAT module |
| 18 | - BAT module |
| 19 | Signal 20 pins module |

**Note:** May change depending on version or technical modification

## Pin assignment




| Signal Name | Pinout | Description |
|---|---|---|
| GND | 5 | Ground |
| TEMP | 15 | Temperature signal |
| RC | 8 | Cable resistance |
| GND | 11 | Ground |
| LOCK | 3 | Connector locking signal |
| PROXY | 4 | Connector connection check |
| GND | 16 | Ground |
| CP | 9 | “Control Pilot” |
| GND | 13 | Ground |
| S&S1 | 7 | Start & Stop charge 1 |
| S&S2 | 1 | Start & Stop charge 2 |
| +12V | 2 | +12V |
| P&P | 10 | Charge permission & prohibition |
| GND | 14 | Ground |
| CAN L | 6 | CAN_H |
| CAN H | 12 | CAN_L |
| - | 17 | Internal use |
| - | 18 | Internal use |
| - | 19 | Not used |
| - | 20 | Not used |

# 5. Specification

## Technical specification

| **Mains supplies 3-phase L1/L2/L3 + GND 3x400$V_{AC}$ (50kW)** | | | |
|---|---|---|---|
| Mains 3-phase voltage range | $V_{AC}$ (P-P) | 400 $V_{AC}$ | ± 10% |
| Earthed electrical system | TT or TN | | |
| Assigned frequency | f | 50/60 Hz | ± 10% |
| Maximum input current | $I_{AC}$ | 90 A | Max |
| Nominal input current | $I_{AC}$ | 80 A | Nom |
| Power Factor | PF | 0,93 | Nom |
| Efficiency | η | 95 % | Nom |
| Harmonic current @ nominal network voltage | THDi | 32 % | Max |

| **Internal AC input protection** | | | |
|---|---|---|---|
| Inrush current limitation per phase | $I_{INRUSH\ LIMIT}$ | < 3 x $I_{AC}$ | Max |
| MCB (Main Circuit Breaker) | $I_{BREAK}$ | 100 A | Nom |
| Breaking capacity of breaker | $I_{BREAK}$ | 6 kA | Max |
| Max earth leakage current | $I_{LEAKAGE}$ | < 3,5 mA | Max |
| Overvoltage (IEC60664-1) | OVC III | | |
| Insulation protection Class | Class II | | |

| **DC output** | | | |
|---|---|---|---|
| Output voltage | $V_{DC}$ | 500 (4) | Max |
| | $V_{DC}$ | 200 | Min |
| Output current | $I_{DC}$ | 125 A (1)(2) | Max |
| | $I_{DC}$ | 5 A | Min |
| Max Output Power | $P_{OUT}$ | 50kW | Max |
| Output connector | Swapped vehicle cable | | |
| Car Plug coupler | COMBO1 / COMBO2 / CHAdeMO / GB | | |
| Output cable length | 6 m | | |

| **Internal DC output protection** | | | |
|---|---|---|---|
| Hardware and software short circuit protection | Yes | | |
| Over voltage protection | $V_{DC}$ | 550 | Nom |
| Overheating internal protection | - | 70 | °C |
| DC output contactor | Oui (2 pôles) | | |
| Rated Current Fuse (output) | $I_{FUSE}$ | 200 | A |
| Galvanic isolation | $V_{input\ /\ output}$ | 4000 | $V_{DC}$ |
| Max time for DC line discharge < 60V | $T_{<60V}$ | 1 | s |

| **Embedded Insulation device** | |
|---|---|
| Response time (tan) | < 3sec. for asymmetrical fault<br>< 62sec. for symmetrical fault |
| Self test time | At power on and every 60s during charge. |
| Measurement method | Non-symmetrical fault detection done continuously<br>Symmetrical fault detection every minute<br>Isolation controller integrity check before each charge |

| **Embedded Insulation device** | | |
|---|---|---|
| Fault trigger threshold (CCS, CHAdeMO and GB before charging only) | 100 Ω/V | ± 10% |
| Warning detection threshold (CCS only) | 500 Ω/V | ± 10% |
| Line voltage L+/L- (Un) | DC 200V…500V | |
| System leakage capacitance Ce | ≤ 1µF: response value (Ran) and time (tan) are not guaranteed for capacitance over 1µF. | |

| **General & dimensions** | | | |
|---|---|---|---|
| External dimensions (mm) | H x L x D | 927 x 730 x 702 mm | |
| Weight (without cable) | kg | 150kg | Max |
| Type of installation | Trolley (4 wheels) | | |
| Protection type (EN60529) | IP | IP21 | |
| Cooling systems | Heatsink with forced air flow by fans IP54 without air filter | | |

| **Climatic & Environment constraints** | | | |
|---|---|---|---|
| Operating temperature (with derating) | -20°C to +40°C(3) | | |
| Storage temperature | -40°C to +70°C | | |
| Relative humidity (without condensation) | RH | 10% to 95% | |
| Installation altitude | Alt | 2 000m | Max |
| Pollution category | 2 | | |

(1) Max output current will be adapted versus maximum carrying current of the vehicle plug.
(2) Output current can be even reduced with the power derating versus temperature.
(3) Potential derating above 30°C.
(4) Refer to the current derating curve according to the mains voltage.

# 6. Handling and storage instructions

## Storage

The charger is supplied in an individual wooden crate. When commissioning the product, all the protection for transport must be removed before powering up the charger.
Keep the charger in its original packaging in an appropriate place:

- placed on dry ground or on a sheet to protect it from damp,
- sheltered from dust, inclement weather and sunlight.

Storage temperature: -40°C to +70°C
Humidity: 10 % to 95 % without condensation

During prolonged storage, check the state of the charging station packaging regularly.
Do not store the charging station for more than a year without powering it up, to avoid the deterioration of in-active electronic components.

## Transport

During the entire transport phase, take all necessary measures to maintain the stability of the transport crate.

**NOTICE**

**RISK OF DAMAGE TO THE CHARGING STATION**
Improper storage or handling may cause damage to the unit.
**Failure to follow these instructions can result in equipment damage.**

**⚠ CAUTION**

**RISK OF INJURY DUE TO DROPPING OR FALLING**

- Follow specified procedures for hoisting operations.
- Take measures to prevent falling when you carry or transfer the unit.

**Failure to follow these instructions can result in minor or moderate injury.**

# 7. Installation

## Visual inspection

Before switching on the power, check that the charging station has not suffered any damage during transport. If there is any sign of damage, do not connect the charging station to the input power supply.
To do so would lead to a risk of electric shock and injury.

## Upstream protection of charger power circuit

It is imperative to have protection of the upstream power circuit by the following electrical equipment:

- a 100A C-curve MCB,
- an RCD.

The customer is responsible for the design of the electrical installation and the choice of protection devices. The customer must ensure the coordination of the protective devices with the charger.

All external circuits connected to your product must be of the Very Low Voltage (SELV) type and be Limited Power Sources less than 15VA and meeting the requirements of Chapters 2.2 and 2.5 of the standards IEC60950-1: 2005 + / A1: 2010 + / A2: 2013 and EN60950-1: 2006 + / A11: 2009 + / A1: 2010 + / A12: 2011 + / A2: 2013.

## Electrical connection

The charger is equipped with a power cable ref. FLPLA018196 or FLPLA018900 which connects to the rear panel.

**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, INJURY, AND/OR BURNING**

- Incorrect connection of the grounding conductor can result in a risk of electric shock.
- This equipment shall be installed, adjusted, and serviced by qualified electrical personnel familiar with the construction and operation of this type of equipment and associated hazards.

**Failure to follow these instructions can result in death or serious injury**

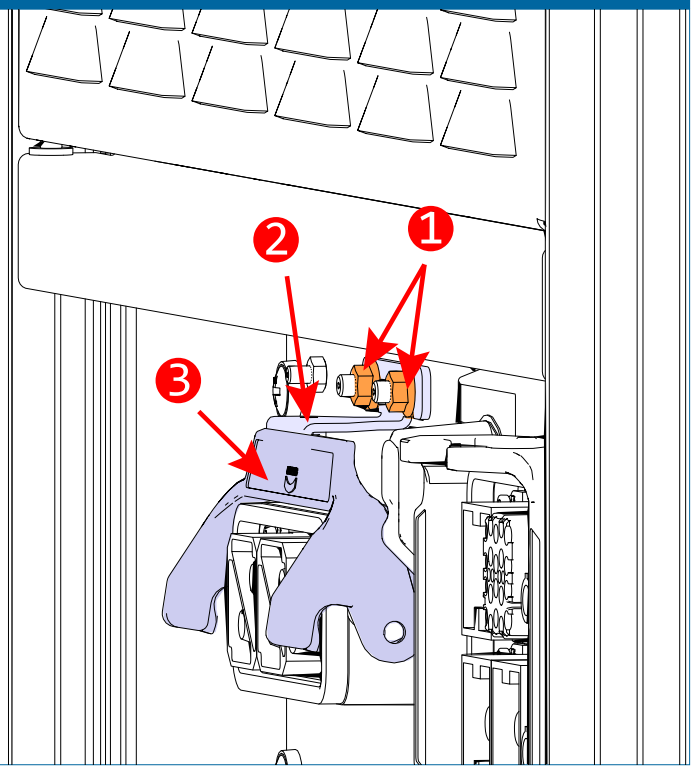
# Input harness connection

## 1 Input harness connection

1. Loosen the Harting connector locking tab nuts (x2) - position 1
2. Remove the locking tab - position 2
3. Push on the Harting connector locking lever - position 3
4. Connect the input harness
5. Pull the connector locking lever
6. Mechanically lock the input Harting connector by placing back the locking tab under the Harting connector locking lever
7. Tighten the locking tab nuts (x2)

**⚠ WARNING**

Be sure to mechanically lock the connectors before connecting the charger to the mains or to the EV.



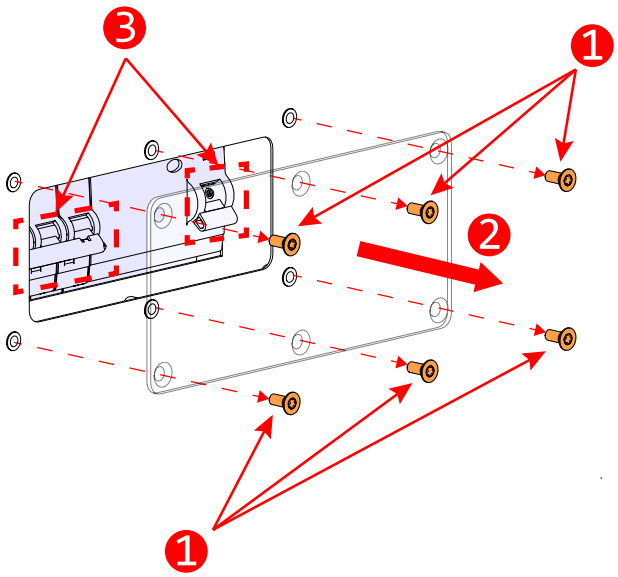

## 2 Reset the circuit breaker

**Note:** Visual inspection of the circuit breaker status is possible through the transparent cover of the circuit breaker hatch.

If the circuit breaker is in the down position (disabled) you must reset it by following the steps below:

1. Remove the screws (x6) from the circuit breaker hatch on the right side of the charger - position 1
2. Remove the circuit breaker hatch cover - position 2
3. Reset the charger internal input circuit breaker (upper position) - position 3
4. Close the circuit breaker hatch
5. Fix the circuit breaker hatch cover using the screws (x6)

**Recommended torque:** 2 N.m



# Battery harness installation

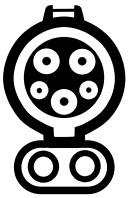
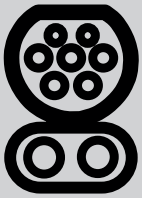
**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, INJURY, AND/OR BURNING**

- Do not use a cord extension set or second cable assembly or adaptator in addition to the coupler/cable assembly for the connection into the vehicle.
- Be sure to mechanically lock the connectors before connecting the charger to the mains.

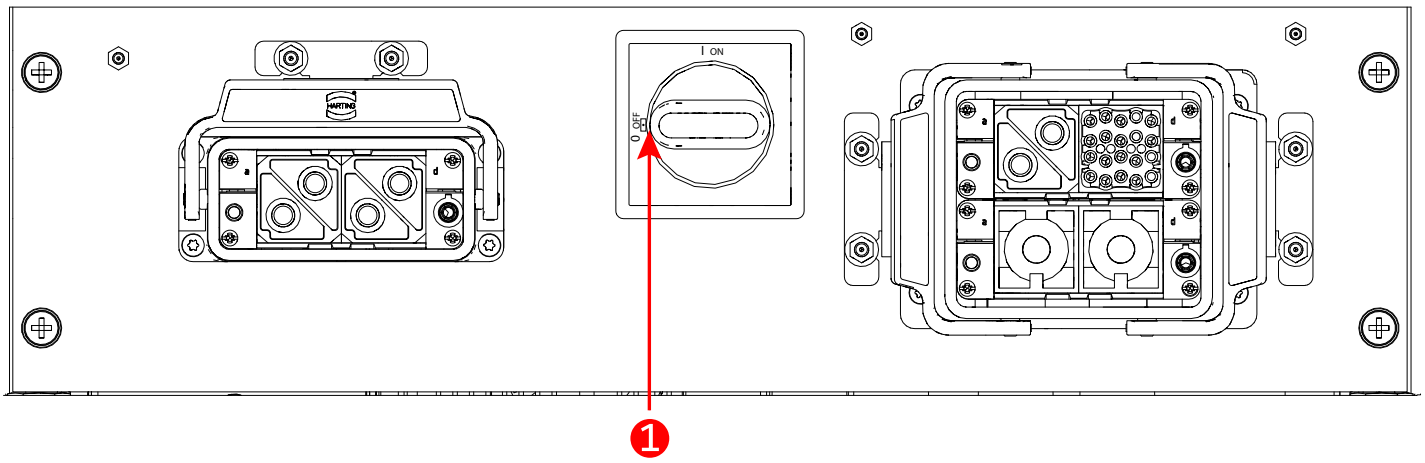
**Failure to follow these instructions can result in death or serious injury**

Ouput cables and connectors are described below:

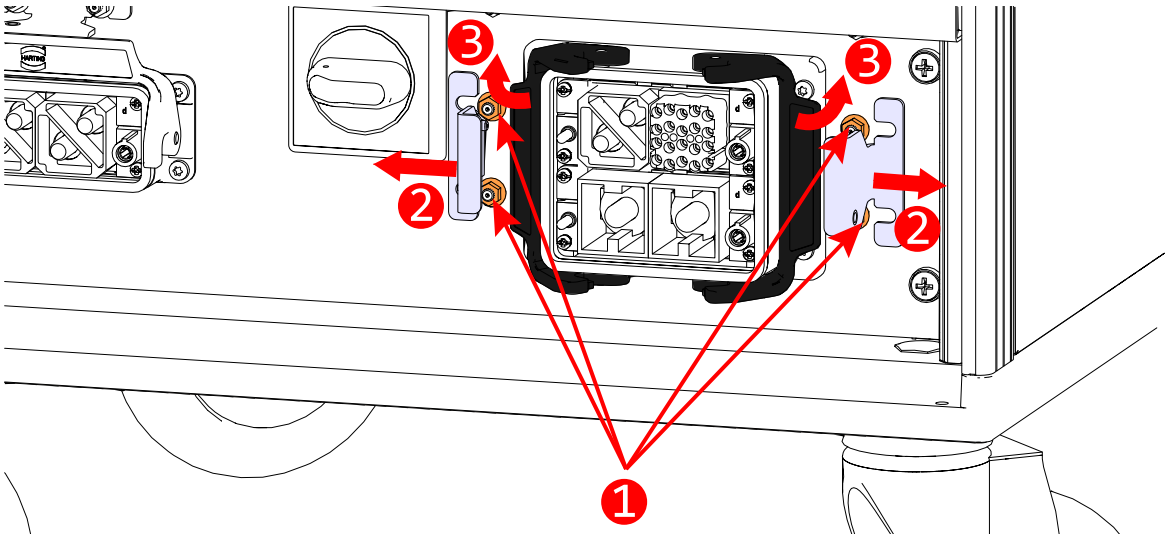
| IES ref. | Description | Length | Manufacturer | Connector |
|---|---|---|---|---|
| FLPLA018118 | COMBO 1 CABLE | 6m | IES |  |
| FLPLA018074 | COMBO 2 CABLE | 6m | IES |  |
| FLPLA018116 | CHADEMO CABLE | 6m | IES |  |
| FLPLA015561 | GB/T 20234.3 CABLE | 5m | IES |  |

The connection of the charging cable to the charger must be done at a standstill. This cable must not be connected to the vehicle side.

1. Check that the disconnecting device is in the “OFF” position - position 1




2. Loosen the nuts (x4) of the locking tabs (x2) of the Harting connector - position 1
3. Remove the locking tabs - position 2
4. Push on the Harting connector locking levers - position 3




5. Insert the connector socket of the dedicated connection charging cable
6. Pull the connector locking levers
7. Mechanically lock the battery Harting connector by placing back the locking tabs under the Harting connector locking levers
8. Tighten the locking tabs nuts (x4)

**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, INJURY, AND/OR BURNING**

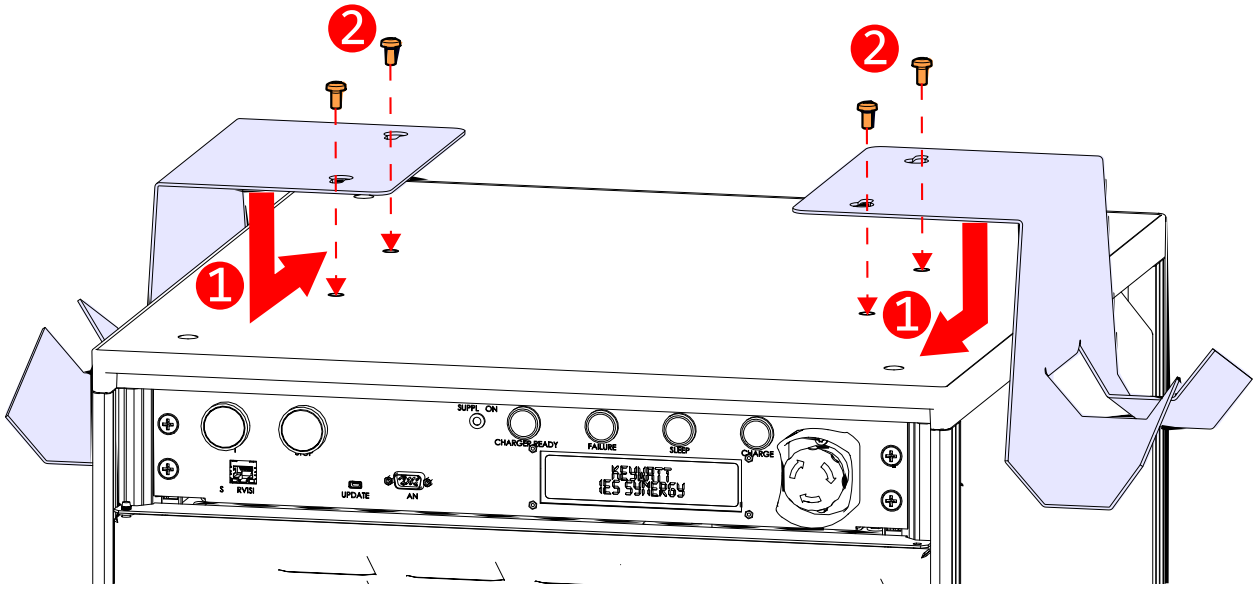
Be sure to mechanically lock the connectors before connecting the charger to the mains or to the EV.

**Failure to follow these instructions can result in death or serious injury**

## Connector and cable support installation

1. Place the supports MKBRN018011 (x2) on the top of the charger positioning them securely at the end of the slotted holes - position 1
2. Fix the supports using the screws FXVIS012307 (x4) - position 2

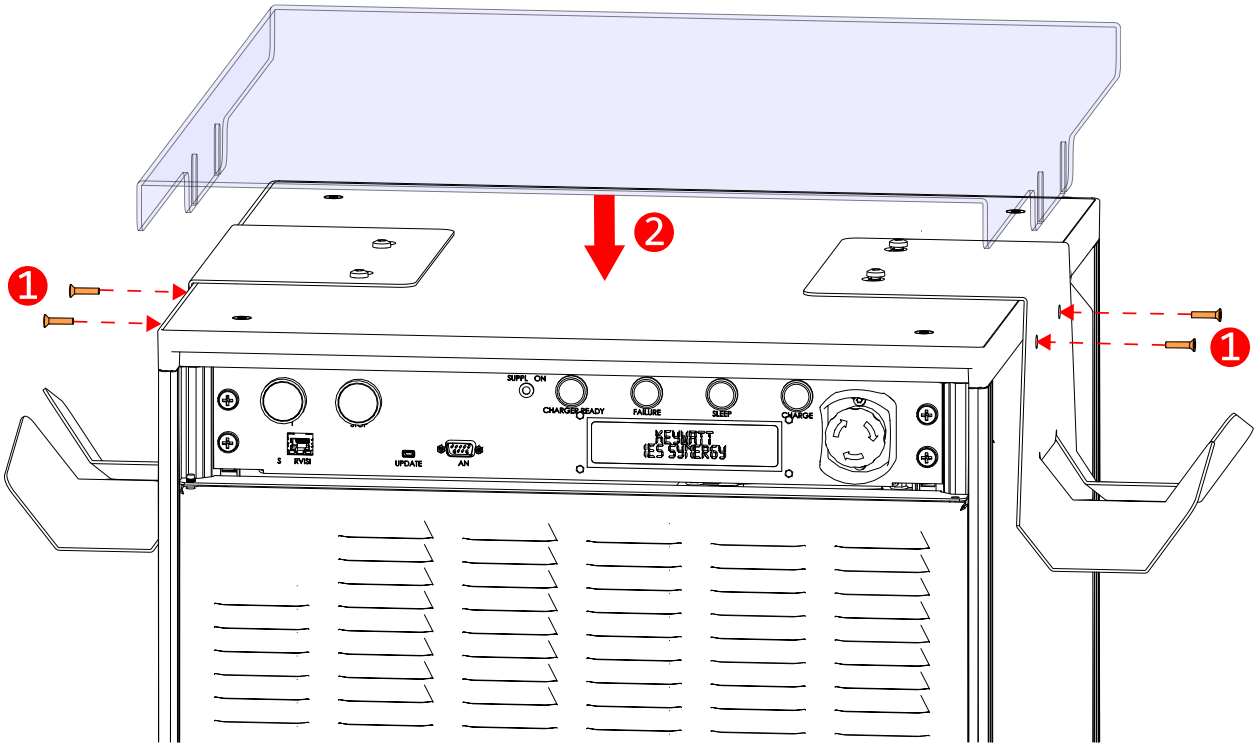
**Recommended torque:** 4 N.m




## Installation of the plexiglass cover

1. Place without tightening completely the screws FXVIS012307 (x4) of the cover MKBRN018953 on the connector and cable supports - position 1
2. Place the cover - position 2
3. Fix the cover tightening the screws.

**Recommended torque:** 3 N.m



# 8. Charger operation

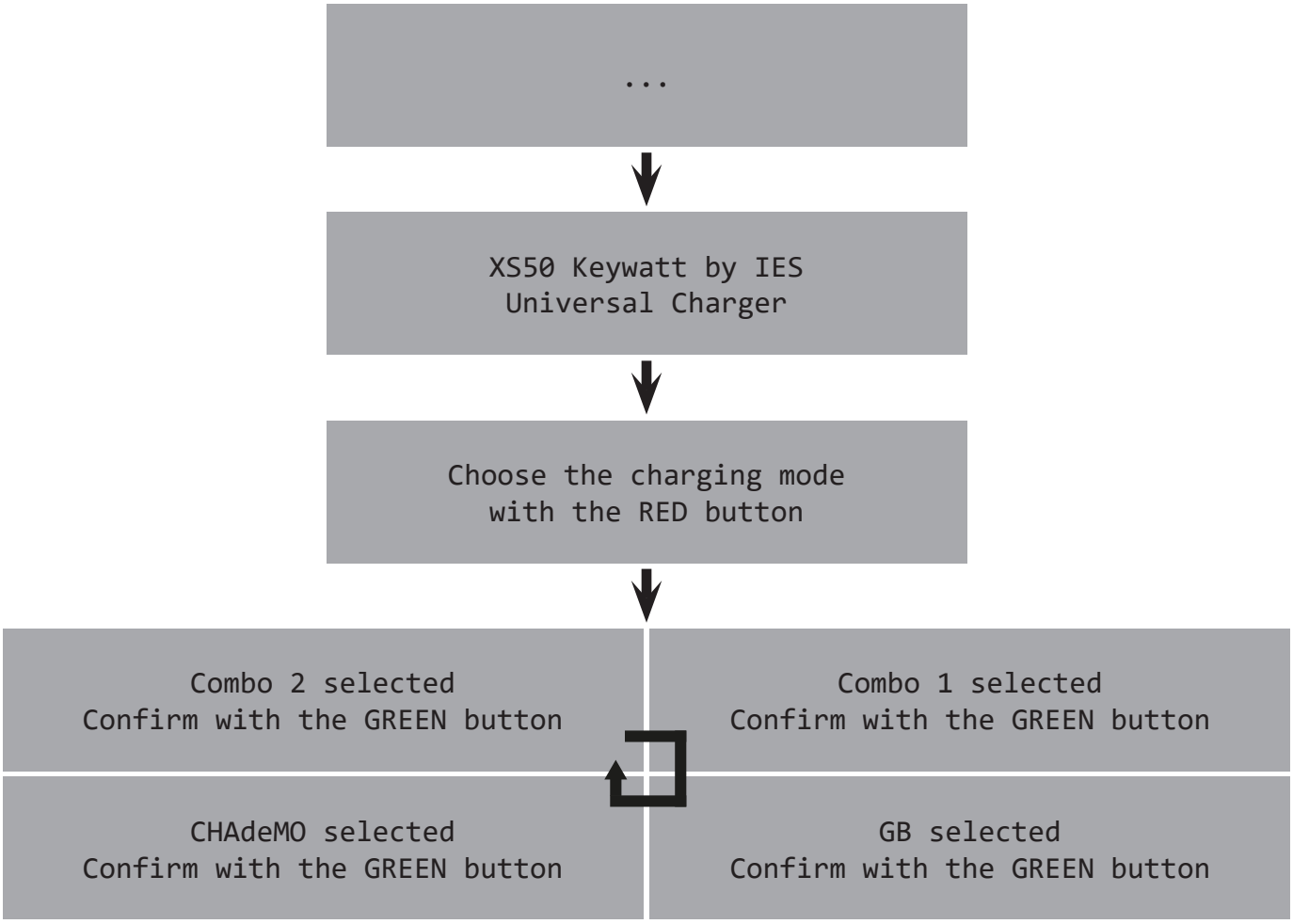
## Starting up

**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, INJURY, AND/OR BURNING**
Make sure no vehicle is connected before starting up the charger.
**Failure to follow these instructions can result in death or serious injury**

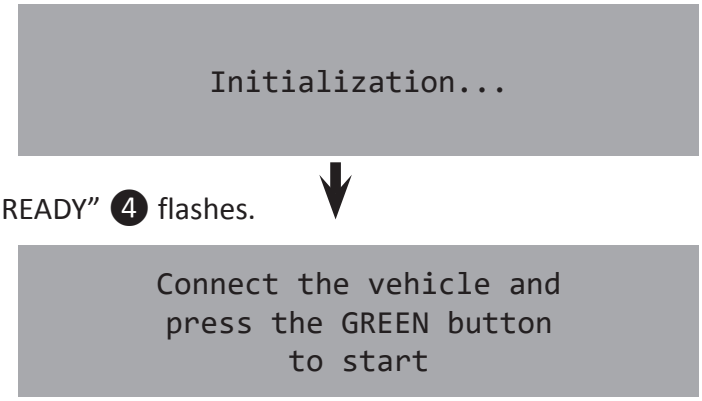
Turn the disconnecting device to the position “I ON” to power up the charger.

The charger displays its name after a startup phase represented by “...” :



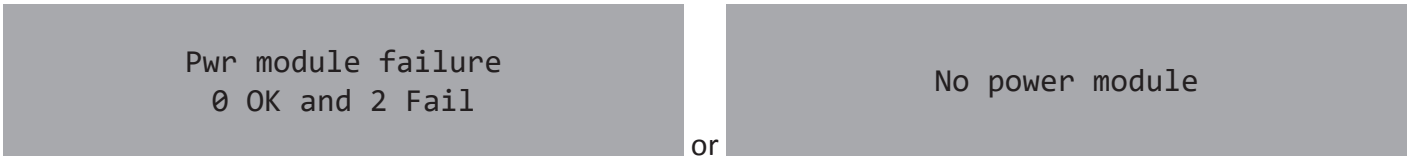
## CHAdeMO mode

Once the CHAdeMO mode selected, the charger performs an internal check and initialization.
The LEDs ❹, ❺, ❻ and ❼ flashes simultaneously during the initialization phase.
Please wait for a few seconds.




→ The LED “CHARGER READY” ❹ flashes.

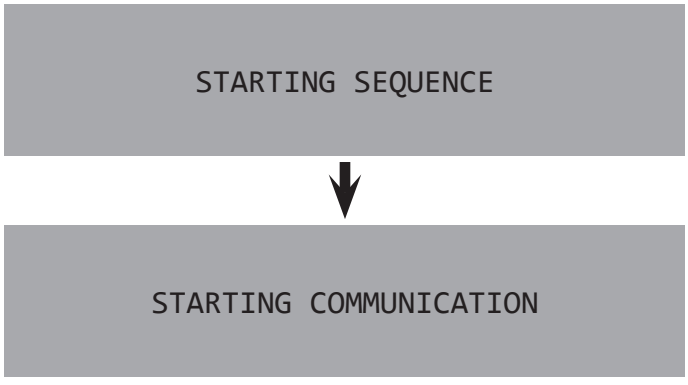
⊗ In the event of an error, the charger will display one of the two messages below




## Starting a charge in CHAdeMO

Connect the charging cable to the vehicle (secure firmly).
Press the “START” button ❶
→ The LED “CHARGER READY” ❹ flashes.

The charger starts to communicate with the vehicle.




Communication has been established.

If there is a communication fault with the BMS system

| START COMMUNICATION<br>Battery incompatible | or | START COMMUNICATION<br>Battery malfunction |
|---|---|---|

Then the charger locks the charging plug and performs the insulation test.

INSULATION TEST...

↓

INSUL. TEST COMPLETED

successfully

⊗ If there is an insulation failure:

Cancel charge...

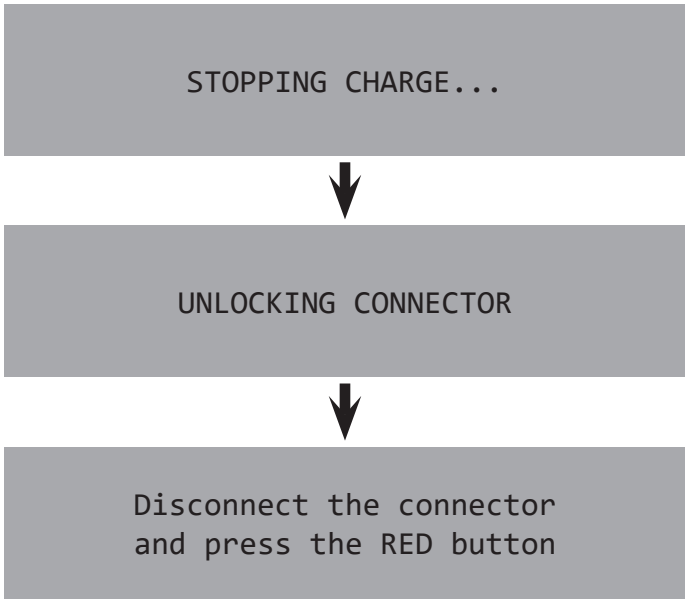
INSULATION FAILURE!!

If there is no failure, the charge starts.

CHARGING 30min
23A 360V 40%

The display indicates the time left, the charging current and voltage and the current battery capacity.
→ The LED “CHARGE” ❼ flashes with a long pulse for 2 seconds.

When charging has finished:




The charger performs the stop charge procedure.
Charging is stopped either by the BMS or by the operator pressing the “STOP” button ❷.
→ The charge status indicator flashes slowly for 2 seconds.

**Note:** The language can be configured via CCU Manager.

### Charger error messages

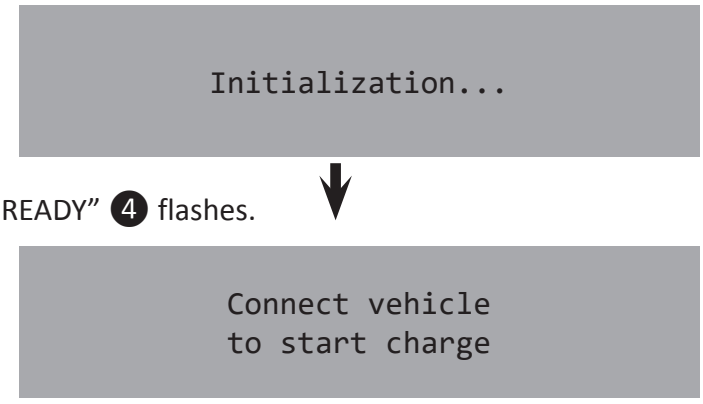
→ The LED “FAILURE” ❺ flashes.

The various displays when an error has occurred during charging:

| | |
|---|---|
| STOPPING CHARGE...<br>Error message | → “Error message” is replaced by the failure cause |
| Vout applied!<br>LOCK Maintenance | → Failure detected when unlocking the CHAdeMO connector |
| discon. & press the RED button<br>Error message | → End of charge displayed when an error occured during the charge |

## Combo mode

Once the Combo mode selected, the charger performs an internal check and initialization.
Please wait for a few seconds.




→ The LED “CHARGER READY” ❹ flashes.

⊗ In the event of an error, the charger will display one of the two messages below:

Pwr module failure
0 OK and 2 Fail

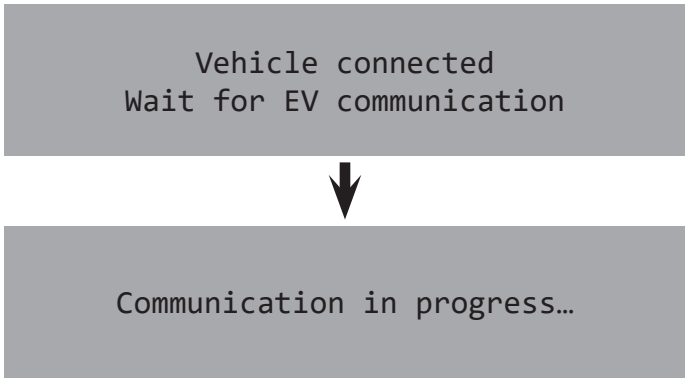
or

No power module

# Starting a charge in Combo

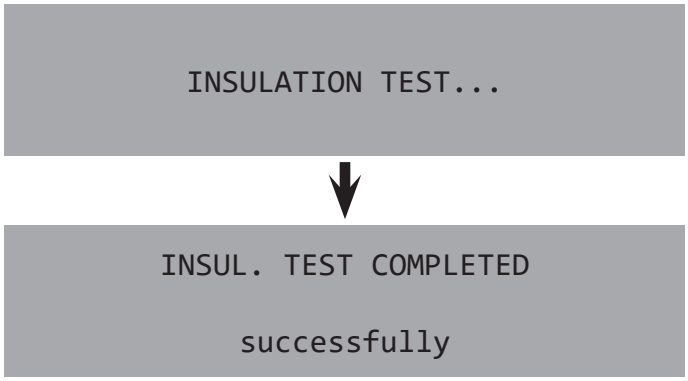
Connect the charging cable to the vehicle (secure firmly).
→ The LED “CHARGER READY” ❹ flashes.

The charger waits to communicate with the vehicle.

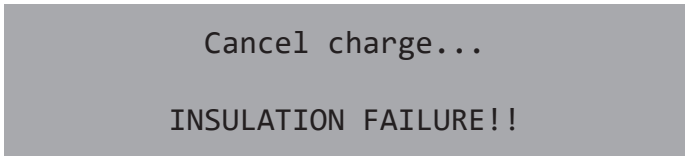



Communication has been established.

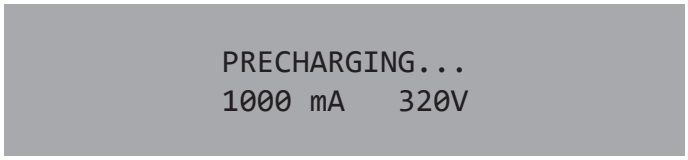
Then the charger performs the insulation test.




⊗ If there is an insulation failure:

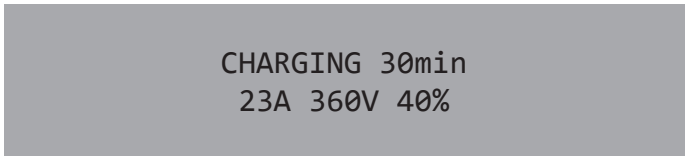



If there is no failure, the charger launches a precharge phase (this step depends on the EV).

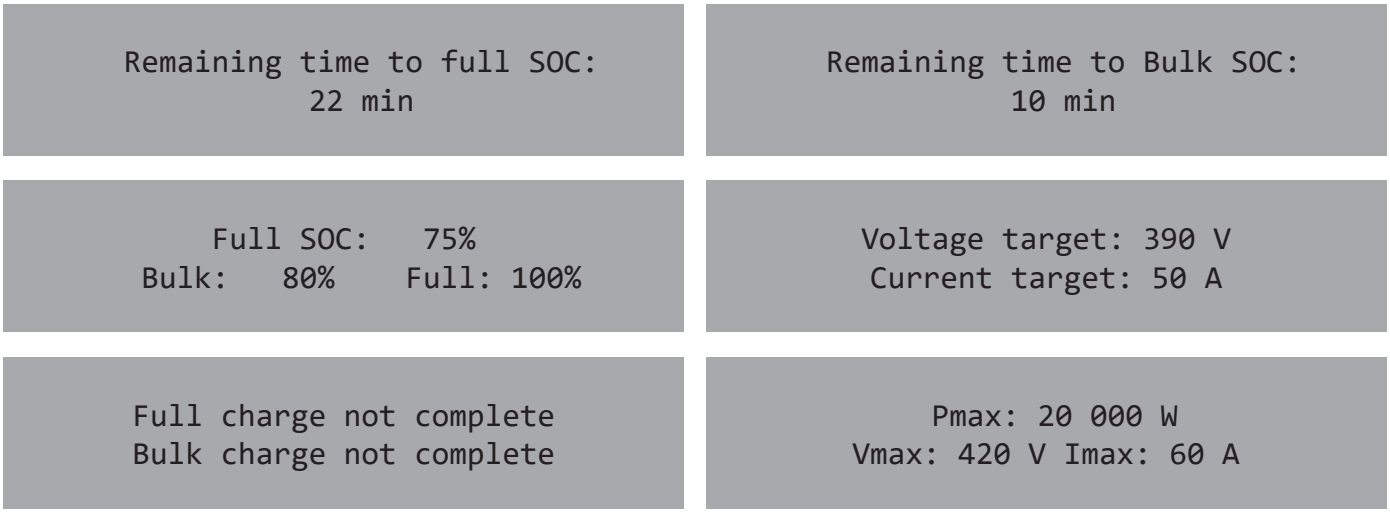



Once the precharge level is reached and after receiving the charge permission, the charger displays

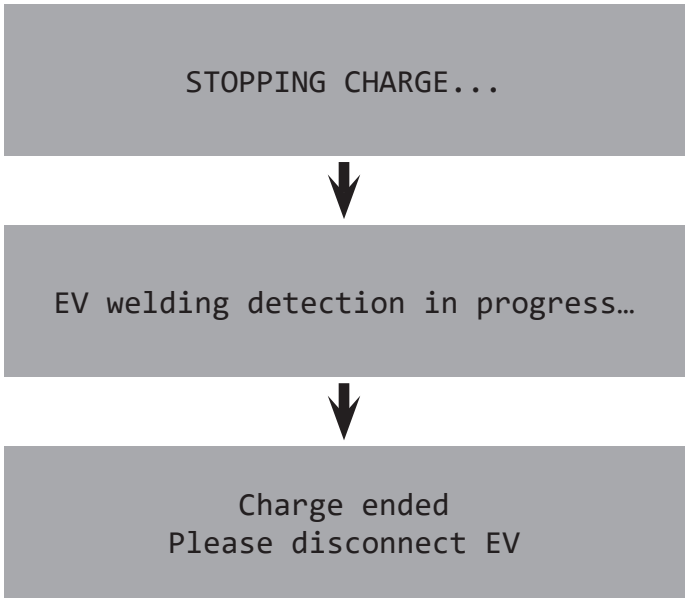
Charging is now in progress.




The display shows the time since the start of charging, the charging current, the voltage and the current battery capacity.
The user can display other parameters and information by pressing the “START” button like:



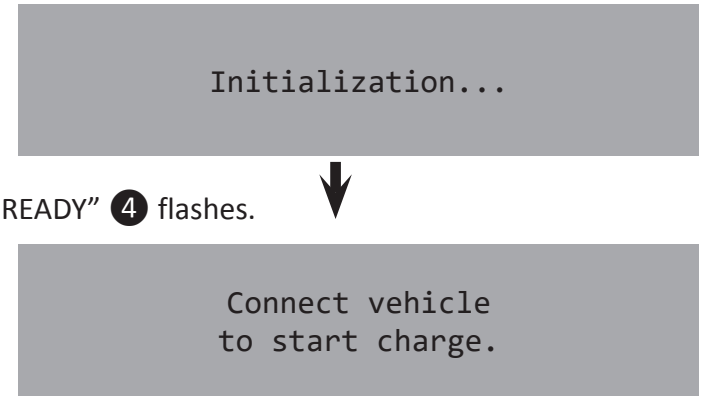

When charging is complete:




The charger performs the stop charge procedure.
Charging is stopped either by the vehicle or by the operator pressing the “STOP” button ❷.
→ The LED “CHARGE” ❼ flashes with a long pulse for 2 seconds.

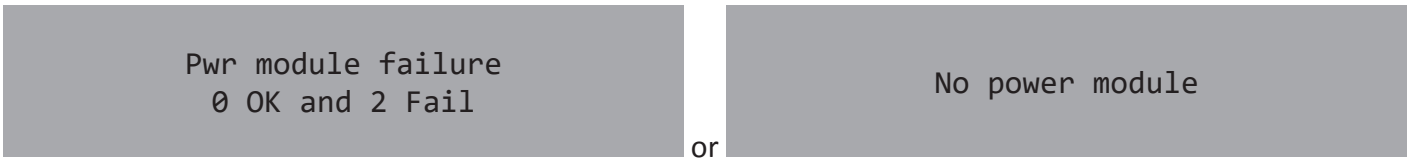
## GB mode

Once the GB mode selected, the charger performs an internal check and initialization.
Please wait for a few seconds.



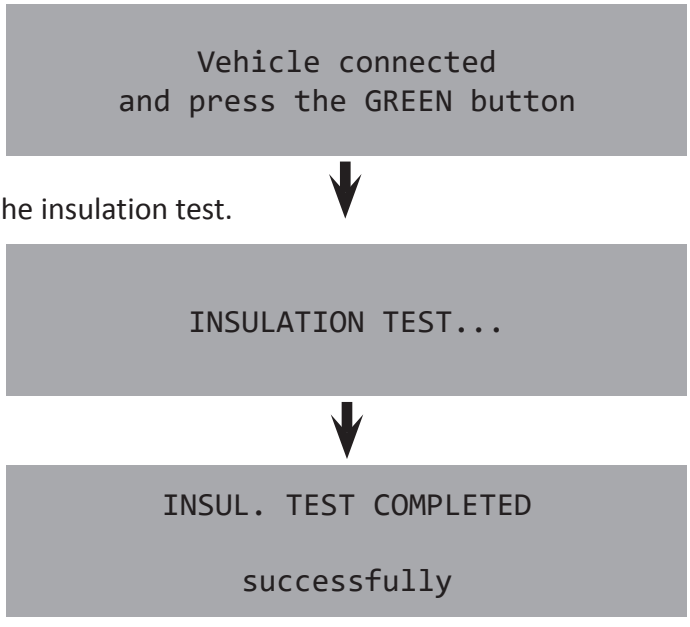

→ The LED “CHARGER READY” ❹ flashes.

⊗ In the event of an error, the charger will display one of the two messages below:



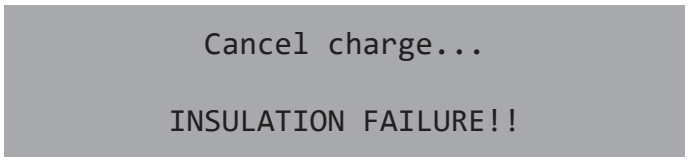

## Starting a charge in GB

Connect the charging cable to the vehicle (secure firmly).
→ The LED “CHARGER READY” ❹ flashes.

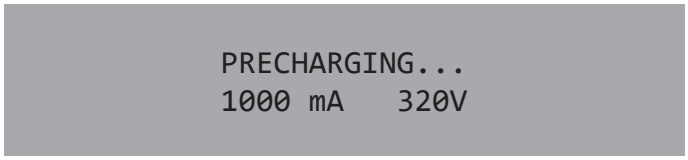



Then the charger performs the insulation test.

⊗ If there is an insulation failure:



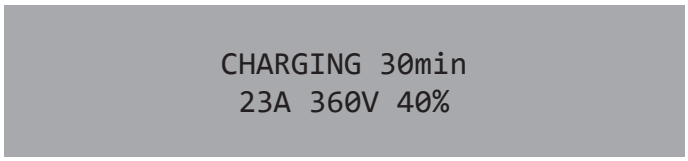
If there is no failure, the charger launches a precharge phase (this step depends on the EV).



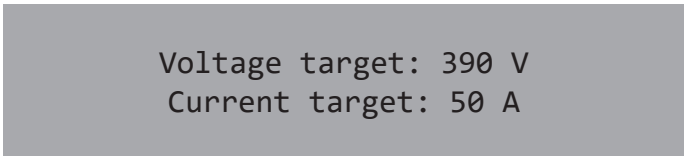

Once the precharge level is reached and after receiving the charge permission, the charger displays

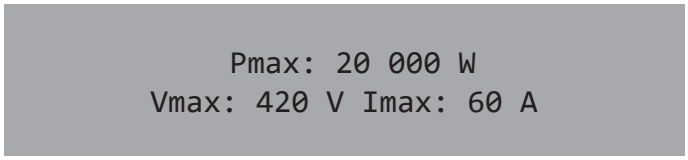
→


Charging is now in progress.

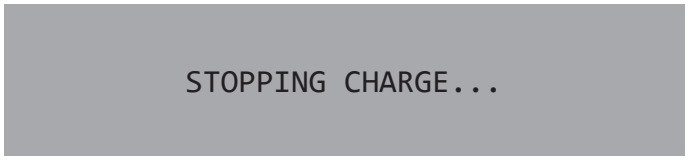


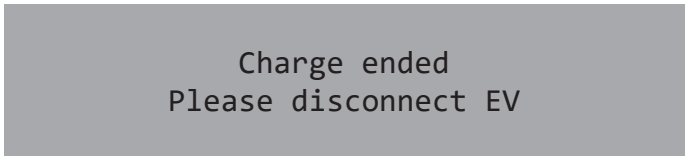

L'écran affiche le temps depuis le début de la charge, le courant de charge, la tension et la capacité actuelle de la batterie.
L'utilisateur peut afficher d'autres paramètres et informations en appuyant sur « START » comme :




When charging is complete:




The charger performs the stop charge procedure.
Charging is stopped either by the vehicle or by the operator pressing the "STOP" button ❷.
→ The LED "CHARGE" ❼ flashes with a long pulse for 2 seconds.

## Emergency Stop messages

→ The LED “FAILURE” ❺ flashes.

| | | |
|---|---|---|
| Emergency Stop... | → | Manual Emergency Stop |
| Emergency Stop!! | → | Software Emergency Stop |
| Emergency Stop!!<br>PSU connection lost | → | Internal Fault Emergency Stop |

# List of error messages

| Message | Description |
|---|---|
| "EXT_Emergency_Stop" | Emergency Stop pushbutton has been activated |
| "ERR Vout_at_start" | Abnormal output voltage at charger start up |
| "Out_Pwr_Switch_Fail." | Defective Charger DC output contactor |
| "Can_Data_invalid" | Incorrect data frame sent by the vehicle on CAN<br>Vehicle fails to update output current request when charging starts |
| "Can_Frame_absent" | No CAN communication |
| "ShortCircuit" | 2 cases<br>- Output current above Imax.<br>- Output current above 5 amps during insulation test. |
| "OverVoltage" | Charger output voltage exceeds maximum voltage limit |
| "ChargerOverHeating" | Cooling defect. Internal power modules have reached the maximum permitted operating temperature |
| "Over Limit I" | The vehicle requires too high a current according to the start of charging calculation. |
| "PSU Absent" | No response from power supervisor (internal fault) |
| "PSU Timeout Change" | Power supervisor timeout during state transition (internal fault) |
| "PSU bad state" | Power supervisor goes into incoherent state (internal fault) |
| "Connector_Lock" | CHAdeMO plug locking coil defect. |
| "BatteryIncompatib." | Battery voltage range not suitable for the charger |
| "BatteryMalfunction" | Vehicle battery fault:<br>- No CAN communication at charge start-up.<br>- Incorrect current or voltage data.<br>- Abnormal voltage at charge start-up. |
| "ChargingStopCtl" | Charge start-up denied (CAN or physical i/o line). |
| "VehicleShiftPosition" | Gearshift is not in neutral (vehicle fault) |
| "VehicleOtherFaults" | Vehicle fault. Check vehicle supervisor. |
| "BatteryOverVoltage" | Overvoltage detected by the vehicle. |
| "BatteryUnderVoltage" | Too low a voltage detected by the vehicle. |
| "BatteryCurrentDiff." | Current measurements mismatch from vehicle measurement and charger CAN data, detected by the vehicle. |
| "HighBatteryTemp." | Battery overheating detected by the vehicle. |
| "VoltageDifferential" | Voltage measurements do not match vehicle measurements and charger CAN data, detected by the vehicle. |
| "InsulationFailure" | Earth fault current detected by charger |
| "ChargerMalfunction" | During battery charging<br>- Charger power supervisor (not CCU) stops charge, after detecting output overvoltage.<br>- Charge aborted by pressing “STOP” button. |
| "PSU ERROR ARU" | Software emergency stop requested by the power supervisor (internal). |

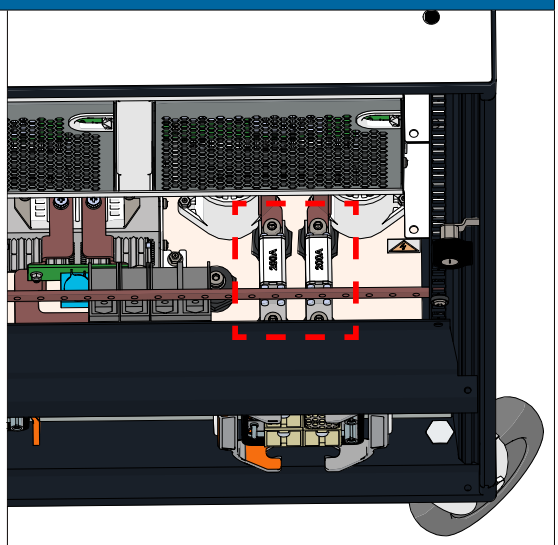
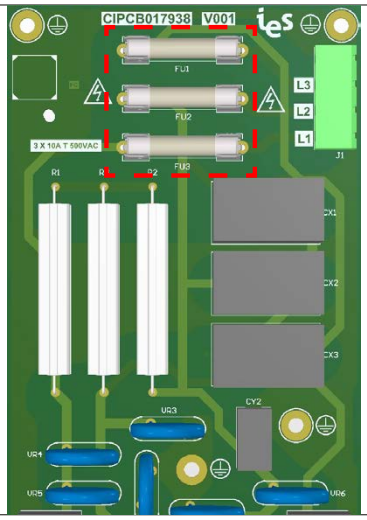
| Message | Description |
|---|---|
| "PSU Modules COM" | Power module communication lost (internal). |
| "PSU CCU COM" | Communication interruption between power supervisor and CCU (internal). |
| "PSU OVERVOLTAGE" | Overvoltage detected by power supervisor (internal). |
| "PSU OVERHEATING" | Overheating detected by power supervisor (internal). |
| "PSU COHERENCY" | Coherency error detected by power supervisor (internal). |
| "PSU INSULATION" | Earth fault detected by power supervisor (internal). |
| "PSU LIMIT Vmax" | Output voltage limit exceeded (+5V) detected by power supervisor (internal). |
| "PSU SHORT CIRCUIT" | Output short-circuit detected by power supervisor (internal). |
| "PSU Bad Vred" | Input voltage out-of-range detected by power supervisor (internal). |
| "OverCurrent" | Output current exceeds the maximum value |
| "ERR EV Charge Status Not Ready" | The vehicle requests a charge but its status is not ready. |
| "ERR Bad Pilot State during charge" | The pilot changes from status C during charging |
| "EV bad pilot state at start" | Pilot status is not A or B at start |
| "Error EV Not Ready" | The EV ready flag is not ready |
| "Error Timeout : EV Session Setup Request not received" | The charger has not received the session setup request (timeout is 20 s) |
| "Error Timeout : EV Ready to Charge State not received" | The charger has not received the ready to charge flag (Timeout is 40s) |
| "Error No message or Client Disconnected" | The charger has detected that the EV is present, but the EV has not sent a request. |

# 9. Maintenance

## Protection fuses location

**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, INJURY, AND/OR BURNING**
Only qualified, trained and authorized people will repair, replace or adjust this equipment
**Failure to follow these instructions can result in death or serious injury**

| Fuse ref. | Location | |
|---|---|---|
| FUCRT011930 | 200A fuses (x2) installed on the output battery side |  |
| FUCRT015901 | 10A fuses (x3) (FU1, FU2, FU3) installed on the mains board (CRAUX017939) |   |

**⚠ CAUTION**

**RISK OF DAMAGE TO THE TERMINAL**

- DO NOT use a high pressure jet to clean the charger.
- Preserve the charger from contact with gasoline, diesel and other automotive fluids.
- DO NOT use solvents to clean the charger.

**Failure to follow these instructions can result in minor or moderate injury.**

**⚠ WARNING**

**RISK OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- To avoid danger of electrical shock or injury, turn off power at the panel board or load center before working on the equipment or removing any component. Do not remove circuit protective devices or any other component until the power is turned off.
- Disconnect electrical power to the harging station before any maintenance work to ensure that it is separated from the supply of AC mains. Failure to do so may cause physical injury or damage to the electrical system and charging unit.
- Maintenance of the charging station shall be conducted only by a qualified technician.
- Wait 15 minutes before opening the door. Residual voltage remains present after the power failure.

**Failure to follow these instructions can result in death or serious injury**

The charger should only be cleaned with a dry cloth, twice a year, with the product switched off and not connected.

Every 6 months:

- Conduct a visual inspection of the air inlet of the charger and ensure that they are not clogged.
- Conduct a visual inspection of the charging cable and ensure that cable does not show any visual damage or deformation.
- Conduct a visual inspection of the charging connector and ensure that it does not show any visual damage, arcing or rust.

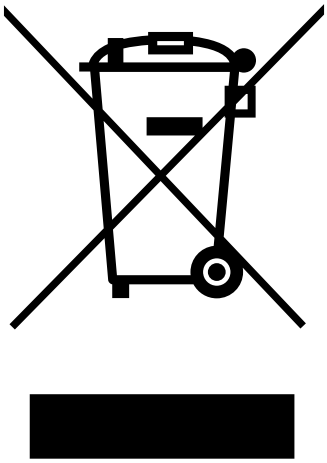
# 10. Protecting the environment

## Recycling Packaging

The packaging materials from this equipment can be recycled. Please help protect the environment by recycling them in appropriate containers.
Thank you for playing your part in protecting the environment.

## End-of-Life Recycling

This product has been optimized to reduce the amount of waste produced at the end of their useful life and for better recovery of component parts and materials when following customary processing procedures.
Products have been designed so that their components can be processed by conventional procedures: decontamination where this is recommended, reuse and/or dismantling in order to improve recycling performance, and crushing to separate out the rest of the materials.



# Notes

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Beyond Charging