



MULTI VEHICLE ULTRA FAST CHARGING SOLUTION

UFC 200

Maintenance Manual

www.deltaww.com



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1 About this manual

1.1 Validity

This manual is part of the UFC 200. It is intended to guide you through the maintenance tasks.



Read this manual before conducting maintenance tasks on the UFC 200.

Follow all safety instructions and working instructions in this manual.

Store this manual in a safe place close to the charger. This will ensure that the manual is available when it is needed.

1.1.1 Related documents

Document	Document Nr.
Delta UFC 200 Planning Guide	EVCS_UFC200_Planning_Guide_V01_en
Delta UFC 200 Installation Manual	EVCS_UFC200_Installation_Manual_V01_en
Delta UFC 200 Power-up Manual	EVCS_UFC200_Powerup_Manual_V01_en
Delta UFC 200 Commissioning Manual	EVCS_UFC200_Commissioning_Manual_V01_en
Delta UFC 200 Configuration Manual	EVCS_UFC200_Configuration_Manual_V01_en
Delta UFC 200 Operation Manual	EVCS_UFC200_Operation_Manual_V01_en
Delta UFC 200 Maintenance Manual	EVCS_UFC200_Maintenance_Manual_V01_en
Delta UFC 200 Troubleshooting Manual	EVCS_UFC200_Troubleshooting_Manual_V01_en
Delta UFC 200 Installation and Commissioning Protocol	EVCS_UFC200_Installation_and_Commissioning_Protocol_V01_en
Delta UFC 200 Preventive Maintenance Protocol	EVCS_UFC200_Preventive_Maintenance_Protocol_V01_en
Delta EVCS Calibrated energy metering system and OCPP specification for CPO	EVCS_Calibrated_energy_metering_system_and_OCPP_specification_for_CPO_V01_en
Delta EV Charging ModBus Register Table for External Energy Management	EVCS_Charging_ModBus_Register_Table_for_External_Energy_Management_V01_en

Table 1: Related documents

Documents are available from EVCS.Service@deltaww.com

1.1.2 Hardware and firmware version

This manual covers the UFC 200 up to the hardware version and firmware version listed below.

Hardware version

The hardware version code provides information about the charger and the available connectors

Nr.	Hardware version code	Comment
1	EVC200 nin1 xx-xx-xxxEx-xxx	4 in 1 model, single side arrangement
2	EVC200 nin1 xx-xx-xx-xx-xxxEx-xxx	6 in 1 model, double side arrangement

Table 2: Hardware version

Firmware version 3.4.6

This manual covers all chargers with firmware version up to version 3.4.6

1.2 Intended use

The UFC 200 serves to charge electric vehicles with direct current (DC) or alternating current (AC). The UFC 200 is designed for a fixed installation with permanent connection to the AC grid. The UFC 200 shall not be installed and used in context with a moveable charging application.

1.3 Standards and guidelines

The following standards and guidelines have been applied and followed.

General

1	DIN EN ISO 12100
2	DIN ISO/TR 14121-2
3	DIN EN ISO 13849-1
4	2011/65/EU (RoHS 2) EN 50581 – Restriction of Hazardous Substances in Electrical and Electronic Equipment
5	2017/2102/EU

Table 3: Standards and guidelines - general

Electromagnetic compatibility

6	2014/30/EU EN 61851-21-2
7	2014/30/EU EN 301 489-1 V1.9.2
8	2014/30/EU IEC 61000-3-11
9	2014/30/EU IEC 61000-3-12

Table 4: Standards and guidelines - electromagnetic compatibility

Low voltage directive

10	2014/35/EU IEC 61851-1
11	2014/35/EU IEC 61851-22
12	2014/35/EU IEC 61851-23
13	2014/35/EU IEC 61851-24
14	2014/35/EU IEC 61439-1
15	2014/35/EU IEC 61439-7
16	2014/35/EU IEC 62196-1
17	2014/35/EU IEC 62196-2
18	2014/35/EU IEC 62196-3

Table 5: Standards and guidelines - low voltage directive

Radio equipment

19	2014/53/EU EN 300 328 V2.2.2
20	2014/53/EU EN 300 330 V2.1.1
21	2014/53/EU EN 301 511 V12.5.1
22	2014/53/EU EN 301 893 V2.1.1
23	2014/53/EU EN 301 908-1 V13.1.1
24	2014/53/EU EN 301 908-13 V11.1.2
25	2014/53/EU EN 301 908-2 V11.1.2
26	2014/53/EU EN 62311
27	2014/53/EU EN 62479

Table 6: Standards and guidelines - radio equipment

Measuring

28	2014/32/EU IEC 62053-41
29	MessEG
30	MessEV
31	DOI 10.7795
32	REA Dokument 6-A
33	PTB-A 50.7
34	DIN EN 50470-3
35	DIN EN 62059-32-1
36	WELMEC 7.2
37	CLC/TR 50579
38	WELMEC Guide 8.4
39	WELMEC Guide 8.6

Table 7: Standards and guidelines - measuring

Miscellaneous

40	EN 60364-7-722
41	DIN VDE 0100-722
42	IEC 60529
43	IEC 62262
44	VDE AR-N 4100 low voltage grid
45	VDE AR-N 4100 medium voltage grid
46	2012/19/EU
47	2014/94/EU EN 17186

Table 8: Standards and guidelines – miscellaneous

1.4 Target groups

This manual is intended for personnel performing maintenance on the UFC 200. For the qualifications needed, see section 2.8.

1.5 Conventions

In this manual, the different types of content are presented differently.

1.5.1 Instructions in the text

Instructions in the text include safety instructions, notes, tasks in sequence and unordered lists of items or tasks.

Safety instructions

Safety instructions are covered in chapter [2. Safety](#)

Task instructions

Each step of a task is indicated by an individual step. Individual tasks are separated by blue bars, the tasks are numbered in sequence. Numbered tasks must be conducted in the order shown.

[image]	Task 1
[image]	Task 2
[image]	Task n

The task is completed.

Images and information

When information is provided together with an image these blocks are separated by black bars.

[image]	Information
[image]	Information
[image]	Information

Lists

In unordered list the content is displayed with triangles which mark individual items.

- ▶ Item 1
- ▶ Item 2
- ▶ Item n

1.5.2 Pictographs

In this manual, pictographs are used to supplement safety instructions and indicate useful information.

1.5.3 Markings on the product

There are multiple stickers and markings on the UFC 200. These stickers and markings must not be removed.

Type plate

The type plate contains information identifying the product and the manufacturer. It is located on the plinth and is visible from the outside.

The type plate also identifies chargers with the optional certified measuring system. The type plate also identifies chargers with the optional certified measuring system. These chargers have the DE-M code, certification number and meter class printed on the type plate.

The production date is encoded in the fourth to seventh digit of the serial number. These four digits show year and week of production. This information is also displayed on the second type plate located on the inside of the charger.

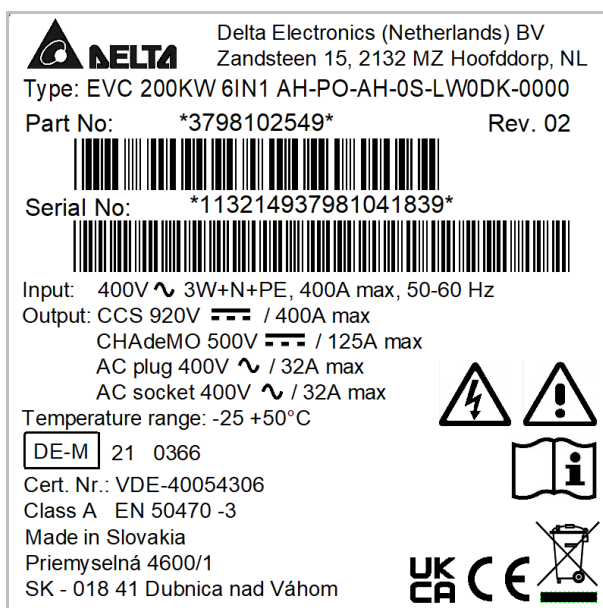


Figure 1: UFC 200 type plate – outside

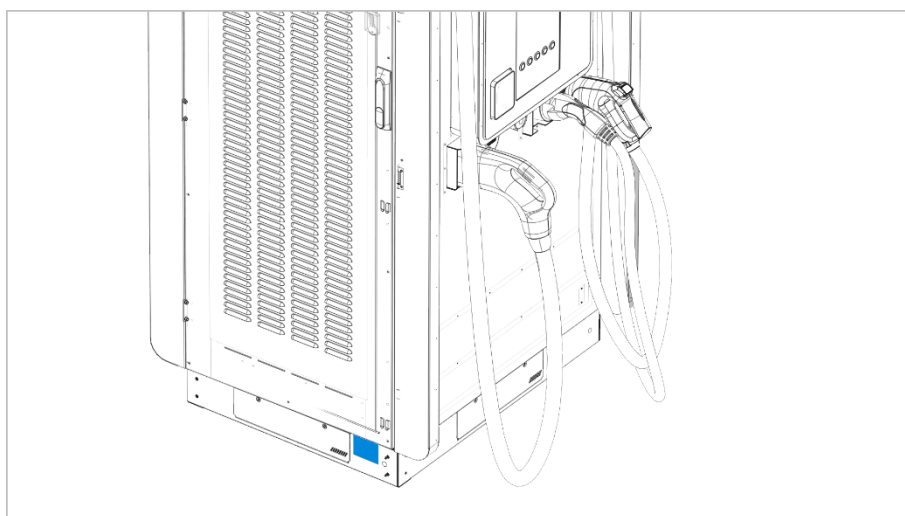


Figure 2: Type plate location – outside

A second type plate is located inside the charger in the cable entry zone. This type plate also contains information about the charger configuration.

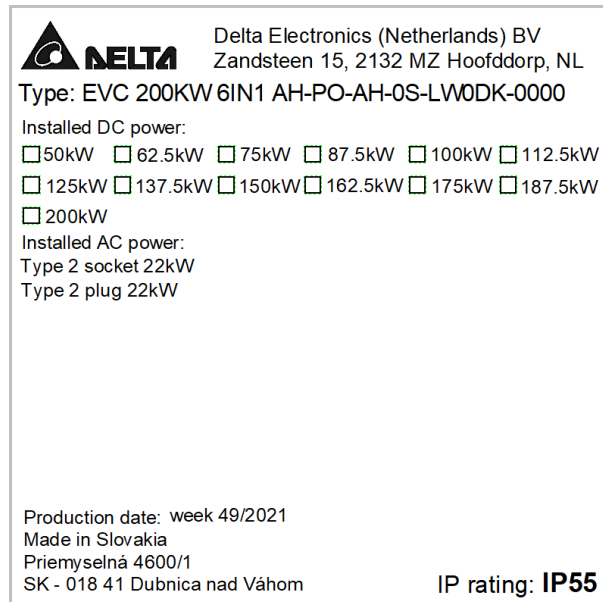


Figure 3: Second type plate - inside

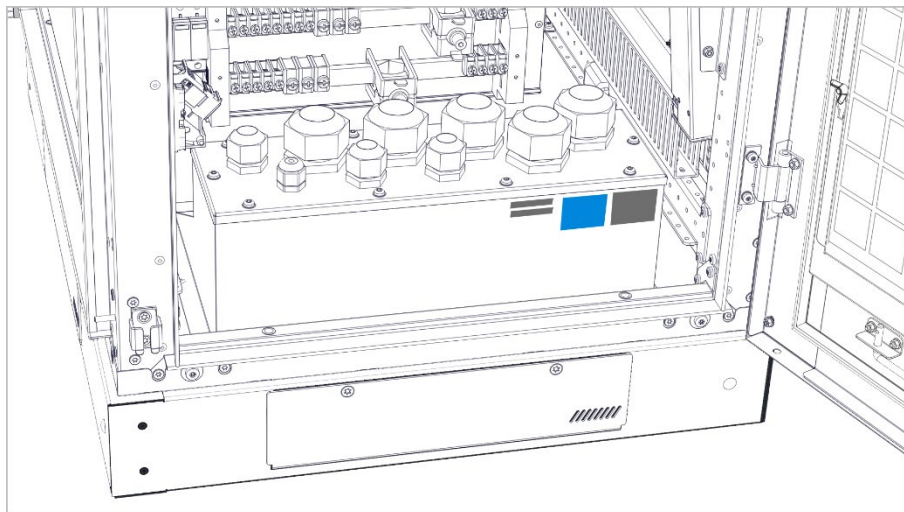


Figure 4: Type plate location - inside

EN 17186 Label

The EN 17186 label identifies compatibility between vehicles and charging infrastructure. There is one individual EN 17186 label for each type of connector. Each type of connector is represented by a letter. For the UFC 200 the following labels apply.





AC plug / Socket outlet	
DC CCS 500 V	
DC CCS 920 V	
DC CHAdeMO 500 V	

Table 9: Connector labels EN 17186

Each connector and each corresponding socket on the charger are identified with a physical EN 17186 label displaying their respective letter. The labels are located adjacent to connector holder and AC socket.

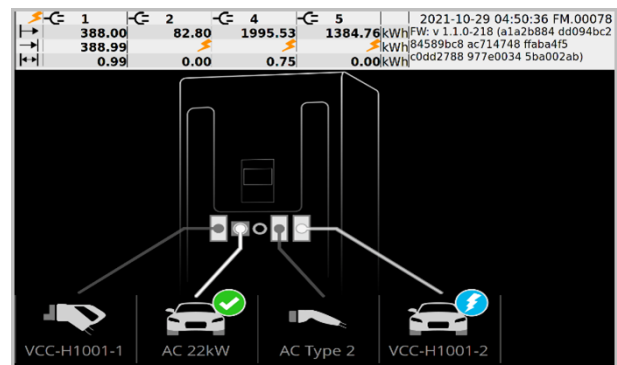


Figure 5: Location of EN 17186 labels and connector ID labels

Connector ID label (German Calibration Law option)

The connector ID labels serve as markers for the end user to identify the corresponding meter information on the user interface.

The connector labels consist of a number and a connector symbol. These labels are positioned below each individual charging connector, under the EN 17186 labels.



QR code with public key (German Calibration Law option)

Two stickers displaying the QR code with the public key for each individual UFC 200 are positioned on the charger.

The first sticker is located on the outside of the charger under the HMI.

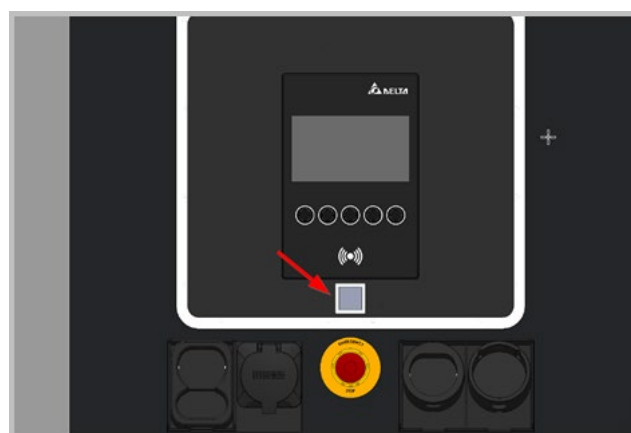


Figure 6: QR code sticker location - outside

The second sticker is located on the inside of the charger above the rectifier area on the measuring capsule.

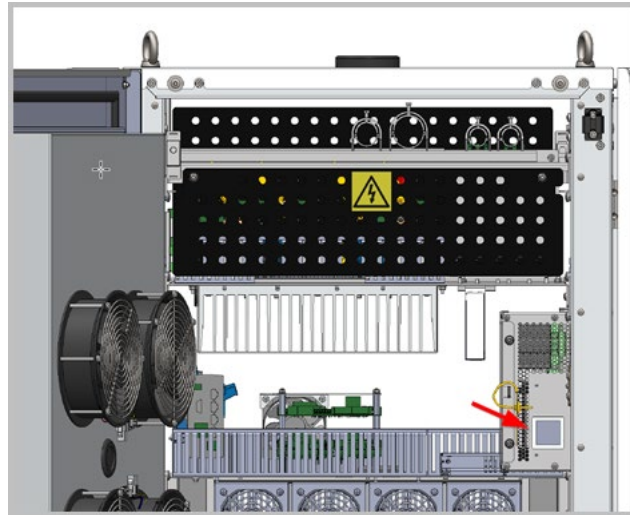


Figure 7: QR code sticker location - inside

High voltage warning sticker

Located on the cover of the right side control board access cover.

High voltage warning sticker

Located on the cover of the left side control board access cover.

High leakage current sticker

Located on the circuit breaker bar under the power modules.

1.5.4 Abbreviations

The following abbreviations are used in this manual.

CPO	Charging Point Operator
MCB	Main Control Block
NAT	Network Address Translation
OCPP	Open Charge Point Protocol
OVP	Over-Voltage Protection
PE	Protective Earth
RCD	Residual Current Device
RFID	Radio Frequency Identification
SOAP	Simple Object Access Protocol
SOP	Standard Operating Procedures
UFC	Ultra Fast Charger
WAN	Wide Area Network
UTP	Unshielded Twisted Pair
HMI	Human Machine Interface
ICCID	Integrated Circuit Card Identifier
IMSI	International Mobile Subscriber Identity
PUG	Power Unit Group
RCBO	Residual Current Breaker with Over-Current
RCM	Residual Current Monitor
MRCD	Modular Residual Current Circuit Breaker
IMD	Insulation Monitoring Device
CSMS	Charging Station Management System
DNO	Distribution Network Operator

Table 10: Abbreviations

2 Safety

This chapter contains general safety information, specific safety instructions and precautions as well as information concerning personnel qualification and proper use of the product.

Before conducting maintenance tasks on the UFC 200, review this manual carefully and consult with a licensed contractor, licensed electrician and trained installation expert to ensure compliance with local building practices, climate conditions, safety standards, and state and local codes.

2.1 General safety information

The following four risk levels and one information level are taken into account in this manual.

Danger



DANGER



Immediate pending danger

Indicates an immediately pending danger that will result in death or serious injury if not avoided.

- ▶ Instruction 1 to avoid danger
 - ▶ Instruction 2 to avoid danger
 - ▶ Instruction n to avoid danger
-

Warning



WARNING



Potential pending danger

Indicates a pending danger that could result in death or serious injury if not avoided.

- ▶ Instruction 1 to avoid danger
 - ▶ Instruction 2 to avoid danger
 - ▶ Instruction n to avoid danger
-

Caution



CAUTION



Potential pending danger

Indicates a pending danger that could result in minor injuries if not avoided.

- ▶ Instruction 1 to avoid danger
 - ▶ Instruction 2 to avoid danger
 - ▶ Instruction n to avoid danger
-

Notice

NOTICE

Danger of damage to property

Indicates potential for damage to property. Is used to highlight actions that are not associated with personal injury.

- ▶ Instruction 1 to avoid damage to property
- ▶ Instruction 2 to avoid damage to property
- ▶ Instruction n to avoid damage to property

Note



Notes indicate important information about the product in the context of the manual.

- ▶ Info 1
- ▶ Info 2
- ▶ Info n

The safety instructions are supplemented by warning pictographs indicating the source and type of danger.

2.2 Safety instructions

All safety instructions in this manual are based on the results of the risk assessment carried out in accordance with the Machinery Directive 2006/XX/EC Annex I and EN ISO 12100. Where applicable, the life cycle phases of the product were taken into account.



WARNING



Electric shock

Danger of electric shock or injury.

- ▶ Turn OFF power at the main distribution board before working inside the equipment or removing any component.
- ▶ Do not remove circuit protective devices or any other component until the power is turned OFF.
- ▶ Do not come into contact with electrical voltage.



WARNING



Injury through suspended load or lifting equipment

Persons in the vicinity of the installation site immediately before the UFC 200 being installed can be injured by lifting equipment or suspended loads.

- ▶ Secure the installation site against unauthorised access.


WARNING

Fire through overheating of terminals

Damaged or improperly connected terminals can cause electric sparks and overheating.

- ▶ Use contact paste
 - ▶ Apply correct torques to terminals.
 - ▶ If there are any signs of overheating, the charger must be shut down and repaired.
-


WARNING

Electric shock

Risk of electric shock through incorrect identification of wires or wire colours.

- ▶ Follow instructions when connecting wires.
-


WARNING

Electric shock

Risk of electric shock during measuring of voltage on uncovered leads.

- ▶ Wear electrician's gloves.
-


WARNING

Electric shock

Risk of electric shock through insufficient grounding of local grid.

- ▶ Before starting work, ensure that the local grid is sufficiently grounded.
-


WARNING

Electric shock from enclosure

Risk of electric shock from enclosure through insufficient grounding of enclosure and doors.

- ▶ Before starting work, ensure that the enclosure is sufficiently grounded.
-


WARNING

Electromagnetic field

Electromagnetic fields can interfere with cardiac pacemakers.

- ▶ Wearers of pacemakers should not stand too close to the control panel and the RFID reader.
 - ▶ They should not stay near the charging cabinet longer than necessary.
-

 **WARNING**



Risk of falling

Risk of falling while working on charger cable glands.
 ▶ Use a standard-compliant ladder.

 **WARNING**



Risk of falling

Risk of falling while working on charger antenna.
 ▶ Use a standard-compliant ladder.

 **WARNING**



Eye damage from arc flash

Opening or closing a circuit breaker can cause an electric arc. The high-intensity light can damage the eyes.

- ▶ Do not look at a circuit breaker when it is opening or closing.

 **CAUTION**



Tripping over charging cable

Charging cables pose a trip hazard.

- ▶ Secure cables when they are not in use.
- ▶ Pay attention during charging.

 **CAUTION**



Risk of cutting

Risk of cutting hands on charger enclosure during unpacking.

- ▶ Wear protective gloves.

 **CAUTION**



Electric-arc flash hazard

Risk of burns from sparks or an electric arc caused by phases being connected to the wrong terminals.

- ▶ Follow the labels printed on the devices.
- ▶ Pay attention.

 **CAUTION**



Electric shock

Risk of electric shock from meter.

- ▶ When working on the meter, wear electrician's gloves.



CAUTION



Injuries through being struck by falling objects

Loose equipment or quickly deposited tools may fall and cause injury.

- ▶ Ensure that you have enough room to carry out your work.
- ▶ Put tools away securely.
- ▶ Keep the workplace tidy.

2.3 Safety precautions

The following safety precautions must be followed.

- ▶ Read the manual before installation, usage or maintenance of the UFC 200.
- ▶ The UFC 200 must be configured according to the safety instructions and work instructions in this manual.
- ▶ Do not put tools, material or body parts into the electric vehicle connector.
- ▶ Do not use the UFC 200 if the chassis, power cord or charging cable are frayed, have broken insulation, or show any other signs of damage.
- ▶ The UFC 200 must be powered up after installation to avoid condensation within the housing.
- ▶ Be sure to preview the standard operating procedures (SOP) and ensure that local building and electrical codes are reviewed before the UFC 200 is configured.
- ▶ Any repair of the UFC 200 must be conducted by Delta, authorized service partner or Delta trained personnel. Otherwise the guarantee is void.
- ▶ Warning labels on the UFC 200 must not be removed.
- ▶ To avoid damage by lightning, local regulations must be followed.
- ▶ Use appropriate protection when connecting to the main power distribution cable.

2.4 In the event of fire



In the event of a fire stay calm and do not panic.

Inform the fire department and provide the following information.

- ▶ Where is the fire.
- ▶ What is on fire.
- ▶ Is human life at risk.
- ▶ Name and telephone number from which you are calling.



Do not hang up the telephone until you are instructed to do so by the emergency services operator.

After emergency services have been notified inform the site administrator and charge point operator.

Fire fighting measures

- ▶ Provide information about the fire to the owner or administrator of the facility.
- ▶ Evacuate all persons from the area of the fire to the planned evacuation area.
- ▶ If possible press the EPO button to stop charger operation.
- ▶ If possible disconnect the power by pressing down the fire breaker.
- ▶ Rescue and fire fighting measures are managed by the owner of the facility or a person authorized by the owner until emergency services arrive on site.
- ▶ Upon arrival of emergency services the staff is obliged to cooperate with the commander of emergency services.



Fire in the electric cabinet cannot be extinguished with water.

2.5 Grounding

An equipment-grounding conductor or a grounded metal and permanent wiring system is required for the connection of the UFC 200. The grounding conductor must be connected to the equipment-grounding bar or lead on the charger. The grounding equipment must be operated via circuit conductors.

Additionally the UFC 200 can be grounded via a plinth grounding bolt. The application of a charger plinth grounding bolt is optional depending on the specific site.

2.6 Limits of use of the product

The table below provides information on the limits of use of the UFC 200.

Protection class	IP 55; IK10 (according to IEC 62262)
Excess voltage category	OVC II
Permissible protection class	Class I (IEC 61140)
Permissible surrounding magnetic field	In range with IEC EN 61000
Temperature range	-25° C to +50° C
Rel. air humidity	< 95% relative humidity, non-condensing

Table 11: Limits of use

2.7 Proper use

The UFC 200 may only be used to charge electric vehicles, within the limits stated under section 2.5. Limits of use of the product.

Chargers under German Calibration Law

Additional information on the proper use of chargers subject to German Calibration Law can be found in the [UFC 200 Planning guide](#) under chapter 10. German Calibration Law.

2.8 Foreseeable improper use

The foreseeable improper use of the UFC 200 includes, but is not limited to:

- ▶ Manipulation of the charging connectors
- ▶ Supplying DC or AC power to other devices than electric vehicles

Chargers under German Calibration Law

- ▶ Operating the charger without correct registration in the German national register “Bundesnetzagentur”.
- ▶ Operating the charger after expiry of calibration date.
- ▶ Operating the charger with a wrong time-zone setting.
- ▶ Operating the charger when not being able to process the invoicing to the end-user according to legal regulation.
- ▶ Operating the charger after repair without verification of the calibration by Delta or state authorities.
- ▶ Failure to follow legal requirement to store repair records by operator according to Mess-EG.
- ▶ Operating the charger purchased as a used 2nd life charger without correct registration in the German national register “Bundesnetzagentur”.

2.9 Personnel qualification

The UFC 200 must be maintained by licensed and certified personnel.

The work described in this document may only be carried out by technicians who have appropriate professional qualifications, the necessary experience and have passed Delta Electronics training.

2.9.1 Personnel qualification for maintenance and repair**Specialist for mechanical work**

Only a trained specialist may carry out mechanical work. In the context of this manual, specialists for mechanical work are responsible for the mechanical maintenance tasks for the UFC 200.

These specialists must have the following qualifications:

- ▶ Qualification in accordance with nationally applicable regulations
- ▶ Knowledge of this manual
- ▶ Knowledge of local safety regulations

Specialist for electrotechnical work

Only a trained specialist may carry out electrical engineering work. In the context of this manual, specialists for electrotechnical work are responsible for the electrical maintenance tasks for the UFC 200.

These specialists must have the following qualifications:

- ▶ Qualification in accordance with nationally applicable regulations
- ▶ Knowledge of this manual
- ▶ Knowledge of local safety regulations

2.9.2 Delta Electronics training

Delta Electronics training covers installation, maintenance and repair of the UFC 200. For more information concerning Delta Electronics training and certification please contact your Delta service partner.

3 Technical data

3.1 General

Attribute	Value
Height	2079 mm
Width	859 mm
Depth	998 mm
Weight	550 kg

Table 12: Technical data - general

3.2 Input

Attribute	Value
AC connection	3 phase TN-S system, L1, L2, L3, N, PE
AC voltage	400 V RMS (L-L) +/- 10%
Frequency	50/60 Hz
Nominal current	410 A RMS at maximum power (200 kW DC + 44 kW AC)
Power factor / THD	0.99 / 2.7%
Mains terminal	Terminal blocks
Transient OVP	Class II / C protection

Table 13: Technical data: input

3.3 Output

Attribute	Value
DC output voltage range	200 V to 1000 V DC
AC output	400 V RMS
Maximum current	500 A DC at 400 V DC / 250 A DC at 800 V DC
Maximum power	200 kW
Cable length / reach distance	3,2 m / 2,2 m 5 m / 3,7 m (option)
Protection	Over current Under current Over voltage Short circuit Ground and isolation monitoring

Table 14: Technical data - output

3.4 User interface and control

Attribute	Value
Display	7 inch LCD
Supported languages	Refer to Delta Electronics UFC 200 Configuration manual
Push button	1 emergency stop button (option)
Keypad	5 buttons
Local authentication	RFID NFC credit card terminal (option)
Network interface	Ethernet 3G / 4G
Protocol	Back-end system integration with OCPP 1.5 and 1.6 tested with OCTT Separate service interface Optional power/energy management interface

Table 15: Technical data - user interface and control

3.5 Environmental conditions

Attribute	Value
Operating temperature	-25° C to +50° C
Storage temperature	-40° C to +80° C
Humidity	< 95% relative humidity, non-condensing
Elevation	2000 m

Table 16: Technical data - environmental conditions

3.6 Mechanical

Attribute	Value
Ingress protection	IP55
Impact resistance	IK10 according to IEC 62262
Cooling	Forced air

Table 17: Technical data – mechanical

3.7 Regulation

Attribute	Value
Certification	IEC 61851-1 IEC 61851-21-2 IEC 61851-22 IECH 62479 IEC 61851-23
EMC	EN 55011 IEC 61851-21-2
German calibration law (Deutsches Eichrecht)	Fully compliant
CC payment	Yes (option)
Accessibility	DIN 18040

Table 18: Technical data - regulation

3.8 DC charging points

Attribute	Value CCS	Value CHAdeMO
Rating cables and connectors	400 A DC	125 A DC / 500 V DC
Compliance	IEC 61851-23 IEC 61851-24 IEC 62196-3 DIN 70121	IEC 61851-23 IEC 61851-24 JEVS G 105, rev. 1.2 compliant

Table 19: Technical data – DC charging points

3.9 AC charging points

Attribute	Value
Nominal AC voltage	400 V RMS
At 22 kW AC socket	3 x 32 A RMS at 22 kW
Protections	RCD Type A + 6 mA DC leakage current detection
Compliance AC connector & socket	IEC 62196-2 Mode 3, Type 2

Table 20: Technical data - AC charging points

3.10 AC charging plug

Attribute	Value
Nominal AC voltage	400 V RMS
At 22 kW AC plug	3 x 32 A RMS at 22 kW
Protections	RCD Type A + 6 mA DC leakage current detection
Compliance AC plug	IEC 62196-2 Mode 3, Type 2

Table 21: Technical data - AC charging plug

4 Product description

This chapter provides a general description of the Delta Electronics Ultra Fast Charger 200.

4.1 UFC 200

Delta Electronics Ultra Fast Charger 200 is a fast charging station for charging battery electric vehicles using AC or DC charging points and for charging plug-in hybrid vehicles using AC charging points.

Depending on configuration the UFC 200 can charge up to 4 vehicles simultaneously. The UFC 200 offers two charging points for DC fast charging up to 200 kW and two charging points for AC charging with 22 kW each. Charging times are optimized by the integrated power management system.

Single side arrangement

The single side arrangement of the UFC 200 can charge up to four electric vehicles and offers the user interface, credit card terminal and four connectors on the front side.

The standard single side configuration offers the following connectors on the front side.

- ▶ CCS
- ▶ AC socket
- ▶ AC plug
- ▶ CHAdeMO

Please refer to figure 1 on the following page showing the whole charger.

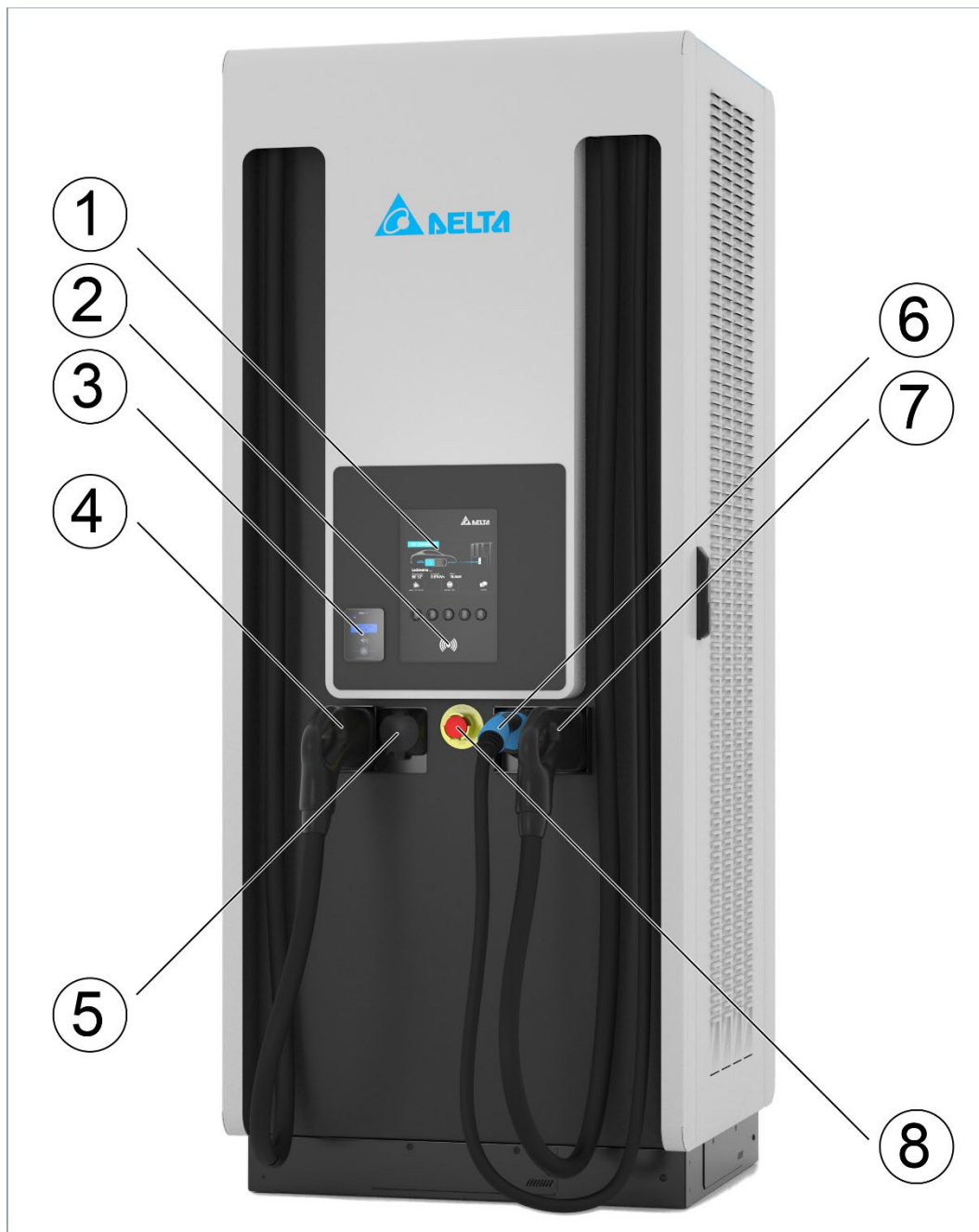


Figure 8: UFC 200 - single side arrangement with CCS, AC socket and plug, CHAdeMO

Pos.	Name of interface	Pos.	Name of interface
1	Display with control buttons	5	AC charging socket up to 22 kW
2	RFID card reader	6	AC charging plug up to 22 kW
3	Credit card terminal (option)	7	DC fast charge CHAdeMO
4	DC fast charge CCS	8	Emergency Power OFF button (option)

Double side arrangement

The double side arrangement of the UFC 200 can charge up to four electric vehicles and offers a user interface on each side of the charger.

The image below shows the front side and back side with the standard connector configuration.



Figure 9: UFC 200 - double side arrangement front view

The standard connector configuration offers the following connectors on the front side.

- ▶ CCS
- ▶ AC plug
- ▶ CHAdeMO



Figure 10: UFC 200 - double side arrangement back view

The standard connector configuration offers the following connectors on the back side.

- ▶ CCS
- ▶ AC socket
- ▶ CHAdeMO

The DC charging system is modular and consists of efficient power units. All charging points are protected by appropriate safety measures in the charging station so that the user is not exposed to any safety risks.

AC power supply

AC power is supplied to the UFC 200 via the local grid.

4.2 User Interfaces

The UFC 200 is equipped with one HMI on the front side of the charger, double sided variants have one HMI on each side.

The UFC 200 has a menu-driven user interface to guide the user through the steps of the charging process and to display status requests about the charging process.

Up to 5 languages can be uploaded to the charger, where the user can then select the most suitable one.

The operation of the UFC 200 is described in the operation manual.



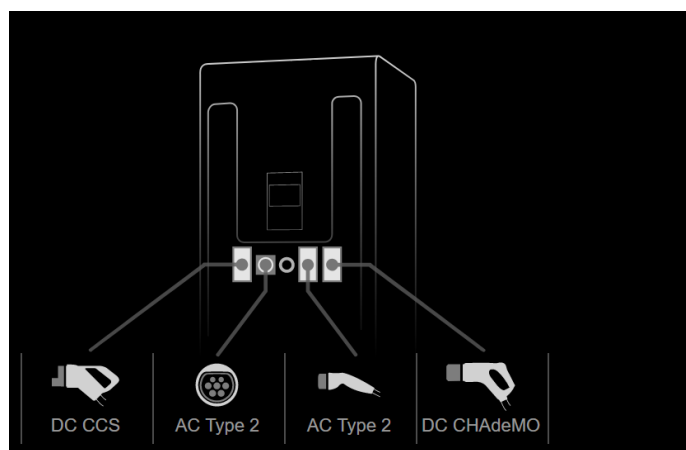
The booting process can take up to 3 minutes to complete. During this time the user interface remains black and the charger cannot be operated.

After the power-up procedure or a power outage consider the time required for booting the system before operating the charger.

4.2.1 Navigation basics

Main menu

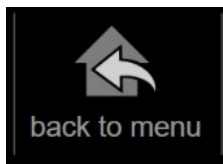
The main menu is shown by default and displays an overview of all available connectors and their status. The individual plug screens are accessed by pressing the buttons at the bottom of the display. Each plug screen provides detailed information about the specific connector or plug.



Main menu

The main menu is shown

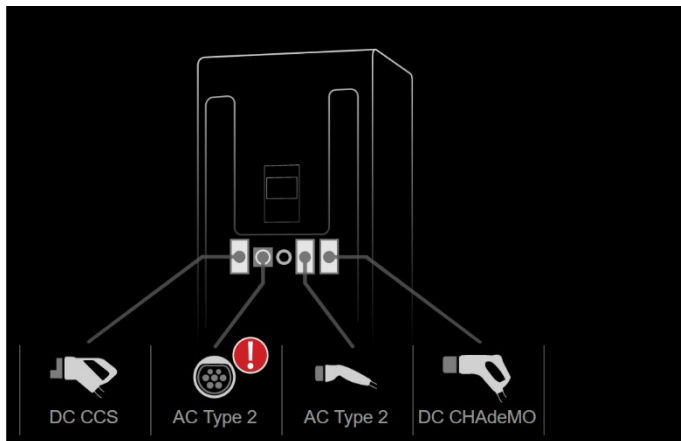
- ▶ When the charger is not in use
- ▶ When there has been no user interaction for 60 seconds
- ▶ When the „back to menu“ button has been pressed



back to menu

The "back to menu" button will revert to the main menu.

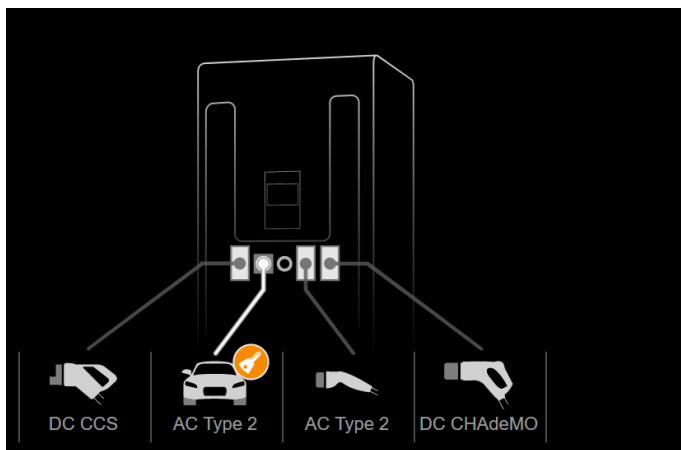
In the main menu the status of each connector is shown using an overlay symbol on the plug icon.



Main menu

Individual plug status

When an electric vehicle is connected to an outlet the plug icon is substituted by an EV icon

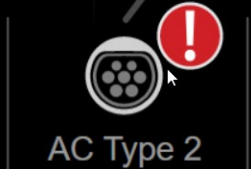
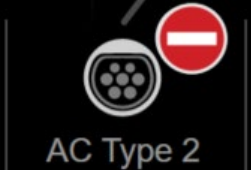
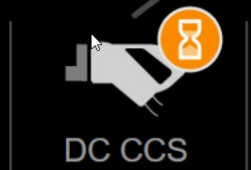

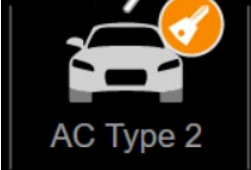



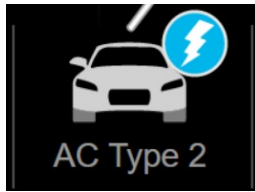
Main menu

EV connected to plug

Display symbols

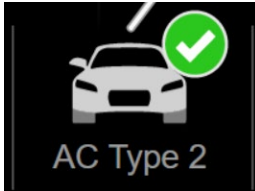
Required user interaction with the charger is indicated by the following symbols.

 <p>AC Type 2</p>	<p>Fault</p> <p>Press the related button to consult the cause of the fault, e.g.:</p> <ul style="list-style-type: none"> ▶ Connector fault
 <p>AC Type 2</p>	<p>Connector not available</p> <p>Only during boot-up</p>
 <p>DC CCS</p>	<p>Connector currently not available</p>
 <p>DC CCS</p>	<p>Connector reserved</p>
 <p>AC Type 2</p>	<p>Authentication pending</p> <p>The EV is connected, the UFC 200 is waiting for authentication by the user</p>
 <p>AC Type 2</p>	<p>Initialization</p> <p>The charging process is being initialized</p>



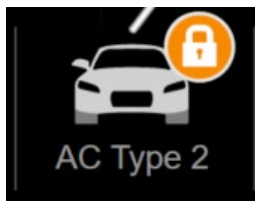
Charging

The EV is being charged, energy is being transferred to the vehicle



Charged

The EV has been charged, no energy is being transferred to the vehicle

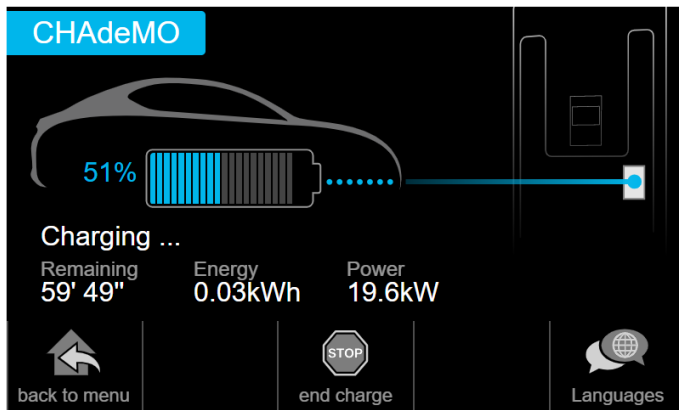


Connector locked

The AC charging cable is locked to the UFC 200 AC socket.
(AC Type 2 socket only)

Plug screens

By accessing the plug screen the user gets detailed information about the selected plug and the corresponding charging session.



CHAdeMO plug screen

Charging session status

The information available on the plug screens depends on the plug type and the specific charger configuration. Depending on availability additional options such as the payment terminal, calibrated energy metering, pricing configuration etc are displayed.

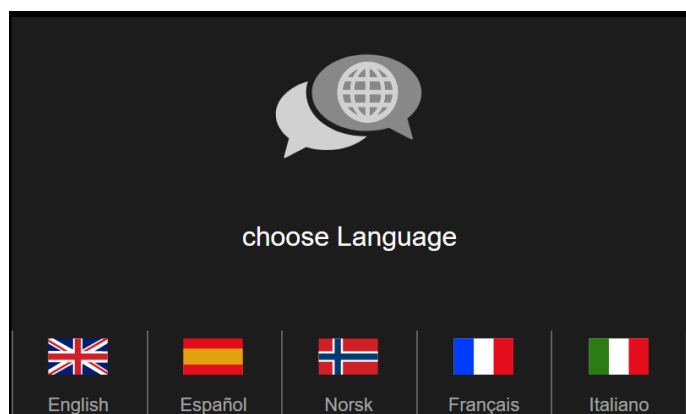
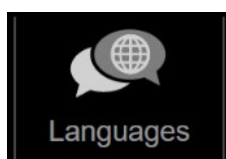
Languages

The UFC 200 allows connector specific language selection.



A different language can be selected for each individual connector.

To access the language selection press the languages button.



Languages

The language can be selected by pressing the “languages” button.

4.3 Charging connectors

The UFC 200 has the following charging connectors available:



CCS

200 A rating (standard)
400 A_{peak} with temperature control (option)
Temperature controlled derating
920 V max.



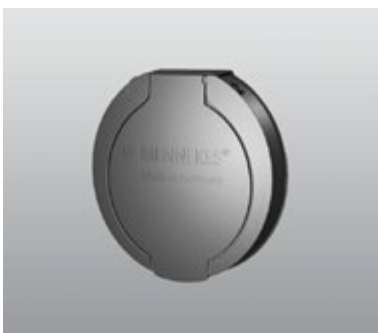
CHAdeMO

125 A / 500 V rating = 62.5 kW



AC plug

Type 2, 22 kW rating



AC socket

Type 2, 22 kW rating

Depending on its set-up, the UFC 200 can charge up to four vehicles simultaneously. In a single-side connector arrangement, the UFC 200 can hold up to four charging connectors. In a double-side connector arrangement, the charger can hold up to six charging connectors.

Cable lengths

Different standard cable lengths are available with the UFC 200.

- ▶ Standard 3.2 m cable with 2,2 m reach
- ▶ Optional 5 m cable with 3,7 m reach

4.4 Connectivity

The UFC 200 can access the back office system via internet or a private network.

The connection is established through the UFC 200's embedded 3G/4G modem or the integrated RUT955 router.

The Delta Electronics service connection is maintained using the integrated RUT955 router's 3G/4G modem.

Wireless connection

The wireless connection is established via the 3G/4G modem.

The customer's SIM card is installed in the controller board SIM card slot. All necessary settings like APN and IP are then set during the UFC 200's configuration.

This type of connection allows the use of private APN to secure traffic. Refer to UFC 200 installation manual for more information on connection enabling.

WAN ethernet connection

The UFC 200 can also be connected to the back office system using an ethernet connection.

This type of connection allows to aggregate traffic from multiple devices installed in one location.

Delta Electronics service connection

The Delta Electronics service connection is maintained through the integrated router's 3G/4G modem and a dedicated SIM card.

Delta can connect to the charger via the service connection to conduct the following:

- ▶ Service ticket for diagnostics and log download
- ▶ Preventive maintenance e.g. stability monitoring
- ▶ Remote support e.g. firmware upgrade, interoperability test support with vehicles

Options

UFC 200 can be provided with an optional credit card terminal supporting contactless payment. For ad-hoc payment, the tariff can be configured on the charger either by the service interface (locally or remotely) or via OCPP.

Product description

Dynamic power allocation logic to individual connectors



4.5 Dynamic power allocation logic to individual connectors

Architecture overview

The UFC 200 contains 2 rectifier groups. Via a DC switchgear, the 2 rectifier groups can be allocated individually to two independent charging points (in case of simultaneous DC charging) or will be combined to provide maximum charging power to a single charging point (in case of single DC charging session).

In the standard charger configuration the rectifier group allocation happens automatically when a second vehicle starts an additional charging session. Re-allocating back when one vehicle finishes a charging session also happens automatically.

The UFC 200 is a scalable platform. During the ordering process each rectifier group is configurable on request.

Single side configuration	Single side configuration	Double side configuration
2 DC charging points	2 DC charging points (3DCin1) with choice of connector	1 DC charging point on each side with choice of connector
	One DC charging session at a time on the selected plug.	One DC charging session at a time on the selected plug on each side.

4.6 Power / energy management

The UFC 200 is equipped with an Ethernet connection. With a ModBus over Ethernet interface it is possible to control the charging power dynamically from the local power manager.

For application related information please also consult section [11 grid compliance](#).

4.7 Safety protection concept for DC connectors

Protection for the DC connectors is realized via an insulation monitoring device IMD. The IMD is incorporated in the main controller.

4.8 Safety protection concept for AC connectors

Protection for the AC connectors is realized via RCD type A combined with the DC current sensor. The threshold is set to 6 mA.

4.9 Lightning protection

The UFC 200 must be installed in a lightning protection zone, which secures the area against direct lightning into the charging station according to IEC 62305. Also the area of human presence in relation to charging service from the product must be protected against lightning and dangerous voltages in the ground.

The minimum cable length between the first-level protection and the UFC 200 is 10 m.

To protect the UFC 200 against damage caused by lightning, a three-level protection concept according to IEC 60364-5-53/A2 is mandatory. The goal is to limit transients and energy absorption step by step.

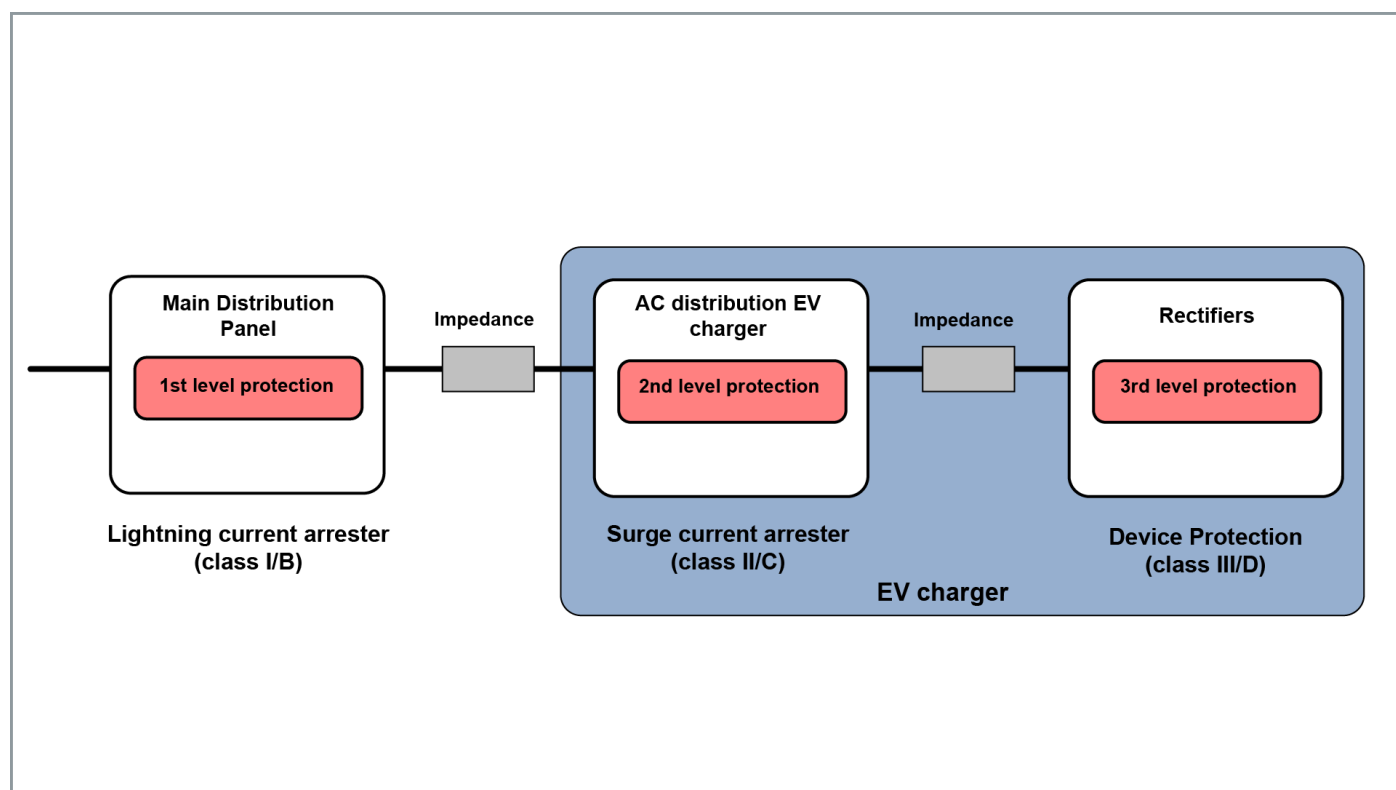


Figure 11: Lightning protection levels

The UFC 200 contains Class II/C surge arrester.

Recommended lightning protection in the main distribution panel for TN-S grid architecture:

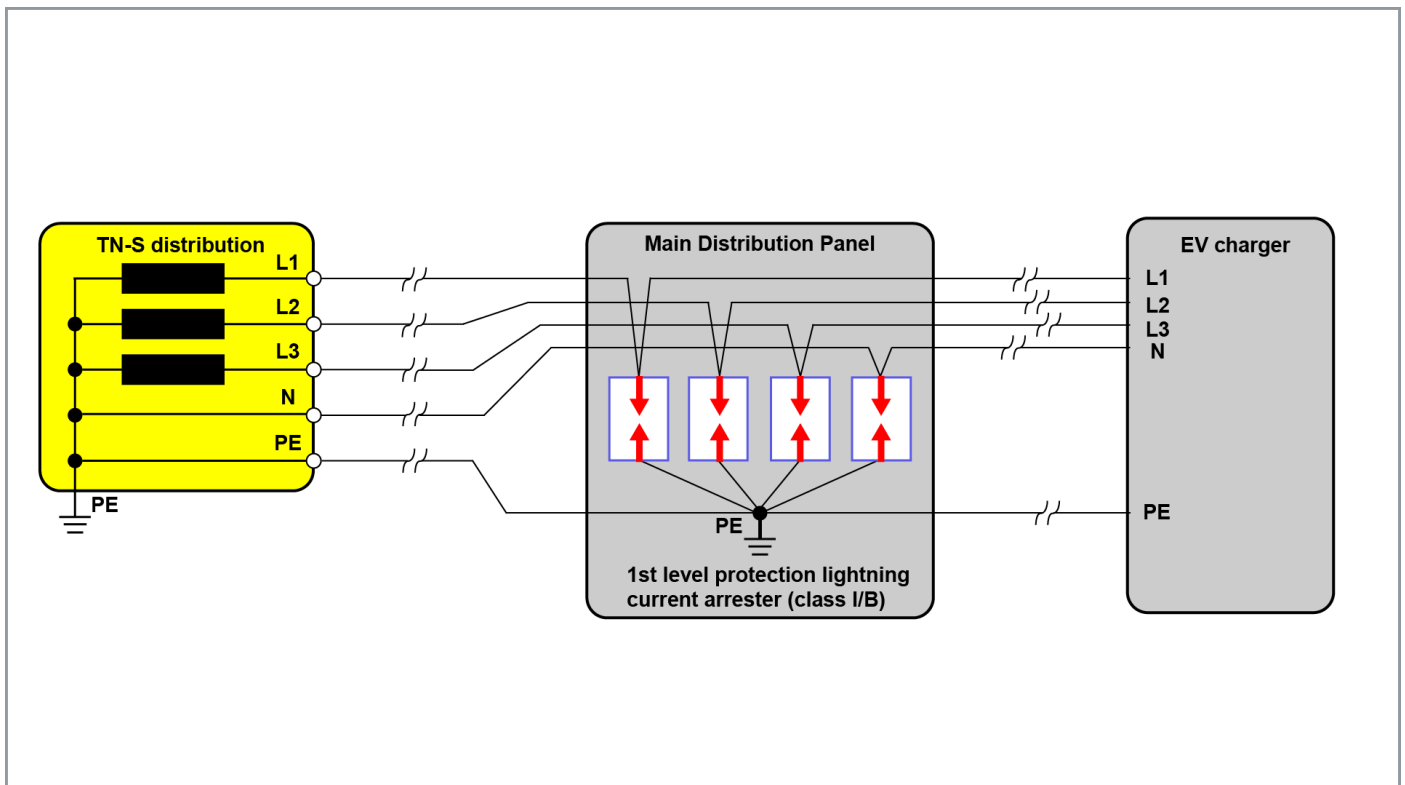


Figure 12: Lightning protection TN-S grid architecture

5 Maintenance inspections

This chapter covers the maintenance inspections for the UFC 200.

5.1 General information

The UFC 200 requires multiple inspections at different intervals.

- ▶ A regular inspection of the UFC 200 must be conducted every six months. The tasks for this inspection are listed in the following chapter.
- ▶ The yearly preventive maintenance inspection must be conducted every 12 months. The results of this inspection must be recorded in the preventive maintenance checklist and sent to Delta.
- ▶ The 2 year periodic check focuses on safety measures and must be conducted every 24 months.

5.2 Regular inspections every six months

The regular inspection of the UFC 200 must be conducted at least every six months. During the inspection the following areas are to be checked.

- ▶ Charger and display are operating normally
- ▶ Charger and charging guns are clean and undamaged
- ▶ Charger ventilation is functioning properly.

5.2.1 Check charger and display operation

- ▶ Perform a visual inspection of the UFC 200.
- ▶ Perform a function check of all charging guns and plugs.
- ▶ Perform a visual check of the display to ensure it is not damaged.
- ▶ Perform a function check of all available functions of the UFC 200

5.2.2 Check charger and charging guns for cleanliness and damage

- ▶ Perform a visual inspection of the UFC 200.
- ▶ Perform a visual inspection of all charging guns and plugs.
- ▶ Ensure all charging guns and plugs are undamaged.
- ▶ Ensure all charging guns and plugs are clean.
- ▶ Ensure there are no foreign objects in the charging guns or plugs.

5.2.3 Check charger ventilation

- ▶ Perform a visual inspection of the UFC 200.
- ▶ Perform an inspection of the chargers slits and openings.
- ▶ Ensure the ventilation fans are running normally.

Maintenance inspections

Yearly inspection according to preventive maintenance checklist



5.3 Yearly inspection according to preventive maintenance checklist

The preventive maintenance checklist covers all inspections which must be conducted every 12 months. The results of the yearly inspection must be recorded in the preventive maintenance checklist and sent to the Delta service email address EVCS.Service@deltaww.com to document proper maintenance of the charger.



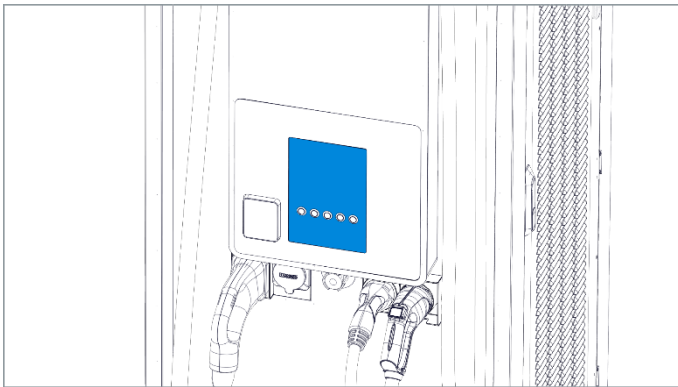
Delta may void warranty if the UFC 200 was not properly maintained.

Perform all checks listed in the preventive maintenance checklist for the yearly periodic check and record the results.

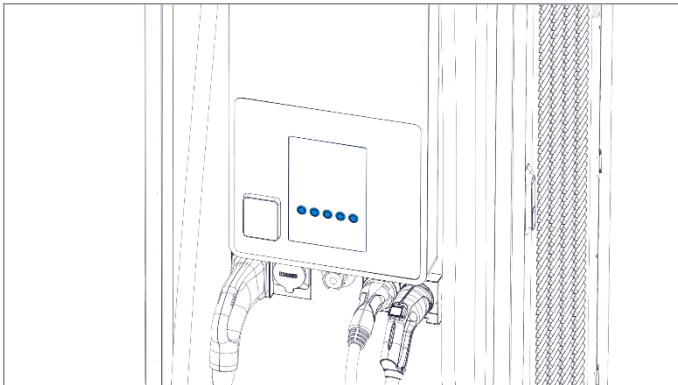
Check UFC 200 exterior

1. Check the exterior for any traces of physical damage.
Wear and tear
Vandalism
Scratches, cracks, etc.
-

Check display and buttons



2. Check the display for damage.
-



3. Check the buttons for damage.
-

4. Check display for visual artifacts (i.e. bad pixels).
-

5. Check screen backlight for function.
-

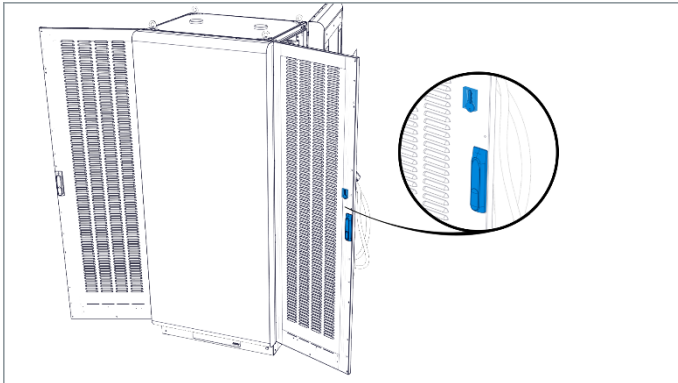
Maintenance inspections

Yearly inspection according to preventive maintenance checklist

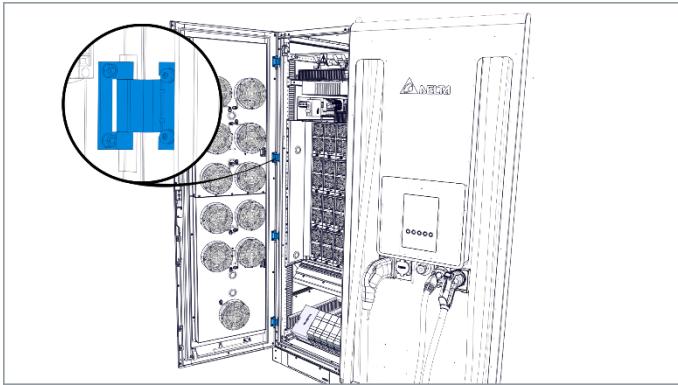


Check door mechanism

Perform the inspection steps for the left door and the right door.

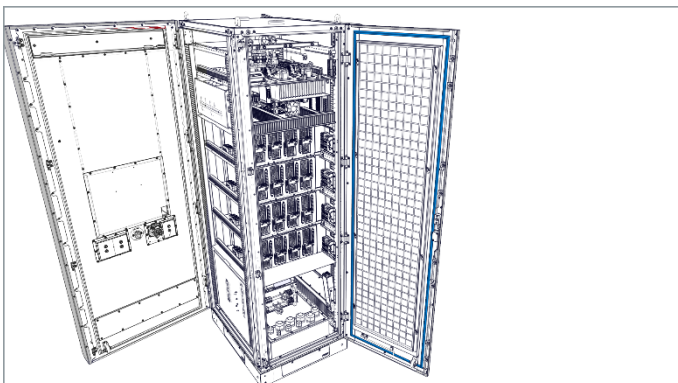


6. Check the door locking mechanism
Locking rods
Fixing points
Handle
Lock



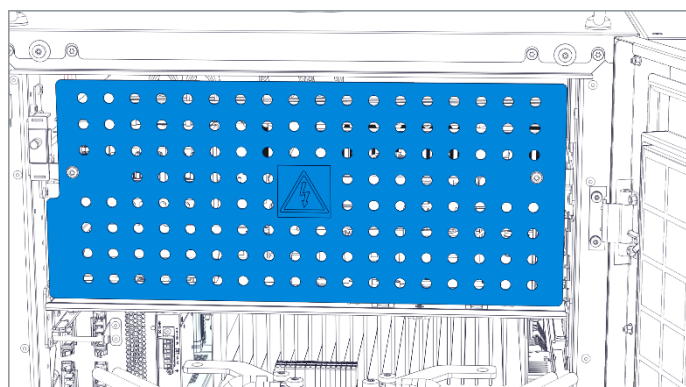
7. Check for smooth movement of all components of the locking mechanism.

8. Check that the doors are not bent.



9. Check that door gaskets are protected by silicon oil.

Check ingress protection and internal covers



10. Check the internal protective covers are mounted in place.

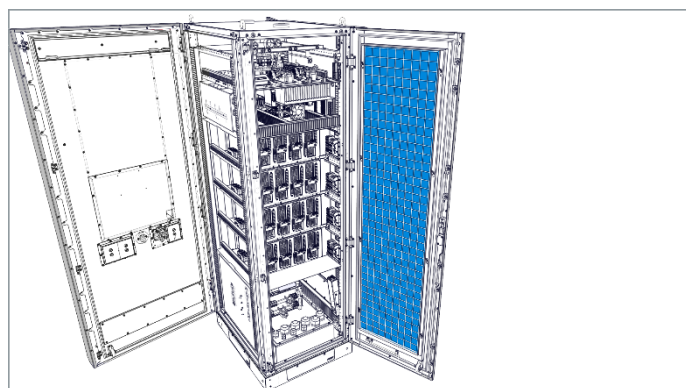
11. Check the interior of the charger for
Contamination
Water ingress
Corrosion

12. Check the interior of the charger for dust.



Sludge build-up consisting of dust and oil (e.g. diesel) can lead to damage of the control board.

Check air filters



13. Check the air filters for cleanliness.

Maintenance inspections

Yearly inspection according to preventive maintenance checklist



Perform visual check of components

14. Perform a visual check of all components for damage and/or corrosion.
15. Check that all components are marked and fitted properly.

Check cables, GFD and HVDC sensing wires

16. Check that all cables are marked.
17. Ensure there are no loose connections on power wires.
18. Check that every cable is properly tightened.



Use insulated tools.

Check over voltage protection

19. Check the indicator field on the over protection modules.



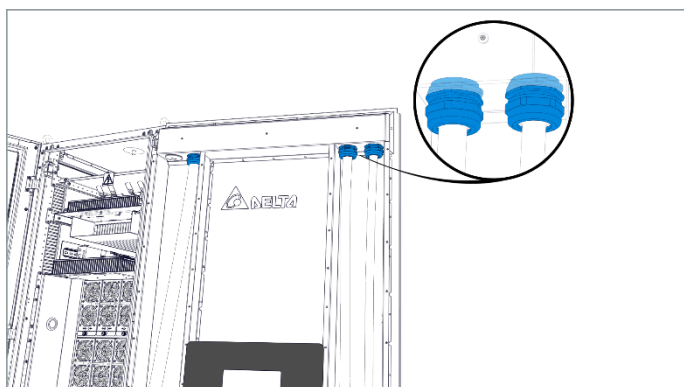
If the indicator field is red, replace the module.

Check charging connectors

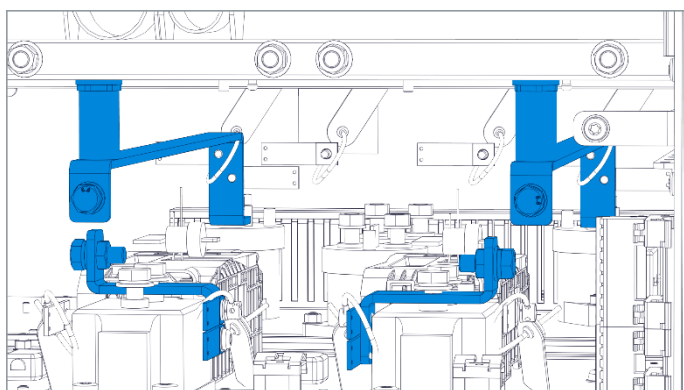
Perform the inspection steps for each of the following components

- ▶ CCS
- ▶ CHEdemo
- ▶ AC2 socket
- ▶ AC2 plug

20. Check charging connectors, cables and resting plates for damage, wear and tear



21. Check that cable glands are properly tightened.



22. Check that charging cables are properly tightened at connection points inside the charger.

Check RFID function

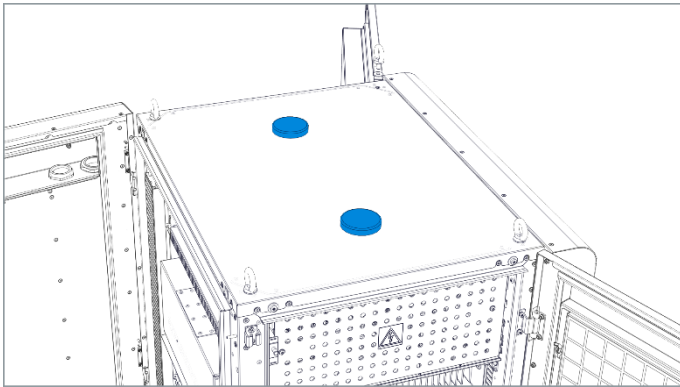
23. Check that the UFC 200 is able to detect RFID cards.

Maintenance inspections

Yearly inspection according to preventive maintenance checklist



Check antenna



24. Check that the antenna is not damaged.

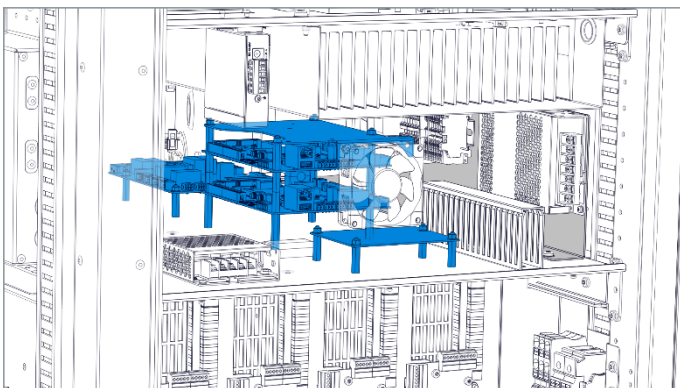
25. Check that there are no traces of water leakage.

26. Check signal strength.

Check electronic control unit

Perform the inspection steps for each of the following components

- ▶ DC plug control board 1
- ▶ DC plug control board 2
- ▶ AC plug control board 1
- ▶ AC plug control board 2
- ▶ 3G modem or ethernet switch



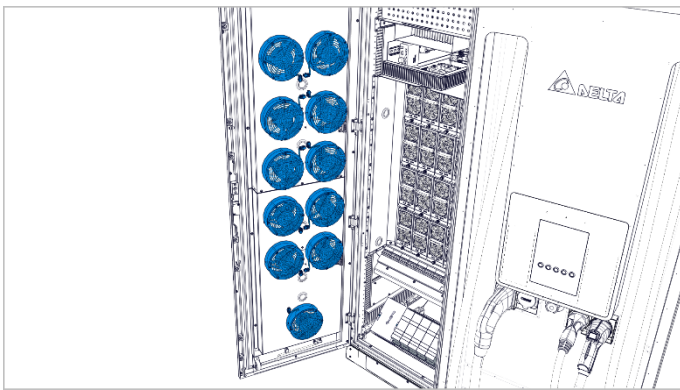
27. Check PCB boards for damage.

28. Check that all cabling is properly fitted into connectors.

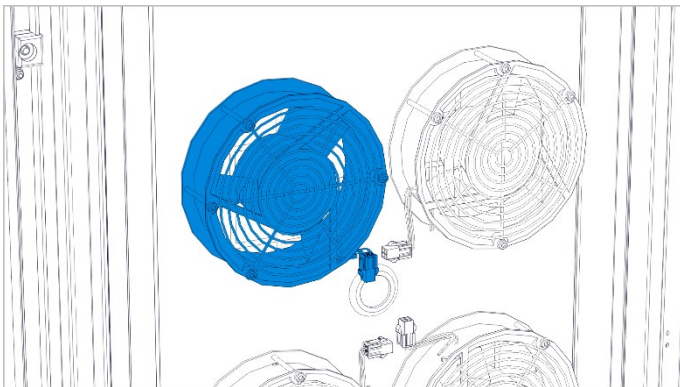
29. Check for corrosion and contamination.

30. Upgrade firmware to latest version.

Check fan function



31. Check that fans are not damaged.



32. Check that fan body and fan blades are not contaminated.

33. Check that fans run at full speed (Power module contactors must be activated and fan PWM control must be disconnected)

5.4 Two year periodic check

The 2 year periodic check covers all inspections which must be conducted every 24 months. The results of the yearly inspection must be recorded in the preventive maintenance checklist and sent to the Delta service email address EVCS.Service@deltaww.com to document proper maintenance of the charger.



Delta may void warranty if the UFC 200 was not properly maintained.

Perform all checks listed in the 2 year periodic check and record the results.

Test of protective conductors – continuity and bonding



The procedure for the following 3 steps is described in section [Continuity and wire connection control](#).

-
1. Check that all exposed conductive parts are connected to main protective earth.

 2. Check that connection resistance is lower than 0,1 [Ohm]

 3. Check that measuring current is a least 200 mA

Test of insulation resistance



The procedure for the following 2 steps is described in section [Insulation resistance control](#).

4. Check that insulation resistance between energized conductors and protective earth is higher than 1 [M Ω] at 500 V DC

5. Check that insulation resistance between energized conductor branches is higher than 1 [M Ω] at 500 V DC.

Test of earth fault loop impedance

6. Check that earth fault loop impedance at AC input complies with local standard. The value must be sufficiently low to enable tripping of upstream protection in requested time.

Test of residual current protection with installation tester

Perform the inspection steps for each of the following components

- ▶ MRCD1
- ▶ MRCD2
- ▶ MRCD3
- ▶ RCBO1



The procedure for the following step is described in section [Residual current protection](#).

7. Check residual current protection with RCD testing equipment.

Be aware that RCBO1 test causes UFC 200 system shutdown. Electric vehicle or simulator is required to properly operate and test the charger safety circuitry.

Use dedicated installation meter and connect the testing probe downstream from contactor on particular branch.



RCBO1 test causes UFC 200 system shutdown.

5.5 Circuit breaker inspection

The UFC 200 is equipped with different circuit breakers and fuses. Ensure that all circuit breakers and fuses are in the closed position and working properly.

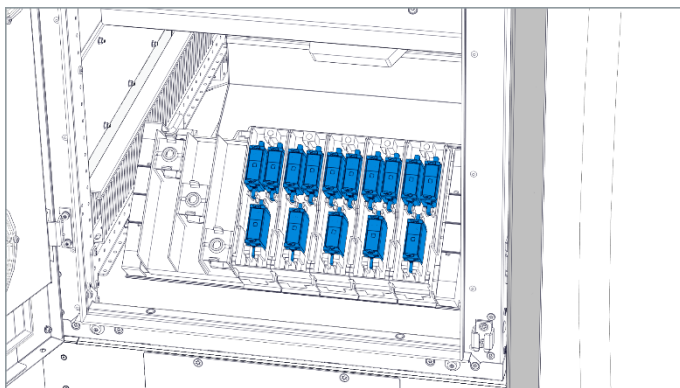
Spare parts

Fuses for the UFC 200 are identified with Delta part numbers

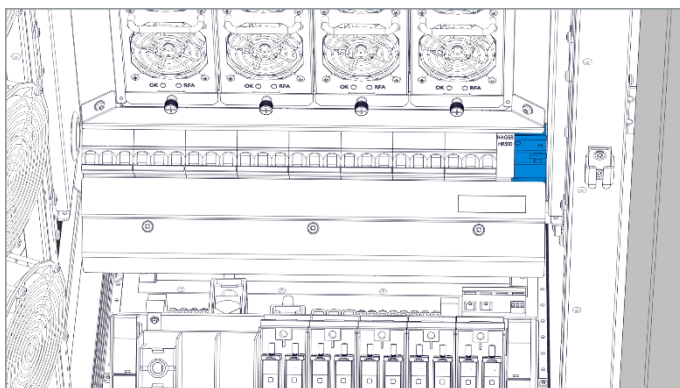
Nr.	Delta SP Nr.	Delta SP Name
1	0890016021	AC circuit fuses FUSE gG P 63A 500V BLADE NH000 3PCE
2	0890016221	DC circuit fuses FUSE gG P 100A 500V BLADE NH000 9PCE

Table 22: Spare parts - fuses

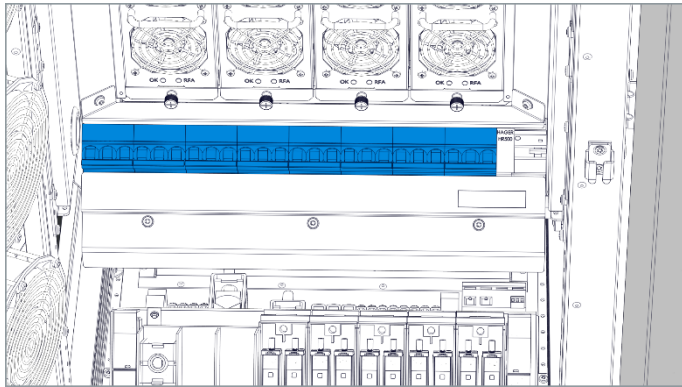
The following steps will guide you through the process.



1. Ensure that the main fuses are in the closed position.



2. Ensure that the controller circuit breaker is in the closed position.



3. Ensure that the circuit breakers for the AC plug and the AC sockets are in the closed position.

4. Ensure that the DC circuit breakers are in the closed position.

5.6 Conducting measurements

This chapter covers specific measurement procedures that are part of the periodic checks.

5.6.1 Continuity and wire connection control

This section covers the testing of protective conductors as required in the two year periodic check.

Verify that all exposed conductive parts are connected to the main protective earth. The resistance of each connection must be less than 0.1 Ω . The minimum current during testing is 200 mA.



Use appropriate measuring tools to conduct the measurements.

The following steps will guide you through the process of checking the ground wire connection and continuity of the CCS plug, AC plug and socket and service socket.

-
1. Connect main PE probe to the rail input PE.

 2. Check the connection to the PE pin of the CCS plug.

 3. Check the connection to the PE pin of the AC plug type 2.

 4. Check the connection to the PE pin of the AC socket type 2.

 5. Check the connection to the door.

 6. Check the connection to the front panel.

 7. Check the connection to the main distribution board.

 8. Check the connection to the gland housing cable.

9. Check the connection to the PE pin of the service socket.

5.6.2 Insulation resistance control

This section covers insulation resistance control.

Check the insulation resistance between live conductors and protective earth as well as between the branches of live conductors. The minimum resistance must be 1 M Ω at 500 V DC.



Use appropriate measuring tools to conduct the measurements.

The following steps will guide you through the process of checking the insulation resistance.

1. Turn off the power.
2. Remove the modules from OVP 1 (overvoltage protection).
3. Disconnect the AC voltage measurement leads from the control units.
4. Turn on the circuit breakers except RCBO 1.



RCBO 1 must remain off due to its connection with sensitive circuits.



The following measurements must be conducted at 500 V DC. The insulating resistance must be at least 1 M Ω .

-
5. Measure the resistance between L1 to PE.

 6. Measure the resistance between L2 to PE.

 7. Measure the resistance between L3 to PE.

 8. Measure the resistance between N to PE.

 9. Measure the resistance to the installation between L1 to L2.

 10. Measure the resistance to the installation between L1 to L3.

 11. Measure the resistance to the installation between L2 to L3.

 12. Measure the resistance to the installation between L1 to N.

 13. Measure the resistance to the installation between L2 to N.

 14. Measure the resistance to the installation between L3 to N.



The following 2 measurements require use of a suitable measurement tool with a type 2 connector (e.g. Seaward EV100 or Metrel A 1532 EVSE adapter) or connecting to the wiring circuit terminals X32A and X63A.

-
15. Measure the insulation resistance of the AC plug.
-

16. Measure the insulation resistance of the AC socket.

17. Connect the voltage measurement leads.

18. Insert the OVP modules.



The DC circuit insulation is checked before each charging session by increasing the voltage charging up to 500 V DC and earth fault monitoring.

The process of checking the insulation resistance is completed.

5.6.3 Residual current protection check

This section covers checking the residual current protection via tester.

Check that in case of a leakage current the residual current and the response time comply with local regulations.



Use an appropriate gauge for the installation.

The following steps will guide you through the process of checking the residual current protection.

1. Ensure charger is powered up.

2. Connect the test probe to the ground.

3. Connect a vehicle or simulator.

4. Initiate a DC charging session.

5. Connect the probe to one of the output ports K1 to K8.
6. Start the type A RCD test.
7. Save the result.
8. Disconnect the vehicle or simulator.
9. Restart MRCD1 using the reset button.
10. Connect a vehicle or simulator.



Use a suitable meter with a type 2 AC connector (e.g. Seaward EV100 or Metrel A 1532 EVSE adapter).

11. Initiate an AC charging session via AC plug.
12. Connect the probe to the terminal circuit X63A of the cable port of the AC charge plug.
13. Start type A RCD test.
14. Save the result.
15. Disconnect the vehicle or simulator.
16. Restart MRCD3 using the reset button.
17. Connect a vehicle or simulator.



Use a suitable meter with a type 2 AC connector (e.g. Seaward EV100 or Metrel A 1532 EVSE adapter).

-
18. Initiate an AC charging session via the AC socket.

 19. Connect the probe to the terminal circuit X32A of the cable port of the AC charging socket.

 20. Start RCD type A test.

 21. Save the result.

 22. Disconnect the vehicle or simulator.

 23. Restart MRCD2 using the reset button.

 24. Start RCD type B test.

 25. Save the result.

 26. Disconnect the vehicle or simulator.

 27. Restart MRCD2 using the reset button.

The process of testing the residual current protection is complete.

5.6.4 Ground resistance check

This section covers conducting a ground resistance check.

In order to provide adequate lightning protection the charger can be grounded locally by connecting the end with an eyelet to the bolt on the plinth of the charging station. Also see [Grounding](#).



This check only applies if grounding via bolt on the plinth has been realized on your specific installation site.



Use appropriate tools and apply a measurement method adapted to the conditions prevailing at your specific installation site.

The following steps will guide you through the process of checking the ground resistance.

1. Measure resistance to ground.
 2. Ensure resistance to ground is less than 5 Ω .
-

The ground resistance check is completed.

5.6.5 Optional leakage current control

This section covers checking for leakage current.

The leakage current results from electromagnetic disturbance of the capacitive filters on the input of the rectifier modules. The task of these filters is to eliminate the effects of high frequency distortions on the system.

The leakage current is constantly measured by leakage current monitors. There is a need to perform this test – optional.

Verify that the leakage current is less than 3,5 mA per rectifier module. The leakage current is measured at the AC input. The leakage current must be less than 3,5 x the number of rectifier modules.



Use a suitable clamp meter to take the measurements.

The following steps will guide you through the process of checking the leakage current.

1. Multiply the amount of rectifiers with 3,5 and note the result.
2. Connect an electric vehicle or simulator to the DC plug.
3. Place the clamp of the meter on the PE conductor of the power input.
4. Note the current flowing to the ground.
5. Compare the current to step 1.

If the current is lower than the calculation the task is complete.

If the current is higher than the calculation, check the PE ground wire of each individual rectifier module to identify which module exceeds the allowable leakage current.

5.6.6 Optional checking of heating points

This section covers the optional process of checking the heating points.

Heating points on specific components can be measured with an infrared thermometer or thermal imaging device. All components have maximum temperature values for stand-by mode, during an AC charging session and during a DC charging session. The maximum temperature values are listed in the table below.

Components	Stand-by [° C]	AC charging [° C]	DC charging [° C]
AC power supply terminals	50°	75°	60°
Controller voltage stabilizer	50°		
HVDC high voltage distribution components	50°		60°
AC distribution components	50°	70°	70°
Fans	50°		75°

Table 23: Heating points - threshold temperatures

The following steps will guide you through the process of checking the heating points within the charger.

1. Ensure the charger is in stand-by mode.

2. Remove the cover.



Note the results of each measurement.

3. Measure the temperature of the AC power supply terminals.

4. Measure the temperature of the HVDC high voltage distribution components.

5. Measure the temperature of the AC distribution components.

6. Measure the temperature of the fans.

7. Perform a DC charging session.

8. Repeat steps 3 – 6.

9. Perform a AC charging session

10. Repeat steps 3 – 6.

11. Install the cover.

The process of checking the heating points is complete.

6 Cleaning

Regularly clean the UFC 200, especially the slits and openings. This ensures that air can freely flow through the charger to avoid overheating.

The UFC 200 must only be cleaned with dry compressed air.



If necessary use an air gun to clean the slits and openings of the charger to prevent any objects from blocking or covering any openings.

7 Maintenance tasks

This chapter covers the maintenance tasks for the UFC 200.

7.1 Safety

 **WARNING**



Electric shock

Danger of electric shock or injury.

- ▶ Turn OFF power at the main distribution board before working inside the equipment or removing any component.
- ▶ Do not remove circuit protective devices or any other component until the power is turned OFF.
- ▶ Do not come into contact with electrical voltage.

 **WARNING**



Injury through suspended load or lifting equipment

Persons in the vicinity of the installation site immediately before the UFC 200 being installed can be injured by lifting equipment or suspended loads.

- ▶ Secure the installation site against unauthorised access.

 **WARNING**



Fire through overheating of terminals

Damaged or improperly connected terminals can cause electric sparks and overheating.

- ▶ Use contact paste
- ▶ Apply correct torques to terminals.
- ▶ If there are any signs of overheating, the charger must be shut down and repaired.

 **WARNING**



Electric shock

Risk of electric shock through incorrect identification of wires or wire colours.

- ▶ Follow instructions when connecting wires.

 **WARNING**



Electric shock

Risk of electric shock during measuring of voltage on uncovered leads.

- ▶ Wear electrician's gloves.


WARNING

Electric shock

Risk of electric shock through insufficient grounding of local grid.

- ▶ Before starting work, ensure that the local grid is sufficiently grounded.
-


WARNING

Electric shock from enclosure

Risk of electric shock from enclosure through insufficient grounding of enclosure and doors.

- ▶ Before starting work, ensure that the enclosure is sufficiently grounded.
-


WARNING

Electromagnetic field

Electromagnetic fields can interfere with cardiac pacemakers.

- ▶ Wearers of pacemakers should not stand too close to the control panel and the RFID reader.
 - ▶ They should not stay near the charging cabinet longer than necessary.
-


WARNING

Risk of falling

Risk of falling while working on charger cable glands.

- ▶ Use a standard-compliant ladder.
-


WARNING

Risk of falling

Risk of falling while working on charger antenna.

- ▶ Use a standard-compliant ladder.
-


WARNING

Eye damage from arc flash

Opening or closing a circuit breaker can cause an electric arc. The high-intensity light can damage the eyes.

- ▶ Do not look at a circuit breaker when it is opening or closing.
-

 **CAUTION**



Tripping over charging cable

Charging cables pose a trip hazard.

- ▶ Secure cables when they are not in use.
- ▶ Pay attention during charging.

 **CAUTION**



Risk of cutting

Risk of cutting hands on charger enclosure during unpacking.

- ▶ Wear protective gloves.

 **CAUTION**



Electric-arc flash hazard

Risk of burns from sparks or an electric arc caused by phases being connected to the wrong terminals.

- ▶ Follow the labels printed on the devices.
- ▶ Pay attention.

 **CAUTION**



Electric shock

Risk of electric shock from meter.

- ▶ When working on the meter, wear electrician's gloves.

 **CAUTION**



Injuries through being struck by falling objects

Loose equipment or quickly deposited tools may fall and cause injury.

- ▶ Ensure that you have enough room to carry out your work.
- ▶ Put tools away securely.
- ▶ Keep the workplace tidy.

There are three maintenance tasks:

- ▶ Filter change
- ▶ Replacement of cables and guns
- ▶ Firmware update

7.2 Filter change

The UFC 200 cabinet has two doors with air filters. These filters must be exchanged regularly to ensure proper air flow.

The minimum recommended interval between filter exchange is 12 months.

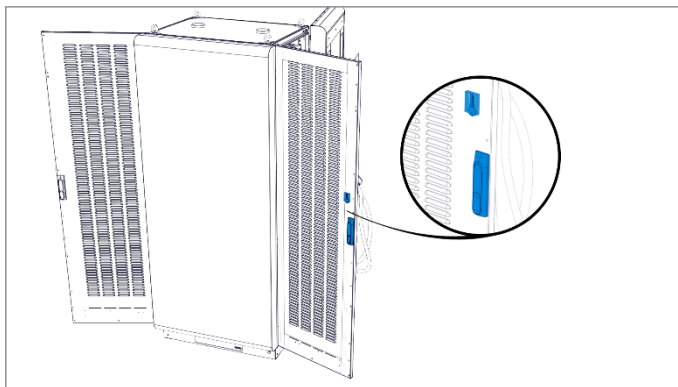
Spare parts

The required spare parts are listed in the table below.

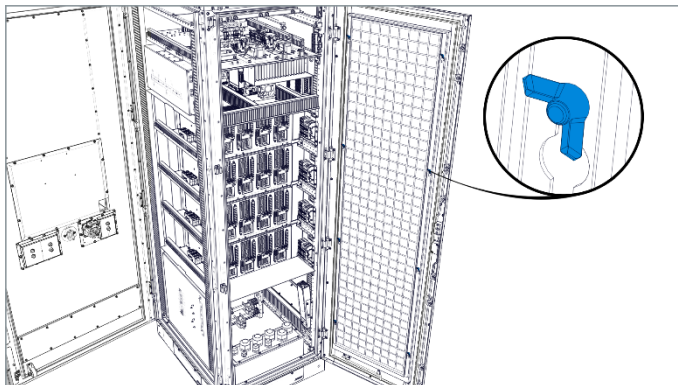
Nr.	Delta SP Nr.	Delta SP Name
1	3243825500	Filter PE 1745*412*16

Table 24: Spare parts - filters

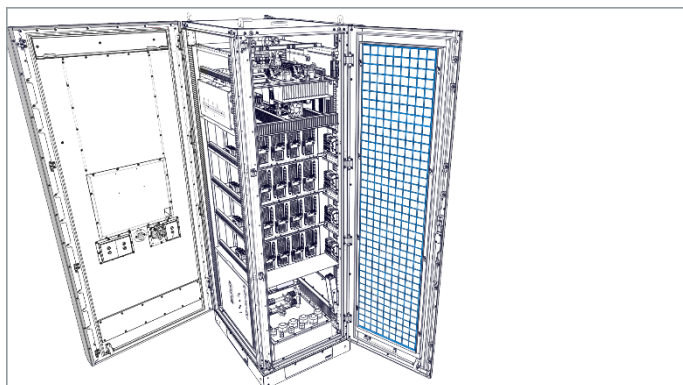
The following steps will guide you through the maintenance task of exchanging the filters.



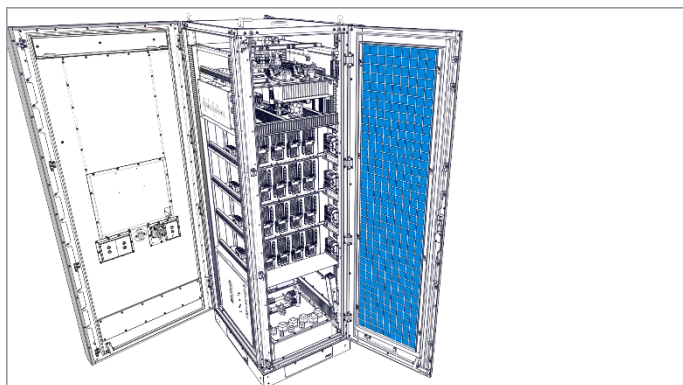
1. Open the side door and lock the door in position with the door stopper.



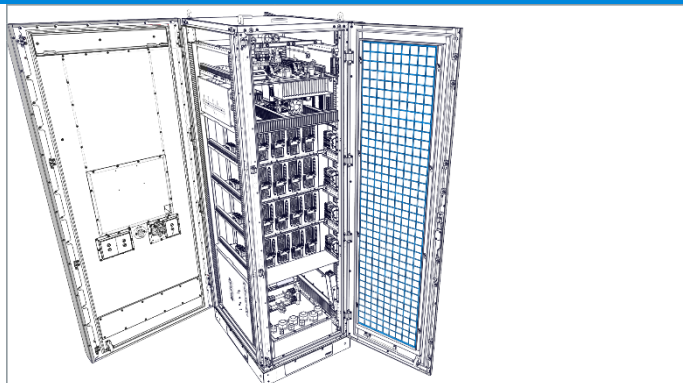
2. Remove the eight M5x12 wingnuts holding the filter cover.



3. Remove the filter cover.



4. Replace the air filter.

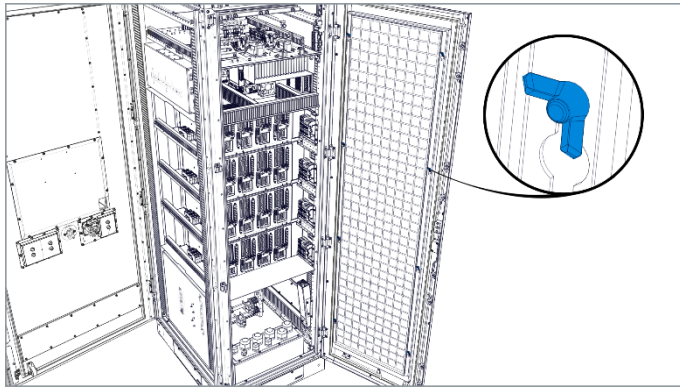


5. Mount the filter cover in position.



The button edge of the cover is equipped with rubber insulation.

Ensure the rubber insulation completely covers the opening.



6. Fix the filter cover in position with the eight wingnuts.

The filter exchange is completed.

7.3 Replacement of cables and guns

This section covers the replacement of cables and guns on the UFC 200.

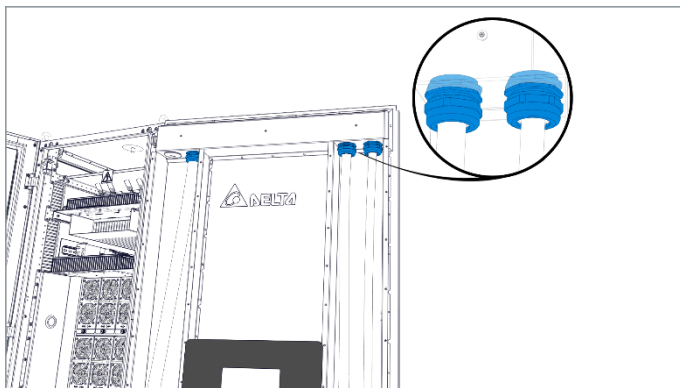
Damaged cables and guns must be replaced.

Spare parts

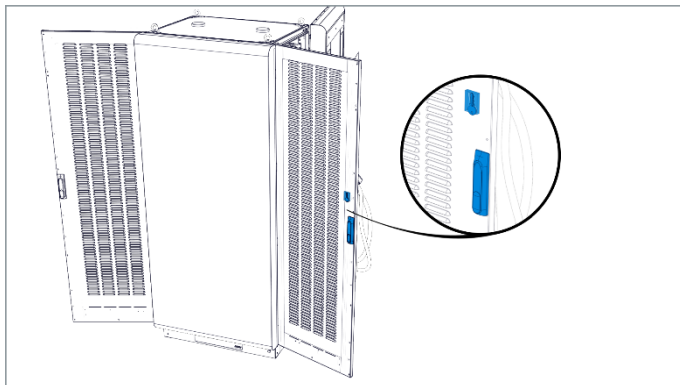
For spare part numbers for connector guns and cables please contact Delta Electronics service with your charger serial number.

The following steps will guide you through the process of replacing the cables and guns.

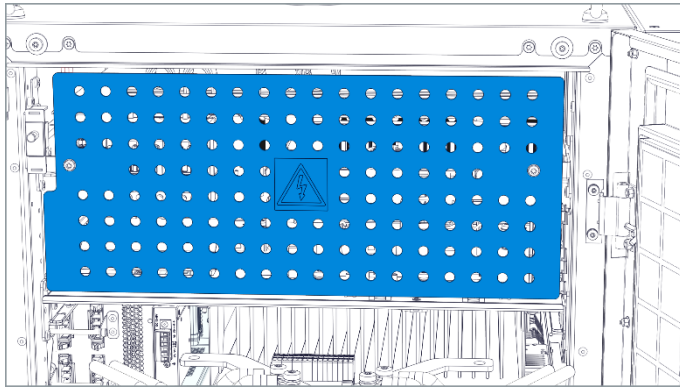
1. Turn of the power supply to the charger.



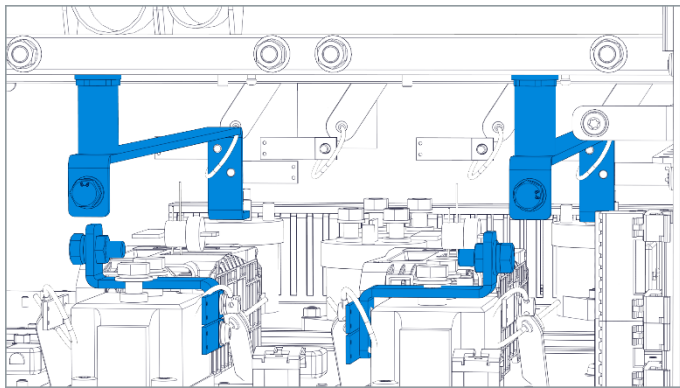
2. Unscrew the cable gland at the top of the charger.



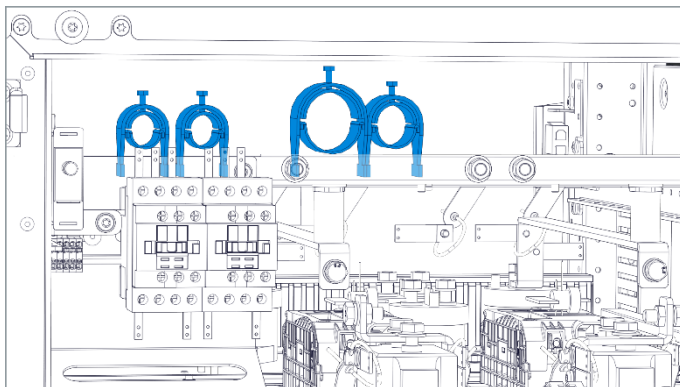
3. Open the side doors and secure them.



4. Unscrew and remove the plastic cover to access the cable connectors.



5. Unscrew and detach the cable from the terminals.

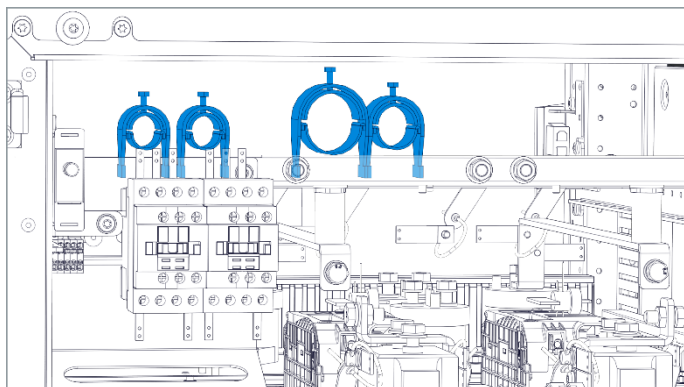


6. Disconnect terminals and remove cable.
7. Release the cable holders.

8. Remove the cables from the charger.

9. Position the new cable in the charger.

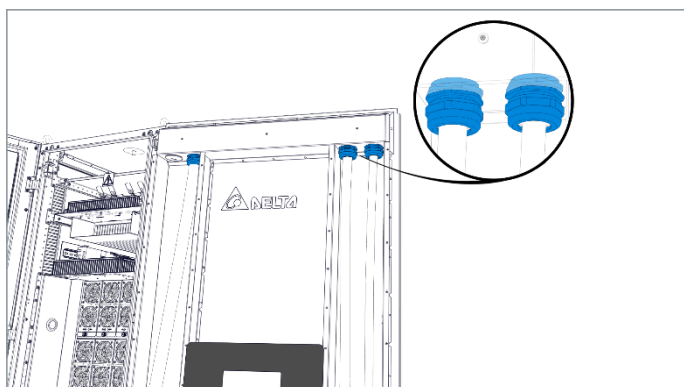
10. Adjust the length of the cable.
-



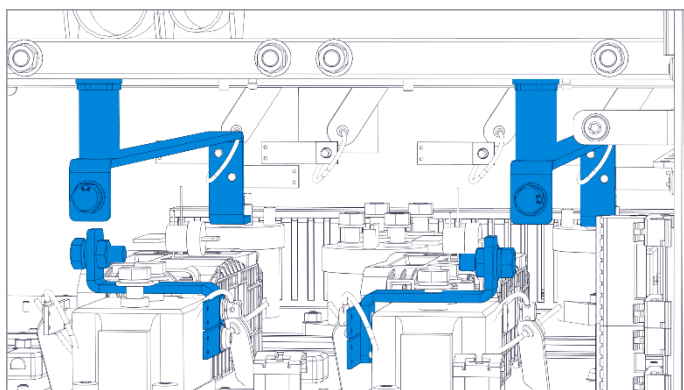
11. Close the cable holders.



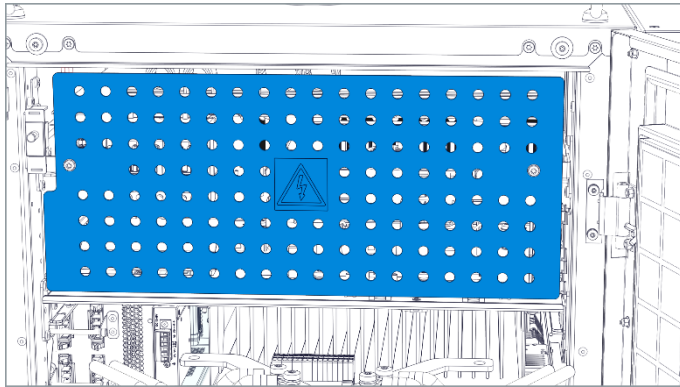
Do not damage the cable holders.



12. Close the cable gland.



13. Connect power cables and signaling cables.



14. Mount the plastic cover and secure it.

15. Perform a visual inspection from connection to end of gun.

16. Close all charger doors.

17. Power up charger.

18. Perform a function check of the new cable and gun.

The maintenance task of replacing the cables and guns is complete.

7.4 Firmware update

Firmware updates are conducted via the site management system.
Refer to the [UFC 200 Configuration manual](#) for detailed instructions.

7.5 Recommended life-cycle and replacement periods for components

Component	Recommended replacement period	Estimated replacement time
Air filters	12 months	5 min per filter
Socket type AC2 32 A	8 years or 10.000 cycles	45 min
Plug type AC2 63 A	8 years or 10.000 cycles	45 min
Plug type CHAdeMO	8 years or 10.000 cycles	45 min
Plug type CCS	8 years or 10.000 cycles	45 min
CPU fan	8 years	5 min
Power module unit fan	8 years	5 min per fan
Contactors K1 – K18	8 years or 10.000 cycles	15 min per contactor
Auxiliary PSUs AC/DC1 – AC/DC5	8 years	5 min per supply
Auxiliary PSUs AC/DC6	8 years	60 min
SD cards (2 pcs)	8 years	Notify Delta before ordering

Table 25: Component replacement intervals



Notify Delta before ordering SD cards.

Delta Service will flash the correct operating system to the SD card.



Delta Service Contacts

EVCS.Service@deltaww.com

Delta Electronics (Netherlands) BV

Zandsteen 15, 2132 MZ Hoofddorp,

Tel.: +31 20 655-0900

Evcs.emea@deltaww.com

Emobility.delta-emea.com

About Delta

Delta, founded in 1971, is a global leader in power and thermal management solutions. Our mission is “To provide innovative, clean and energy-efficient solutions for a better tomorrow” and our businesses encompass Power Electronics, Energy Management and Smart Green Life. Delta has sales offices, manufacturing facilities and R&D centers worldwide. In 2014 Delta was ranked at the highest A-level of the Climate Performance Leadership Index of the Carbon Disclosure Project (CDP). Since 2011, Delta is part of the Dow Jones Sustainability Indices (DJSI) World Index.