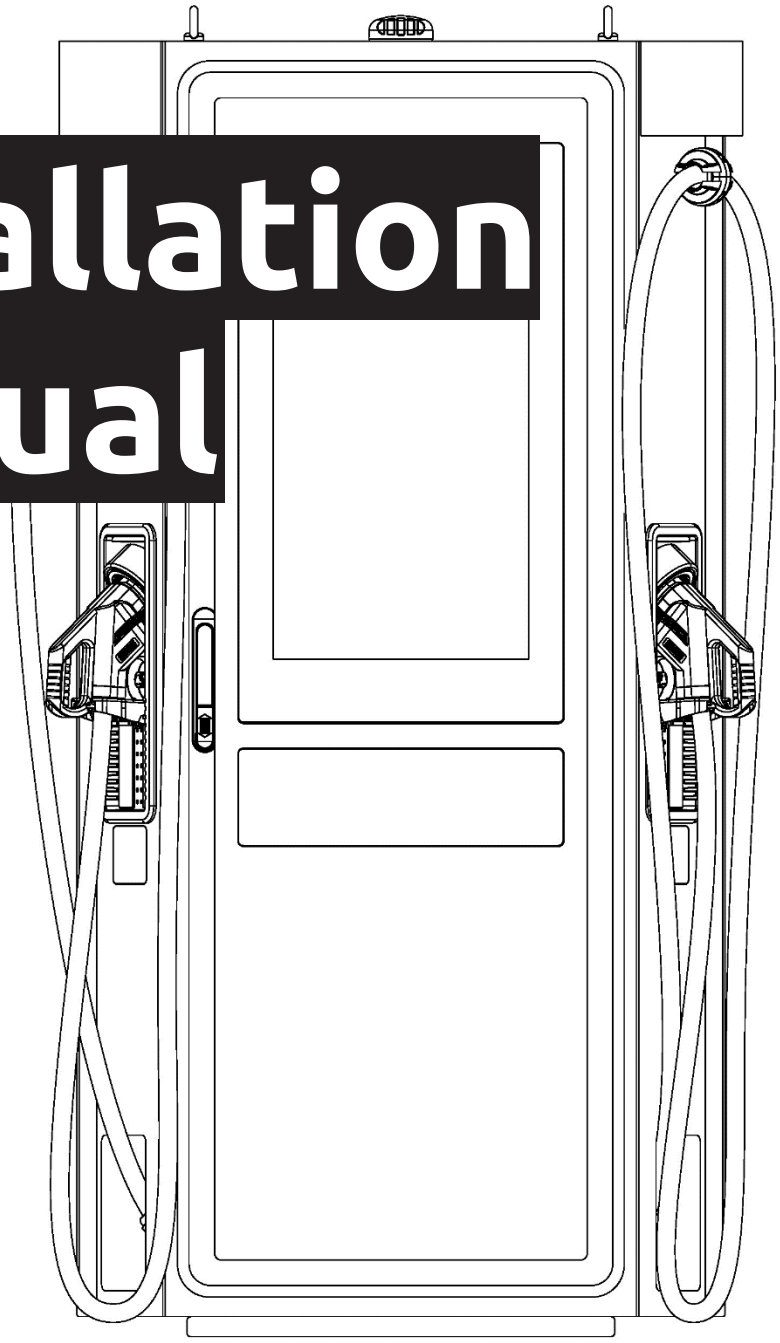
blueberry
FUSION

Installation Manual



PRODUCT DOCUMENTATION 2.0

Powered by i-charging

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blueberry

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i-charging

1. ABOUT THE MANUAL

The purpose of this manual is to provide the steps and settings required for mechanical and electrical installation of blueberry FUSION charging station.

Please make sure that this manual is carefully read and ensure that all safety notices given are followed.

All technical details, specifications and design characteristics of the product may change without prior notice. The content of this document was carefully checked, however, in case of any inaccuracy, the user is asked to report it to i-charging. This manual should be saved for future reference.

2. IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual must be read carefully before the installation and operation of the blueberry FUSION. Incorrect operation as a result of non-compliance with the instructions provided by this manual may lead to severe injuries or damages.

The working steps described must only be carried out by qualified personnel who, based on their knowledge and experience, can assess, and carry out all steps described in this installation manual and recognize potential hazards. The blueberry FUSION shall be installed, connected, and approved for operation according to local codes and regulations. Under no circumstances does the compliance with the information in this manual relieve the user to comply with all applicable local codes and safety standards.

FIRE PROTECTION

To avoid fire, the following rules must be observed:

- The user must under no circumstances make any changes to the blueberry FUSION or use it in a manner that was not designed for. Any disregard of this instruction represents a safety risk and will void the warranty with immediate effect.
- It is forbidden to use blueberry FUSION when is technically inoperative or which does not correspond to its intended use or to the conditions specified by the manufacturer or which are not subject to periodic checks.

Damages that may occur resulting from custom installations, that are not described in this document are not i-charging responsibility.

GROUNDING INSTRUCTIONS

Each cabinet of the blueberry FUSION shall be connected to an equipment grounding conductor or a grounded, metal, and permanent wiring system.

Before Charging

Before operating any cabinet of the blueberry FUSION, make sure that the surrounding environment is free from hazards, that the blueberry FUSION does not have any error message on the display and that the charging cable(s) are not damaged.

Safe Charging Session

Perform the charging process as described in the User Manual. Once the process is completed, the plug must be placed in the correspondent holder.

In Case of Fire

In case of an emergency, the main switch of the switchboard power supply shall be turned off.

In case of fire, the main switch of the switchboard power supply shall also be turned off and the source of the flame must be eliminated with a class C fire extinguisher. All components of blueberry FUSION are self-extinguishable which means that in case of fire, once the source of the flame has been removed, it will cease burning.

End of Life Disposal

Do not dispose blueberry FUSION at public landfill sites. According to the European directive 2012/19/EU (WEEE2) on waste electrical and electronic equipment, the device is excluded from the scope of application, being classified as a large-scale fixed installation. Act in accordance with the local waste utilization regulations. The equipment should be dismantled by specialized companies.

Installation Waste

At the end of installation activities ensure that all packaging waste, namely plastics (EWC 15 01 02), wood (EWC 20 01 38) and cables (EWC 17 04 11), is correctly segregated and sent to a waste collection. For proof purposes, documented evidence must be requested and maintained according to local legal requirements.

2.1. Safety Notices

Special warnings and safety measures may appear throughout this document or on the equipment to warn of potential hazards or to call attention.

The symbols carry the following meanings:

RISK OF ELECTRIC SHOCK!

Procedures marked with this symbol must not be carried out under any circumstances before following the “DANGER” instructions.
Actions contrary to these safety notices may lead to severe injury and death.

WARNING!
Procedures marked with this symbol should be carried out with special care. Hazards that may lead to personal injuries.

CAUTION!

Procedures marked with this symbol must be carried out with special care.
Hazards that may lead to damage in the equipment itself or to other electric devices.

PLEASE NOTE!

Sections marked with this symbol are intended to draw attention to important information that is necessary for the reliable operation of the blueberry FUSION charging station.

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3. PRODUCT INFORMATION

The blueberry FUSION charging station represents the current state of technology and complies with all current technical safety requirements to power plug-in electric vehicles (PHEV) and battery electric vehicles (BEV) today. It is designed for fast charging in both public and private locations, indoor or outdoor, such as retail and commercial parking spaces, fleet charging stations, highway rest areas and workplace. blueberry FUSION allows sequential and simultaneous charging, through dynamic power allocation to each output. Due to its modularity, it is possible to add 50kW power modules at any time, if it does not exceed 150kW.

All values below @25 °C (77°F) except where indicated.

3.1. Electrical Properties

		INPUT
	CE	North America
Input Voltage [V a.c.]	3x 340 – 530+N[1]+PE	3x 340 - 530 +PE
Max. Input Current [A]	N_{pm}[2] * 76 @ 400V	N_{pm} * 63 @ 480V
Input Power [kVa]	N_{pm}[2] * 53	N_{pm} * 53
Input Frequency [Hz]	45 - 66	45 - 66
Efficiency [%]	95	95
Power Factor	0.99	0.99
THDi [%]	< 4	< 4
		OUTPUT
Voltage Range [V d.c.]	150 to 1000	150 to 1000
Max. Current [A d.c.]	125, 250, 375	125, 375
Max. Power [kW]	N*50	N*50
		GENERAL
Rated Diversity Factor	1	1
Pollution Degree	3	3
Installation systems	TT and TN-S	TT

[1]Neutral is only necessary if the equipment has a GB/T output

[2]N_{pm} – number of power modules – up to three

3.2. Mechanical properties

Dimensions [H x D x W]	2000x540x1000 mm	|	78.74 x21.26 x39.37 in
Weight	Up to 590 Kg	|	up to 1301 lbs
Dimensions of package [H x D x W]	2250x800x1200mm	|	88.58x31.49x47.24 in
Weight including package	Up to 660 Kg	|	up to 1455 lbs
Impact protection	IK10		
Housing	Steel		
Corrosion protection	C5 according to ISO12944:2018		

3.3. HMI properties

Contactless card specification	ISO/IEC 14443A/B, ISO/IEC 15393, Mifare, NFC reader mode; Optional: Credit card reader, GooglePay and ApplePay
Local Interface	Touch screen 32''/ Mobile App

3.4. Communications

Communication protocol	OCPP1.6 / 2.0
Network Connection	2G/3G/4G (LTE) Modem; 10/100 Base-T Ethernet; Wi-Fi

3.5. Environment properties

Operating Temperature	-35 °C; +50 °C | -31°F; 122°F
Maximum Elevation	2000 m | 6561 feet
Protection Degree	IP54/ "Rainproof"
Humidity [%]	5 to 95, non-condensing
Operating Noise Level [dBA]	tbd

3.6. Standards

DC Charging	EN IEC 61851-1/ EN61851-23 / IEC61851-21-2/ CHAdeMO | GB/T 18487.1 | GB/T 18487.2 | GB/T 18487.3 DIN70121/ ISO15118 including Plug&Charge EcoG | OS UL 2231-1/ UL 2231-2/ UL 2202 (under certification)
Connection	CCS2 (IEC 62196-3) JEVS (G105) SAE J1772 GB/T20234.3
EMC emission	IEC 61000-6-4 (IEC 61000-6-3 Class B on the AC input port)
EMC Immunity	IEC 61000-6-2
Usability	ADA

3.7. Product overview

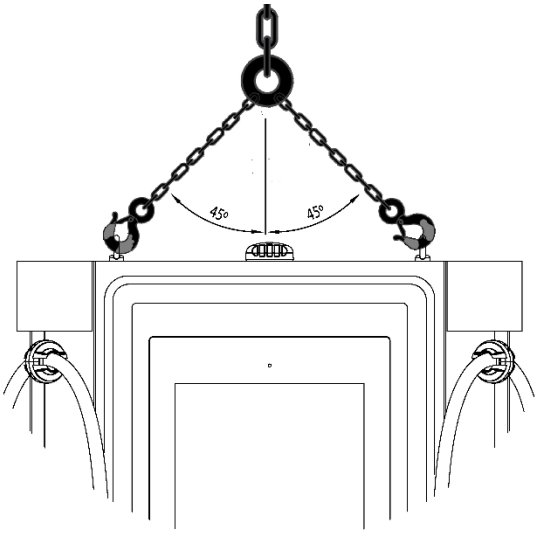
1. Touchscreen display
2. Authentication | Payment system
3. Air inlet area
4. blueberry Fusion logo
5. locking system (DIN 18252).
6. Energy meter (optional)
7. Fast stop button
8. Connector support
9. Status led
10. Cable clamp
11. Cable retraction system
12. Air outlet area
13. i-charging logo

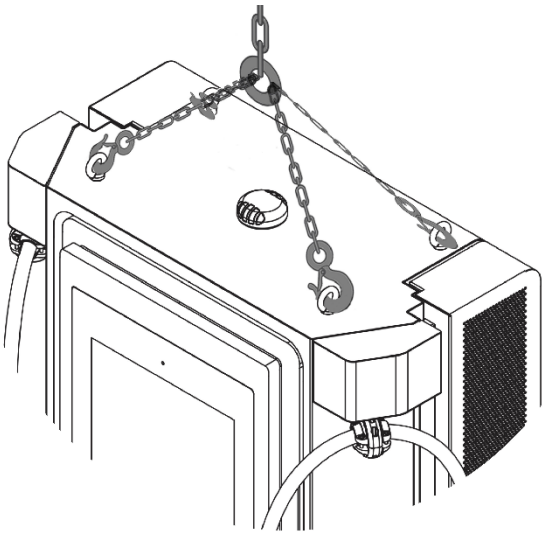
4. HANDLING

The blueberry FUSION charging station is delivered in a package with the following dimensions [H x D x W] and weight:

- 2220 mm x 785 mm x 1150 mm – up to 710 Kg
  (87.40 in x 30.91 in x 45.27 in – 1565 lbs)

The blueberry FUSION charging station can only be transported vertically, using a forklift, pallet jacket, or using a crane and the eyebolts in the top of the equipment, as presented below. In this case, the angle must be 45º for the weight to be evenly distributed between the two eyebolts.





WARNING!
Be careful when moving the equipment. Due to its heavy weight, incorrect transportation may lead to personal injuries or can damage the equipment itself.

i-charging strongly recommends unpacking the blueberry FUSION charging station only in the installation site and as close as possible to the commissioning date.

Before unpacking, it is important to check that there is no damage in the package, and after it, it is critical to verify that the equipment is in good condition and unharmed.

Once the blueberry FUSION is already placed in the installation site, the eyebolts must be replaced by M12 stop ends, supplied by i-charging.

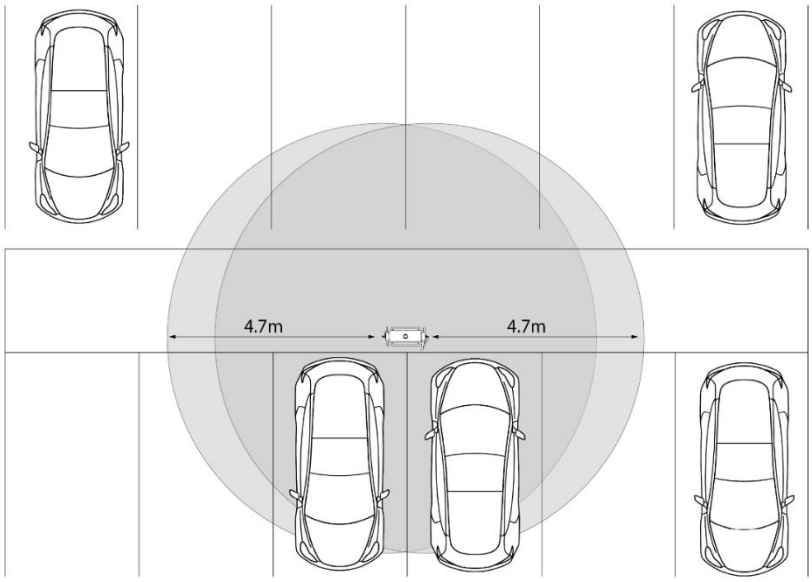
PLEASE NOTE!
If any problem has been identified in the equipment, please, make a formal complaint to the carrier and notify customer care.

5. INSTALLATION REQUIREMENTS

5.1. Site configuration

The blueberry FUSION charging station is a fixed stationary equipment and it is intended to be used both indoor and outdoor. For the placement of the charger there are several factors, such as the configuration of the parking areas, vehicles to charge and the reach of the charging cables, that can influence the suitability of the site.

The blueberry FUSION charging station is equipped with a cable management system for the DC cable that prevents it from touching the floor. With this system, the total cable reach of the charger is 4.7m (185 in). The charger should be positioned considering the parking spots and the cable reach.

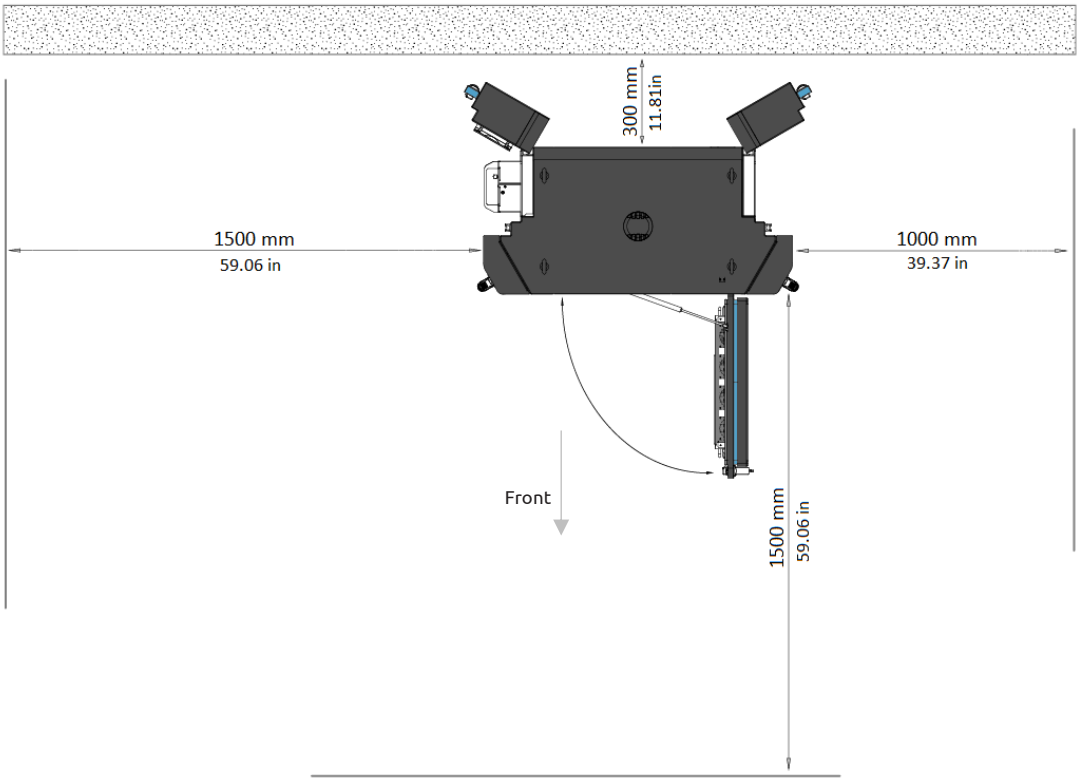


WARNING!
The installation of blueberry FUSION shall not be made in a commercial garage (repair facility) or closer than 6,1m (20 feet) of an outdoor motor fuel dispensing device.

PLEASE NOTE!
To ensure the access for maintenance and free air circulation in the ventilation system, a clearance around the blueberry FUSION charging station must be kept.

The blueberry FUSION charging station has a service door in the front and one door on each side. It also has an air inlet on the right side and an air outlet on the left side. Do not install any objects near the inlets and outlets and, if necessary, take precautions to prevent snow blocking them.

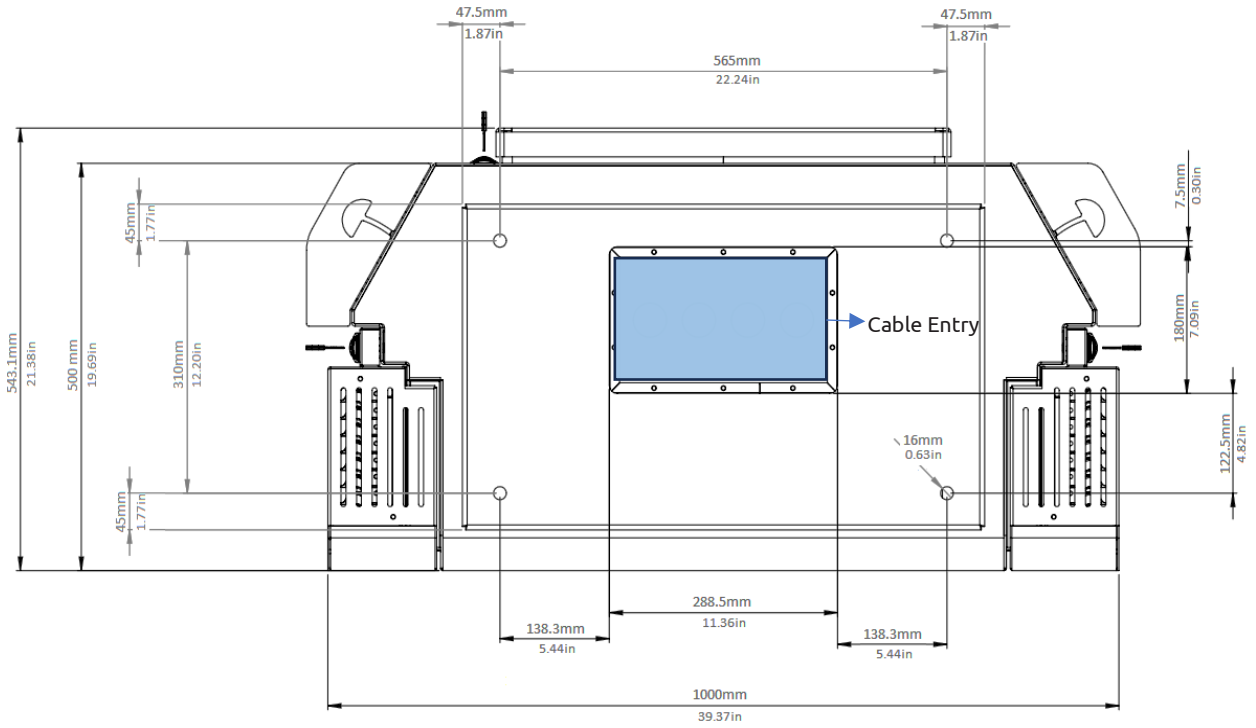
Please make sure that the distances presented below are satisfied and that there are no road barriers that prevent the door from opening.



For harsh environments, i-charging strongly recommends installing the blueberry FUSION charging station under a shelter. It will ensure the performance and longevity of the equipment and it will provide a comfortable environment for users during periods of high and low temperatures, rain, snow and heavy dust.

5.2. Foundation

The blueberry FUSION charging station shall be mounted in a solid ground, concrete foundation/floor. The foundation shall be dimensioned according to the drill layout and local standards. The drilling layout is presented below.



To fix the blueberry FUSION charging station, 4 x M12 chemical anchors shall be applied in the concrete foundation, with a maximum length of 25mm (0.98in). Please be aware that the cable shall be routed through the area, positioned in the center of the equipment base.

5.3. Upstream Protection

CAUTION!
The blueberry FUSION charging station protection devices outside the charger are to be done according to the local regulations and codes.

i-charging recommends an upstream installation of a residual current device of 300mA Type A and a short circuit protective device according to the following table:

CE

Power	Short circuit protective device
50kW	125A 3P C curve, >16kA
100kW	250A 3P C curve, >16kA
150kW	320A 3P C curve, >16kA

North America

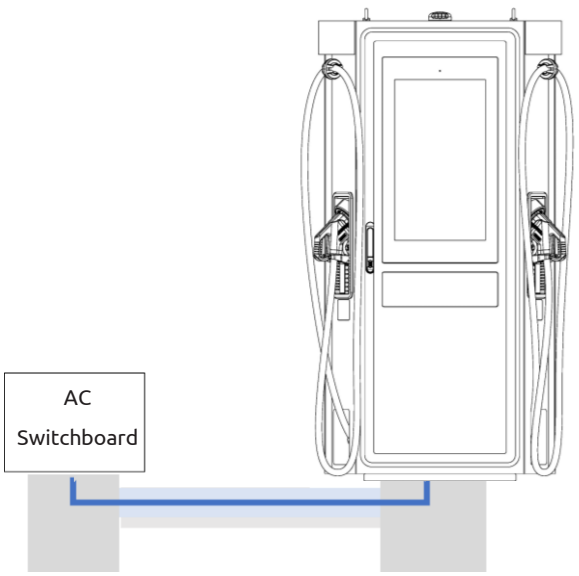
Power	Short circuit protective device
50kW	125A 3P C curve, >16kA
100kW	200A 3P C curve, >16kA
150kW	300A 3P C curve, >16kA

5.4. Cabling

The cross section of the cable conductor depends on the length and method of installation and shall have always into account the local standards.

For installations no longer than 50m from the service panel, i-charging recommends:

- 3x conductor (copper) 95 mm^2 (AWG 3/0)
- 1x conductor 16mm^2 (AWG 6) if blueberry FUSION has a GB/T output
- 1x earth cable (copper) 50 mm^2 (AWG 1)



PLEASE NOTE!
The maximum cross section on the blueberry FUSION main switch is 150 mm^2 (300 MCM)

6. INSTALLATION

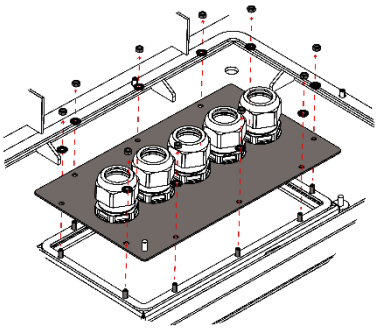
DANGER!
Make sure that the main switch of the Switchboard power supply that feeds the blueberry FUSION charger product is set to the off position.

TOOLS:

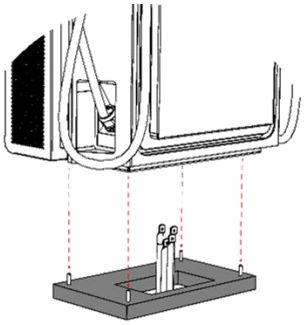
- Ratchet Wrench size 8 and 13
- Wire stripper pliers
- Crimping pliers
- Screwdriver
- Phase sequence meter

FASTENERS:

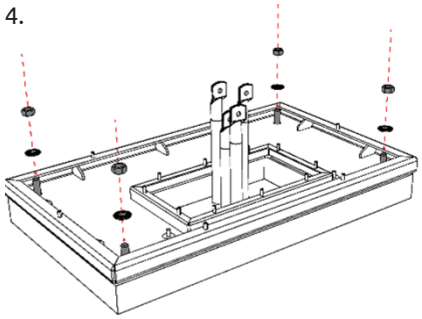
- 4 x M12 Hexagon Nuts
- 4 x M10 Hexagon Nuts
- 4 x M12 Washers
- 4 x M10 Washers
- 1 x M8 x 20 screw
- 4 x M10 x 20 screw
- 1 x M8 Ring terminal, 70mm²
- 1 x M8 Ring terminal, 16mm²
- 3 x M10 Ring terminal, 120mm²



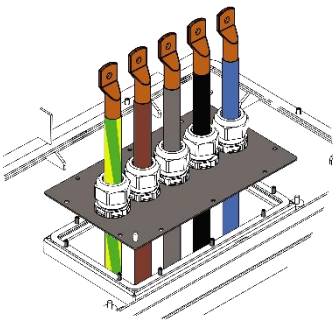
Step 1 – Remove the bottom plate from blueberry FUSION. It is necessary to untight 10x M5 hexagon nuts with a ratchet wrench size 8. Save the fasteners for step 4.



Step 2 – Place the blueberry FUSION on the ground floor, matching the bottom holes with the chemical anchors.



Step 3 – Place the matching washers and tight the hexagonal nuts to fix the blueberry FUSION to the ground. Use a ratchet wrench size 13.

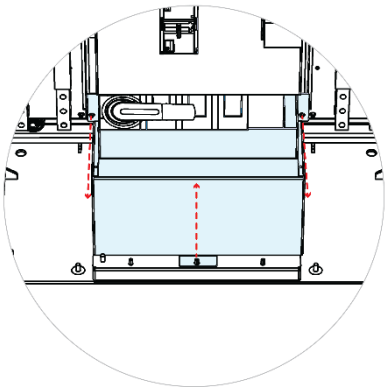


Step 4 – Place the bottom plate that was removed in step 1 with the same fasteners. Route the cables through the cable gland. Please note that Neutral is only necessary for a blueberry

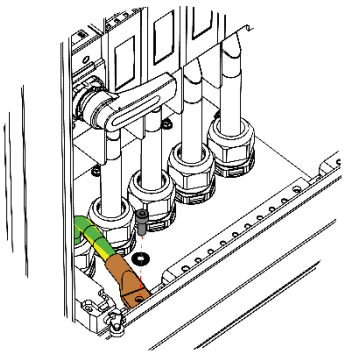
FUSION with a GB/T output.

DANGER!

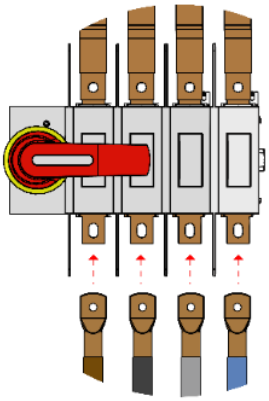
Make sure that the main switch of the Switchboard power supply that feeds the blueberry FUSION charger product is set to the off position.

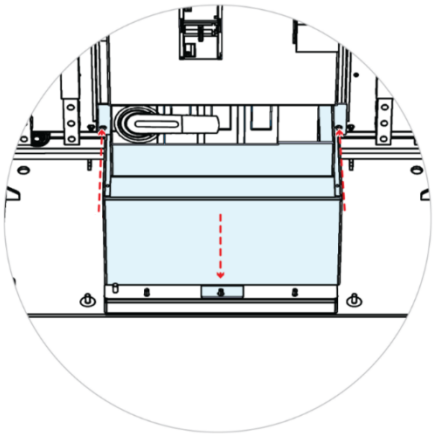


Step 5 – Remove the switch disconnector protection (S1), placed in the bottom of blueberry FUSION, as shown in the image. Save the fasteners to assemble it again on Step 8.



Step 6 - Connect the earth cable to the busbar placed in the bottom of blueberry FUSION, as shown in the image. For that, it is necessary to crimp an M8 ring terminal on the cable and then to tight the ring terminal with a M8 x 20 screw on the busbar, with a tightening torque of 28 N.m.



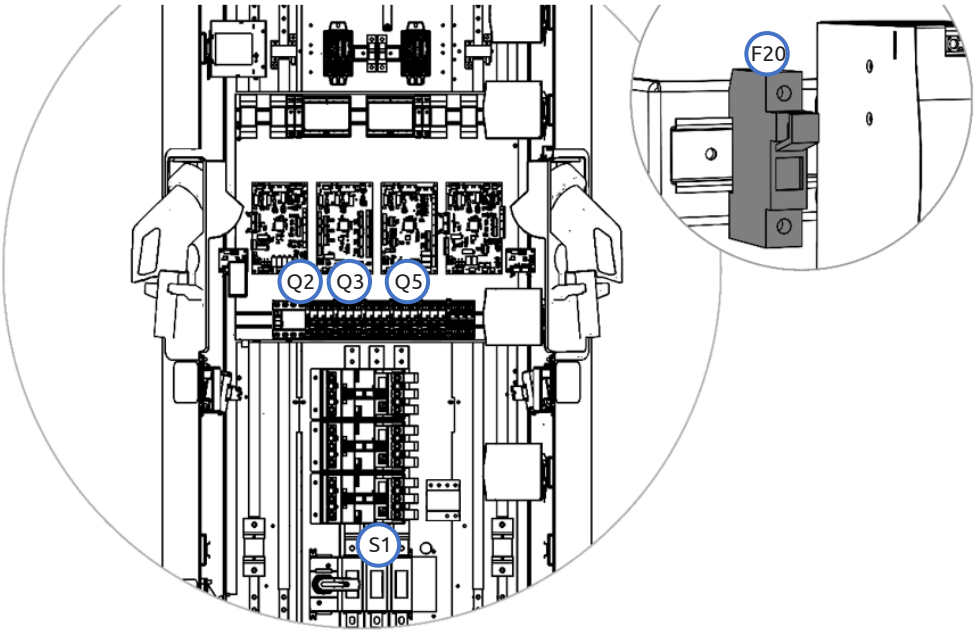


Step 7 – Connect the AC power conductors to the switch disconnector (S1) placed on the bottom of Power Unit. For that, it is necessary to crimp a M10 ring terminal on each cable. Ensure that the phases are connected in a clockwise direction. Ring terminals shall be placed below the switch disconnector bars (as shown in the image above) with an M10 screw with its matching washer ant nut. Apply a tightening torque between 30 N.m to 37 N.m. Please note, if blueberry FUSION has a GB/T output, it is necessary to connect Neutral (N).

Step 8 - To ensure IP2XB, the switch disconnector protection shall be assembled again with the same fasteners.

PLEASE NOTE!

To avoid water condensation inside the cabinet, the switch disconnector **S1**, the residual current device **Q2** (RCD) and the circuit breakers **Q3** (electronics) and **Q5** (climate system) shall be left **switched on**, allowing the heating resistances to turn on if necessary. See the image above to check where are located these components inside the cabinets. **Make sure that fuse F20 is opened**.



7. COMMISSIONING

7.1. Installation Validation

Before starting up blueberry FUSION charging station:

- Must be done the following inspections:

#	TOPIC:	OK / NOK
1.	Site complying with clearance conditions and safety requirements	
2.	Absence of physical and structural damage	
3.	Charger ground fixation and leveling complies with manual requirements	
4.	Locking system is closing adequately	
5.	Upstream protection rating in Low voltage distribution board is according with the manual (refer chapter 5.3)	

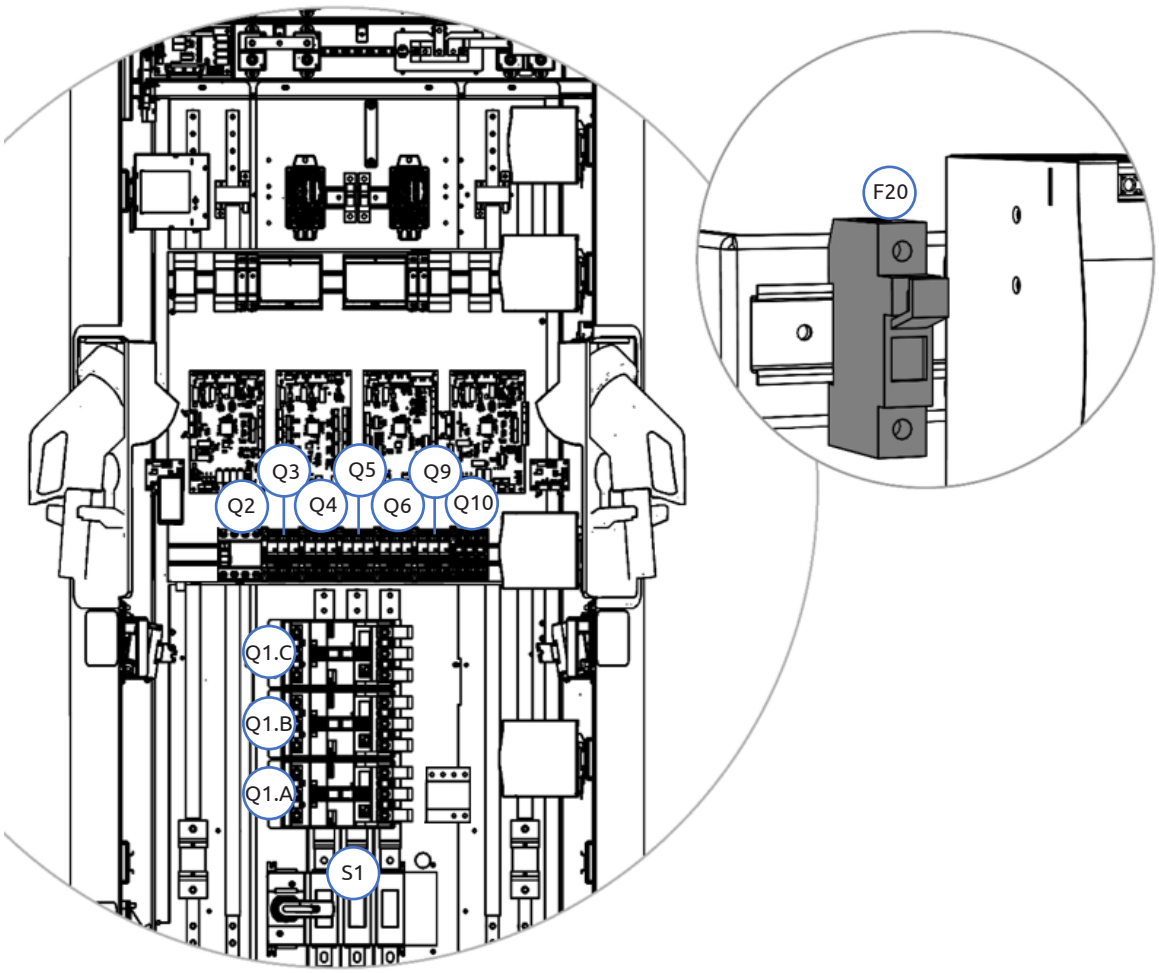
- Must be done the following measurements:

#	TOPIC:
6.	Confirm AC voltage between phases and phases and ground. The voltage must be according to the local grid and within blueberry FUSION charger range (refer chapter 3.1)

7.2. Start Up

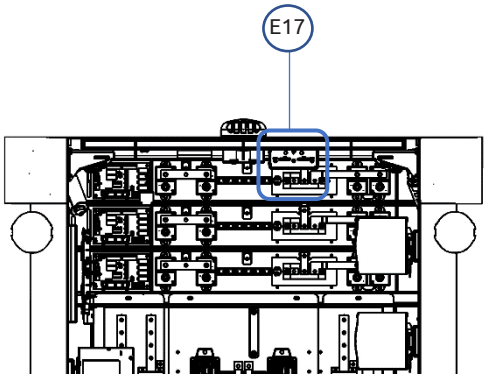
The start-up of the blueberry FUSION charging station shall begin by **switching on** the circuit breakers **Q1.A, Q1.B, Q1.C** (power circuit - according to the number of power modules), **Q4** (HMI), **Q6** (cable retractor), **Q9** (auxiliary components).

Please make sure that the switch disconnector S1, the residual current device Q2 and the circuit breakers Q3 and Q5 are also switched ON, as stated in chapter 6.



The next step of commissioning is the **configuration** of the charger on the maintenance tool which can be accessed by one of two ways described in the **Service Manual**.

For that, check below the router position on blueberry FUSION:



For the **user guide** please refer to **blueberry User Manual document**.