hypercharger

Installation and Maintenance Manual

Hypercharger HYC200
(100 kW – 200 kW)
Ultra-fast charging system for electric vehicles

for HW version 4

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Installation and Maintenance Manual

Version

Version 1-1 of Installation and Maintenance Manual, 18/07/2024

Original English version

Although the contents of this document have been carefully checked for accuracy, errors cannot be completely ruled out. If you discover an error, please inform us via support@hypercharger.it.

Manufacturer

Alpitronic Srl
Via di Mezzo ai Piani, 33
39100 Bolzano (BZ)
ITALY
Tel.: +39 0471 1961 000
Fax: +39 0471 1961 451
Homepage: http://www.hypercharger.it
E-mail: info@hypercharger.it

Service

Alpitronic Srl
Via di Mezzo ai Piani, 33
39100 Bolzano (BZ)
ITALY
Tel.: +39 0471 1961 333
Fax: +39 0471 1961 451
Homepage: http://www.hypercharger.it
E-mail: support@hypercharger.it

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This manual contains important instructions that must be followed during installation and maintenance of the device. It is imperative to consider the following points:

Notice

Warranty claims:
Please note that all warranty claims will be void if you ignore the contents of this installation and maintenance manual.

Changes to the device:
If changes are made to the device that are not included in the documentation from the original manufacturer Alpitronic Srl or have not been authorised by Alpitronic Srl, Alpitronic Srl is no longer considered to be the manufacturer of the switchgear assembly, but rather the person who made the changes.

Updates and revisions:
The information contained in this document is updated regularly and without notice to our customers.
To ensure that you have the latest information, we ask you to register on the document platform Hyperdoc using the link below:

https://account.hypercharger.it/register

Use of images:
The images included in this manual show a random configuration of the charging station and do not necessarily correspond to your specific setup. The images serve illustrative purposes only.

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1. Important safety instructions for installation and maintenance

KEEP THESE INSTRUCTIONS

This chapter contains all safety instructions that must be observed when installing and maintaining the HYC200. Improper operation due to non-observance of this installation and maintenance manual can result in death, serious injuries or significant property damage. These safety instructions must be read carefully before installing, operating and maintaining the device.

Symbol descriptions:

WARNING

This symbol indicates potential hazards that can result in severe injury or death if not properly followed.

RISK OF ELECTRIC SHOCK

Highlights the potential for electric shock if precautions are not taken.

WARNING OF HOT SURFACES

Indicates areas or parts that can become hot during operation and may cause burns upon contact.

WARNING OF HEAVY WEIGHTS

This symbol indicates components or devices that are heavy and can cause injuries if handled carelessly.

RISK OF CRUSHING

This symbol indicates potential crushing hazards, particularly when installing or transporting equipment.

RISK OF TIPPING

This symbol indicates that stability is at risk and must be secured with additional means (tipping protection).

CO_2 FIRE EXTINGUISHER

This symbol indicates the recommended type of fire extinguisher to use in the event of a fire.

ESD PROTECTION AREA

This symbol indicates certain electronic components that are sensitive to electrostatic discharge and must be protected to prevent damage.

NOTICE

Used to highlight important information about the device or its use, not necessarily related to safety.

WARNING: Serious consequences for non-compliance with regulations

Non-adherence to the instructions contained in this manual may lead to fatal consequences, severe injury, or substantial property damage.

DANGER: High Voltage Hazards

Before you begin installing, dismantling, repairing or replacing components, it is important to note the following points:

- Only certified technicians are authorised to carry out the activities described above.
- Always ensure that the power supply to the HYC200 is switched off during any work on the Hypercharger: to do this, turn off the main switch QB1.
  For certain activities, such as replacement of the input switchgear, the main power supply on the transformer cabin must also be switched off (the specific safety measures can be found in the corresponding replacement instructions).
- Secure the main power supply/main switch from being switched on again using a lock-out/tag-out device.
- Ensure that unauthorised persons maintain a safe distance from the HYC200, especially when the doors are open.
- Warning: Even when the circuit breakers are switched off, the HYC200 can still have dangerous residual voltages (up to 1000 V DC). Before removing the protective covers, be sure to allow a **5-minute** hazardous voltage discharge period after disconnecting the HYC200 from its power source.
- Perform a voltage check to ensure that electrical power is disconnected from the system. Please strictly adhere to the 5 basic safety rules of electrical engineering.
- After any intervention, ensure that all doors, openings and protective covers on the HYC200 are securely closed and locked.

WARNING: Risk of burns due to heated components

Certain components inside the HYC200, e.g. the SiC Power-Stacks, fuses and cables, may exhibit elevated temperatures even after being disconnected from the power supply. Make sure that all components have cooled down sufficiently before starting any work on the Hypercharger. Use appropriate safety gloves if necessary.

WARNING: Handling heavy equipment

The HYC200 and some of its components (e.g. SiC Power-Stack, output switchgear) can be very heavy.

- For this reason, always use suitable safety shoes and gloves.
- Use suitable lifting devices, e.g. a crane for lifting the entire charging station (see Chapter 5.2) and a stack lifter for lifting a SiC Power-Stack (see Chapter 4.7.1)

WARNING: Risk of crushing

There is a risk of crushing injuries when assembling, disassembling, repairing or replacing components. Always exercise caution. If necessary, use appropriate protective gloves to minimize the risk.

WARNING: Risk of tipping

If the HYC200 is released from its anchoring, there is an increased risk of tipping over. This is particularly the case if the weight is distributed unevenly within the charging station (e.g. uneven distribution of the SiC Power-Stacks or charging cables). Before the Hypercharger is removed from its attachment, it must be secured against tipping over, e.g. by attaching the crane hooks to the 2 eyelets on the top of the charging station.

WARNING: Behaviour in the event of a fire

In case of fire

1. If there is an emergency stop switch for the external power supply (e.g. at gas stations), activate it immediately.
2. The charge point operator CPO should clearly display all emergency procedures, including the location and use of the emergency stop switch.
3. Alert the fire department immediately. In the event of injuries, the emergency services must be informed immediately. The emergency numbers must be clearly displayed by the charge point operator CPO.
4. If there is no emergency stop switch, the charge point operator CPO must immediately disconnect the charging station from the external power supply directly at the grid connection point. It is pointed out that the grid disconnection at the grid connection point may only be carried out by authorised and appropriately trained personnel.
5. Evacuate everyone present at the scene of the fire or instruct them to move away from the danger zone.
6. Compliance with local fire safety and occupational health regulations ensures that fire-fighting measures are carried out by trained personnel in accordance with the specified standards. The charge point operator CPO must make this information clearly visible. In any case, even in the absence of a corresponding regulation, fire-fighting measures should only be left to trained people.
7. When fighting fires, always maintain a sufficient safety distance of at least 2 meters from the charging station to minimise the electrical risk. Only use extinguishing agents that are suitable for electrical devices (e.g. a CO_2 fire extinguisher, whereby the distance of the spray jet to the charging station must be at least 2 m to avoid dangerous voltage flashovers).

CAUTION: Measures to prevent electrostatic discharge

The HYC200 contains components and assemblies that are susceptible to electrostatic discharge (e.g. circuit boards). Take appropriate ESD measures to protect the electronics during any work on the Hypercharger:

- Wear a grounding bracelet and ground it at one of the potential equalisation points on the charging station, e.g. on the doors.
- If you use gloves, they must be ESD compliant.

Notice

The main switch for switching off the device is located at the bottom of the service door side and is marked “QB1” (see Figure 15). Turn the circuit breaker to position “0”, this will turn off all internal components of the HYC200. Please note possible discharging times of up to 5 minutes.

By pressing the (optionally installed) emergency stop switch (Chapter 4.8.2), the charging process is interrupted/deactivated and the SiC Power-Stacks of the Hypercharger are switched off. Please note possible discharging times of up to 5 minutes.

2. Intended use

The Hypercharger ultra-fast charging system for electric vehicles is designed for indoor and outdoor use to perform fast charging for electric vehicles.

Notice

The charging station is designed for stationary installation.

No additional cables are required for the connection between the charging station (Electric Vehicle Supply Equipment, EVSE) and the electric vehicle (EV), apart from the cables for the AC charging option. The charging cable must not be modified to extend or shorten the cable length.

No adapters may be used that are not explicitly approved by the vehicle manufacturer.

The use of Y-cables or similar devices is not permitted.

No cable extensions may be used.

National application guidelines and specifications for charging stations must be taken into account.

3. Target group

This installation and maintenance manual is aimed both at charge point operators (CPOs) regarding the proper operation of the charging station, as well as at installation and maintenance technicians regarding installation, commissioning and maintenance.

3.1. Requirements for the charge point operator CPO

The charge point operator CPO is obliged to only entrust the proper operation of the charging station to persons with relevant basic knowledge of high-performance electrical systems and electric vehicles and proven knowledge of this installation and maintenance manual. The following requirements apply with regard to installation, commissioning and maintenance.

3.2. Requirements for installation, commissioning and maintenance

The installation, commissioning and maintenance of the charging stations may only be carried out by people who have received professional qualifications in accordance with the regulations applicable in the location where the charging station is located and who are familiar with local legal safety standards. Furthermore, these people must individually have successfully completed the training courses prescribed by Alpitronic. Further information about the mandatory training courses is available on the website https://training.hypercharger.it/.

In addition, before any work is carried out, this installation and maintenance manual must be read carefully by the responsible persons and strictly adhered to.

If you have any questions, the Hypercharger support team can be reached using the contact details listed above.

4. Product description

The HYC200 from the Hypercharger product family can be equipped with up to 2 DC charging cables and a 22 kW AC charging socket.

Up to 2 SiC Power-Stacks of 100 kW each can be installed to supply the DC charging cables installed on the HYC200 (detailed information in chapter 4.7.1).

Model	**DC-Power**	**Charge Interfaces** (see chapter 4.1)
HYC200	- 1 SiC Power-Stack → 100 kW - 2 SiC Power-Stacks → 200 kW	- 1 DC Charging cable - 2 DC Charging cable - 22 kW AC charging socket

Table 1: Overview of DC power & charge interfaces

Figure 1: DC power equipment

Figure 2: Charge interface equipment

Notice

As standard, the Hypercharger housing is delivered in the colour “Noir 2100” and the reflector strips in “RAL6038”.
Customers can optionally configure both the colour of the housing powder coating and the colour of the reflector strips themselves. Individual foiling can also be ordered.

Customs tariff number of the Hypercharger: 85044060

The order of the charging points with a view of the charging cable door is always from left to right, AC (if available) is last (see Figure 3).

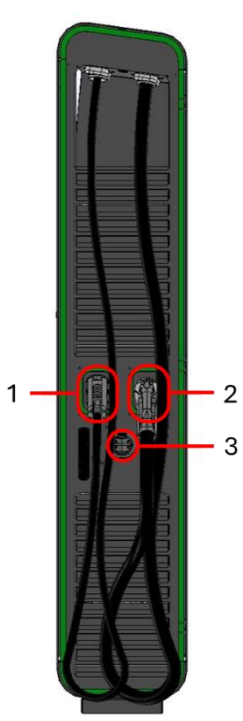


Figure 3: Order of charging points

4.1. Charging interfaces

The following charge interfaces can be selected for the HYC200:

Charging interfaces					
Charging interface	**Voltage [V]**		**Current [A]**		**Possible cable lengths**
	Min.	**Max.**	**Max.**	**Boost**	
CCS2	150 V DC	1,000 V DC	250 A DC		3.5 m 5 m 5.5 m
CCS2	150 V DC	1,000 V DC	400 A DC	600 A DC	3.5 m 5 m 7 m 15 m
CCS2 HPC (liquid-cooled)	150 V DC	1,000 V DC	500 A DC	600 A DC	3.5 m 5 m 5.5 m
CHAdeMO	150 V DC	500 V DC	125 A DC		3.5 m 5 m 5.5 m
GB/T	150 V DC	1000 V DC	250 A DC		3.5 m 5.5 m
22 kW AC Type 2 charging socket (with lock)		3 x 230 V AC	32 A AC		

Table 2: Charging interfaces

Notice

The usable DC power of the HYC200 is limited by the maximum current of the DC charging cable used.

The maximum current is stated on the nameplate of the respective charging station (see chapter 4.3.1).

The application mixture “innovatek Protect IP 52% Color” is used as a cooling liquid. Only the original, which can be ordered from Alpitronic, may be used (sales@hypercharger.it).

The GB/T charging cable is only available for automotive multi-chargers.

Please note that CHAdeMO cables can only be operated at a maximum altitude of 2,000 m above the sea level.

The boost function can only be guaranteed for a certain period of time depending on ambient conditions (ambient temperature, cable length and previous charging cycles).

The CCS2 charging cables are equipped with temperature sensors that can derate the maximum available charging current when the defined temperature limits are reached.

The following combinations are possible:

HYC200	
Exit 1	**Exit 2**
CCS2*	N/A
CCS2*	CHAdeMO
CCS2*	CCS2*
* Cooled cable possible	

Table 3: Possible combinations of charging interfaces

This Figure 4 shows the DC power characteristics with one or two Hypercharger SiC Power-Stacks and different cable types:

- CCS2 HPC liquid-cooled 500 A (with boost up to 600 A)
- CCS2 400 A (with boost up to 600 A)
- CCS2 and GB/T 250 A
- CHAdeMO 125 A

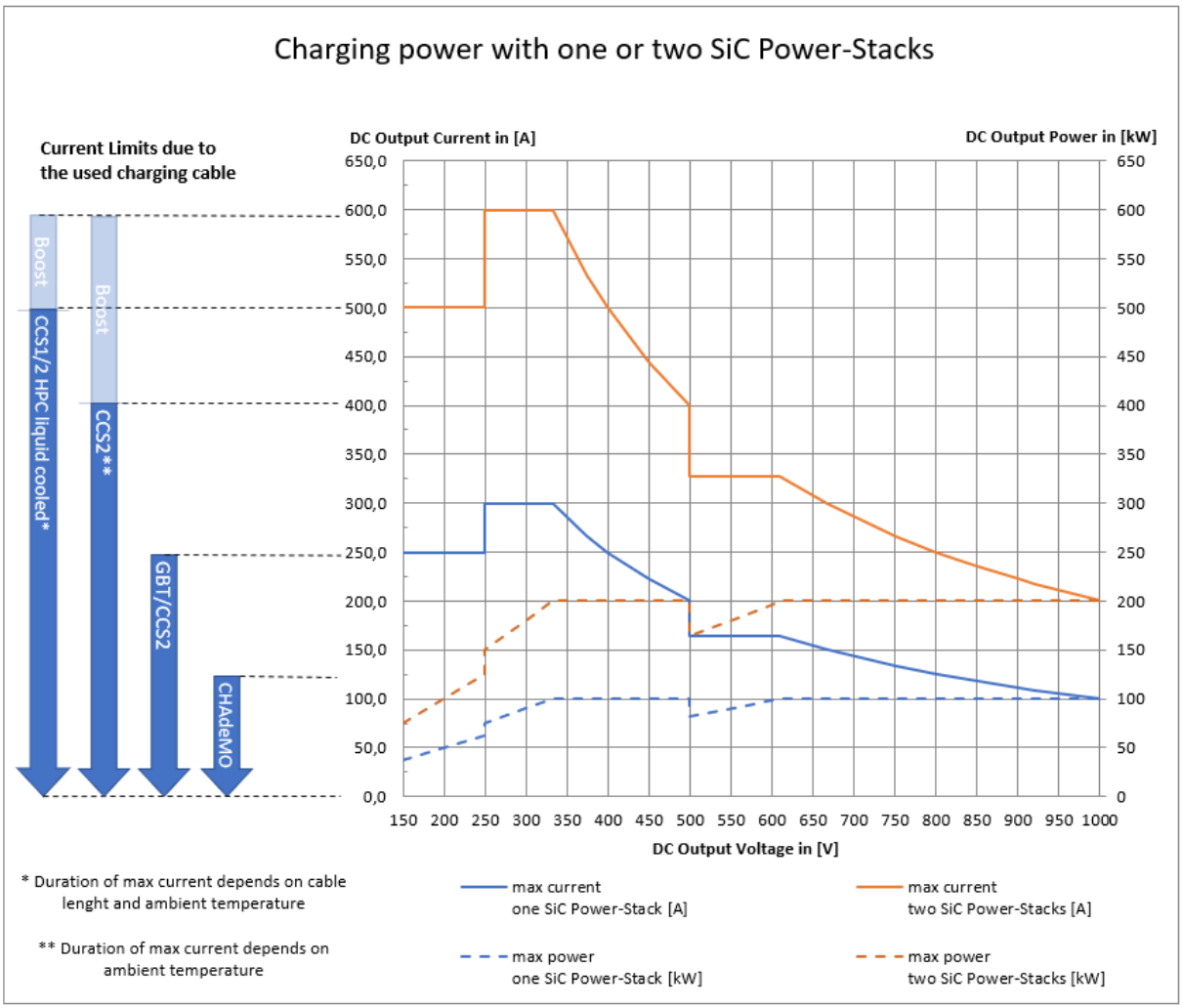


Figure 4: DC power characteristics in different configurations

In its standard configuration, the Hypercharger is equipped with a cable length of **3.5 m** or **5 m**. Figure 5 shows the operating radius (3 m and 4 m) of the cables for the two Hypercharger DC outputs.

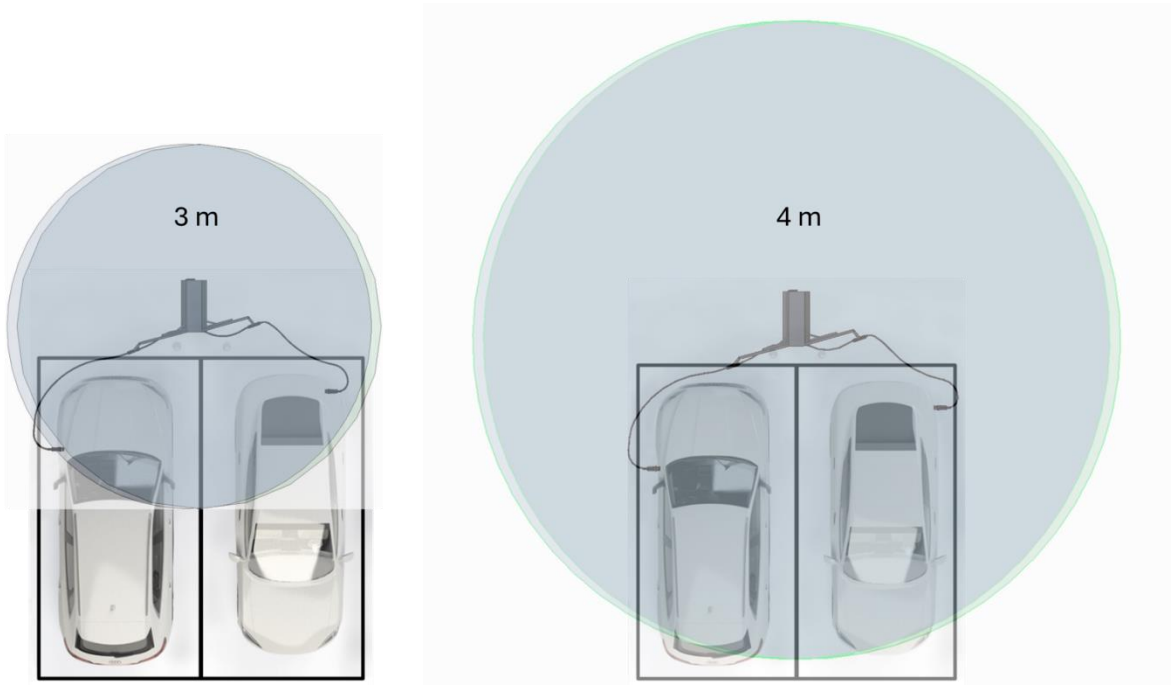


Figure 5: Cable radii for charging cables 3.5 m (left) and 5 m (right)

The cable radii of the 3.5 and 5 m cables refer to a standard charging height of 0.8 m.

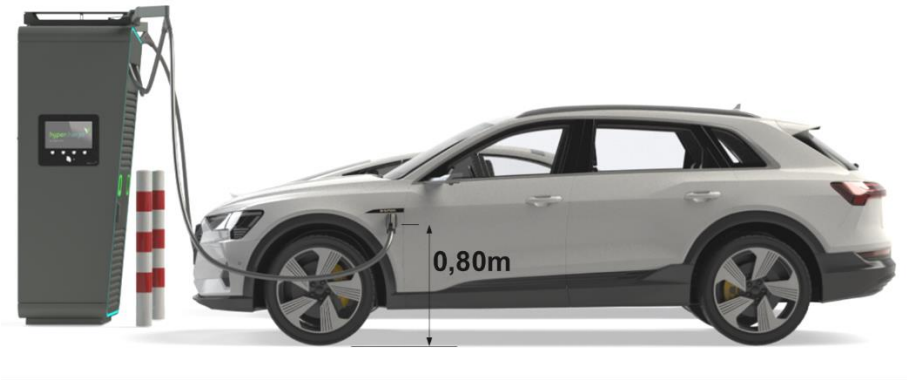


Figure 6: Standard charging height of 0.8 m

Notice

Make sure that there are no sharp edges within the operating radius of the charging cables to ascertain that the insulation of the charging cables is not damaged and proper functioning is still guaranteed.

For easier handling of the 5 m charging cable, a cable management option can be ordered. This prevents the cables from touching the floor and becoming damaged.

Notice

The cable management is specially optimised for cable lengths of 5 m and is recommended for such equipment.

It is also possible to use the cable management for shorter or longer charging cables, but in the first case the cable loses its radius and cables longer than 5.5 m touch the floor despite the cable management.

The cable management must be ordered separately. For this, turn to sales@hypercharger.it.

Instructions for installing the cable management are available on the Hyperdoc document platform.

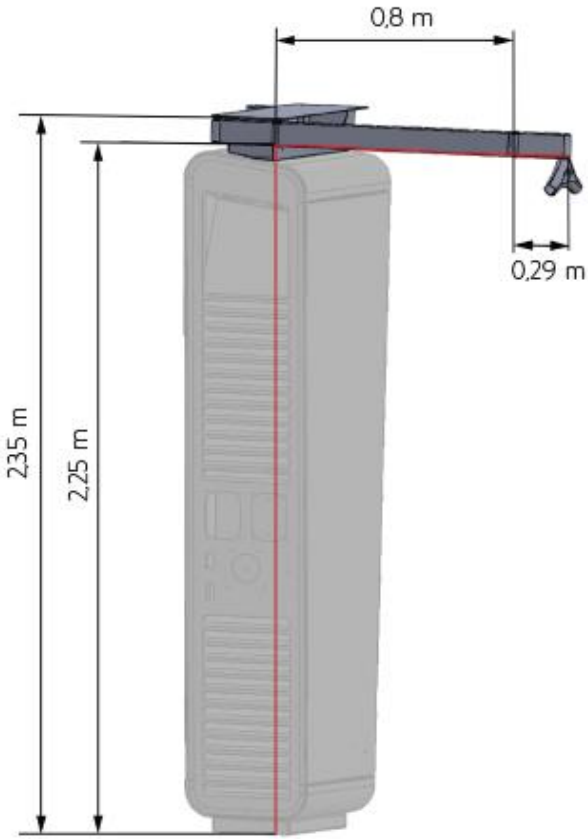


Figure 7: Cable management

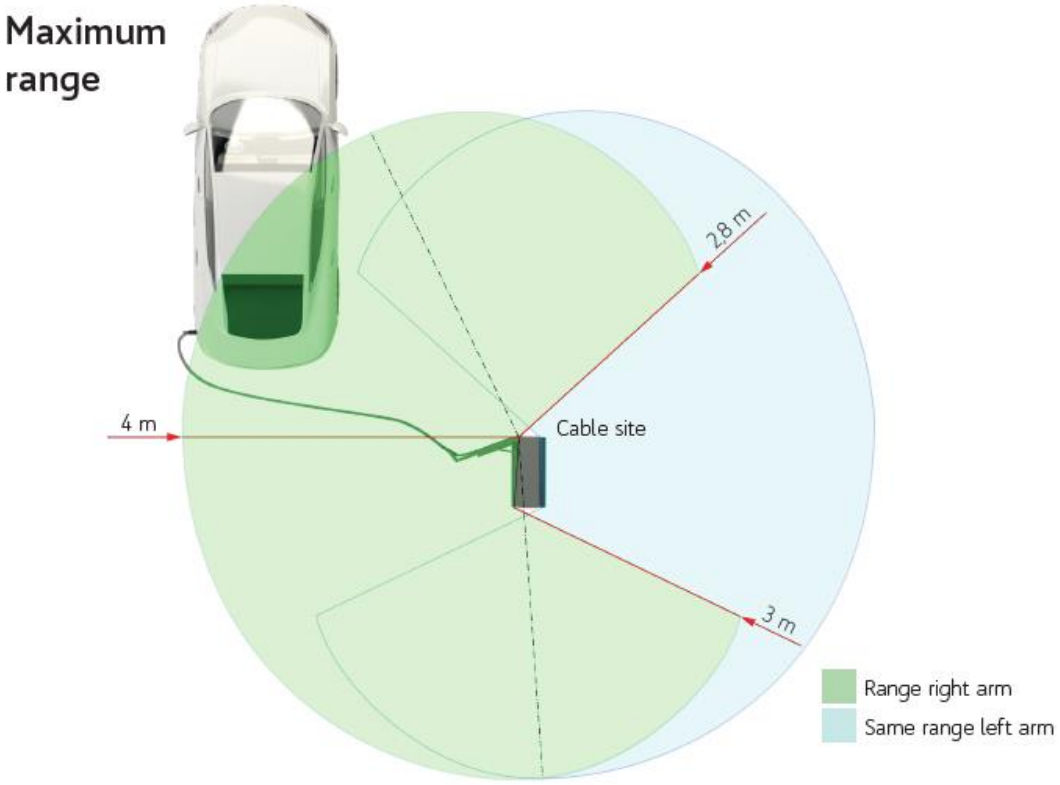


Figure 8: Cable management range

4.2. Granularity

Thanks to the new switching matrix in the output switchgear, the power output of the HYC200 can be distributed more efficiently and a granularity of 50 kW steps is possible.

Depending on the equipment of the charging station, up to 3 power outputs (2x DC and 1 x AC) can be operated simultaneously, while maintaining the galvanic isolation between the network and the vehicles as well as the vehicles from each other.
If necessary, the SiC Power-Stacks can be connected in parallel so that the maximum charging power of 200 kW is made available via a single DC charging cable.

Table 4 shows how the output power can be divided in the case of a HYC200 with 2 charging interfaces and 2 SiC Power-Stacks:

	1	**2**	**3**	**4**	**5**
Connector A	0 kW	50 kW	100 kW	150 kW	200 kW
Connector B	200 kW	150 kW	100 kW	50 kW	0 kW

Table 4: Possible distributions of output power

Notice

	The example shown above corresponds to the most common HYC200 configuration; further examples for other configurations can be viewed in a separate document on the Hyperdoc document platform.
	The distribution depends on various factors such as load management, connected load and the possible charging capacity or power demand of the respective vehicles.

4.3. Exterior view

The following figure shows the various elements of the device from the outside.

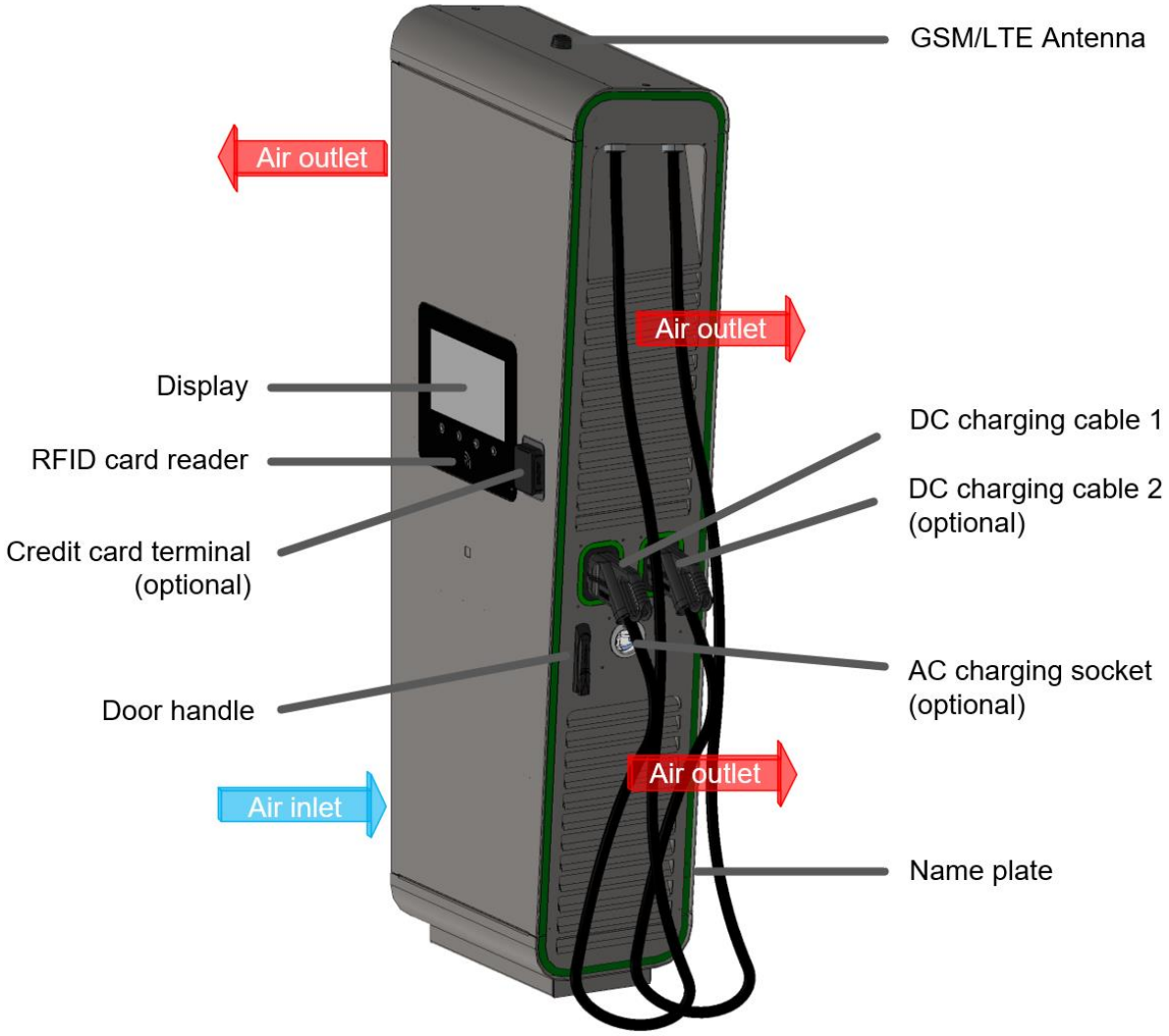


Figure 9: HYC200 exterior

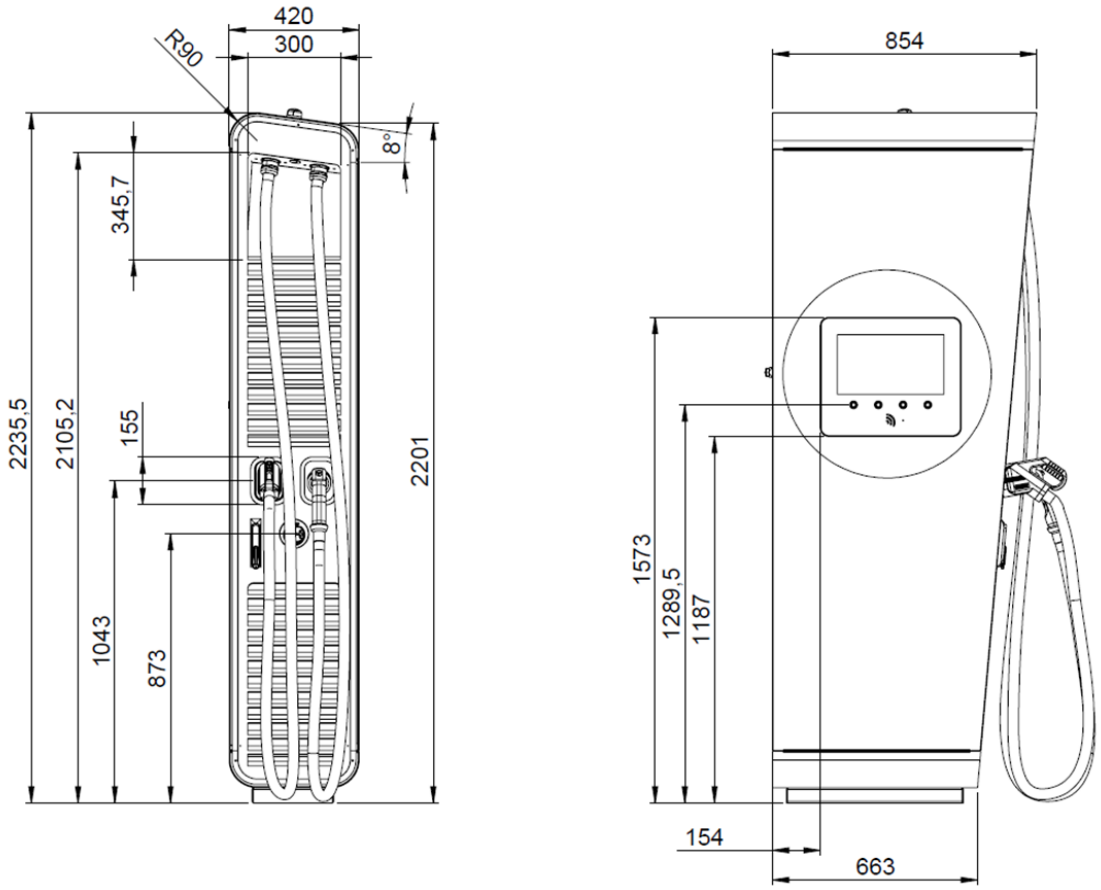


Figure 10: Outer dimensions of the HYC200 (in mm)

4.3.1. Nameplate

The nameplate is located opposite the display door in the lower right corner. It contains the CE marking, serial number and electrical characteristics of the charger.

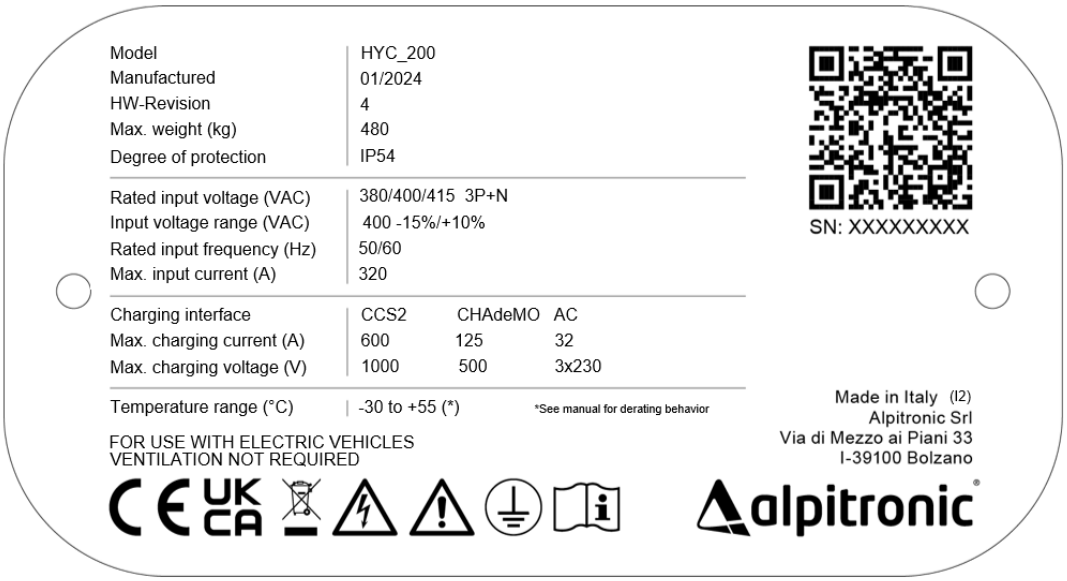


Figure 11: Example of a HYC200 nameplate

4.4. Opening the Hypercharger

The Hypercharger has three doors that allow access to the inside of the device (Figure 13). The service door and the charging cable door are equipped with locking cylinders to lock the device. This is a profile half cylinder (made of brass and nickel-plated) with a pin cylinder and adjustable 8x45° thumb.

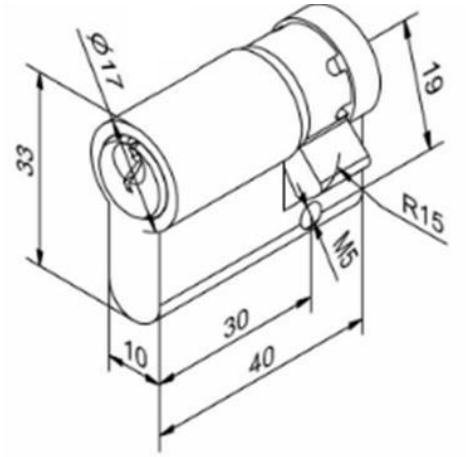


Figure 12: Half cylinder used (in mm)

Notice

If you want to replace the locking cylinder, make sure to only use half cylinders with a maximum length of 30/10. Otherwise, the cover flap can no longer be closed properly.

When opening the display door, make sure that the service and charging cable doors are already open! Otherwise, there is a risk that the reflector strips of the service door will be damaged.

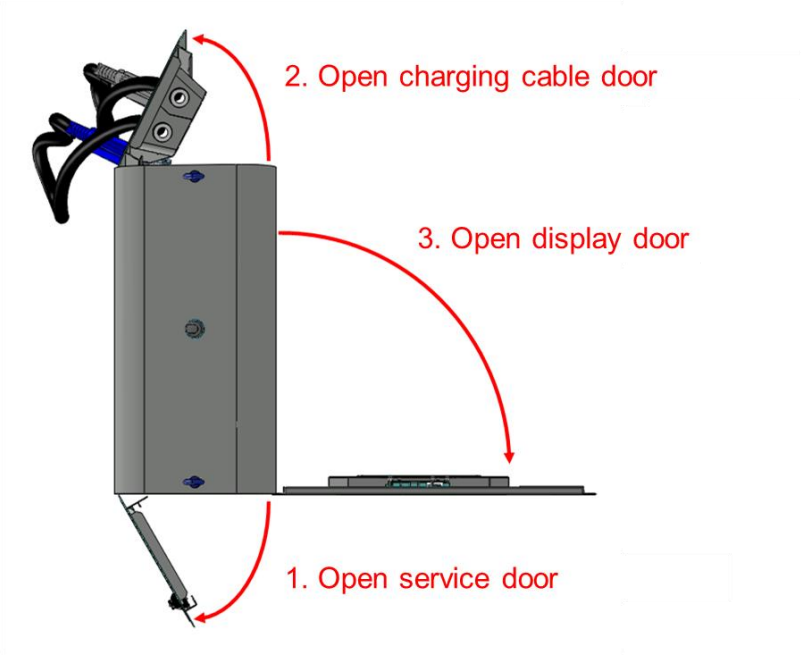


Figure 13: Order to open the Hypercharger doors

The display door can be opened by releasing the locking mechanism behind the charging cable door, as shown in the following image.

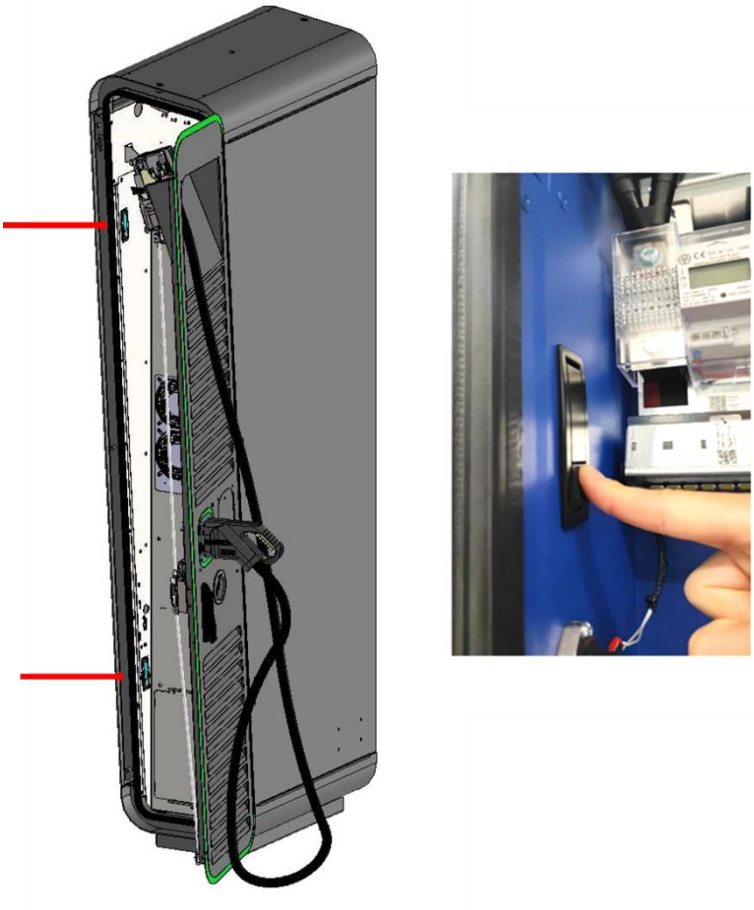


Figure 14: Locking mechanism for the display door

Notice

	Condensation on surfaces can lead to defects in charging station components! If it is raining, the HYC200 doors should only be opened if the charger is adequately covered.
	If the door is opened as far as it will go, make sure that no greater forces act on the door beyond the mechanical stop, in order to avoid damaging (bending) the door hinges. In such a case, for safety reasons, it is necessary to check whether the tightness of the door is still guaranteed.
	When closing the doors, follow the correct order once again and ensure that all protective covers have been installed and that the doors have been properly locked.

4.5. Interior view

The following images show the interior view of the HYC200 on the side of the service door (Figure 15), display door (Figure 16) and charging cable door (Figure 17).

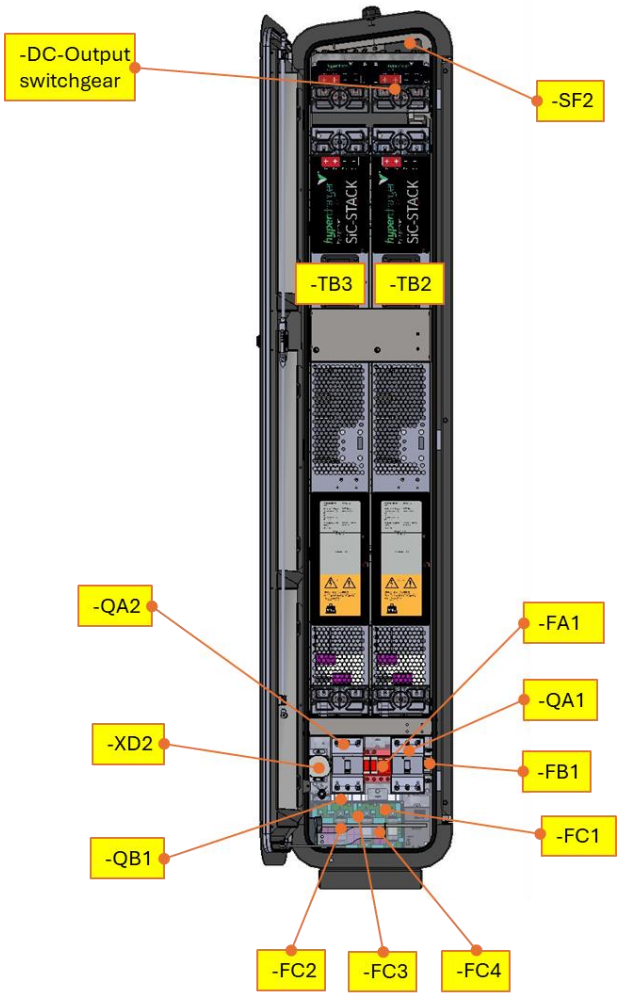


Figure 15: Interior view (service door side)

Labelling	Description
-FA1	Integrated overvoltage protection (SPD)
-FB1	10 A circuit breaker with residual current monitoring for the service socket
-FC1	Class aR Input fuse
-FC2	Backup fuse for SPD
-FC3	Fuse internal power supply (24 V auxiliary supply, service socket)
-FC4	Backup fuse
-QA1, -QA2	160 A circuit breaker / 3P
-QB1	400 A Main switch / 4P
-SF2	Door contact switch 1 (optional)
-TB2, -TB3	SiC Power-Stacks
- XD2	Service socket 230 VAC for maintenance

Table 5: HYC200 components (service door side)

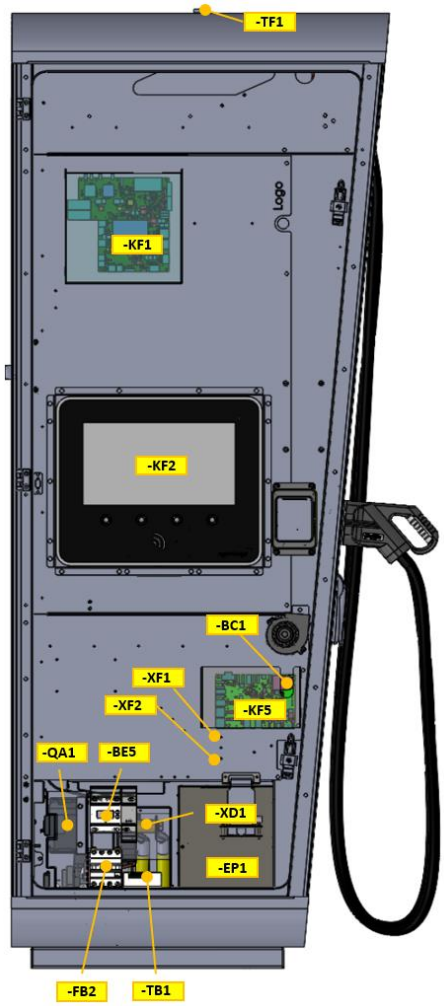


Figure 16: Interior view (display door side)

Labelling	Description
-BC1	DC residual current monitoring for AC charging (optional, only if an AC charging socket is present)
-BE5	MID compliant AC energy counter (optional, only if AC charging socket is available)
-EP1	Cooling unit for cooled charging cable (optional)
-FB2	32 A circuit breaker with residual current monitoring (optional, only if AC charging socket is available)
-KF1	CTRL_COM control board
-KF2	Display
-KF5	CTRL_EXT control board
-QA1	160 A circuit breaker / 3P
-TB1	24 V auxiliary supply
-TF1	Antenna (2G,3G, 4G/ LTE)
-XD1	Busbars power input
-XF1	Ethernet network socket (service)
-XF2	Ethernet network socket (client-LAN)

Table 6: HYC200 components (display door side)

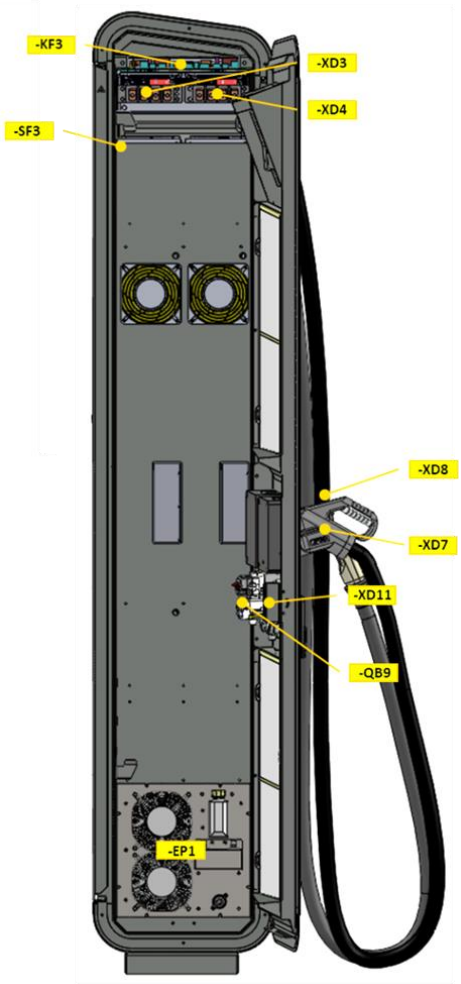


Figure 17: Interior view (charging cable door side)

Labelling	Description
-EP1	Cooling unit for cooled charging cable (optional)
-KF3	CTRL_IO control board
-QB9	Relay for AC charging (optional, only if AC charging socket is available)
-SF3	Door contact switch 2 (optional)
-XD3	DC connection block for vehicle line connection XD7 (DC output 1)
-XD4	DC connection block for vehicle line connection XD8 (optional, only if DC output 2 is available)
-XD7	DC charging port 1
-XD8	DC charging port 2 (optional)
-XD11	AC charging socket (optional)

Table 7: HYC200 components (charging cable door side)

Notice

The load management can be connected to both the Ethernet network sockets XF1 and XF2.

A **type F** (Italian standard) service socket is installed as standard. Alternatively, a **type E** socket (French standard) can be installed upon request.

Two different adapters are also available:

- **Adapter 1:** Type A+B (USA / Japan), Type G (UK), Type I (Australia / China), Type J (Switzerland)
- **Adapter 2:** Type D (India), Type H (Israel), Type K (Denmark)

For this, please turn to sales@hypercharger.it.

4.6. Circuit diagram

Figure 18 shows the circuit diagram of the HYC200.

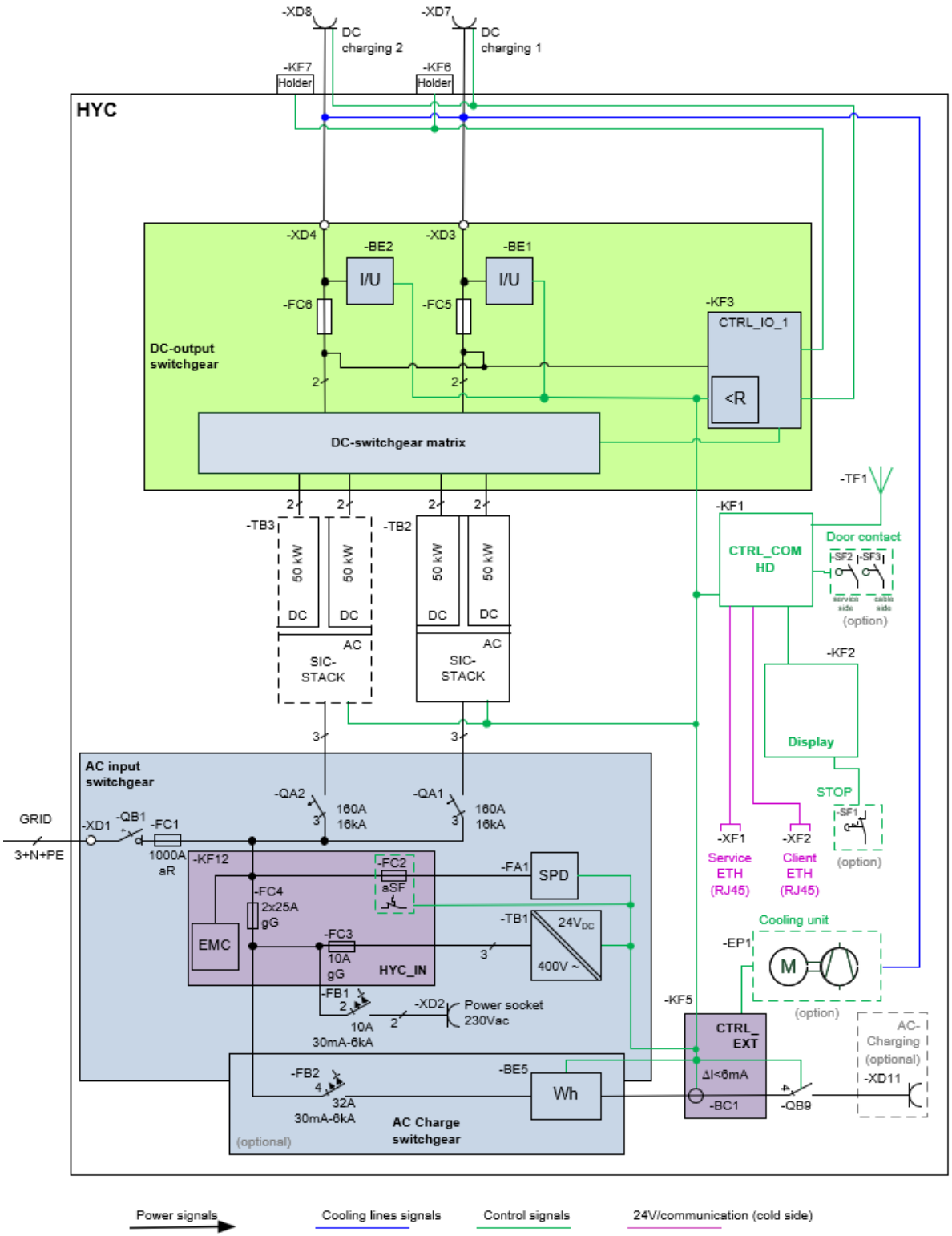


Figure 18: Circuit diagram of the HYC200

Labelling	Description
-BC1	DC residual current monitoring for AC charging (optional, only if an AC charging socket is present)
-BE1	DC energy counter for DC output 1
-BE2	DC energy counter for DC outputs 2 (optional)
-BE5	MID compliant AC energy counter (optional, only if AC charging socket is available)
-EP1, -EP2	Cooling unit for cooled charging cable (optional)
-FA1	Integrated overvoltage protection (SPD)
-FB1	10 A circuit breaker with residual current monitoring for the service socket
-FB2	32 A circuit breaker with residual current monitoring (optional)
-FC1	Class aR Input fuse
-FC2	Backup fuse for SPD
-FC3	Fuse internal power supply (24 V auxiliary supply, service socket)
-FC4	Backup fuse
-FC5	Fuse DC output 1
-FC6	Fuse DC outputs 2 (optional)
-KF1	CTRL_COM control board
-KF2	Display
-KF3	CTRL_IO control board
-KF5	CTRL_EXT control board
-KF6	Cable plug holder for DC output 1
-KF7	Cable plug holder for DC outputs 2 (optional)
-KF12	HYC_IN including EMC components and fuses
-QA1, QA2	160 A circuit breaker / 3P
-QB1	400 A Main switch / 4P
-QB9	Relay for AC charging (optional, only if AC charging socket is available)
-SF1	Emergency stop switch (optional)
-SF2, -SF3	Door contact switch 1+2 (optional)
-TB1	24 V auxiliary supply
-TB2, TB3	SiC Power-Stacks
-TF1	Antenna (2G, 3G, 4G/LTE)
-XD1	Busbars power input
-XD2	Service socket 230 VAC for maintenance
-XD3	DC connection block for vehicle line connection XD7 (DC output 1)
-XD4	DC connection block for vehicle line connection XD8 (optional, only if DC output 2 is available)
-XD7	DC charging port 1
-XD8	DC charging port 2 (optional)
-XD11	AC charging socket (optional)
-XF1	Ethernet network socket (service)
-XF2	Ethernet network socket (client-LAN)

Table 8: HYC200 circuit diagram legend

4.7. Main components

4.7.1. Main switch

Due to limited space, the HYC200 is equipped with a removable switch lever to operate the main switch. To switch the Hypercharger on, insert the lever as shown in the following picture.

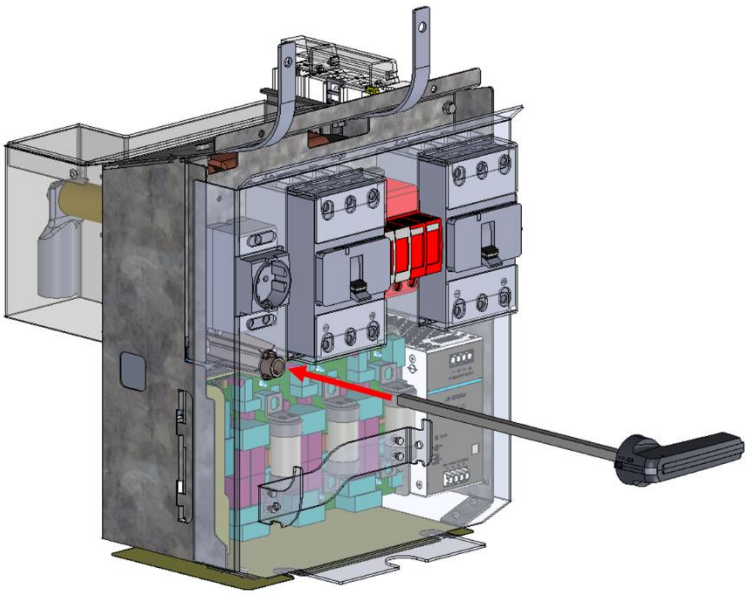


Figure 19: Insert switch lever

Push the lever all the way in and turn it to the right to turn on the main switch.

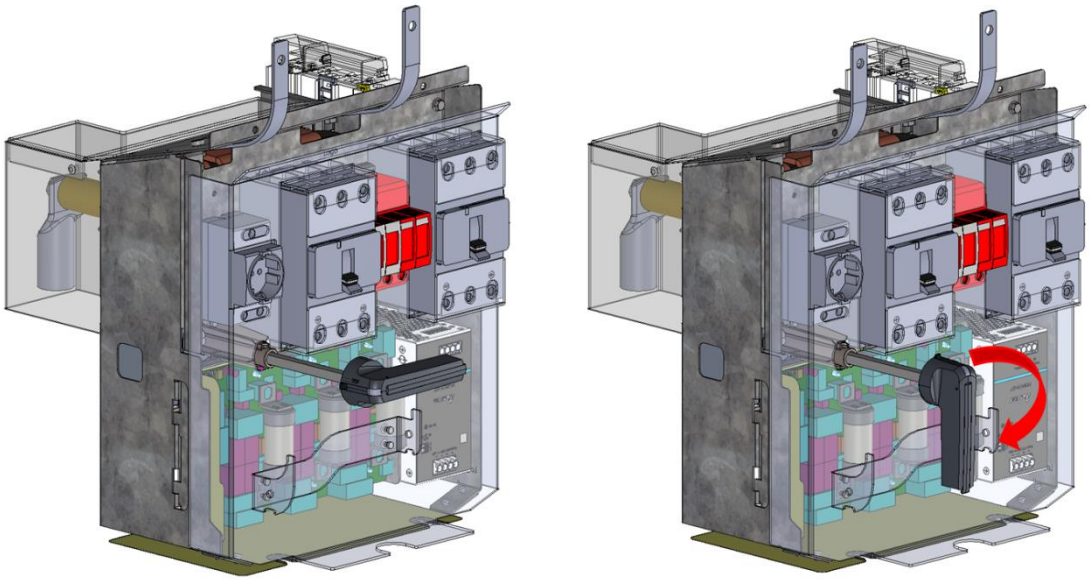


Figure 20: Turn on the main switch

To switch off the Hypercharger again, turn the lever counterclockwise.

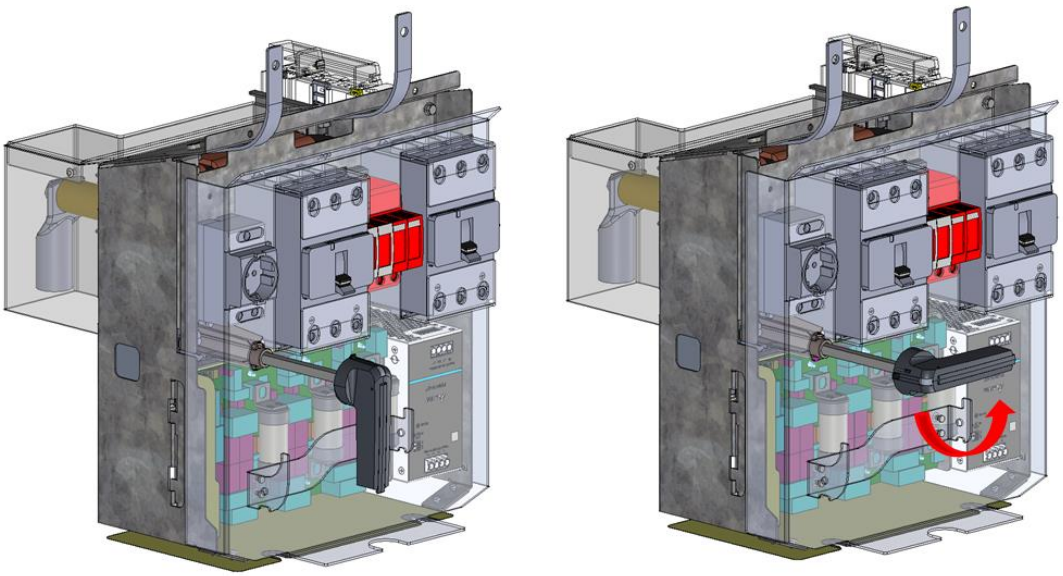


Figure 21: Turn off the main switch

At the end, make sure that the lever is correctly removed and repositioned in its support (marked in red).

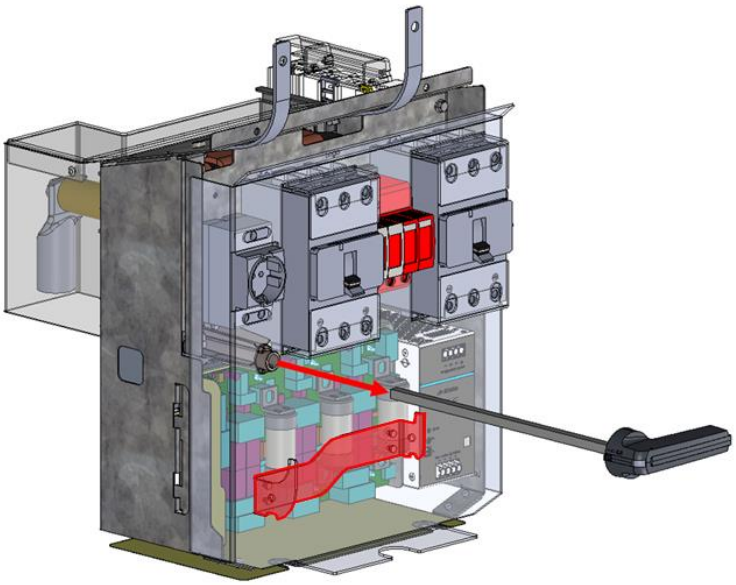


Figure 22: Remove the lever

4.7.2. SiC Power-Stack

The SiC Power-Stack is the power module that converts the alternating voltage to an electrically isolated direct voltage. The dimensions of the SiC Power-Stack are provided in Figure 23, the weight is 110 kg.

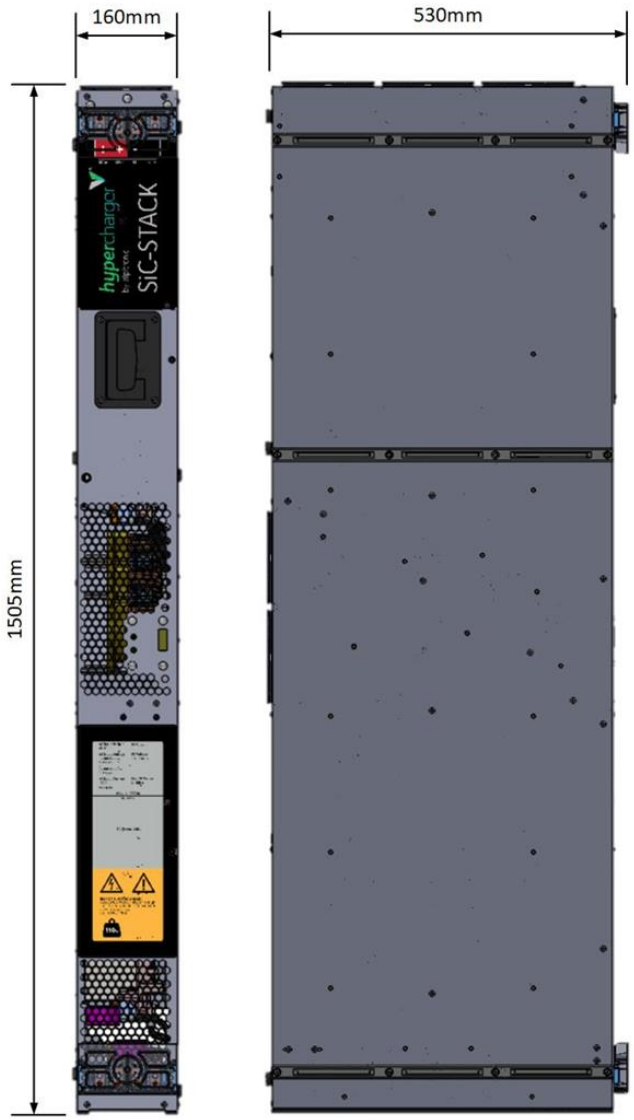


Figure 23: Dimensions of the SiC Power-Stack

The supply lines on the AC connection block have a cross section of 50 mm^2.

Figure 24 shows the AC connection block at the bottom of the SiC Power-Stack.

Notice

Tighten the screws with a torque of **15 Nm**.

Figure 24: AC connection block

The output lines on the DC connection block have a cross section of 35 mm². Figure 25 shows the DC connection block at the top of the SiC Power-Stack.

Notice

Tighten the screws with a torque of **15 Nm**.

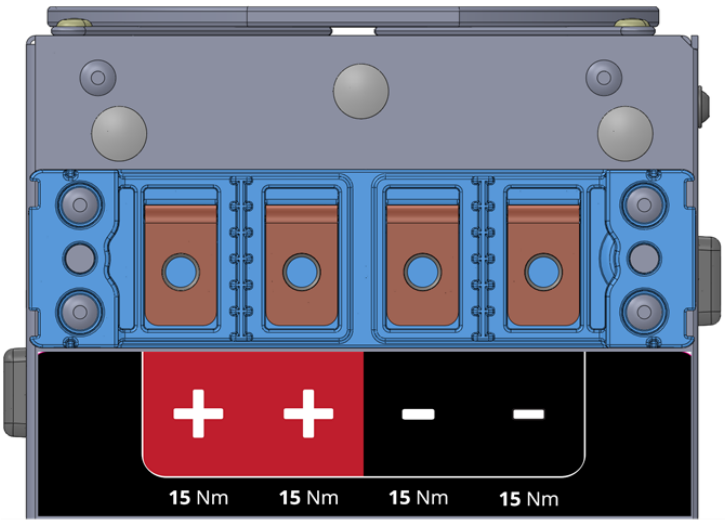


Figure 25: DC connection block

Parameter	Nominal value
Type of protection	IP20
Place of assembly	For control cabinet installation
Manner of assembly	Plug-in module
Installation height	Up to a maximum of 4,000 m above sea level
Humidity transport or storage area	0 - 95% rel. (not condensing)
Operating humidity range	0 - 95% rel.
Protection class	Class I (Protective earthing)
Storage temperature range	-40 °C … +55 °C
Operating temperature range	-30 °C … +55 °C (+40 to +55 °C with derating)

Table 9: SiC Power-Stack technical data

Type	Width (mm)	Length [mm]	Height [mm]	Weight [kg]
SiC Power-Stack	160	516	1505	110

Table 10: Mechanical data

Electrical connection data of AC connection (input):

Parameter	Nominal value
AC operating voltage	3x 220/230/277 (380/400/480) Vac + PE (+10 % / -15 %)
Frequency	50/60 Hz (± 5 %)
Rated current input	160 A
Rated power	100 kW
Power factor	PF > 0.99
Inlet fuse to be used	160 A type B or type C
Network type	TN-S / TN-C / TN-CS / TT

Table 11: Electrical connection data of AC connection

Electrical connection data DC connection (output):

Parameter	Nominal value
Operating voltage range	150…1000 VDC
Output current	2x 0…150 A

Table 12: Electrical connection data DC connection

Attention

	Adhere to all safety warnings outlined in Chapter 1 of this manual.

Warning

	After the SiC Power-Stack has been disconnected from the power supply, dangerous residual voltages may still be present. For this reason, the discharge time of **5 minutes** must be strictly adhered to before opening the device.
	During operation, increased temperatures can be expected at the air outlets of the SiC Power-Stacks.
	One SiC Power-Stack weighs 110 kg. A suitable aid must be used for transport. If necessary, a specially designed stack lifter can be ordered from Alpitronic. For this, please turn to sales@hypercharger.it.

Notice

	Due to the increased leakage current, a minimum protective conductor cross-section of ≥ 10 mm² CU or ≥ 16 mm² AL is required.
	In certain cases, e.g. for installations in TT networks, the installation of a residual current device (RCD) is mandatory. If one is required by local regulations, a type B residual-current device (RCD) or an equivalent protective device against direct residual currents must be used. $I_{\Delta N}$ = 300 mA is recommended.
	If the circuit breaker of a SiC Power-Stack is in the middle position, this indicates a malfunction. Contact Hypercharger support (support@hypercharger.it) and under no circumstances switch the circuit breaker on again to avoid damage to the SiC Power-Stack.
	The HYC200 has a modular design and can be equipped with a maximum of 2 SiC Power-Stacks. A so-called air conduction plate is installed in all unoccupied positions, which regulates air circulation. In order to be able to carry out a possible SiC Power-Stack upgrade, a corresponding online training course offered by Alpitronic must be completed. Find more at https://training.hypercharger.it/.

4.7.3. Input switchgear

The following figure shows the HYC200 AC input switchgear.

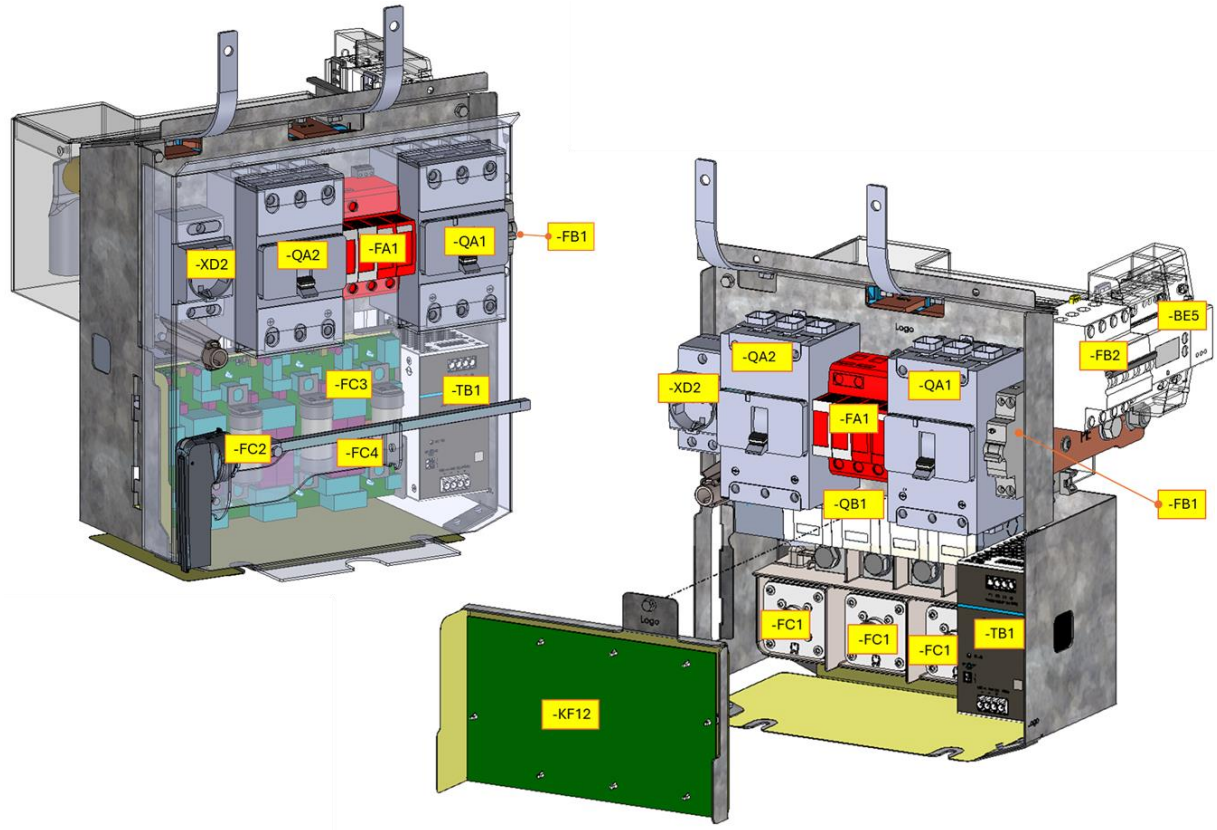


Figure 26: AC input switchgear (front side)

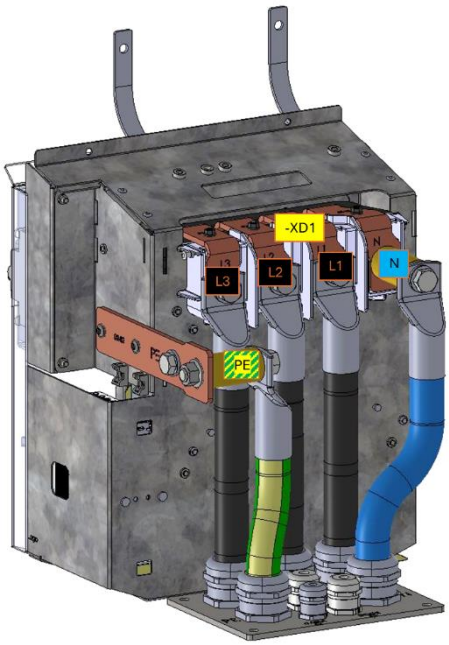


Figure 27: AC input switchgear (back side)

Labelling	Description
-BE5	MID compliant AC energy counter (optional, only if AC charging socket is available)
-FA1	Integrated overvoltage protection (SPD)
-FB1	10 A circuit breaker with residual current monitoring for the service socket
-FB2	32 A circuit breaker with residual current monitoring (optional, only if AC charging socket is available)
-FC1	Class aR Input fuse
-FC2	Backup fuse for SPD
-FC3	Fuse internal power supply (24 V auxiliary supply, service socket)
-FC4	Backup fuse
-KF12	HYC_IN including EMC components and fuses
-QA1, -QA2	160 A circuit breaker / 3P
-QB1	400 A Main switch / 4P
-TB1	24 V auxiliary supply
-XD1	Busbars power input
-XD2	Service socket 230 VAC for maintenance

Table 13: Components of the AC input switchgear

4.7.4. Output switchgear

The following two figures show the DC output switchgear of the HYC200.

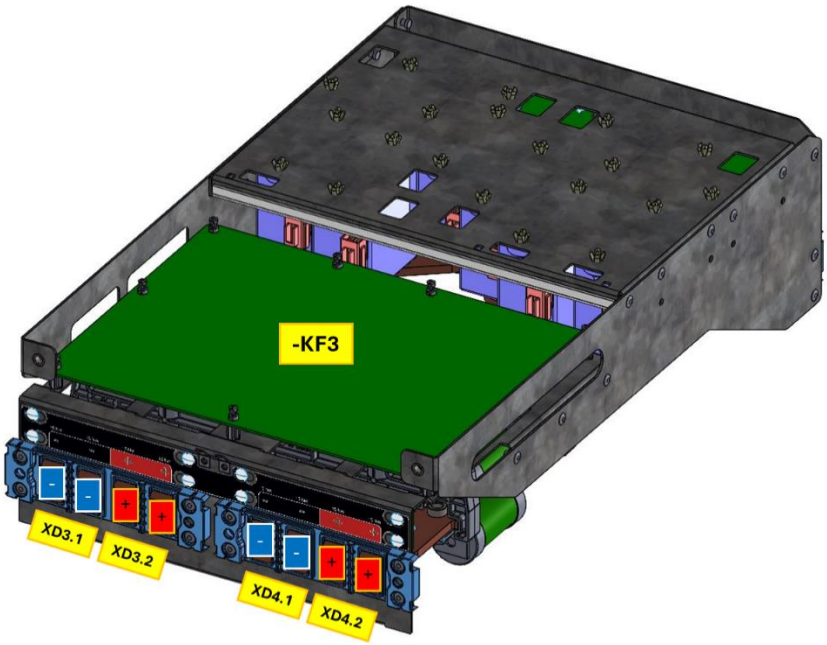


Figure 28: DC output switchgear (view from above)

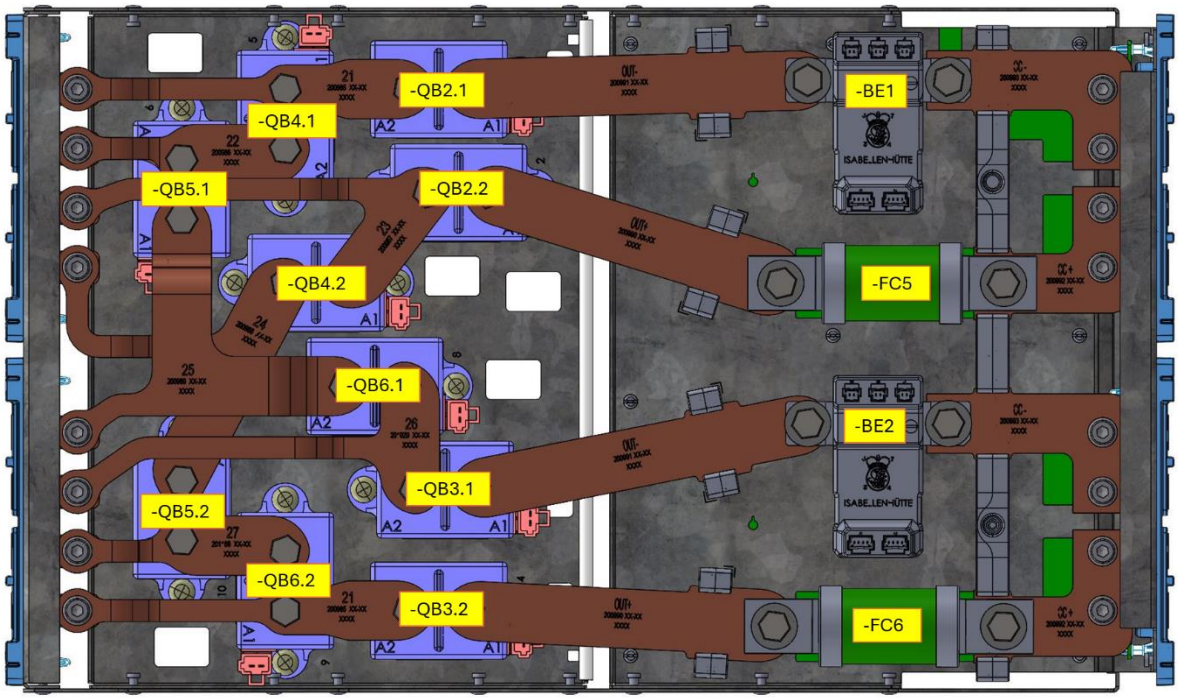


Figure 29: DC output switchgear (view from below)

Table 14 describes the individual components identified in the figures above:

Labelling	Description
-BE1	DC energy counter for DC output 1
-BE2	DC energy counter for DC outputs 2 (optional, only if DC outputs 2/3/4 are available)
-FC5	Fuse DC output 1
-FC6	Fuse DC outputs 2 (optional)
-KF3	CTRL_IO control board
-QB2.1, -QB2.2	Relay DC output 1
-QB3.1, -QB3.2	Relay DC output 2 (optional, only if DC output 2 is available)
-QB4.1, -QB4.2 -QB5.1, -QB5.2 -QB6.1, -QB6.2	Relay to operate SiC Power-Stacks in parallel
-XD3.1	DC busbar - pole for charging cable connection XD7 (DC output 1)
-XD3.2	DC busbar + pole for charging cable connection XD7 (DC output 1)
-XD4.1	DC busbar - pole for charging cable connection XD8 (DC output 2)
-XD4.2	DC busbar + pole for charging cable connection XD8 (DC output 2)

Table 14: Components of the DC output switchgear

4.7.5. CTRL_COM

The CTRL_COM is the main board of the Hypercharger. It is located on the inside of the display door opening. It contains the modems, the eight-port switch, the SOM and other interfaces to the individual secondary boards of the charging unit.

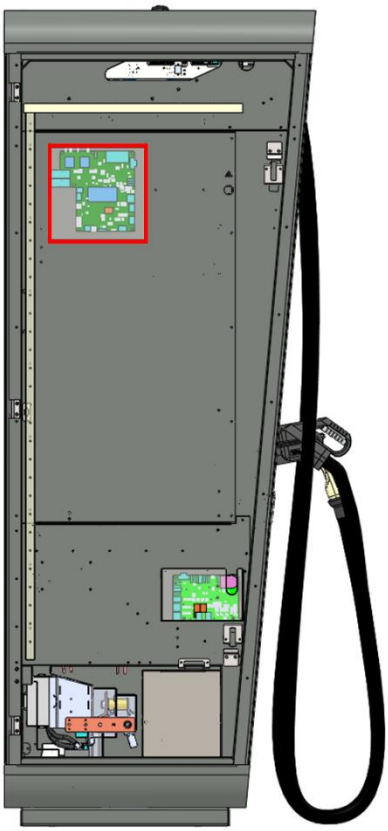


Figure 30: Position of the CTRL_COM in the Hypercharger

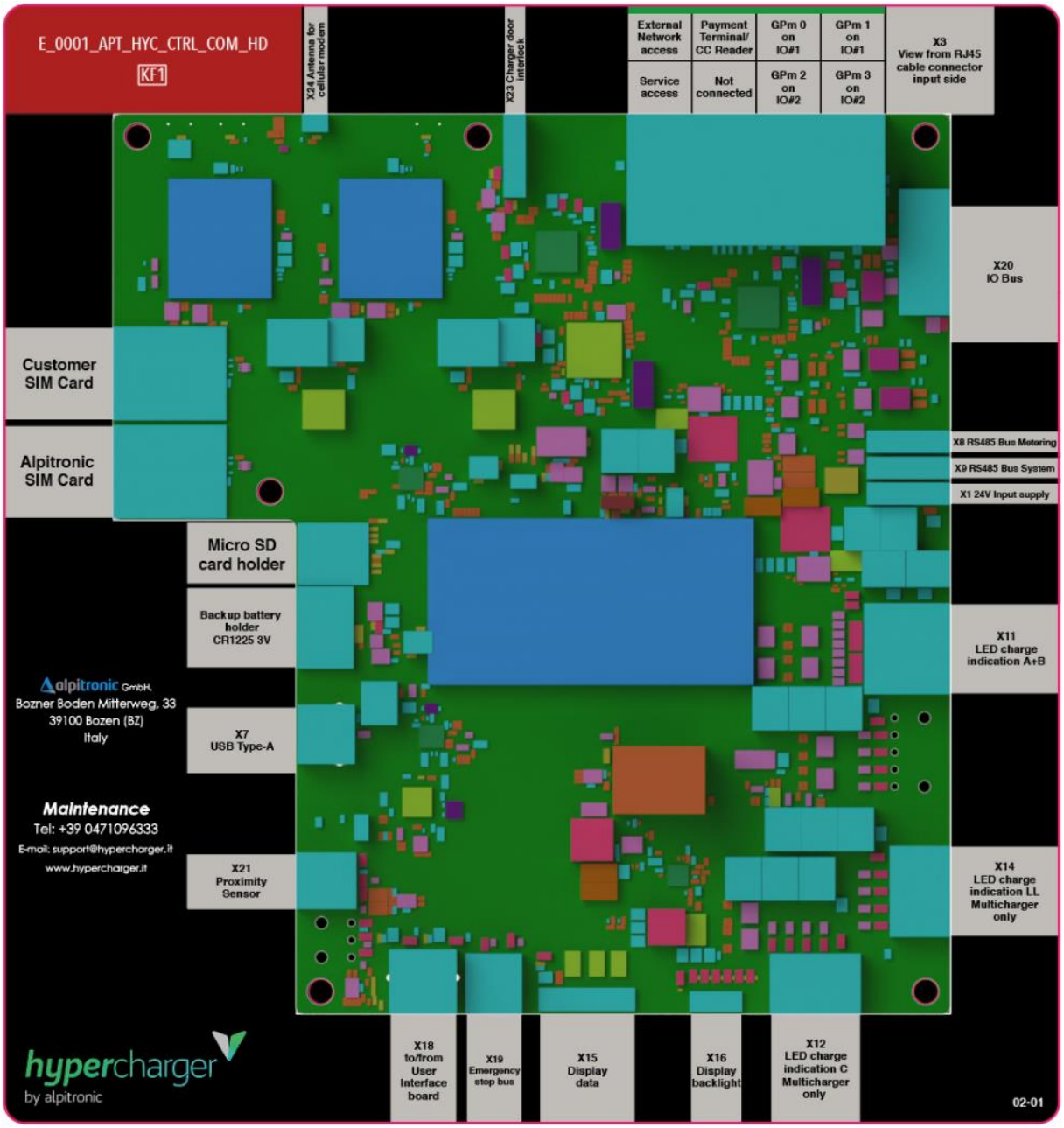


Figure 31: CTRL_COM

Notice

The SIM card slots are designed for Mini SIM cards (“standard size”). The charging station is delivered with an Alpitronic SIM card already installed. A customer SIM card can be inserted.

4.7.6. Display including RFID reader

The display module is equipped with an RFID reader.

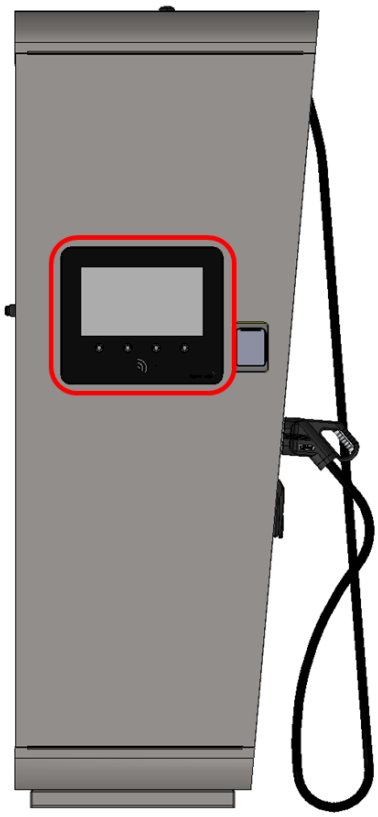


Figure 32: Display module

The display has the following features:

Parameter	Nominal value
Display diagonal	15.6”
Resolution	1.366 (H) x 768 (V) Pixel
Brightness	1000 cd/m^2

Table 15: Display properties

The following RFID standards are supported:

- NFCIP-1, NFCIP-2 protocol
- ISO/IEC 14443A, ISO/IEC 14443B PICC, NFC Forum T4T modes via host interface
- NFC Forum T3T via host interface
- ISO/IEC 14443A, ISO/IEC 14443B PCD according to NFC Forum digital protocol T4T platform and ISO-DEP
- FeliCa PCD mode
- MIFARE Classic PCD encryption mechanism (MIFARE Classic 1K/4K)
- NFC Forum tag 1-5 (MIFARE Ultralight, Jewel, Open FeliCa Tag, MIFARE DESFire)
- ISO/IEC 15693/ICODE VCD mode

4.7.7. CTRL_EXT

The CTRL_EXT board is used to control the supply of the various control boards, the cooling unit and other subcomponents. If the charging station has an AC output, it also takes over the 6 mA DC residual current detection for this.

The CTRL_EXT is located inside the display door opening, the exact location is marked in the following figure.

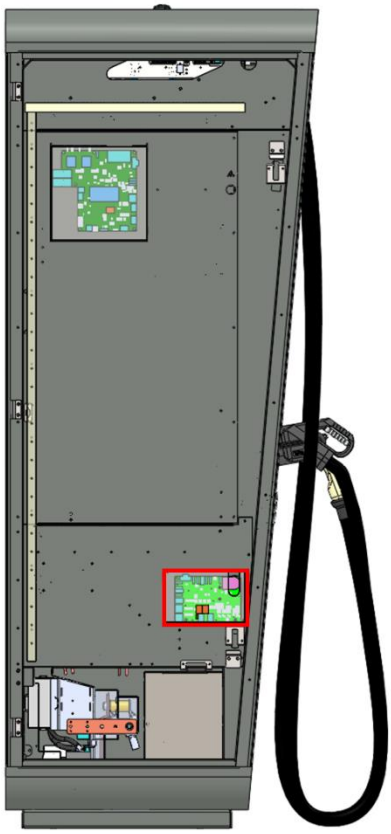


Figure 33: Position of the CTRL_EXT in the Hypercharger

4.8. Additional options

4.8.1. Cooling unit

When using an actively cooled cable (see chapter 4.1), a cooling unit is required.

Notice

The HYC200 can be equipped with a maximum of one cooling unit and therefore with one cooled charging cable.

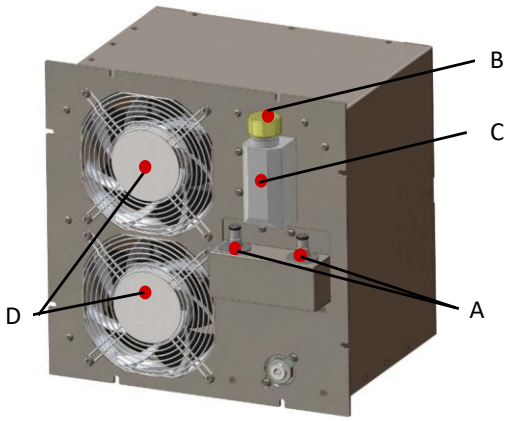


Figure 34: Cooling unit for one cooled charging cable (optional)

A Connection of cooling hose
B Filler neck
C Level indicator
D Fan

To facilitate the electrical installation of the Hypercharger, the cooling unit should be removed during the connection of the grid cables (see chapter 6.6).

“innovatek Protect IP 52% Color” from innovatek OS GmbH is used as **coolant**. The cooling liquid is supplied in an application mixture of 52%, which provides freeze protection down to -40°C. The capacity is approx. 1.5 l per cooling unit and charging cable.

Notice

Please note that for proper functionality, only the original coolant intended for this purpose must be used! You can send orders to sales@hypercharger.it, the cooling liquid is then delivered in 1 litre bottles.

When filling the system, make sure that no air bubbles form in the cooling system, which could reduce the cooling performance. During refilling, the cooling unit should be disconnected from the supply to avoid overflow.

4.8.2. Emergency stop switch

The emergency stop switch was mandatory in the CHAdeMO 1.0 standard. In the CHAdeMO 1.1 standard (as of June 2016), the emergency stop switch is no longer required as a standard and the standard version of the Hypercharger is designed without an emergency stop switch. However, the emergency stop switch can be ordered optionally upon request.

When the emergency stop switch is activated:

- Every ongoing charging process is interrupted, all SiC Power-Stacks are deactivated and the contactors are opened towards the vehicle
- The auxiliary functions of the Hypercharger remain running. Diagnostic functions can be accessed via the backend or the web interface
- this can be detected via the backend or the diagnostic web interface

The emergency stop switch is deactivated mechanically by turning the emergency stop switch counterclockwise. The Hypercharger will then be ready for operation again after a few minutes and new charging processes can be started.

4.8.2.1. External emergency stop

There is also the option for an external emergency stop, which can be triggered via an external 230 V AC supply (provided by the customer). Here, a relay is installed inside the display door below the CTRL_EXT board (see chapter 4.7.7), the wiring of which can be routed outside by the customer.

Figure 35: Position of the external emergency stop relay in the Hypercharger

The external 230 V cable is connected to terminals N, L and PE.

Depending on the requirements, a working current or closed-circuit release can be activated.

To activate a closed current, please connect contacts C1 and NO. This mode allows the charging station to operate when the relay is activated and voltage is present.

The shunt release allows the charging station to operate when the relay is not activated. If there is voltage at the contacts N, L and PE, this contact opens and the charging station is in emergency stop. To activate this mode, please connect contacts C2 and N2.

The relay should be set to “auto”. To check functionality, you can manually set the relay to "0" or "1", but be sure to set it back to "auto" afterwards.

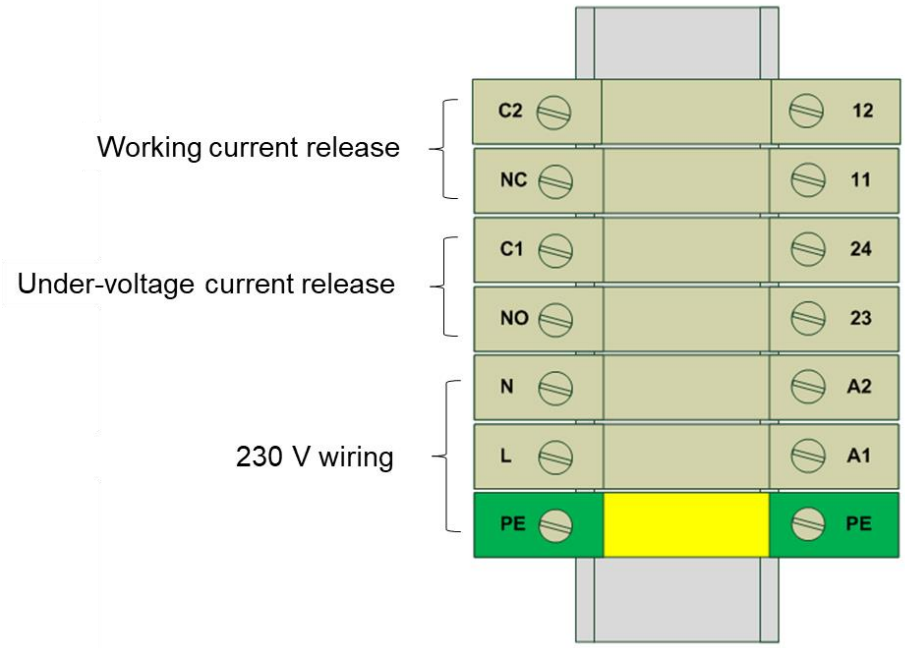


Figure 36: Connection options for external emergency stop

4.8.3. Crash Sensor

A crash sensor can optionally be installed in the Hypercharger. This is supplied externally and triggers the charging station to be switched off if the set inclination is exceeded or if the charging station is exposed to vibrations. The crash sensor can be installed by Alpitronic at the customer's request.

Notice

Please note that the crash sensor is installed in the same position in the HYC200 as the external emergency stop relay (see Figure 35). For this reason both options cannot be combined.

4.8.4. Door contact switch

In order to detect the opening of the Hypercharger doors via the customer backend, door contact switches can be ordered as an option.

4.8.5. Credit card terminal

Optionally, the HYC200 can be equipped with a credit card terminal.

Various manufacturers and payment service providers are supported, but there are country-specific differences as not all models are available in all countries. Which credit and debit cards are supported also depends on these factors.

Notice

	Contact sales@hypercharger.it to find out more about the options available in your country.
	If the models you want are not yet supported, the technical requirements can be checked. At the discretion of Alpitronic, new models may be implemented on a project basis.

4.8.6. Barrier-free Hypercharger

The Hypercharger product family can also optionally be ordered barrier-free. As shown in Figure 37, the screen is offset downwards by 20 cm.

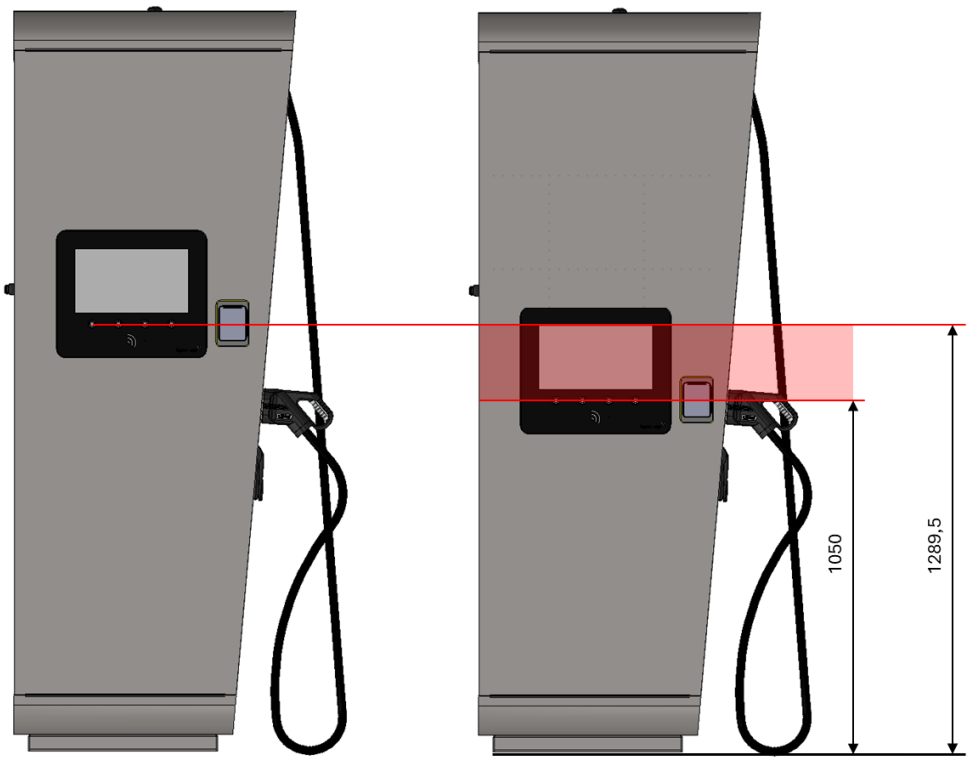


Figure 37: Dimensions of the barrier-free Hypercharger (in mm)

5. Packaging, transport and storage

5.1. Packaging

The Hypercharger comes in custom-made packaging made from 100% recyclable wood or cardboard. Both variants are transported on a metal pallet. Plastic fleece and polyethylene foam are used for padding and fixation, which must be disposed of separately.

Notice

	For more information about packaging, please contact sales@hypercharger.it.
	All Hyperchargers are equipped with two “Tiltwatch” stickers before transport. This makes it possible to see whether the Hypercharger was transported vertically (= green display) or has fallen (= red display). If the latter is the case, accept the delivery only with reservations and inform logistics@alpitronic.it.

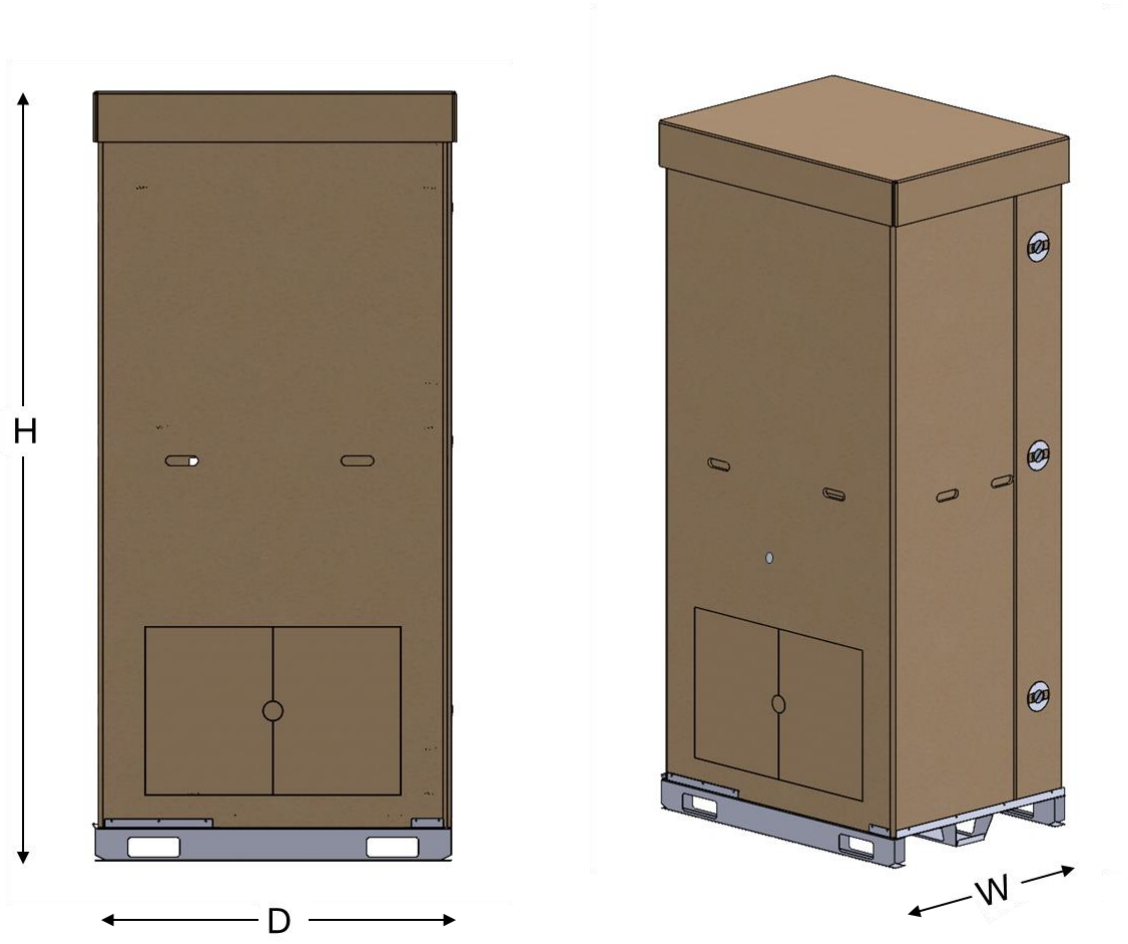


Figure 38: HYC200 cardboard packaging

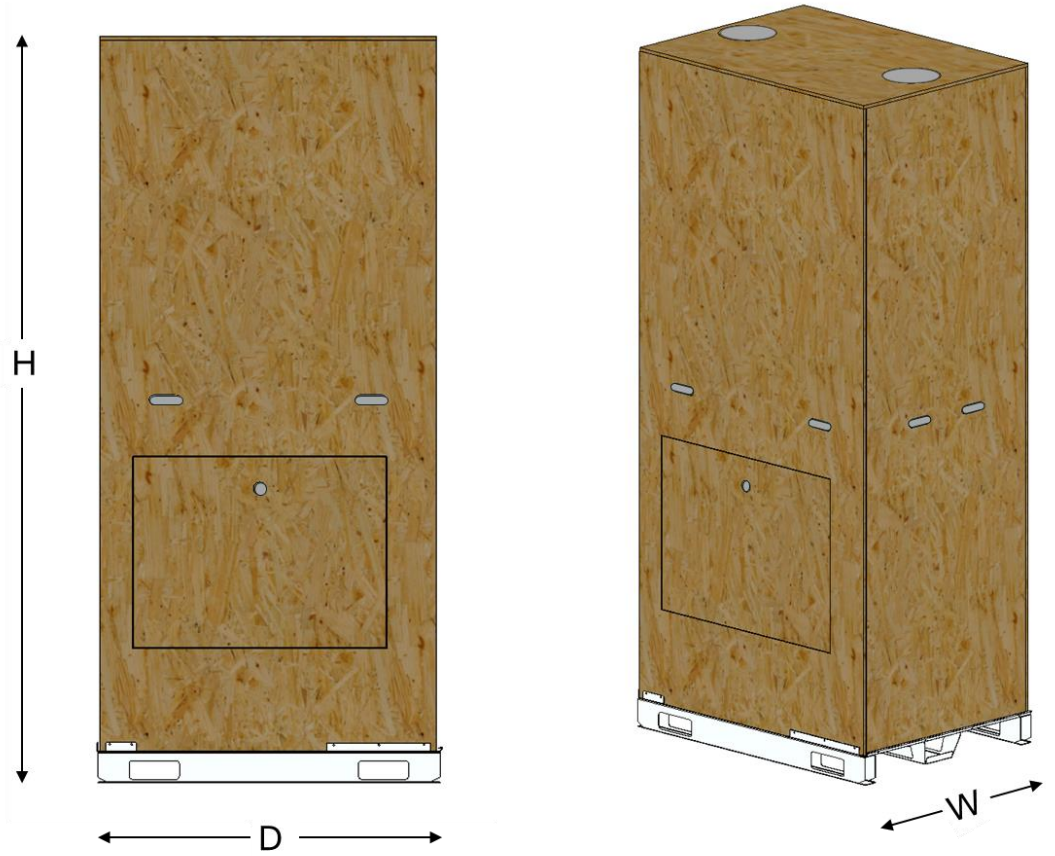


Figure 39: HYC200 wood packaging

Table 16 allows calculating the weight of the Hypercharger product configurations depending on the packaging type, cable management, number of stacks, DC charging outlets and cooling units (maximum 1 for HYC200).

Device properties	Hypercharger weight (kg)	Packaging weight (kg)	Size incl. packaging (cm)
HYC200 a: Number of charging cables b: Number of SiC Power-Stacks c: Cable management d: Cooling unit	~150+a*11..30+ b*110+c*30+d*12 **≤ 472**	Cardboard packaging + metal pallet: 28 + 23 Wood packaging + metal pallet: 90 + 23	W x H x D 80 x 238 x110

Table 16: Weight calculation for HYC200

Notice

The HYC200, including packaging, can weigh up to 585 kg, depending on the configuration.

5.2. Transport and storage

Notice

The Hypercharger must be transported vertically!

The Hypercharger can be moved vertically with a forklift or with a crane by attaching it to the two crane eyelets.

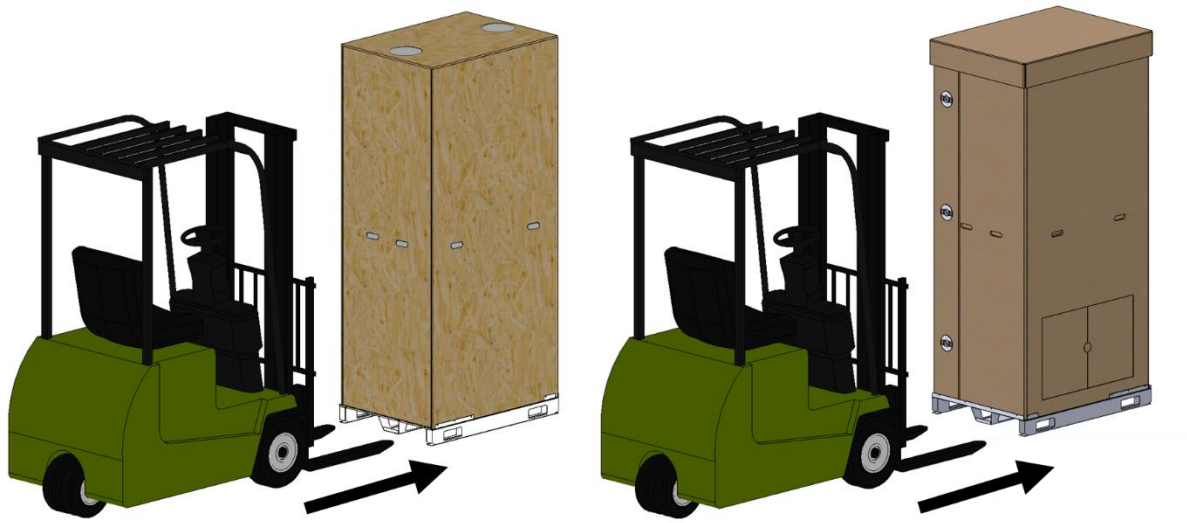


Figure 40: Vertical transport with forklift

Notice

When transporting the Hypercharger with a crane, all two crane eyelets (2 x M12) must be used (see Figure 41).

The maximum angle of the lifting strap should be 55° (see Figure 41). The minimum distance from the crane hook to the Hypercharger roof is 775 mm. If the distance is less than this, there is a risk that the roof will bend.

To transport the Hypercharger with cardboard packaging by crane, remove the top cover (see Figure 42, point 2) to expose the crane eyelets.

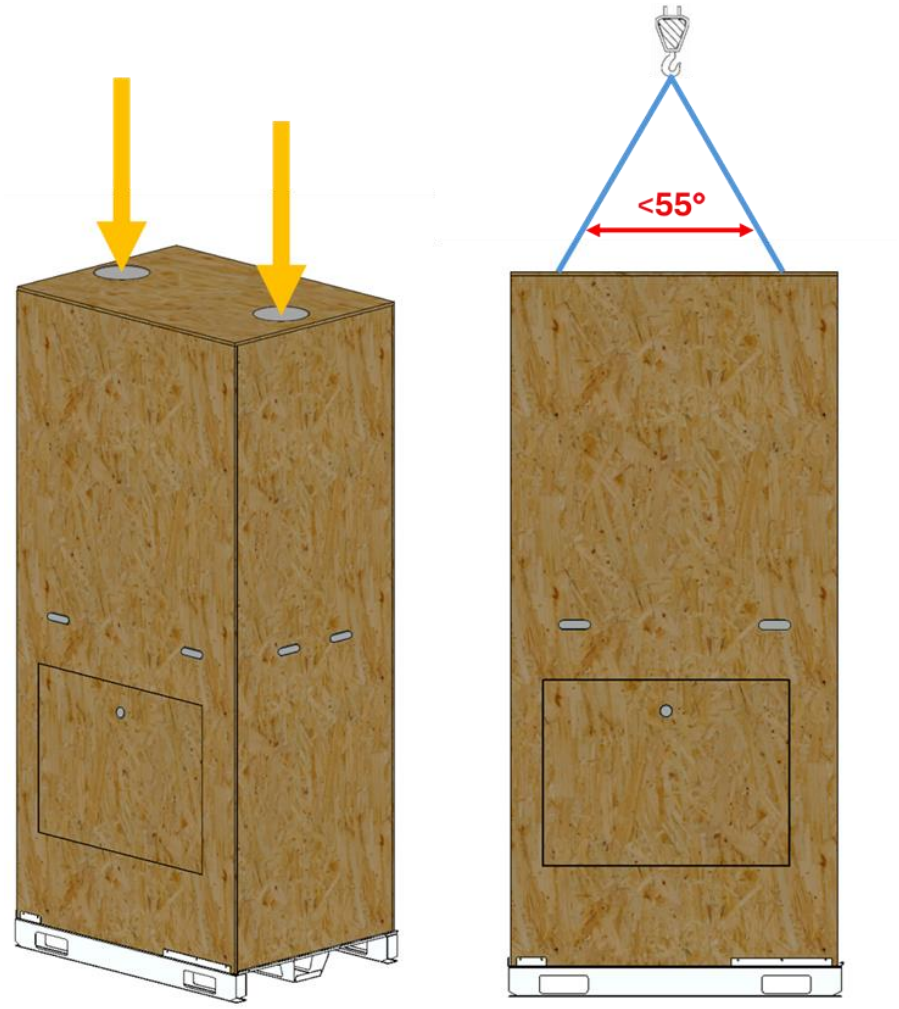


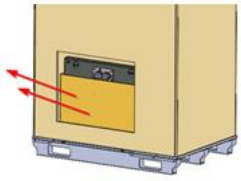
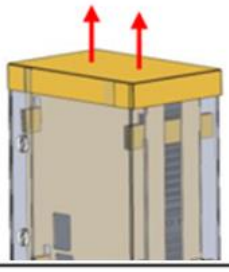
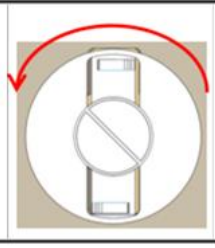
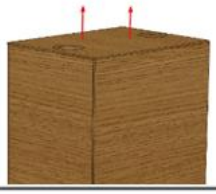
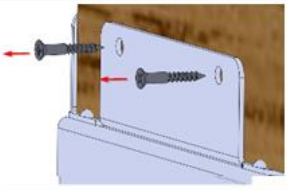
Figure 41: Position of the crane eyelets and maximum lifting strap angle

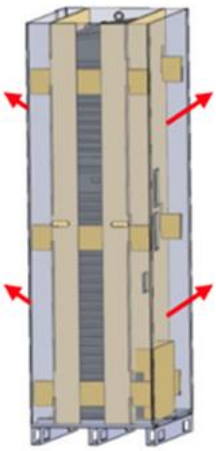
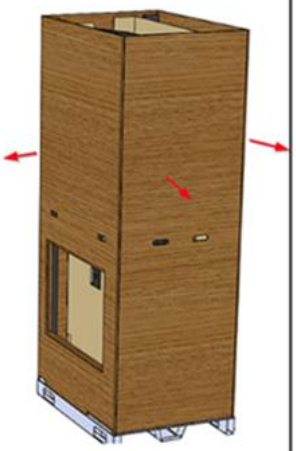
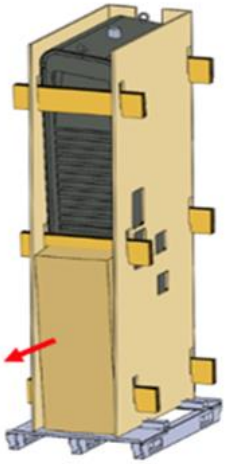
Notice

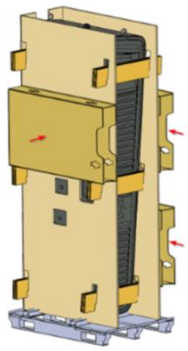
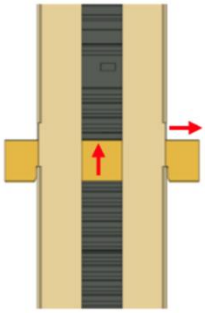
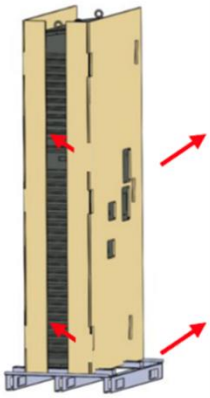
	The Hypercharger must be stored in its original packaging in a dry environment and temperatures from -40°C to +55°C.
	Be particularly careful when unpacking with knives, the HYC200 or other components could be damaged.

5.3. Unpacking the Hypercharger

It is recommended that you transport the Hypercharger to its final destination in its original packaging and unpack it there. The following images show the order in which the Hypercharger should be unpacked.

1	2	3
		
Open the box window and remove the box with the base plate. In the box you will find the base plate.	The top cover of the box is removed by lifting it.	Remove the three bayonet locks by turning them counter-clockwise.
		
OPTIONAL: For wooden packaging, the wooden window must be unscrewed.	OPTIONAL: For wooden packaging, the wooden roof must be unscrewed and removed.	OPTIONAL: For wooden packaging, all screws must be removed.

4		5
		
Remove the first layer of the box.	OPTIONAL: Remove the side walls of the wooden packaging.	OPTIONAL: Remove this box. You will find the cable management in this box.

6	7	8	9	10
				
Remove the boxes. The charging cable can be found inside.	Remove the six connecting struts by sliding them up and then to the side.	Remove the rest of the box and the fleece.	Open the service door.	*Remove the screws at the bottom of the hypercharger. WARNING: Only unscrew if the charging station is secured using the crane eyes.

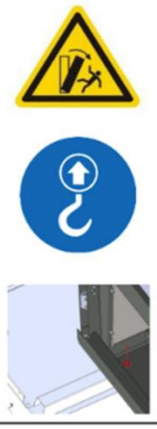
11	12	13	14	15
				
Open the charging cable door. Use all ring bolts to raise the hypercharger.	Open the display door.	If present, remove the cooling unit.	*Remove the screws at the bottom of the hypercharger. WARNING: Only unscrew if the charging station has been secured using the crane eyes.	Close all doors, lift the Hypercharger with a crane and remove the pallet.

Figure 42: Procedure for unpacking the Hypercharger

***Attention**

Before loosening the fastening screws between the Hypercharger and the pallet, the device must be protected from tipping over. This protection must be maintained until final installation on the foundation.

An angle adapter insert is required to remove the screws securing the Hypercharger to the pallet, as shown in Figure 43.

Figure 43: Angle adapter insert for pallet screw removal

***Notice**

These screws can be reused during assembly. They are used to mount the Hypercharger on the base (see chapter 6.5).

6. Mechanical and electrical installation

This chapter describes the mechanical assembly and electrical installation of the HYC200.

Attention

	Adhere to all safety warnings outlined in Chapter 1 of this manual.

Notice

	The installation of the charging stations may only be carried out by professionally qualified individuals, as per local regulations and safety standards. These individuals must also have successfully completed the mandatory training courses provided by Alpitronic. Further information about these training courses is available on the website https://training.hypercharger.it/.
	The warranty may be void if the installation is not carried out properly.

6.1. Design of the supply

Notice

	The HYC200 can be used in TT, TN-S, TN-C and TN-CS type supply networks.
	To ensure proper functioning of the charging station, the power supply must meet the requirements of IEC 60364-4-41. Occasional faults may occur if the power supply is provided by diesel generators or in unstable microgrids.
	The total power of the HYC200 is limited to a 400A grid connection.
	The EMC measures of this product meet the interference voltage limits Class A ≤ 20 kVA (IEC 61851-21-2:2018). The HYC200 is designed for Type A (industrial) environments. Use in Type B environments (residential, commercial, and small businesses) may result in undesirable electromagnetic interference. In this case, the user may need to take appropriate remedial action.

Notice

	The conductor cross-sections used depend on various factors such as cable length, power and fuse protection and must be defined by the electrical project designer in accordance with local regulations.
	The recommended cross-sections for copper cables are **240 mm²** for L1, L2, L3 & PE (PEN) and **25 mm²** for the neutral conductor. The latter can be lower than the active conductors, as only the current for the service socket and for AC charging (if present) flows via the neutral conductor.
	Details about the cable glands and the corresponding clamping areas of the cable entry plate can be found in Table 18.
	The dimensioning of the cables and protective devices outside the Hypercharger must be carried out in accordance with local regulations and in compliance with the technical specifications of the Hypercharger (see chapter 13).
	Depending on the network configuration, a protective conductor current of >100 mA can be used. This must be taken into account when designing the protective grounding and protective measures. **Due to the leakage current, a minimum cross-section of the protective conductor of ≥ 10 mm² CU or ≥ 16 mm² AL is required.** If a residual-current device (RCD) has to be installed in the supply line (as is usual for installations in the TT network), an **RCD type B or an equivalent protective device** against direct residual currents must be installed (e.g. RCD type A in conjunction with a suitable device for switching off the supply with DC residual currents > 6 mA). Type B with a typical $I_{\Delta N}$ = 300 mA is recommended.
	The Hypercharger is equipped with a type 1+2 combined overvoltage arrester as standard. This means that the charging station can be set up in the LPZ Zone 0A. Care must be taken to connect to a suitable earthing system, taking into account country-specific legal requirements. It is also the responsibility of the installer to check whether lightning protection has been installed for the supply line in accordance with the country-specific legal requirements.
	To ensure selectivity, it must be ensured that overcurrent or residual current protective devices connected in series only trip the device located directly upstream of the fault location. The test should be carried out in accordance with IEC 61439-2.
	A separate document on the design of the network connection is available on the Hyperdoc document platform.

6.2. Site preparation

During installation of the HYC200 it must be ensured that a minimum distance to possible objects around the Hypercharger is maintained in order to ensure sufficient airflow and to have enough space available for possible service or maintenance work.

Notice

The position of the Hypercharger is to be chosen in such a way that possible damage due to foreseeable circumstances is avoided. Sufficient mechanical impact protection should be provided to protect the charging station.

Figure 44 lists the recommended and minimum clearances to consider when site preparing a HYC200. The recommended distances are designed for convenient maintenance of the Hypercharger, while the prescribed distances represent the absolute minimum for maintenance work, for example to be able to replace a SiC Power-Stacks.

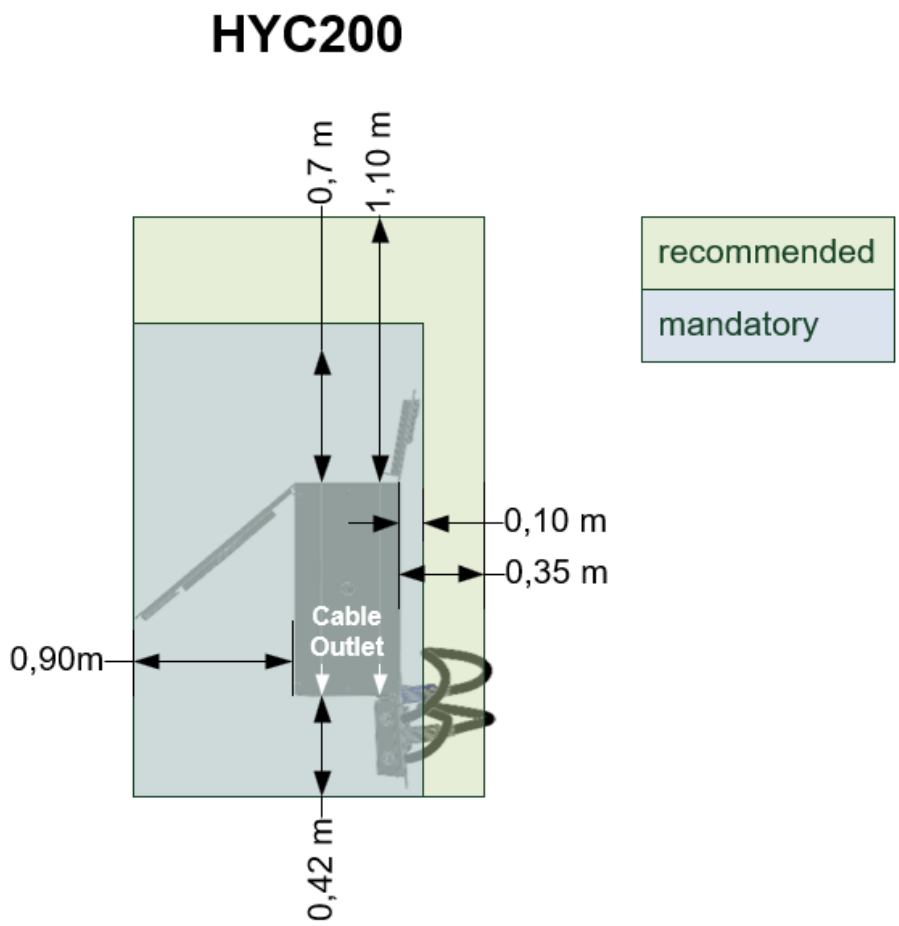


Figure 44: Recommended minimum distances for site preparation

Notice

	The legal minimum widths for escape routes must be adhered to in any case.
	Before installation, compliance with all legal requirements for the installation site (e.g. safety against overturning, impact protection, fire protection, effects of frost, etc.) and special operating conditions in accordance with IEC 61439-2/-7 must be checked.
	Each charging cable must be located as close as possible to the parking space to be served, taking into account ergonomics and mechanical impact protection. Note the cable radius (Figure 5).
	The ground condition must be firm and level in the areas shown.
	If the Hypercharger is installed in a closed or even partially closed environment, it must be prevented that the exhaust air is reintroduced into the supply air circuit. Impairments to air circulation can lead to a reduction in the performance of the charging station.

6.3. Placing the concrete foundation

The Hypercharger must be installed on a firm and level surface. This can be a concrete foundation or a concrete floor.

Notice

	When dimensioning the foundation, proof of static stability must be provided in accordance with relevant standards.
	A foundation can also be ordered as an option from Alpitronic (sales@hypercharger.it). This measures 80 x 80 x 102 cm and weighs 770 kg.

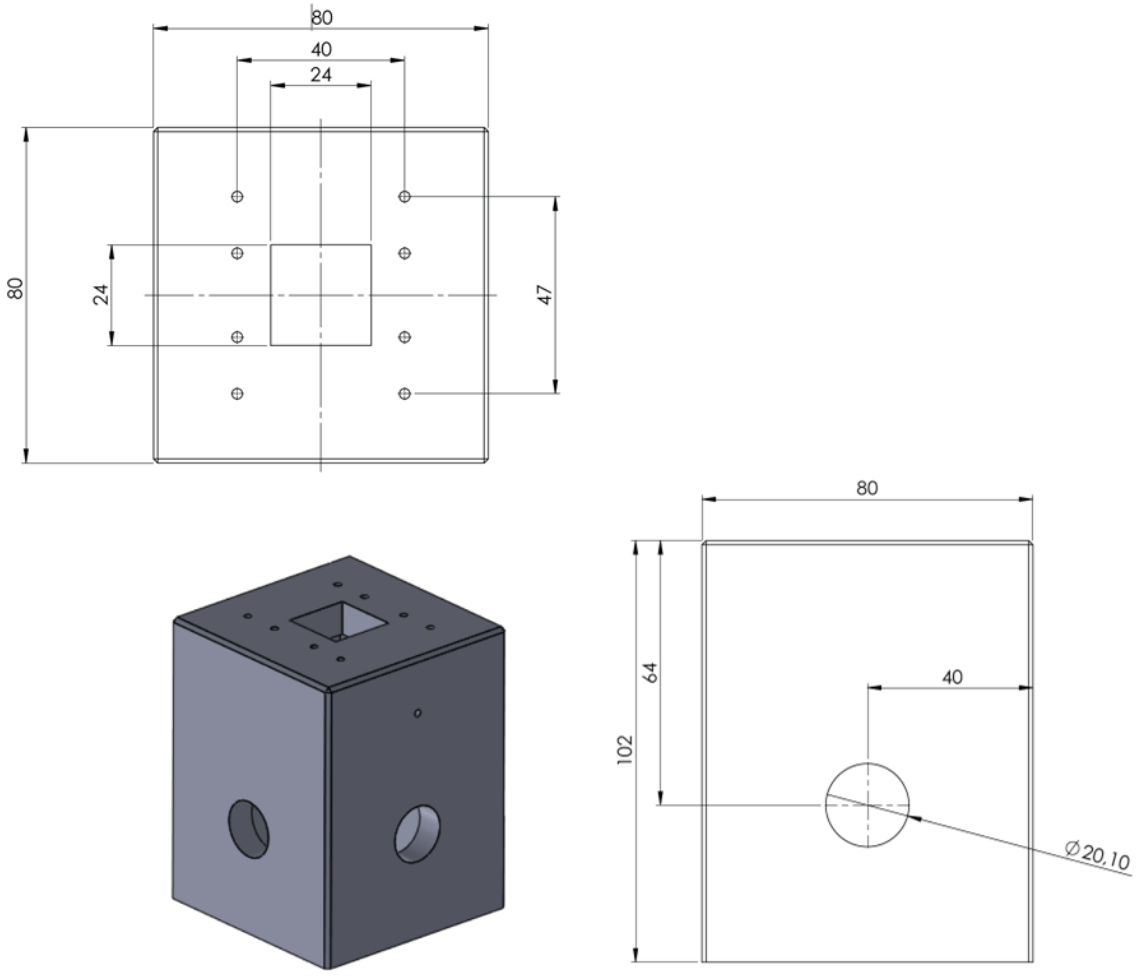


Figure 45: Hypercharger concrete foundation (dimensions in cm)

Notice

	The Hypercharger foundation is designed for wind zones of level 3 (maximum wind speed of 27.5 m/s; wind load q_b = 0.47 kN/m²) and terrain category II.

The foundation must be raised using suitable lifting equipment, such as a crane. There are no eyelet bolts for positioning the Hypercharger foundation. For this reason, it is recommended to insert a support beam (wooden beam/double-T beam) in the central opening (visible in Figure 45).

A granular subbase of at least 10 cm should be installed over an area of 1 x 1 m. The foundation must be backfilled with material GW, GI, SW, SI in accordance with DIN 18196 up to the lower edge of the base and compacted in layers.

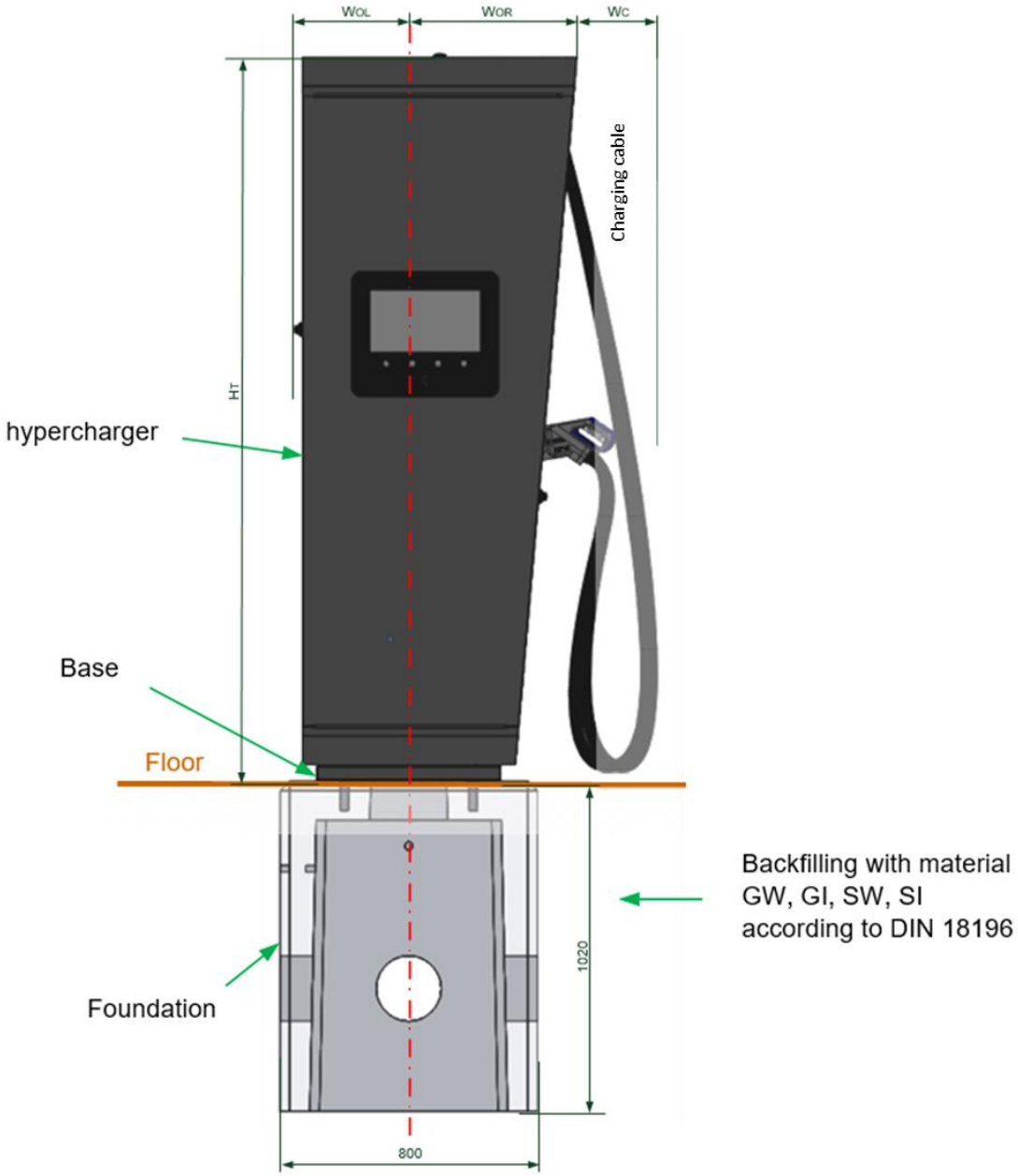


Figure 46: HYC200 on concrete foundation

Abbreviation	HYC200
H_T	2250 mm (± 3 mm)
W_C[1]	300 mm
W_{OL}	357 mm (± 3 mm)
W_{OR}	516 mm (± 3 mm)

Table 17: Dimensions

Notice

Due to the concrete foundation, the bending radius of the grid cables is 0.73 m. The diameter of the side openings is 20 cm.

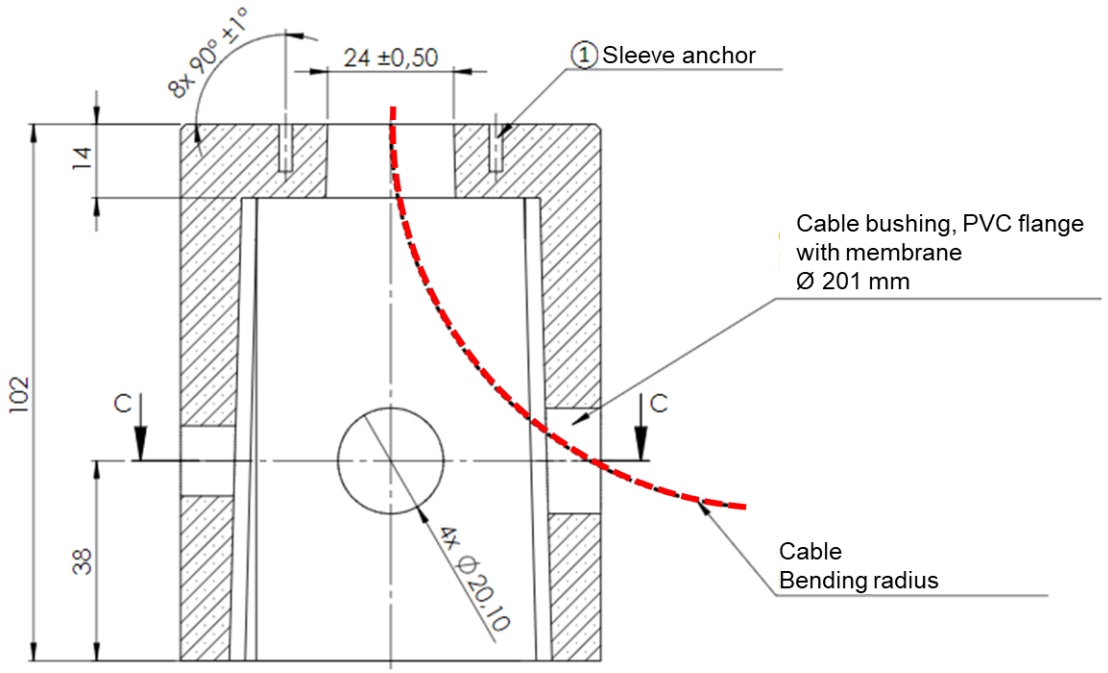


Figure 47: Grid cables bending radius

[1] This area may vary depending on the cable length.

6.4. Fastening the base to the foundation

The base is supplied with the charging station (Figure 48) and includes a cable entry plate with the cable glands (Figure 49).

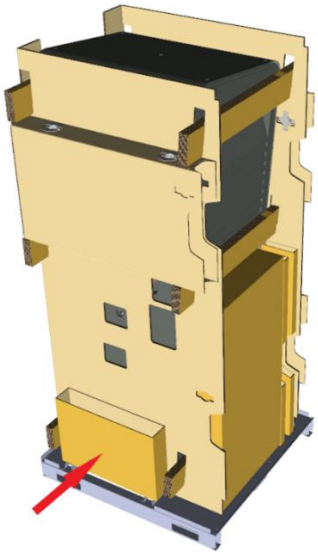


Figure 48: Packaging of base including cable entry plate

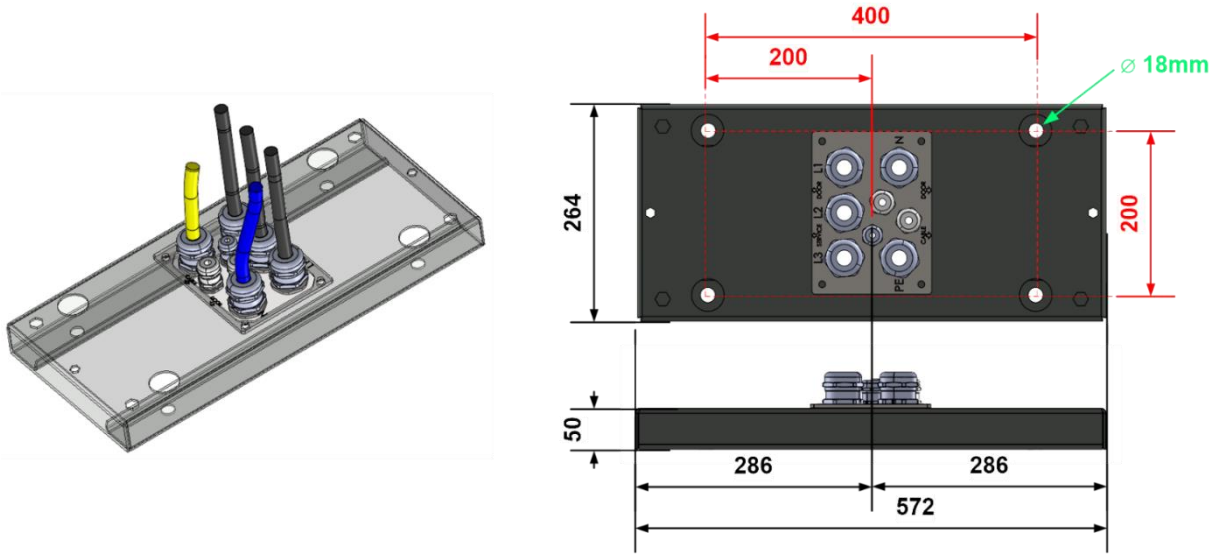


Figure 49: HYC200 base including cable entry plate (in mm)

Notice

The use of the cable entry plate is absolutely necessary! Not using one can cause dust and dirt to build up, which can damage the Hypercharger.

The HYC200 has a single cable gland for each phase and three additional cable glands can also be used for data cables, e.g. for load management:

Cable gland	Amount	Clamping area	Usage
M40	5	19-28 mm	L1, L2, L3, N, PE
M20	1	7-13 mm	Data cable (if available)
M25	2	11-17 mm	Data cable (if available)

Table 18: Available cable glands on the Hypercharger base

Notice

The required cable glands depend on the power supply cable used. Any changes to the standard variant must be coordinated with sales@hypercharger.it when the charging station is ordered.

Warning

Before you continue with the next steps, make sure that the grid cables are completely free from voltage (see chapter 1).

Lead the grid cables from the foundation through the cable entry plate. Pay attention to both the correct position of the individual grid cables (the positions are engraved on the cable entry plate) and the correct orientation of the base itself:

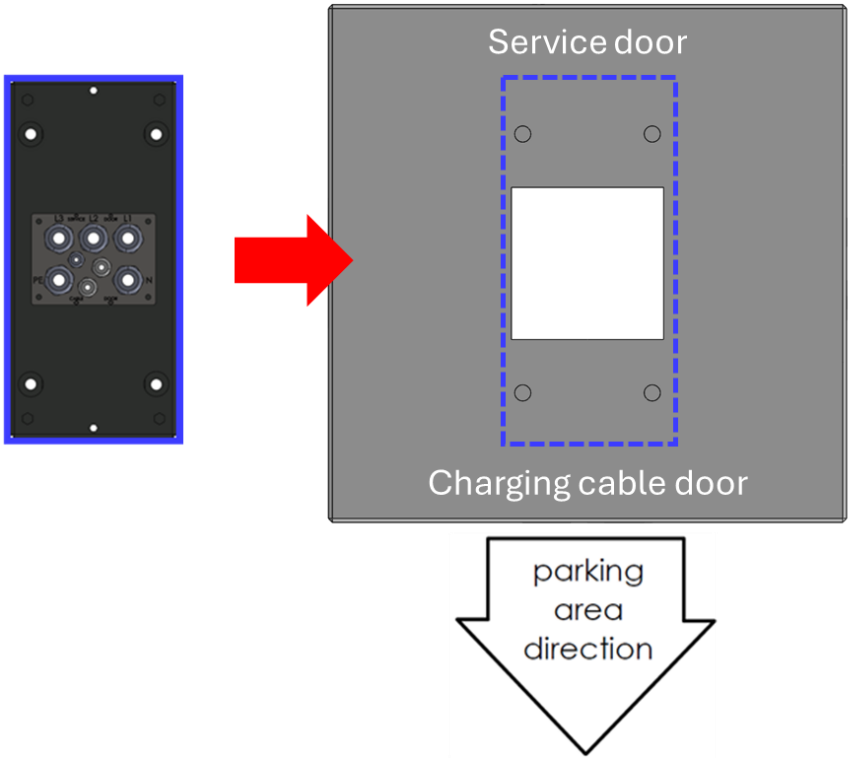


Figure 50: Alignment of base on the foundation

The external dimensions for the HYC200 (starting from the centre of the base) are shown in the following figure and given in Table 19.

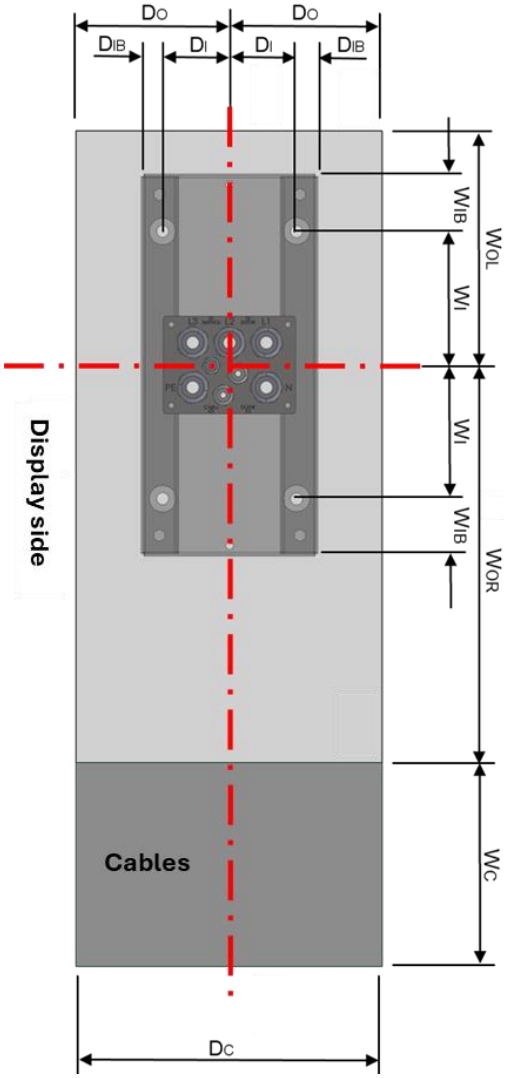


Figure 51: Distances between the base and the external dimensions of the HYC200

Abbreviation	HYC200
D_C	420 mm
D_I	100 mm
D_{IB}	32 mm (± 3 mm)
D_O	210 mm (± 3 mm)
W_C	300 mm
W_I	200 mm
W_{IB}	86 mm (± 3 mm)
W_{OL}	357 mm (± 3 mm)
W_{OR}	519 mm (± 3 mm)

Table 19: Distances from base to external dimensions of HYC200

The base can now be attached to the concrete foundation.

Notice

	If a concrete foundation was ordered, 4 fixing screws (M16 x 30 mm) and washers (M16 x 3 mm) are supplied with the Hypercharger.
	If the foundation was not ordered separately, stainless steel screws and washers should be used.
	Tighten the screws with a torque of **90 Nm**.

6.5. Preparing the grid cables

Installing the grid cables on the Hypercharger (see Chapter 6.7) is difficult due to the limited installation space. For this reason, it is recommended to use a so-called **cable jig**.

This mounting aid replicates the position of the individual screw connections of the AC input switchgear and allows the grid cables to be prepared (cutting to the correct length, correct positioning) before the Hypercharger has been positioned and secured on the base.

Notice

	The cable jig can be ordered at sales@hypercharger.it.

Attach the cable jig to the base.

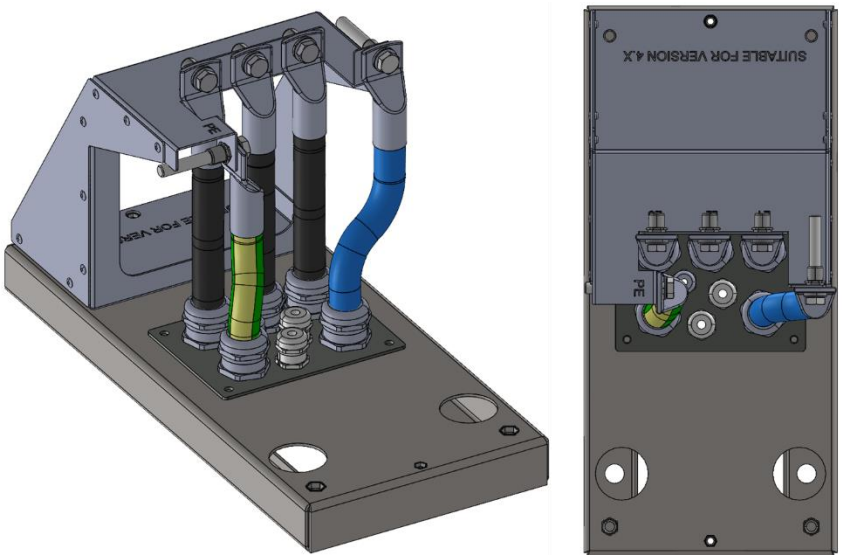


Figure 52: Cable jig for preparing the grid cables

Now shorten all grid cables to the intended length, fit them with suitable cable lugs and fix them to the ends of the grid cables with suitable crimping pliers.

Notice

Cable lugs must be used between M12 and M16. M16 should preferably be used, as this increases the tolerance compensation for the position of the cable lug.

After the cable lugs have been screwed onto the cable jig, the cable glands can be tightened, thereby fixing the connection points in the correct position.

Notice

All cable glands have to be tightened with an appropriate tool. If certain screw connections are not used, these must also be tightened and provided with a dummy plug (included in delivery), shown in Figure 53.

Figure 53: Tighten cable glands

Before proceeding with installation, remove the cable jig and apply heat shrink tubing to all lead wires.

6.6. Attaching the Hypercharger to the base

Now the Hypercharger can be attached to the base.

To do this, the Hypercharger must be removed from the metal pallet. To do this, open all doors of the Hypercharger.

Notice

Make sure the doors are opened in the correct order (see chapter 4.4).

If a cooling unit is present, it is recommended that it is removed due to limited installation space to facilitate the subsequent installation of the grid cables. To do this, the cooling unit must be unplugged and the fixing screws loosened.

Warning

Before the Hypercharger is removed from its attachment, it must be secured against tipping over (e.g. by attaching the crane hooks to the 2 eyelets on the top of the charging station).

Now the fastening of the Hypercharger to the metal pallet can be removed and the Hypercharger can be lifted with a crane.

If there is no crane plate available to distribute the weight, there is a risk that the roof of the Hypercharger will bend. To avoid this, the angle of the lifting strap should be a maximum of 55° and the distance between the roof and the crane hook should be at least 775 mm (see Figure 41).

Then position the Hypercharger on the base and screw it into place at the four fastening points.

Figure 54: Positioning and attaching the HYC200 on the base

Notice

To fasten it, use the screws and washers with which the Hypercharger is attached to the metal pallet upon delivery (four M12 x 30 mm screws and 32 mm washers). Alternatively, 30 or 40 mm washers can also be used.

Tighten the screws with a torque of **90 Nm**.

6.7. Attaching the grid cables

After the Hypercharger has been mechanically installed, the power lines can be connected to the busbars of the input switchgear.

Notice

	The screws (M12 x 30 and M12 x 85) on the input rails are already present.
	Due to the limited installation space, the grid cables are mounted offset on the busbars of the input switchgear. To ensure correct positioning, the 2 brass sleeves supplied must therefore be fitted to the outer cable connections (see red markings in Figure 55).
	In the new version of the cable jig, the offsets of the screw connections are already modelled (see Figure 52). The brass sleeves therefore do not need to be attached to the cable jig when preparing the power cables. If you are still using a cable jig without offsets, the brass sleeves must also be used when preparing the power cables on the cable jig.
	The brass sleeves have a length of 55 mm, an outer diameter of 30 mm and an inner drilling diameter of 13 mm.

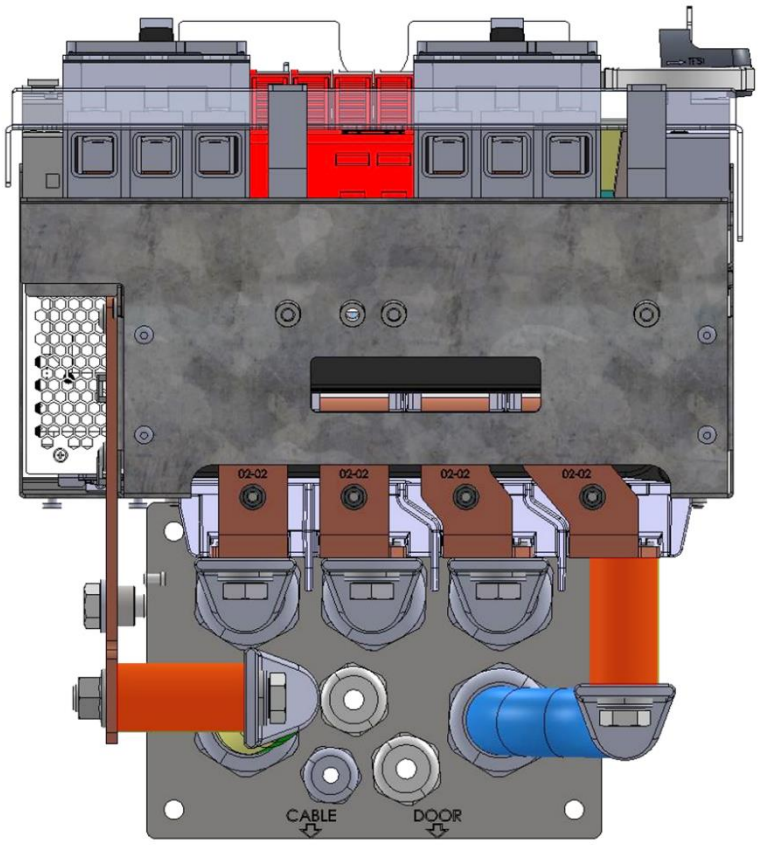


Figure 55: Brass sleeves on the cable jig

Fasten the cable lugs of the grid cables directly to the busbars or brass sleeves using a standard M12 washer (DIN125), a contact washer and an M12 screw.

Notice

Tighten the screws with a torque of **35 Nm**.

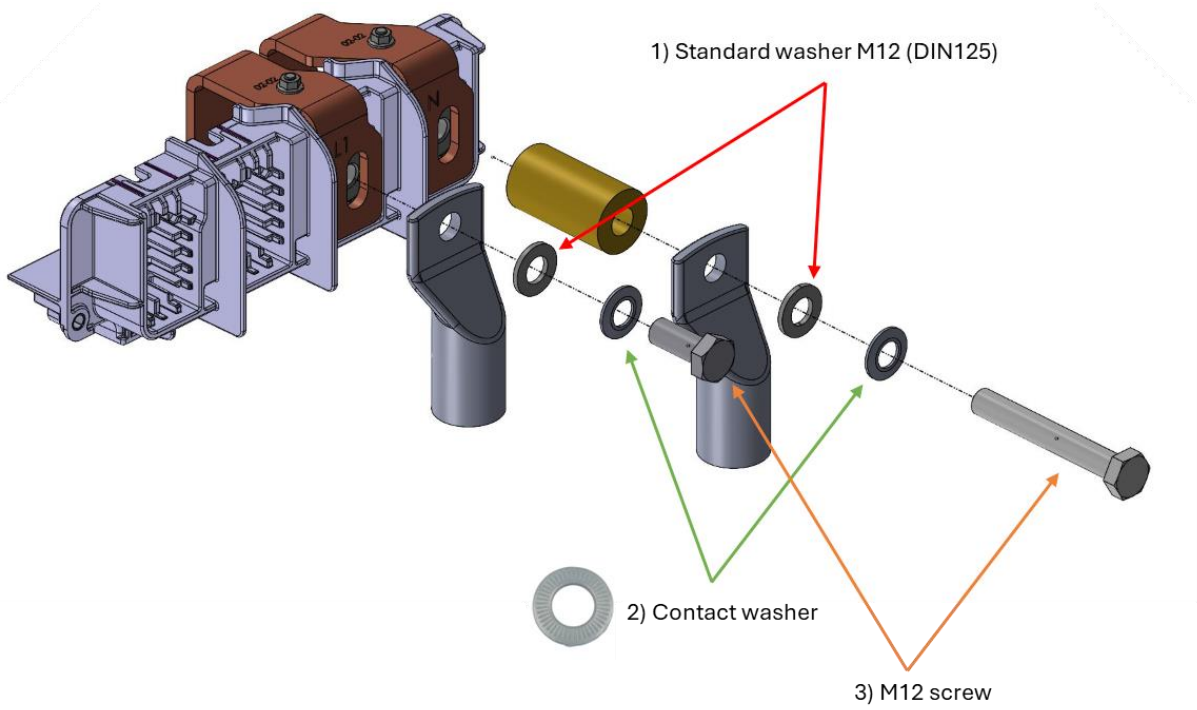


Figure 56: Fastening the cable lugs

After connecting the grid cables, be sure to attach the appropriate plexiglass covers.

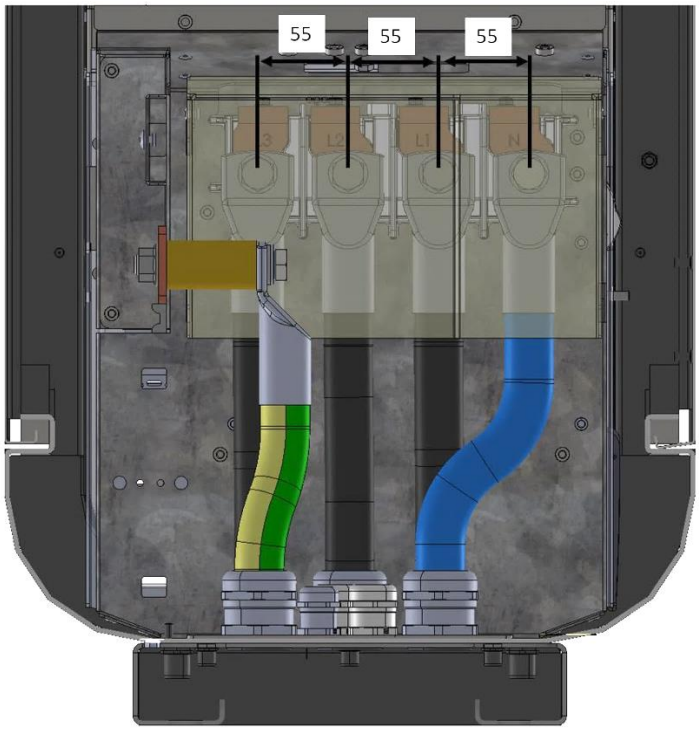


Figure 57: Screw connection of the grid cables to the conductor rails (in mm)

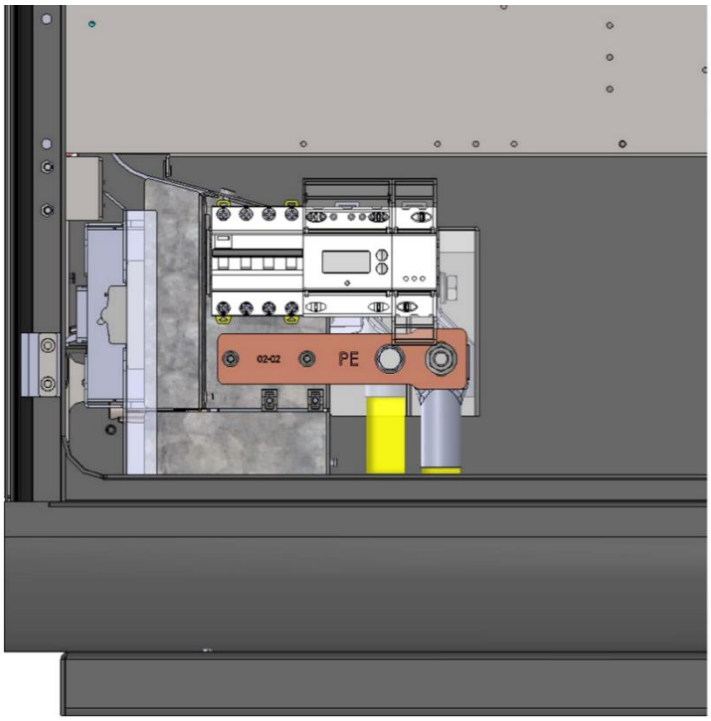


Figure 58: Side view of the grid cable connection

6.8. Final steps

Finally, reinstall the cooling unit if present. Fasten them and connect the connector and the cooling hoses.

Close all doors properly again.

Unpack the charging cables and insert them into the corresponding cable plug holders.

In addition, the crane eyelets should be removed and the locking screws, which are included in the scope of delivery, should be attached.

7. Commissioning

Correct commissioning and checking of the safety devices is required for safe operation of the charging station.

Attention

	Adhere to all safety warnings outlined in Chapter 1 of this manual.
	Before commissioning, check whether the charging station and all associated connections have been properly installed in accordance with this manual.

Warning

	Make sure that all live parts are equipped with the appropriate touch protection before the device is switched on.

Notice

	The commissioning of the charging stations may only be carried out by professionally qualified individuals, as per local regulations and safety standards. These individuals must also have successfully completed the mandatory training courses provided by Alpitronic. Further information about these training courses is available on the website https://training.hypercharger.it/.
	All of the following commissioning checks are mandatory. These must be carried out by filling out the **digital commissioning protocol** on Hyperdoc and sending it (including photo documentation) to Alpitronic. Improper commissioning and the lack of a corresponding commissioning protocol can lead to the warranty becoming void. For Hyperdoc registration: https://account.hypercharger.it/register (the digital protocols are only available to appropriately trained technicians (see above)).

All the points listed below are binding and must be carried out by the operator of the Hypercharger (or the installation company commissioned by them) **at the time of commissioning**.

Depending on the individual conditions of use of the Hypercharger, further checks may be necessary. Therefore, the following list should not be taken as complete.

Commissioning checks	Description
External visual inspection	• Condition of housing • IP degree of protection (IP54) • Stability • Accessibility
Checking charging cables & plugs	• Checking all cable parts (cable sleeve, cable, cable plug, mating face, pins) for the absence of damage (e.g. cable sheath intact, no crushing or cracks, pins undamaged, cable intact at transfer point, etc.) • Are all outside cable glands tight? • For cooled cables (if available). Check that drainage openings are clear
Checking the input grid cable glands	Visually verify that the input grid cable glands are tight
Checking screws	• Visual random check of internal screw connections • Random check of tightening torques
Check the cooling unit (if available), and replace coolant if necessary	• filling level • Connection • Absence of air pockets & creases • Coolant concentration • Coolant PH-value
Check for cleanliness	Check the cleanliness inside the charging station
Check condensation	Check for the absence of traces of condensation inside the charging station
Check filter mats	Check integrity
Check protective measures	• Visual inspection of the earthing system • Test earthing resistance • Test continuity of the equipotential bonding connections
Checks on the supply line	• Testing the insulation resistance on the busbars of the input switchgear / main switch (grid side) • Information on the existing protective device • Verification of the security
Verification of insulation resistances DC charging outlets	Check the insulation resistance of the pins for each existing DC charging outlet
Verification of RCD for AC	• Test activation time & current DC • Test activation time & current AC • Test activation time & current, as well as the loop impedance ZL1-PE on the service socket (XD2)
Verification of the cooling unit	Verification of fan & pump noise
Touch protection	Check whether all protective covers have been correctly attached after the electrical installation
Check RFID reader	Functional test of the RFID reader
Check connectivity of SIM cards	• Check the connection to the Alpitronic backend

	• Check the connection to the customer backend
Check the display elements	• Functional test of the display + button • Functional test of the screen display and, if necessary, the touch screen of the credit card terminal
Verification of LED rings	Functional test of the LED rings on the connectors
Suitability check / checking of components relevant to calibration law (if available, see appendix to calibration law for details)	• Nameplate • Cabling relevant to calibration law • Plastic seals on DC and/or AC meters • Adhesive seal • Overlay

Table 20: Checks to be carried out during commissioning

8. Diagnosis and parameterisation

After successful mechanical and electrical installation of the Hypercharger, the correct function of the device can be checked using a diagnostic and parameterisation tool. The so-called **Web interface** can be loaded via any browser with a standard IP address:

Default IP address	192.168.1.100

Table 21: Standard IP address of the Hypercharger

Notice

Further information about the web interface can be found in the corresponding configuration manual, which is available on the Hyperdoc document platform.

9. Error description and correction

Attention

Adhere to all safety warnings outlined in Chapter 1 of this manual.

Description of fault	Possible error cause	Troubleshooting
The display remains black	No power supply	Check whether all circuit breakers are switched on.
A SiC Power-Stack cannot be switched on	The SiC Power-Stack circuit breaker (-QA1-QA2) is switched off	Turn on the appropriate circuit breaker.
No communication from the backend	No connection via Ethernet or mobile network	Check the connection of the Ethernet network (-XF2) and/or the antenna (-TF1). Start the charging station in diagnostic mode and use the diagnostic tool for further error localization.
Charging not possible	Error in the configuration of the charging station	Start the charging station in diagnostic mode and use the diagnostic tool for further error localization.

Table 22: Error description and correction

10. Preventive Maintenance

For the safe operation of the charging station, annual maintenance of the charging station and a check of its safety devices is required. Depending on the installation location of the charging station and the environmental influences prevailing there (such as dirt, moisture, etc.), shorter maintenance intervals may also be necessary for certain components. Regular inspection is therefore recommended.

Attention

Adhere to all safety warnings outlined in Chapter 1 of this manual.

Notice

The preventive maintenance of the charging stations may only be carried out by professionally qualified individuals, as per local regulations and safety standards. These individuals must also have successfully completed the mandatory training courses provided by Alpitronic.

Further information about these training courses is available on the website https://training.hypercharger.it/.

All of the following preventive maintenance work is mandatory. These must be carried out by filling out the **digital maintenance protocol** on Hyperdoc and sending it (including photo documentation) to Alpitronic.

Failure to maintain an appropriate maintenance protocol may void the warranty.

For Hyperdoc registration: https://account.hypercharger.it/register (the digital protocols are only available to appropriately trained technicians (see above)).

Depending on the individual operating conditions of the Hypercharger, further maintenance work may be necessary. Therefore, the following list should not be taken as complete.

Maintenance work	Description
External visual inspection	• Condition of housing • IP degree of protection (IP54) • Stability • Accessibility • Credit card terminal (if available)
Checking charging cables & plugs	• Checking all cable parts (cable sleeve, cable, cable plug, mating face, pins) for the absence of damage (e.g. cable sheath intact, no crushing or cracks, pins undamaged, cable intact at transfer point, etc.) • Are all outside cable glands tight? • For cooled cables (if available). Check that drainage openings are clear
Checking the input grid cable glands	Visually verify that the input grid cable glands are tight
Checking screws	• Visual random check of internal screw connections • Random check of tightening torques
Check the cooling unit (if available), and replace coolant if necessary	• Filling level • Connection • Absence of air pockets & creases • Coolant concentration • Coolant PH-value
Check for cleanliness	Check the cleanliness inside the charging station
Check condensation	Check for the absence of traces of condensation inside the charging station
Check and replace filter mats if necessary	Checking for integrity and contamination
Review of protective measures	• Visual inspection of the earthing system • Test earthing resistance • Test continuity of the equipotential bonding connections
Check the supply line (only if there is no commissioning protocol)	• Testing the insulation resistance on the busbars of the input switchgear / main switch (grid side) • Information on the existing protective device • Check short-circuit current
Checking insulation resistance of DC charging outlets	Check the insulation resistance of the pins for each existing DC charging outlet
Verification of RCD for AC	• Test activation time & current DC • Test activation time & current AC • Test activation time & current, as well as the loop impedance ZL1-PE on the service socket (XD2)
Check overvoltage protection	Check the optical defect display of the overvoltage protection
Check residual current protective devices	Functional test of the circuit breakers with residual current monitoring
Touch protection	Check whether all protective covers have been correctly attached
Check main switch	Functional test of the main switch QB1
Verification of the cooling unit	Verification of fan & pump noise
Check RFID reader	Functional test of the RFID reader
Check connectivity of SIM cards	• Check the connection to the Alpitronic backend

	• Check the connection to the customer backend
Check the display element	• Functional test of the display + button • Functional test of the screen display and, if necessary, the touch screen of the credit card terminal
Verification of LED rings	Functional test of the LED rings on the connectors
Suitability check / checking of components relevant to calibration law (if available, see appendix to calibration law for details)	• Nameplate • Cabling relevant to calibration law • Plastic seals on DC and/or AC meters • Adhesive seal • Overlay • Recalibration of measuring devices that are compliant with calibration law • If necessary, functional tests including accuracy tests

Table 23: Annual maintenance work

11. Reparation and service

The modular design of the Hypercharger enables easy repair of defective components.

Warning

	Adhere to all safety warnings outlined in Chapter 1 of this manual.

Notice

	Please note that repairs to the Hypercharger **are only** carried out by professionally qualified individuals, as per local regulations and safety standards. These individuals must also have successfully completed the mandatory training courses provided by Alpitronic. All necessary legal and safety measures must be observed!
	Be sure to consult Hypercharger support before repairs are carried out. support@hypercharger.it or +39 0471 1961 333
	Every repair and every component replacement must be reported to support@hypercharger.it, including the serial numbers of the individual parts.
	To order spare parts, contact aftersales@hypercharger.it.

Hypercharger support is available around the clock (24/7) by phone on +39 0471 1961 333 or by email (support@hypercharger.it).

12. Disposal

Electrical and electronic equipment contains materials, components and substances that may be hazardous and pose a threat to human health and the environment. Therefore, the Hypercharger and its components must not be disposed of with household waste, but must be collected separately.

The Hypercharger is subject to the WEEE Directive 2012/19/EU (Waste of Electrical and Electronic Equipment), which is implemented differently in the EU countries. Depending on the country, traders and/or manufacturers must register and report the exported quantities of electrical and electronic equipment and, if necessary, pay a fee.

The packaging made of wood/cardboard and plastic, as well as the 3V button battery (BR1225) contained in the CTRL_COM circuit board must be disposed of separately.

Please contact your local authority for suitable collection points.

Notice

For more information, please contact Hypercharger support or contact a dedicated WEEE Advisory Service directly.

13. Technical data

13.1. General technical data

Parameter	Nominal value
Type of protection	IP54
Place of assembly	Indoors and outdoors
Humidity transport or storage area	0 - 95% rel. (not condensing)
Operating humidity range	0 - 95% rel.
Storage temperature range	-40 °C to +55 °C
Operating temperature range	-30 °C to +55 °C (+40 to +55 °C with derating)
Corrosion protection class	C3
Mechanical shock resistance (IEC62262)	IK10
Type of fastening	Floor mounting (base)
Accessibility	Without restrictions
Installation height	Up to a maximum of 4,000 m above sea level. If CHAdeMO cables are present, the max. installation height is limited to 2,000 m a.s.l.
Protection class	Class I (Protective earthing)
Supported charging modes	Mode 4 with optional 22 kW AC charging (Mode 3)

Table 24: General technical data

Notice

The full performance potential is not guaranteed at every temperature and altitude.

13.2. Mechanical data

Type	Width (mm)	Height [mm]	Depth [mm]	Weight [kg]
HYC200	420	2250	854	See Table 16

Table 25: Mechanical data

13.3. Electrical Connection Data

Notice

The Hyperchargers are intended for direct connection to the supply network.

Parameter	Nominal value
Operating voltage U_{NOM}	400Vac +N +PE (+10 % / -15 %)
Network types	TT, TN-S, TN-C, TN-CS
Frequency	50/60 Hz (±5 %)
Maximum input current	320 A
Contribution to short circuit current	320 A
Typical efficiency*	> 97 %
Maximum connection cross-section	240 mm^2
Permissible outer diameter of the supply line	19-28 mm
Conditional short-circuit current I_{cc}	50kA at 500V by 400A gG fuse
	50kA at 415V by 400A model case circuit breaker
Overvoltage category	OVC III
Integrated overvoltage protection (SPD)	Type 1+2
Cross-section of the connection terminals	M12 thread

Table 26: Electrical Connection Data

* For further details, please contact our sales department.

13.4. Radio communication

The HYC200 radio modem supports the following frequency bands:

Frequency band	Transmission level (maximum nominal power)
WCDMA B1, B8 (UMTS900, UMTS2100)	24 dBm
LTE FDD B1, B3, B7, B8, B20, B28	23 dBm
GSM 900	33 dBm
GSM 1800	30 dBm

Table 27: Frequency bands and transmission levels

13.5. Typical standby power consumption

Type	Power level	Power [W]
HYC200	Standby mode*	< 100 W

Table 28: No-load power dissipation at 400 V AC

* This value may vary depending on different factors, such as the presence of a credit card terminal and the model used, the presence of calibration law meter, the number of output cables and the different display brightness settings.

14. Declaration of Conformity

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EU Declaration of Conformity

Manufacturer:
alpitronic GmbH – srl
Via di Mezzo ai Piani 33
ITALY-39100 Bolzano

Product Name: HYC_200

The company alpitronic srl located in ITALY-39100 Bolzano, manufacturer of the above-mentioned product, declares under its own responsibility that the product is in conformity to what is foreseen by the following European Community directive:

- **EU Directive 2014/53/EU**, for the provision of radio equipment on the market
- **EU Directive 2011/65/EU** on the restriction of the use of certain hazardous substances in electrical and electronic equipment with amendment acc. to 2017/2102 (RoHS2)

The following relevant harmonised standard(s) has/have been used for the presumption of conformity with EU Directive 2014/53/EU:

- EN 300 330 V2.1.1: 2017
- EN 301 511 V12.5.1: 2017
- EN 301 908-1 V15.1.1: 2021
- EN 301 908-2 V13.1.1: 2020
- EN 301 908-13 V13.2.1: 2022
- EN 301 893 V2.1.1: 2017
- EN 301 328 V2.2.2: 2019

Article 3, (1), a) of EU Directive 2014/53/EU requires the objectives of 2014/35/EU with regard to safety requirements to be met. This is demonstrated by compliance with the applicable areas of the following harmonised European standards:

- EN IEC 61851-1:2019
- EN 61851-23:2014/AC:2016-06
- EN 62477-1:2012
- EN 62311:2008

Article 3, (1), b) of EU Directive 2014/53/EU requires an adequate level of electromagnetic compatibility to be ensured in accordance with Directive 2014/30/EU. This is achieved by compliance with the applicable areas of the following harmonised European standards:

- EN 301 489-1 V2.2.3: 2019
- EN 301 489-52 V1.1.0: 2016
- EN 61000-6-2:2005
- EN 61000-6-4:2007/A1:2011

The following international standards were also taken into account for EMC:

- EN 301 489-3 V2.1.1: 2019
- IEC 61851-21-2:2018 (class A)

Signed for and on behalf of:

Bolzano, 10.06.2024

Philipp Senoner, CEO

15. Table of Figures

16. List of tables