



Operation Instructions and Installation Guide - Hardware

**hypercharger HYC_150 / HYC_300
(75 kW – 300 kW)
ultra-fast charging system for electric vehicles**

for HW-Versions 4



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Operation Instructions and Installation Guide

Version

Version 2-2 of operation instructions and installation guide, February 2021

Original English version
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Attention



If the installation instructions described in this document are not adhered to, any warranty claim will be void.

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1. Safety instructions

This chapter contains the safety instruction which must be considered at installation, operation and maintenance of the hypercharger ultra-fast charging system for electric vehicles. Incorrect operation as a result of non-compliance with the operation instructions may lead to severe injuries or damages. This safety operation must be read carefully before the installation, operation and maintenance of the hypercharger ultra-fast charging system.

1.1. Designated use

The hypercharger ultra-fast charging system for electric vehicles is intended to be used both in indoor and outdoor environments for performing ultra-fast charging for electric vehicles.

Attention

The charging station is designed for a stationary installation in an ambient with pollution degree class 3.

For the connection between the electric vehicle supply equipment (EVSE) and electric vehicle (EV), no additional cables are required besides the AC cable, which needs to be in possess of the user. A charging cord shall not be altered to extend or divide the cable length.



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No adapters may be used which 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.

1.2. Users

These operation instructions and installation guides are intended for the operators responsible for installation, operation, service and maintenance of the hypercharger ultra-fast charging system for electric vehicles. These operators should have an in-depth knowledge of electrical high-power systems and electric vehicles. Prior to carrying out any work the operator and the responsible technical personnel must carefully read these instructions.



1.3. Safety instructions for installation and maintenance

These warnings and instructions apply to all activities of installation, service and maintenance on the hypercharger.

Attention



Any disregard from these instructions can lead to serious or fatal personal injury, as well as serious damage to property.

Attention



Installation and maintenance of the hypercharger ultra-fast charging system for electric vehicles must only be carried out by qualified personnel.

Before putting the system into operation, check the correct state of the installation and all connections.

Electrostatic discharge



The control cabinet contains components and circuit boards that are sensitive to electrostatic discharge. During assembly and maintenance, sufficient ESD measures should be taken to protect the electronic components (for example, wearing a grounding wristband).

Warnings

Warning of hazardous electrical voltage

Installation and maintenance of the hypercharger may be carried out only while power is off/disconnected. Before performing any installation, disassembly, repair or replacement of components, switch off the external group switch and the main switch in the hypercharger cabinet and do a voltage check to make sure that the electrical power is disconnected from the system.



Inside the hypercharger cabinet, hazardous electrical voltages are present (up to 1000 Vdc) even if all circuit breakers are switched off, do not allow unqualified persons to go near it.

Only hypercharger certified technicians are permitted to install, disassemble, repair or replace components on the hypercharger. The hypercharger cabinet doors must be properly closed and locked after installation, service or repair operations.



Warning of hot surface



Some internal components of the hypercharger like Power-Stack housings, cooling system, and conductors can remain hot long after the power supply has been disconnected.

Prior to performing any task such as disassembly, repair or replacement of components make sure that all components have cooled down.

Heavy weight



Please note that the individual components of the device can be very heavy, for example the Power-Stacks.

Crushing



Please take care good when assembling and disassembling components in order to avoid crushing people or body part.

Remarks



Pushing the (optionally installed) Emergency stop button (see chapter 2.6.2) on the front door stops charging/disables charging. The hypercharger Power-Stacks will be turned off.



To turn off the hypercharger, one can find the main switch QB1 (see Figure 13 and Figure 14) in the cabinet, rotate the handle to position '0'. This will turn off all internal components of the hypercharger.

2. Product description

The hypercharger product line offers the choice between two different housings, which can be configured with various options as shown in the following table:

Model	DC-Power	Options (see chapter 2.1)
HYC_150	- 1 Power-Stack → 75 kW	- 1 DC charging cable
	- 2 Power-Stacks → 150 kW	- 2 DC charging cables - AC socket with shutter or AC cable
HYC_300	- 1 Power-Stack → 75 kW	- 1 DC charging cable
	- 2 Power-Stacks → 150 kW	- 2 DC charging cables
	- 3 Power-Stacks → 225 kW	- 3 DC charging cables
	- 4 Power-Stacks → 300 kW	- AC socket or AC cable

Table 1: Overview DC power and options of the hypercharger product family

Remark

As standard, the hypercharger housing is delivered with the housing colour "RAL Noir 2100". The reflector strips on the door have the standard colour "Pantone 3115 C".
The customer can choose any RAL housing color as well as any RAL reflector strip color as an option. It is also possible to order individual foiling.

75 kW hypercharger Power-Stacks are used to supply the DC charging cables installed on the hypercharger with power (detailed information in chapter 2.5.1).
One Power-Stack can supply only one DC charging cable at the same time. The hypercharger Power-Stacks can be switched in parallel mode to increase the power conducted via one DC charging cable.

The HYC_150 can be equipped with at least one or a maximum of two Power-Stacks and with up to a maximum of 2 DC charging cables and a 22 kW AC charging socket or AC cable:



Figure 1: Configuration HYC_150

The HYC_300 can be equipped with one, two, three or four Power-Stacks and with up to 3 DC charging cables and a 22 kW AC charging socket or AC cable:



Figure 2: Configuration HYC_300

Remark

The order of the charging points (with view of the charging cable door) is always from left to right, AC - if available - is in last place.



Figure 3: Order of charging points HYC_150 and HYC_300

Remark

Customs tariff number of the hypercharger: 85044055

2.1. Charging interfaces

The following charging interfaces can be selected for the hypercharger:

Charging interfaces		
Charging interface	Max. Voltage capability [V]	Max. current capability [A]
CCS Combo 2 (not liquid cooled cable)	1.000V DC	200 A / 250 A / 400 A (500 A Boost) DC
CCS Combo 2 HPC (liquid cooled cable)	1.000V DC	500 A DC
CHAdeMO (not liquid cooled cable)	500V DC	125 A DC / 200 A DC
22 kW AC Socket Type 2 (with shutter) or AC cable	400V 3~	32 A AC

Table 2: Charging interfaces

Attention



The total performance of the HYC_150 is limited to a 250 A grid connection.
The total performance of the HYC_300 is limited to a 500 A grid connection.

Remark



The usable DC-Power on a DC-outlet is limited by the maximum current of the used DC-charging cable. The effective current carrying capacity of the charging interfaces is specified on the nameplate (see chapter 2.2.1).

For the automotive industry also CCS1 and GB/T interfaces are possible:

Charging interfaces		
Charging interface	Max. Voltage capability [V]	Max. current capability [A]
CCS 1 US (not liquid cooled cable)	600 V DC	200 A DC
GB/T China	750 V DC	250 A DC

Table 3: Additional charging interfaces for automotive multichargers

The following charging interfaces can be selected for the hypercharger in various combinations:

Charging interfaces			
Connector 1	Connector 2	Connector 3	Connector 4
HYC_150			
CCS Combo 2*		N/A	N/A
CHAdeMO		N/A	N/A
CCS Combo 2*	CCS Combo 2*	N/A	N/A
CCS Combo 2*	CHAdeMO	N/A	N/A

The following figure shows the DC-Power characteristic with one, two, three and four hypercharger Power-Stacks and different cable types:

- 500 A CCS2 HPC liquid cooled cable
- 400 A CCS2 non liquid cooled cable (500 A with boost)
- 250 A not liquid cooled GB/T and CCS2 cable
- 200 A not liquid cooled CCS1, CCS2 and CHAdeMO cable
- 125 A not liquid cooled CHAdeMO cable

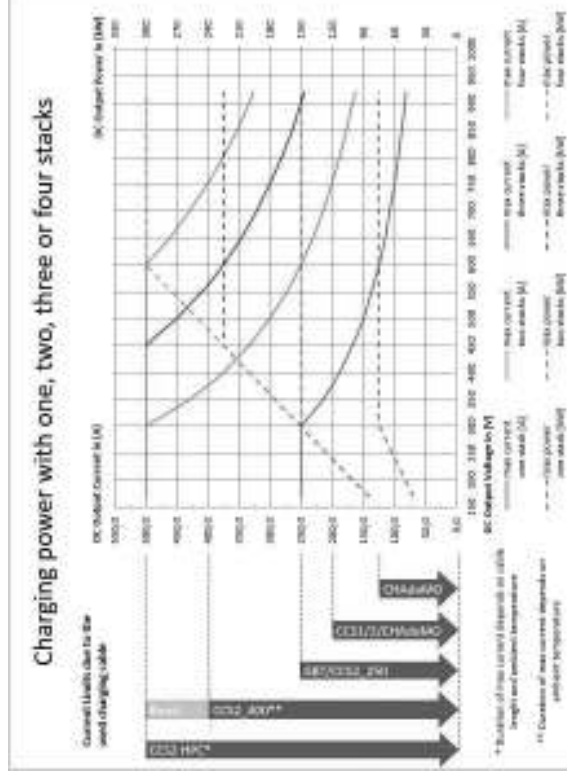


Figure 4: DC-Power characteristic in different configurations

In its default configuration, the hypercharger comes with a cable length of 3.5 m. The following figure shows the operating radius (3 m) of the cables for the two DC outlets of the hypercharger.

Remark



Optionally, longer cable lengths can be ordered (max. 5 m for cooled and max. 7 m for uncooled cables). Please contact sales@hypercharger.it.

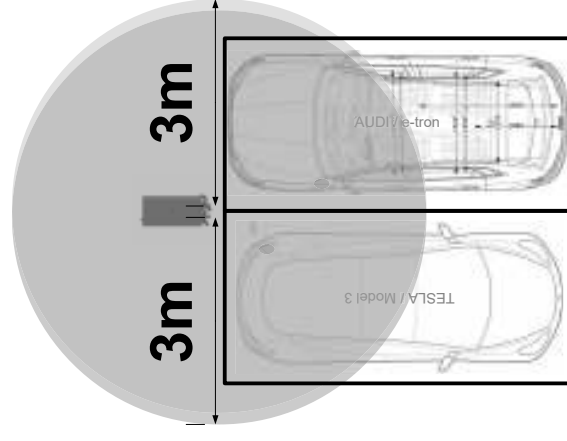


Figure 5: Cable reach for the two DC outlets of the hypercharger

2.2. Exterior view

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

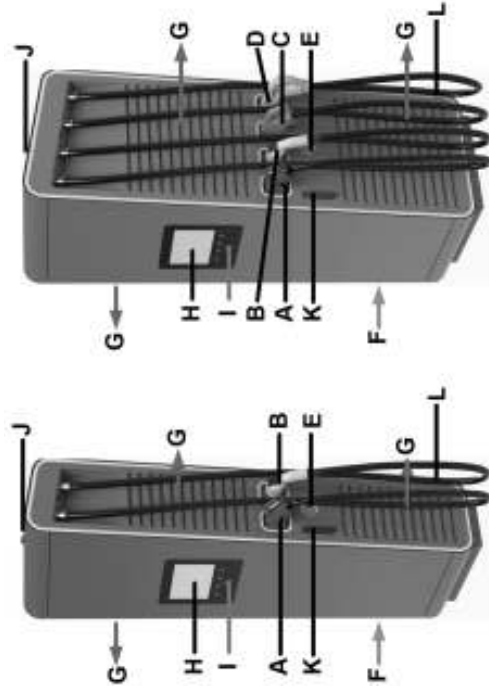


Figure 6: Elements of the charging station HYC_150 and HYC_300

- A DC charge outlet 1
- B DC charge outlet 2 (optional)
- C DC charge outlet 3 (optional)
- D DC charge outlet 4 (optional)
- E AC charge socket (optional)
- F Air inlet
- G Air outlet
- H Display / HMI
- I RFID card reader
- J GSM / LTE antenna
- K Door handle
- L Nameplate

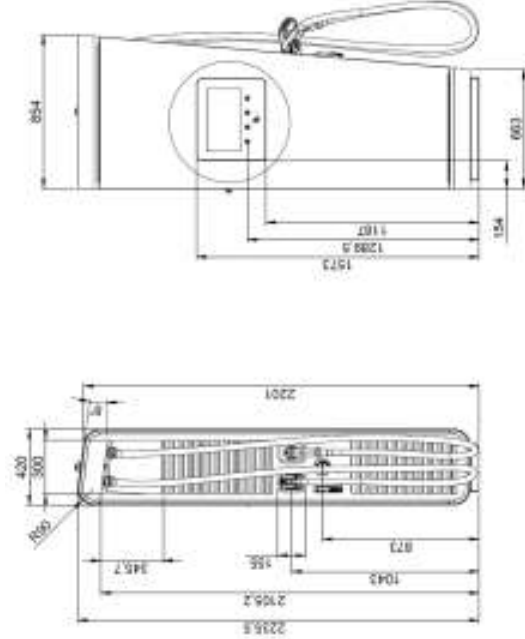


Figure 7: External dimensions HYC_150 (in mm)

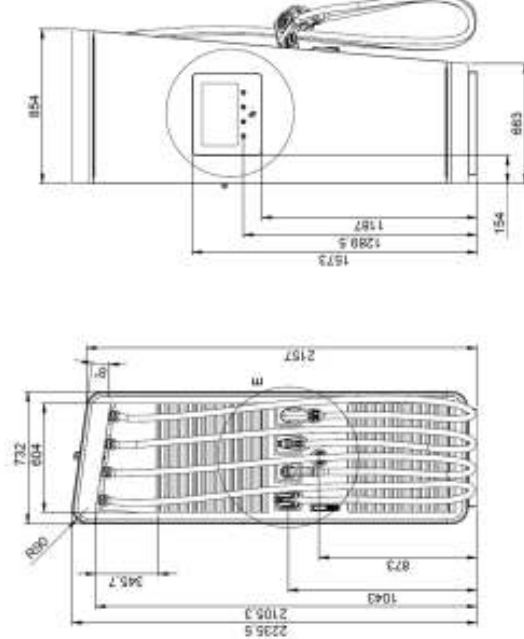
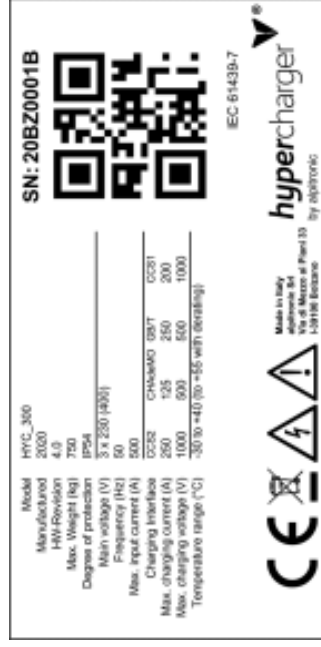


Figure 8: External dimensions HYC_300 (in mm)

2.2.1. 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.



2.4. Internal view

2.4.1. HYC_150 internal view

The following figure shows the hypercharger internal view of HYC_150.



Figure 13: Internal view hypercharger HYC_150 (service-, display-, charging cable side)

The following table describes the single components indicated in the figure above:

Identifier	Description
-BC1	DC fault current monitoring for AC charging (optional, only when AC-socket or AC cable is present)
-BE5	AC meter (MID compliant)
-EP1	Cooling unit for cooled charging cable (optional, only with cooled charging cable)
-FA1	Lightning protection and EMI filter device
-FB1	10 A circuit breaker with fault current monitoring for internal supply and service-socket
-FB2	32 A circuit breaker with fault current monitoring (optional, only with AC-Socket)
-KF1, -KF2	CTRL_COM HD control board, CTRL_COM Display
-KF3	CTRL_IO control board
-KF5	CTRL_EXT control board
-QA1, -QA2	125 A circuit breaker / 3P

Identifier	Description
-QB1	250 A main switch / 4P
-QB9	Contactors for AC charging (optional, only when AC-socket is present)
-SF2	Door contact switch (optional)
-SF3	Door contact switch (optional)
-TB1	Auxiliary 24 V power supply
-TB2, -TB3	hypercharger Power-Stacks
-TF1	Antenna (3G, 4G/LTE)
-XD1	Mains input busbars
-XD2	Power socket 230 Vac for service
-XD3	DC-busbar for vehicle cable connection XD7 (DC-outlet 1)
-XD4	DC-busbar for vehicle cable connection XD8 (optional, only when DC-outlet 2 is present)
-XD7	DC charge outlet 1
-XD8	DC charge outlet 2 (optional)
-XD11	AC socket (optional, only when AC-socket is present)
-XF1	Ethernet-network-socket (service)
-XF2	Ethernet-network-socket (client-LAN)

Table 5: hypercharger HYC_150 cabinet components

Remark



The Ethernet port XF1 can be used for load management.

2.4.2. HYC_300 internal view

The following figure shows the hypercharger internal view of HYC_300:



Figure 14: Internal view hypercharger HYC_300 (service-, display- and charging cable-side)

The following table describes the single components indicated in the figure above:

Identifier	Description
-BC1	DC fault current monitoring for AC charging (optional, only when AC-socket or AC cable is present)
-BE5	AC meter (MID compliant)
-EP1	Cooling unit for cooled charging cable (optional, for cooled charging cable)
-EP2	Cooling unit for cooled charging cable (optional, for cooled charging cable)
-FA1	Lightning protection and EMI filter device
-FB1	10 A circuit breaker with fault current monitoring for internal power supply and service socket
-FB2	32 A circuit breaker with fault current monitoring (optional, only when AC charging socket is present)
-FC1	Input filter circuit
-KF1, -KF2	CTRL_COM_HD control board, CTRL_COM Display
-KF3	CTRL_IO control board
-KF4	Additional CTRL_IO board (for 3 or 4 DC Outputs)
-KF5	CTRL_EXT control board
-QA1, -QA2, -QA3, -QA4	125 A circuit breaker / 3P
-QB1	500 A main switch / 4P
-QB9	Contactors for AC charging (optional, only when AC-socket is present)
-SF2	Door contact switch (optional)
-SF3	Door contact switch (optional)
-TB1	Auxiliary 24 V power supply

Identifier	Description
-TB2, -TB3, -TB4, -TB5	hypercharger Power-Stacks
-TF1	Antenna (3G, 4G/LTE)
-XD1	Mains input busbars
-XD2	Power socket 230 Vac for service
-XD3	DC-busbar for vehicle cable connection XD7 (DC-outlet 1)
-XD4	DC-busbar for vehicle cable connection XD8 (optional, only when DC-outlet 2 is present)
-XD5	DC-busbar for vehicle cable connection XD9 (optional, only when DC-outlet 3 is present)
-XD6	DC-busbar for vehicle cable connection XD10 (optional, only when DC-outlet 4 is present)
-XD7	DC charge outlet 1
-XD8	DC charge outlet 2 (optional)
-XD9	DC charge outlet 3 (optional)
-XD10	DC charge outlet 4 (optional)
-XD11	AC socket (optional, only when AC-socket is present)
-XF1	Ethernet-network-socket (service)
-XF2	Ethernet-network-socket (client-LAN)

Table 6: hypercharger HYC_300 cabinet components

Remark



The Ethernet port XF1 can be used for load management.

2.5. Main components

2.5.1. Power-Stack

The Power-Stack is the power module that converts the AC voltage to an electrically isolated DC voltage.

The following figure shows the dimensions of a Power-Stack.

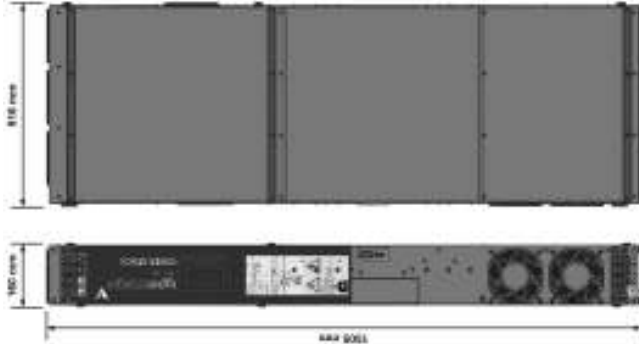


Figure 15: Dimensions of Power-Stack

The supply lines at the AC connection block must have a minimum cross section of 35 mm². The tightening torque is 15 Nm. Figure 16 shows the AC connection block at the bottom of the Power-Stack.

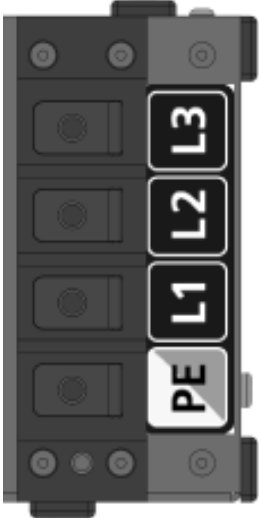


Figure 16: AC connection block

The output lines at the DC connection block must have a minimum cross section of 35 mm². The tightening torque is 15 Nm. Both DC+ and DC- connections must be used in parallel. Figure 17 shows the DC connection block at the upper end of the Power-Stack.



Figure 17: DC connection block

The stack has a status display consisting of 4 LEDs:

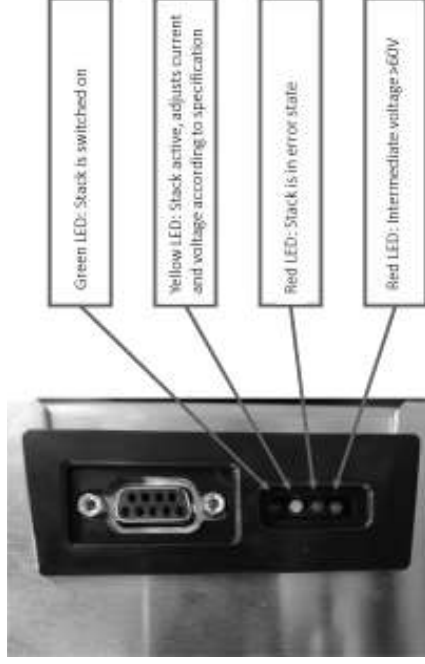


Figure 18: Status indication of Power-Stack

Parameters	Nominal value
Protection class	IP20
Installation site	For switch cabinet installation
Type of installation	Plug-in module
Installation altitude	Up to a maximum of 2.000 m.a.s.l.
Humidity-range for transport or storage	0 - 95 % rel. (non-fogging)
Humidity-range for operation	0 - 95 % rel.
Degree of pollution	Pollution degree class 2
Overvoltage category	OVC II
Protection class	Class I (protective earthing)
Storage temperature range	-40 °C - +55 °C
Operating temperature range	-30 °C - +40 °C (up to +55 °C with derating)

Table 7: Technical data

Type	Width [mm]	Length [mm]	Height [mm]	Weight [kg]
Power-Stack 75 kW	160	516	1505	95

Table 8: Mechanical data

Electrical data AC connection (input):

Parameters	Nominal value
AC operating voltage	3x 400 Vac +PE (+10 % / -15 %) 3x 480 Vac +PE (+10 % / -15 %)
Frequency	50 Hz (± 5 %) 60 Hz (± 5 %)
Nominal current input	120 A
Nominal power	75 kW
Power factor	PF > 0.99
Cross section of the AC terminals	Bolt with M8 thread for connection cross section 35...70 mm²
Max. Rated short-circuit current I_{pk}	17 kA (peak)
Allowed rated short-time current I_{aw}	4 kA (rms)
Pre-fuse to be inserted	125 A Type B or Type C
Network type	TN-S / TN-C / TN-CS / TT / IT

Table 9: Electrical data AC connection

Electrical data DC connection (output):

Parameters	Nominal value
Operating voltage range	150 ... 1000 Vdc
Output current	0 ... 250 A
Cross section of the DC terminals	Bolt with M8 thread for connection cross section 35... mm²

Table 10: Electrical data DC connection

Attention



Take note of all hazard warnings in chapter 1.3



Due to the increased leakage current, a minimum protective conductor cross section of $\geq 10 \text{ mm}^2 \text{ CU}$ or $\geq 16 \text{ mm}^2 \text{ AL}$ is required



Dangerous residual voltages

After the Power-Stack has been disconnected from the power supply, the discharge time for dangerous voltages of 5 minutes must be observed before the device is opened.



The Power-Stack is compatible with type B RCDs (residual current circuit breakers)



During operation, increased temperatures must be expected at the air outlets

2.5.2. Input Switchgear

The following figure shows the AC input switchgear of the HYC_150:

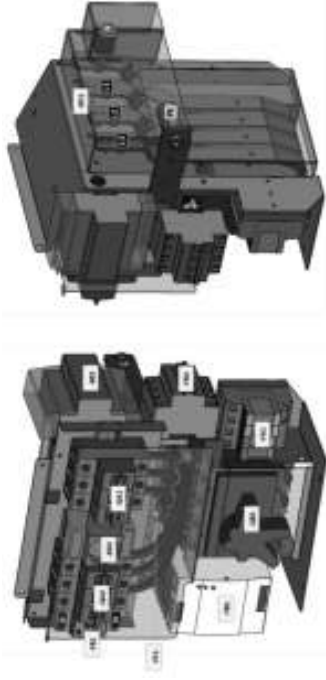


Figure 19: AC input switchgear of the HYC_150

The following table describes the single components highlighted in the figure above:

Identifier	Description
-BE5	AC meter (MID compliant)
-FA1	Lightning protection and EMI filter device
-FB1	10 A circuit breaker with fault current monitoring for internal power supply
-FB2	32 A circuit breaker with fault current monitoring (optional, only when AC charging socket is present)
-FC1	Input filter circuit
-QA1, -QA2	125 A circuit breaker / 3P
-QB1	250 A main switch / 4P
-TB1	Auxiliary 24 V power supply
-XD1	Mains input busbars
-XD2	Power socket 230 Vac for service

Table 11: AC input switchgear components for hypercharger HYC_150

The following figure shows the AC input switchgear of the HYC_300:

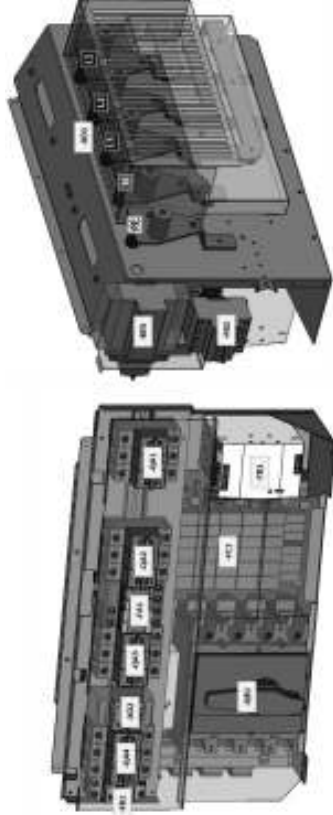


Figure 20: AC input switchgear of the HYC_300

The following table describes the single components highlighted in the figure above:

Identifier	Description
-BE5	AC meter (MID compliant)
-FA1	Lightning protection and EMI filter device
-FB1	10 A circuit breaker with fault current monitoring for internal power supply and service socket
-FB2	32 A circuit breaker with fault current monitoring (optional, only when AC charging socket is present)
-FC1	Input filter circuit
-QA1, -QA2, -QA3, -QA4	125 A circuit breaker / 3P
-QB1	500 A main switch / 4P
-TB1	Auxiliary 24 V power supply
-XD1	Mains input busbars
-XD2	Power socket 230 Vac for service

Table 12: AC input switchgear components for hypercharger HYC_300

Remark



If a residual current device (RCD) is installed, a type B is recommended.

For the HYC_300 there is the optional version HYC_300_f with three upstream 630 A fuses available (e.g. JEAN Müller 630 A aR - R2086940), which allow a prospective short-circuit current I_p of 48 kA.

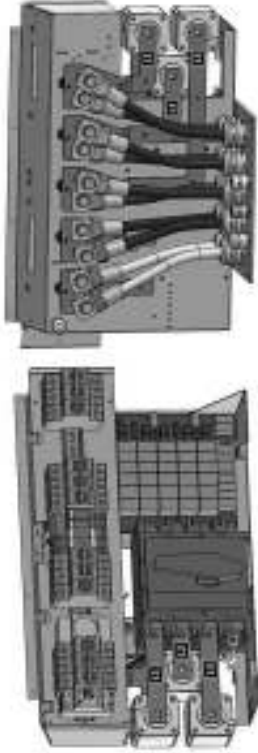


Figure 21: Input switchgear HYC_300_f with fuses (optional)

2.5.3. Output Switchgear

The following two figures show the DC output switchgear of the HYC_150.

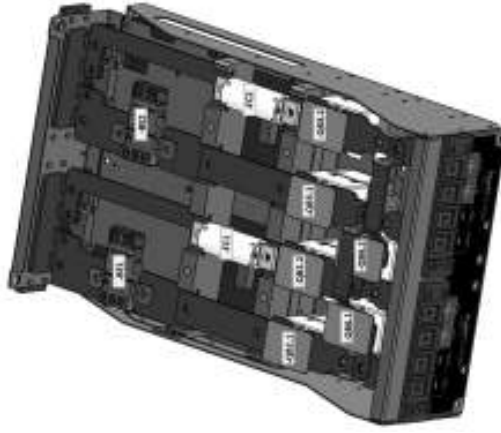


Figure 22: DC output switchgear of the HYC_150 (bottom view)



Figure 23: DC output switchgear of the HYC_150 (top view)

The following table describes the single components highlighted in the figures above:

Identifier	Description
-BE1	DC-meter for DC-outlet 1
-BE2	DC-meter for DC-outlet 2 (optional)
-FC1	DC-outlet 1 fuse
-FC2	DC-outlet 2 fuse (optional)
-KF3	CTRL_IO control board
-QB2.1 -QB2.2	DC-outlet 1 contactors
-QB3.1 -QB3.2	DC-outlet 2 contactors (optional, only when DC-outlet 2 is present)
-QB4.1 -QB4.2	DC-contactors to switch Power-Stacks in parallel mode
-XD3.1	DC-busbar - pole for vehicle cable connection XD5 (DC-outlet 1)
-XD3.2	DC-busbar + pole for vehicle cable connection XD5 (DC-outlet 1)
-XD4.1	DC-busbar - pole for vehicle cable connection XD6 (DC-outlet 2)
-XD4.2	DC-busbar + pole for vehicle cable connection XD6 (DC-outlet 2)

Table 13: DC output switchgear components for hypercharger HYC_150

The following figure shows the DC-output switchgear of the HYC_300:

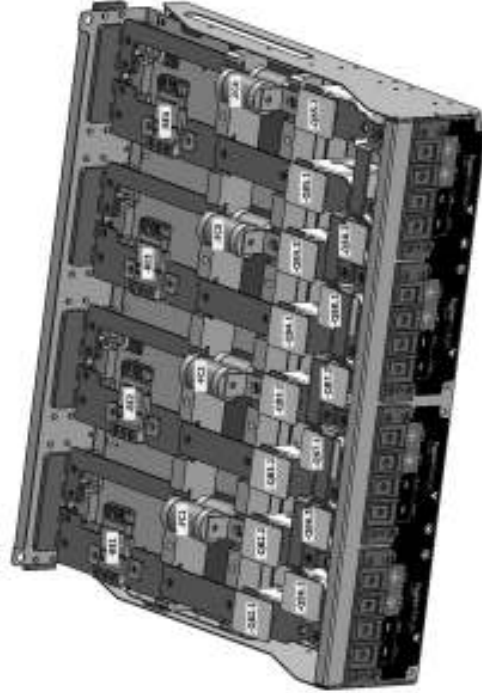


Figure 24: DC output switchgear of the HYC_300 (bottom view)

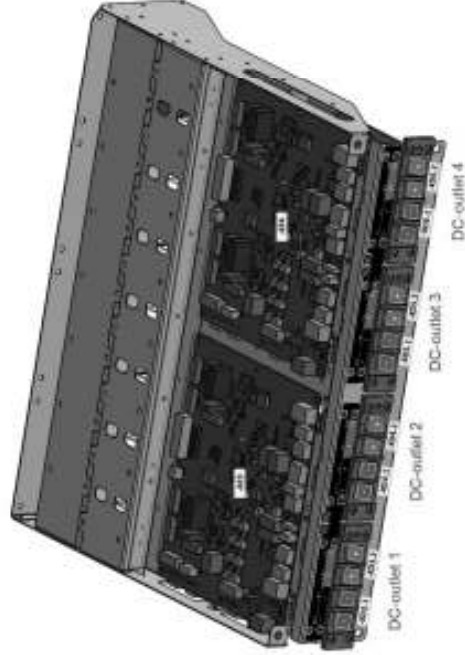


Figure 25: DC output switchgear of the HYC_300 (top view)

The following table describes the single components highlighted in the figures above:

Identifier	Description
-BE1	DC-meter for DC-outlet 1
-BE2	DC-meter for DC-outlet 2 (optional)
-BE3	DC-meter for DC-outlet 3 (optional)
-BE4	DC-meter for DC-outlet 4 (optional)
-FC1	DC-outlet 1 fuses
-FC2	DC-outlet 2 fuses (optional)
-FC3	DC-outlet 3 fuses (optional)
-FC4	DC-outlet 4 fuses (optional)
-KF3	CTRL_IO control board
-QB2.1, -QB2.2	DC-outlet 1 contactors
-QB3.1, -QB3.2	DC-outlet 2 contactors (optional)
-QB4.1, -QB4.2	DC-outlet 3 contactors (optional)
-QB5.1, -QB5.2	DC-outlet 4 contactors (optional)
-QB6.1, -QB6.2	DC-contactors to switch Power-Stacks in parallel mode
-QB7.1, -QB7.2	
-QB8.1, -QB8.2	
-XD3.1	DC-busbar - pole for vehicle cable connection XD7 (DC-outlet 1)
-XD3.2	DC-busbar + pole for vehicle cable connection XD7 (DC-outlet 1)
-XD4.1	DC-busbar - pole for vehicle cable connection XD8 (DC-outlet 2)
-XD4.2	DC-busbar + pole for vehicle cable connection XD8 (DC-outlet 2)
-XD5.1	DC-busbar - pole for vehicle cable connection XD9 (DC-outlet 3)
-XD5.2	DC-busbar + pole for vehicle cable connection XD9 (DC-outlet 3)
XD6.1	DC-busbar - pole for vehicle cable connection XD10 (DC-outlet 4)
XD6.2	DC-busbar + pole for vehicle cable connection XD10 (DC-outlet 4)

Table 14: DC output switchgear components for hypercharger HYC_300

2.5.4. CTRL_COM

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

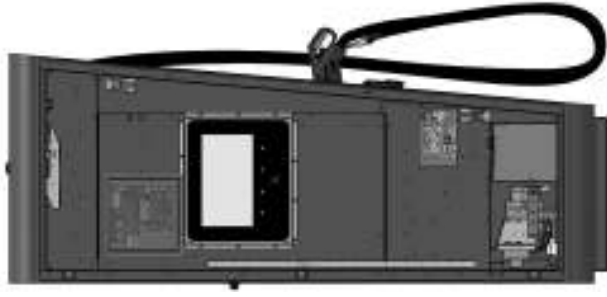


Figure 26: Location of the CTRL_COM in the hypercharger

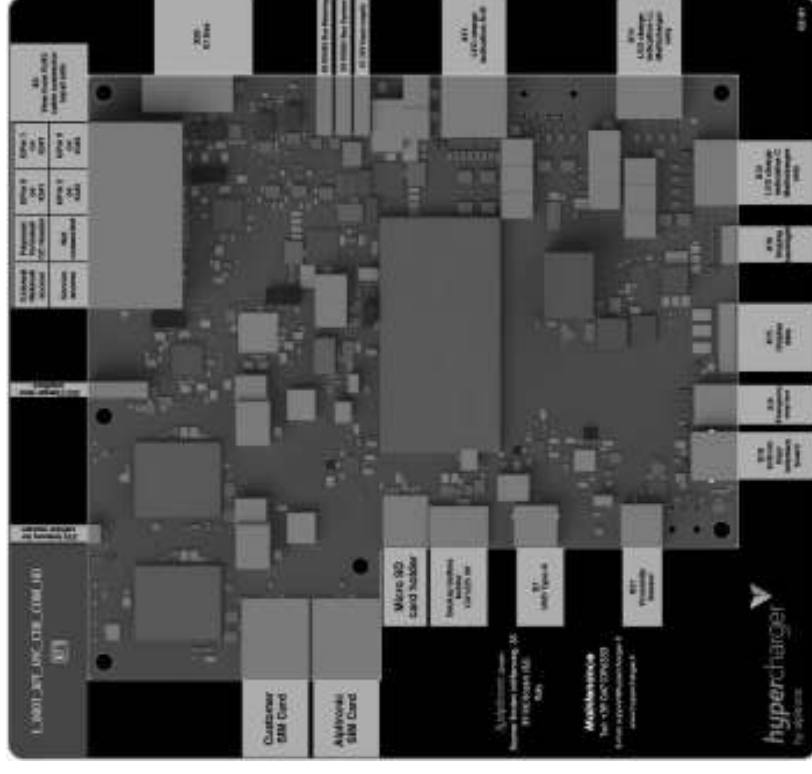


Figure 27: CTRL_COM

Remark



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.

2.5.5. Display incl. RFID reader

The display module is equipped with an RFID reader.

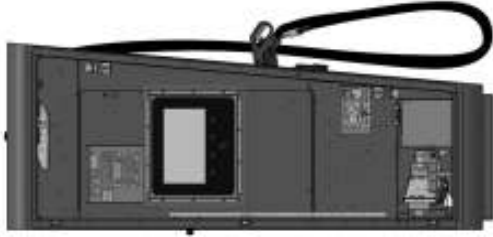


Figure 28: Display module

The display has the following characteristics:

Parameters	Nominal value
Display diagonal	15,6"
Resolution	1.366 (H) x 768 (V) pixels
Brightness	1000 cd/m²

Table 15: Display properties

The supported RFID standards are the following:

- 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 designed 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 to 5 (MIFARE Ultralight, Jewel, Open FelICa tag, MIFARE DESFire)
- ISO/IEC 15693/ICODE VCD mode

2.5.6. CTRL_EXT

The CTRL_EXT board was introduced with hardware version 4 and replaces the functions of the DS24 board. Its tasks are 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 handles the 6 mA DC fault current detection.

The CTRL_EXT is located in the display opening, the exact position is marked in the following figure.



Figure 29: Location of the CTRL_EXT in the hypercharger

2.6. Additional options

2.6.1. Cooling unit

If an active cooled cable is used (see chapter 2.1) a cooling unit for each cooled cable is needed.

Remark



Only one cooling unit can be installed in the HYC_150, a maximum of two cooling units are possible in the HYC_300.

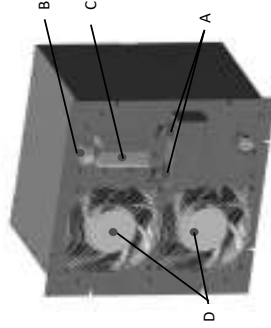


Figure 30: Cooling unit for cooled charging cable (optional)

- A Connection cooling liquid
- B Filler neck
- C Fill level indicator
- D Cooling fans

To facilitate the electrical installation of the hypercharger, the cooling unit should be removed during grid connection (see chapter 4.2.4)

Cooling liquid

The only coolant that can be used is 'innovatek Protect PRO Konzentrat' by innovatek OS GmbH. The coolant is delivered in a default concentration of 52 % with an antifreeze protection reaching -40°C. The filling volume is approx. 1.5 l for cooling unit and charging cable.

Attention



Note that for proper operation, use only the original intended coolant! Orders can be sent to sales@hypercharger.it, the coolant is delivered in 1 liter bottles.

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

2.6.2. Emergency stop button

The emergency stop button was a mandatory requirement of the CHAdemo 1.0 standard. With the CHAdemo 1.1 standard (from June 2016) it is not mandatory anymore and the standard hypercharger is not equipped with an emergency stop button. The emergency stop button can be ordered optionally.

When the emergency stop button is activated:

- Every ongoing charging procedure is immediately interrupted, all Power-Stacks are shut down and the contactors are opened towards the vehicle
- The hypercharger is still internally energized and can be reached via backend or the diagnostic web interface
- Its activation can be detected by the backend or the diagnostic web interface.

The deactivation of the emergency stop button is carried out manually, by pulling the button outward. After a few minutes the charger is operational and ready for new charging procedures.

2.6.2.1. External emergency stop relay

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). In this case, a relay is installed inside the display door below the CTRL_EXT board (see chapter 2.5.6), its cabling can be routed to the outside by the customer.

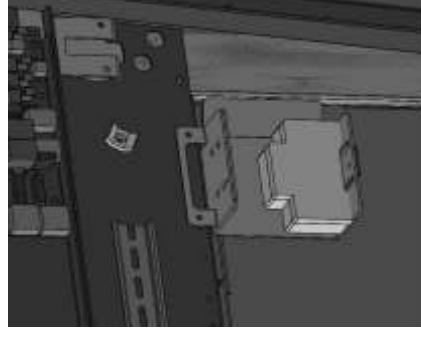


Figure 31: Location of the relays in the hypercharger

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

Depending on the requirements, a working current or under-voltage current release can be activated.

To activate under-voltage release, please connect the contacts C1 and NO. This mode enables the charging station to operate when the relay is activated and voltage is applied.

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

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

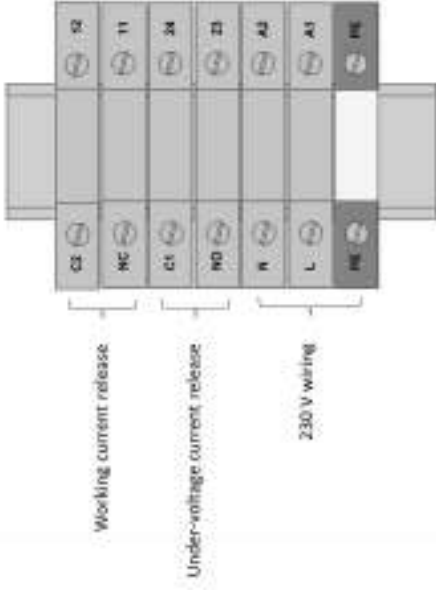


Figure 32: Connection options external emergency stop

Remark



Detailed installation instructions can be requested from hypercharger support (support@hypercharger.it).

2.6.3. Crash sensors

Optional crash sensors can be installed in the hypercharger. These can be installed by the customer or by alpitronic on request, in which case they must be provided by the customer.

2.6.4. Door contact switches

To detect the opening of the hypercharger doors via the customer backend, door contact switches can be ordered as an option.

2.6.5. Credit card terminal

alpitronic uses the COR A20 contactless reader with OPM-C60 controller from CCV Germany. Before mounting the credit card terminal, the customer must conclude an agreement with a payment provider such as BS-Payone, Concordis or CCV. alpitronic then gets the correctly configured CCV terminal, which is then installed in the charging station. The terminal ID of the provider is transmitted by the customer to alpitronic and installed on the terminal (alternatively also configurable by the customer after delivery of the hypercharger).

A credit card terminal provided by the customer can also be installed if it is one of the models mentioned above. The credit card terminal supports all common credit and bank cards, and the payments made can be viewed in the back end with a certain time delay.



Figure 33: Contactless credit card terminal (model COR A20)

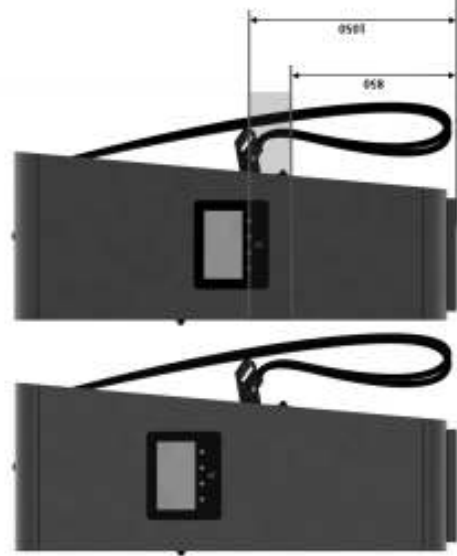


Figure 34: Barrier-free hypercharger

3. Packaging, transport and storage

3.1. Packaging

The hypercharger is delivered in a specialized wood packaging (100% recyclable wood). A laminated polyethylene packaging foam (Stratocell-R 01-01) is used for padding, which must be disposed of separately.

The following figure and table show the packaging and size information for the two charger types.

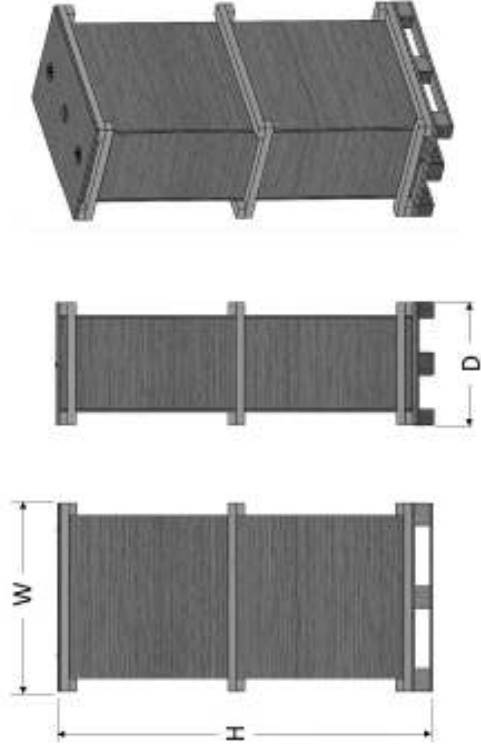


Figure 35: Packaging of the hypercharger

Type	W [mm]	D [mm]	H [mm]
HYC_150	1200	800	2340
HYC_300	1200	1120	2340

Table 16: Dimensions of the packaging

The following table allows for an easy weight calculation of the various hypercharger configurations depending on the type of housing, number of stacks, number of DC-charging interfaces and cooling units (max. 1 for HYC_150 and 2 for HYC_300).

Type	Weight of hypercharger [kg]	Weight of packaging [kg]	Threat size for eyebolts
HYC_150 s... number of Power-Stacks c... number of charging interfaces cu... number of cooling units	~ 200*s*95+c*30+cu*12 <462	100 wood 3 Stratocell	2 x M12
HYC_300 s... number of Power-Stacks c... number of charging interfaces cu... number of cooling units	~ 250*s*95+c*30+cu*12 <774	115 wood 4 Stratocell	4 x M12

Table 17: Maximum weight and threat size for eyebolts for different hypercharger product types

3.2. Transport and storage

Attention



In its wood packaging, the hypercharger must be transported vertically!



Figure 36: Vertical transport with pallet truck or forklift

In addition to the transport with a pallet truck or a forklift, the hypercharger can be moved by crane, using the two (HYC_150 housing) or four (HYC_300 housing) crane eyelets. These crane eyelets are mounted directly to the housing and are peeking through the packaging, allowing the transfer of the charger while in its protective packaging.

Attention



The maximum angle of the sling should be 55°.
The minimum distance from the crane hook to the hypercharger roof should be 775 mm. If you do not maintain this distance, there is a risk that the roof will bend.

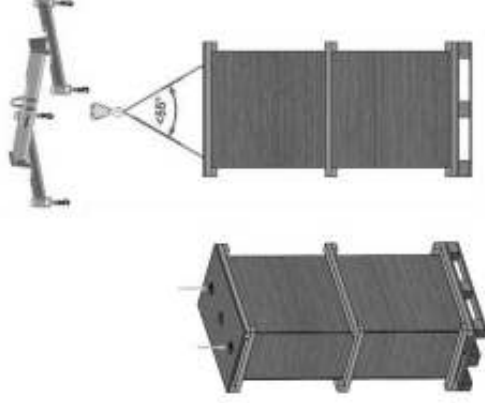


Figure 37: Crane eyelets on top of the packaging

Attention



The hypercharger must be stored in its original packaging at a relative ambient humidity of 0-95% (non-fogging) and temperatures of -40 °C to + 55 °C.

3.3. Unpacking

It is recommended to transport the hypercharger to its definite destination in its original packaging and unpack it there. The following illustrations show the sequence how to unpack the hypercharger:

1	2	3	4	5
Remove the hypercharger base	Remove the screws and lift top cover	Remove screws on all edges and remove side panels	Remove screws on front and rear panel	Open display door
6	7	8	9	10
Remove the packaging material	Open service door	*Remove screws on the base plate of the hypercharger	Open charging cable door	

Figure 38: Unpacking the hypercharger

*Attention



Before loosening the mounting screws between the hypercharger and the pallet, the hypercharger must be protected against overturning. This protection must be maintained until final mounting to the foundation.

Remark



These screws can be reused during the installation. They are used to mount the hypercharger on the base plate (see chapter 4.1.4).

4. hypercharger installation and commissioning

This chapter describes the mechanical and electrical installation of the hypercharger. It is recommended to install the hypercharger according to the steps below:

- Site configuration (chapter 4.1.1)
- Placement of a concrete foundation (chapter 4.1.2)
- Mounting the hypercharger base on the foundation (chapter 4.1.3)
- Preparation of the mains power-supply cables (chapter 4.2.3).
- Mounting the hypercharger on the base plate (chapter 4.1.4)
- Grid connection (chapter 4.2.4)

4.1. Mechanical installation of the hypercharger

The following figure shows the relevant components for the mechanical installation:

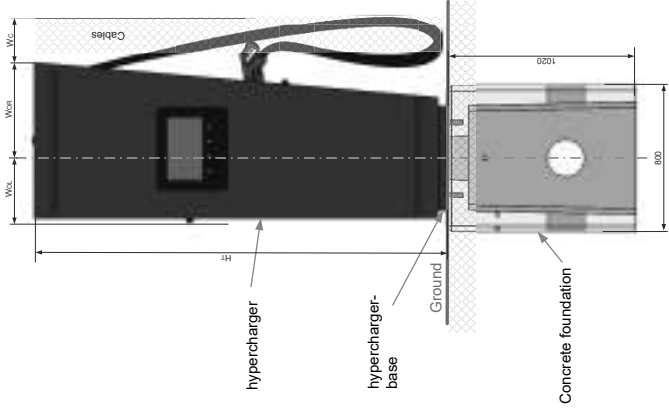


Figure 39: Relevant components for the mechanical installation of the hypercharger

Distance	HYC_150	HYC_300
Ht	2250 mm (± 3 mm)	2250 mm (± 3 mm)
Wc	300 mm	300 mm
Wcl	357 mm (± 3 mm)	357 mm (± 3 mm)
Wor	519 mm (± 3 mm)	516 mm (± 3 mm)

Table 18: Distances

4.1.1. Site configuration

When installing the hypercharger, it must be ensured to maintain a minimum distance from possible objects around the hypercharger, in order to allow adequate airflow and to have enough space for possible service or maintenance operations.

Attention



The position of the hypercharger is to be chosen in a way to avoid any potential damage caused by any foreseeable circumstance.
A mechanical ramming protection with enough stability should be provided to protect the charging station.

Figure 40 shows the recommended and minimum distances which should be kept free during installation on site. The recommended distances are designed for convenient maintenance of the hypercharger, while the mandatory distances represent the absolute minimum for maintenance work, e.g. to be able to carry out a Power-Stack exchange.

Attention



The legal minimum widths for escape routes must be respected in any case.



Before installation, compliance with all legal requirements for the installation site (e.g. stability against tipping, impact protection, effects of frost, etc.) must be checked.



Taking the ergonomics and mechanical impact protection into account, each charging outlet must be positioned as close as possible to the parking-space to be supplied. Pay attention to the cable radius (Figure 5).

Remark



The surrounding ground should ideally be completely flat.

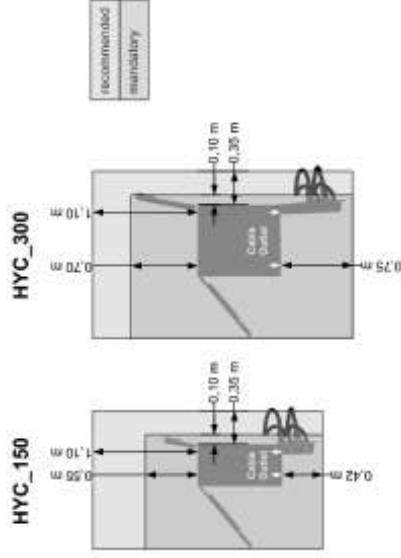


Figure 40: Recommended distances for site configuration

If the hyperchargers operating location is in a closed or partially closed environment, it is essential to eliminate airflow from the air outlet to the air inlet. Any obstruction of the air circulation may lead to a derating of the charging station.

The following points are taken from a publication by German insurers on loss prevention (VdS 3471):

- no highly flammable materials should be stored in the immediate vicinity of the charging station
- in fire-hazardous locations according to VdS 2033, areas with explosion risks, no charging stations are permitted
- the installation of a fire alarm system is recommended - where appropriate – in order to detect fires at an early stage
- when installing in garages, the garage regulations must be considered
- an additional surge protection device in the supply circuit is recommended

4.1.2. Placement of a concrete foundation

The mounting of the hypercharger must be performed on a solid ground, this can be a concrete foundation or a concrete floor. When dimensioning the foundation, it is recommended to perform a static load capacity analysis according to relevant norms.

A foundation can also be ordered optionally from alpitronic (sales@hypercharger.it). This measures 80 x 80 x 102 cm and weighs 770 kg and can be used for both the HYC_150 and the HYC_300.

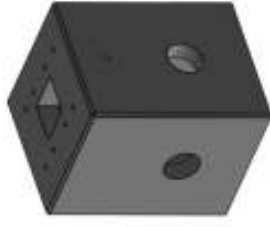


Figure 41: hypercharger concrete foundation

Remark



The hypercharger foundation is designed for level 3 wind zones (maximum wind speed of 27.5 m/s; wind load $q_k = 0.47 \text{ kN/m}^2$) and terrain categories II.

There are no screw eyes 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 41), by means of which a crane can lift and position the foundation.

A clean layer of at least 10 cm should be installed on an area of 1 x 1 m. The foundation should be backfilled with material GW, GI, SW, SI according to DIN 18196 and compacted in layers.

Remark



The foundation should be backfilled to the lower edge of the cable entry plate.

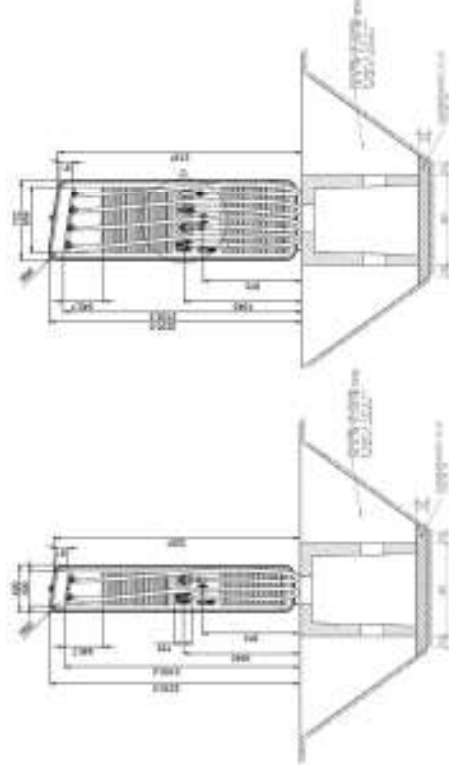


Figure 42: Backfill of the foundation

4.1.3. Mounting the hypercharger base on the foundation

The hypercharger base (or base plate) is delivered with the hypercharger, it is attached to the outside of the wooden packaging.

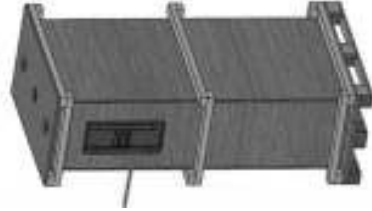


Figure 43: hypercharger base

The hypercharger base includes a cable entry plate with the cable glands, which are determined based on the ordered power cables. This is used for cabling the mains cables; more detailed information is provided in chapter 4.2 on the electrical installation.

The following two figures show the hypercharger bases incl. cable entry plates and their dimensions.

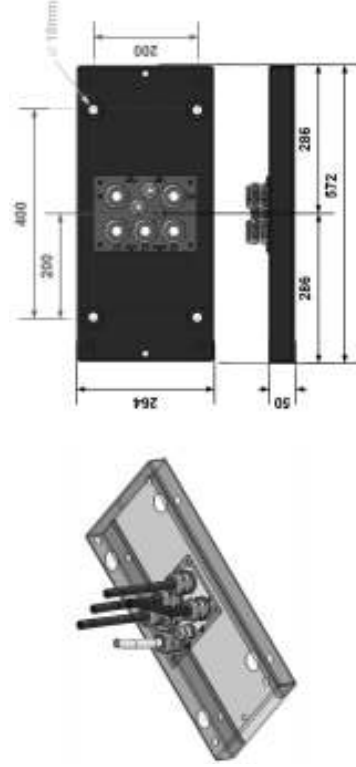


Figure 44: hypercharger base for the HYC_150 (dimensions in mm)

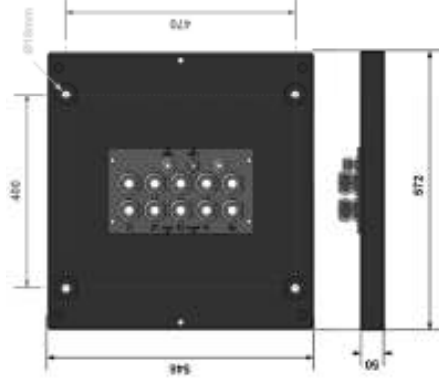


Figure 45: hypercharger base for the HYC_300 (dimensions in mm)

Attention



The use of the cable entry plate is mandatory! If not used, dust and dirt can be sucked in, which can damage the hypercharger.

The hypercharger base must be fixed to the concrete foundation. The mains power-supply cables for connecting the hypercharger to the grid are routed through the foundation and the cable entry plate. Thus, the base fixes the connection of the mains supply with the hypercharger, using cable glands.

Remark



If a concrete foundation has been ordered, 4 fixing screws (M16 x 80 mm) and washers (M16 x 30 mm) are supplied with the hypercharger.



If the foundation was not ordered separately, stainless steel screws should be used to mount the base on the foundation.

Attention



The screws must be tightened with a torque of 90 Nm.

The position of the base plate and the cable entries must be defined coming from the foundation.

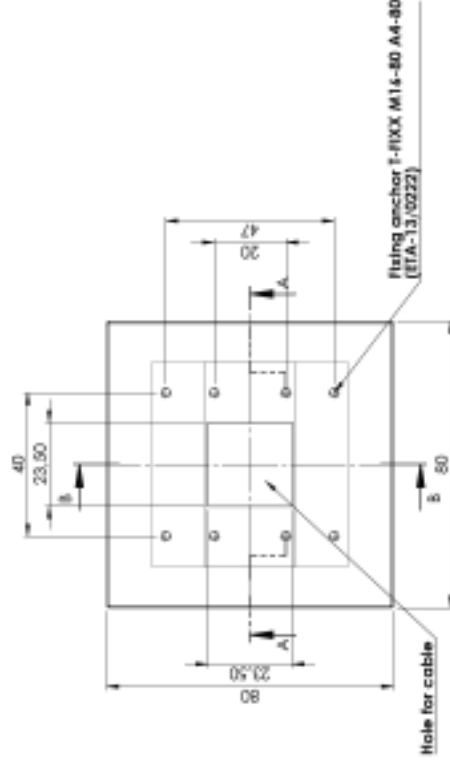


Figure 46: Position of the HYC_150 (blue) and HYC_300 (red) base on the foundation

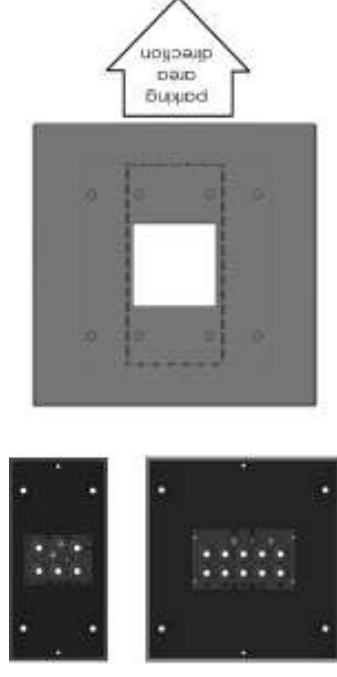


Figure 47: Alignment of the base and cable entry plates on the foundation

The external dimensions for the HYC_150 (related to the center of the base plate) are shown in the following figure and specified in Table 19.

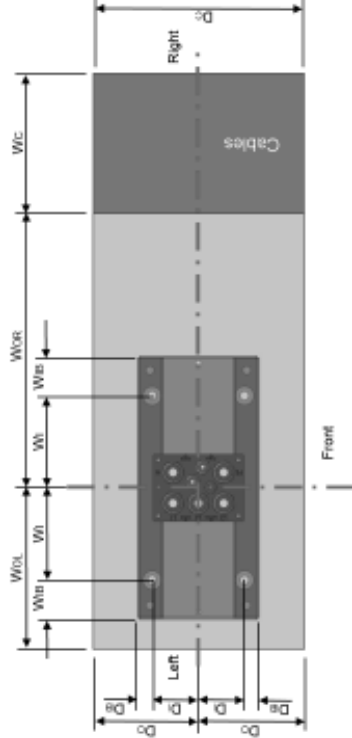


Figure 48: Distances between the base and the outer dimensions of the HYC_150 (top view)

The external dimensions for the HYC_300 (related to the center of the base plate) are shown in the following figure and specified in Table 19.

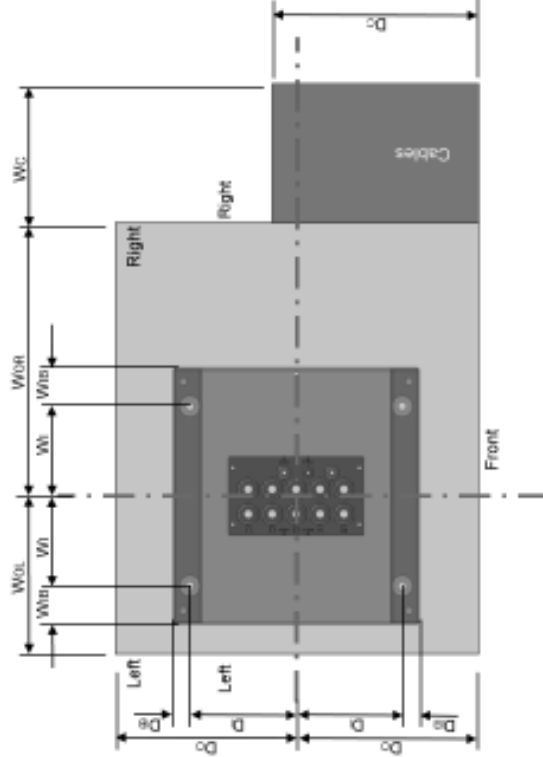


Figure 49: Distances between the base and the outer dimensions of the HYC_300 (top view)

Distance	HYC_150	HYC_300
Dc	420 mm	420 mm
Di	100 mm	235 mm
Dia	32 mm (± 3 mm)	38 mm (± 3 mm)
Do	210 mm (± 3 mm)	366 mm (± 3 mm)
Wc	300 mm	300 mm
Wl	200 mm	200 mm
Wle	86 mm (± 3 mm)	86 mm (± 3 mm)
WOL	357 mm (± 3 mm)	357 mm (± 3 mm)
WOR	519 mm (± 3 mm)	516 mm (± 3 mm)

Table 19: Distances between base plate and outer dimensions of charging station

4.1.4. Mounting the hypercharger on the base plate

Before fixing the hypercharger to the base, the power cables must be prepared (see chapter 4.2.3).

Once this step has been carried out, the hypercharger can be positioned on the base with a crane (using the eyelets provided on the top) and screwed tight.

Remark



The screws with which the hypercharger is secured to the wooden pallet on delivery (see chapter 3.3) can be used for fixing (four M12 x 30 mm screws and 32 mm washers).



You can also use 30 or 40 mm wahl

Attention



The screws must be tightened with a torque of 90 Nm.

4.2. Electrical installation

The dimensioning of the cables and the protection devices outside the hypercharger has to be done according to the local regulations and in order to respect the technical specification of the hypercharger stated in chapter 11.

4.2.1. hypercharger schematic HYC_150

The following figure shows the schematic of the hypercharger for the HYC_150:

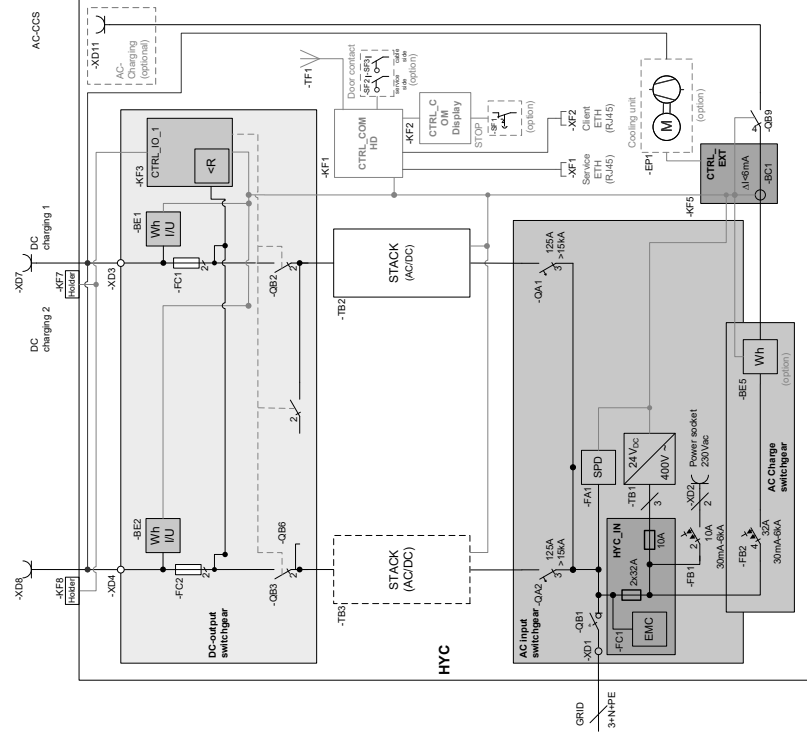


Figure 50: hypercharger schematic for the HYC_150

4.2.2. hypercharger schematic HYC_300

The following figure shows the schematic of the hypercharger for the HYC_300:

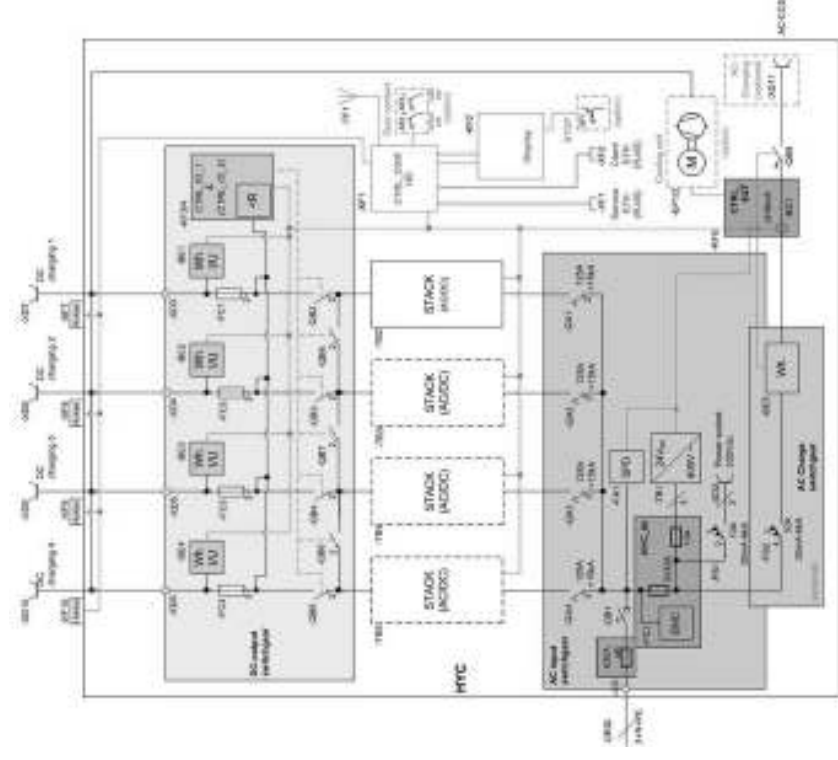


Figure 51: hypercharger schematic for the HYC_300

Remark



The fuses marked in red in Figure 51 are only provided for the optional HYC_300_f variant (see chapter 2.5.2).

4.2.3. Preparation mains power-supply cables

Before the hypercharger base is mounted, the mains-side cables are conducted through foundation and hypercharger base.

As described in chapter 4.1.3, different cable entry plates are available depending on the model:

HYC_150	HYC_300
5 x M40 Hole for cable glands with a clamping range of: 19-28 mm (L1, L2, L3, N, PE)	10 x M40 Hole for cable glands with a clamping range of: 19-28 mm (2 x L1, L2, L3, N, PE each)
1* x M20 Hole for cable glands with a clamping range of: 7-13 mm	1* x M20 Hole for cable glands with a clamping range of: 7-13 mm
2*x M25 Hole for cable glands with a clamping range of: 11-17 mm (for data cable, if used)	2*x M25 Hole for cable glands with a clamping range of: 11-17 mm (for data cable, if used)
* other configurations, if wanted, must be requested by the customer	

Table 20: Available cable entry plates for hypercharger base

The necessary cable glands are determined by what type of mains power-supply cable is used and should be defined during the ordering process of the hypercharger.

Remark



If you require a modification of the standard variant of the cable entry plate, please contact the sales team (sales@hypercharger.it).

M12 - M16 (preferable M16 - to facilitate the connection) cable lugs can be used to connect the cables.

To determine the position of the cable lugs, a so-called **cable jig** can be used. This can be ordered separately.

This cable jig is mounted to the base of the hypercharger and mimics the position where the cable glands are going to be positioned on the AC input switchgear. By using the cable jig, the cable lugs can easily be brought in the correct position and attached without being hindered by a restricted access inside the cabin (see Figure 55 and Figure 56). After mounting the cable lugs to the cable jig, the cable glands can be tightened, fixing the connection points to the switchgear in the correct position.

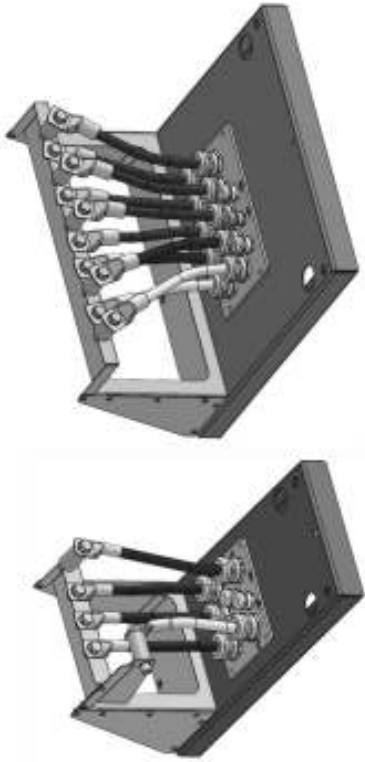


Figure 52: Cable jig, used to prepare mains power supply cables (HYC_150 left and HYC_300 right)

The cable jig can be removed once the cable lugs are in the correct position and the mechanical installation procedure can continue (see chapter 4.1.4).

Remark



The brass sleeves have a length of 55 mm, an outer diameter of 30 mm and an inner diameter of 8 mm.



With the HYC_300, two PE and N conductors (as shown in Figure 52) are not necessarily required; one ground and one neutral conductor are also sufficient. The dimensioning is to be selected according to the locally prevailing regulations.

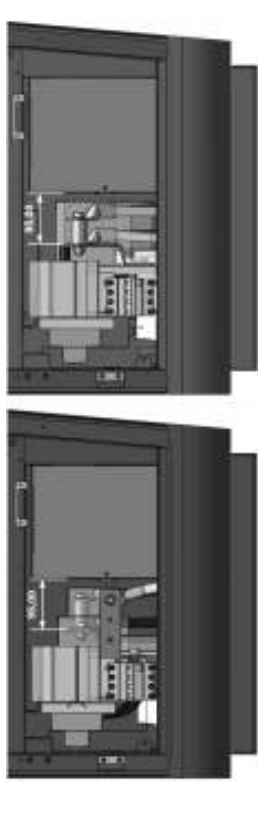


Figure 54: Sideview of the input busbars (HYC_150 left, HYC_300 right)

Remark



If a cooled cable is used (optional), the cooling unit(s) for cooled charging cable must be removed during grid connection (see 2.6.1). Therefore, remove the fixing screws, disconnect all cables (label them to be able to reconnect them later correctly) and remove the cooling unit.

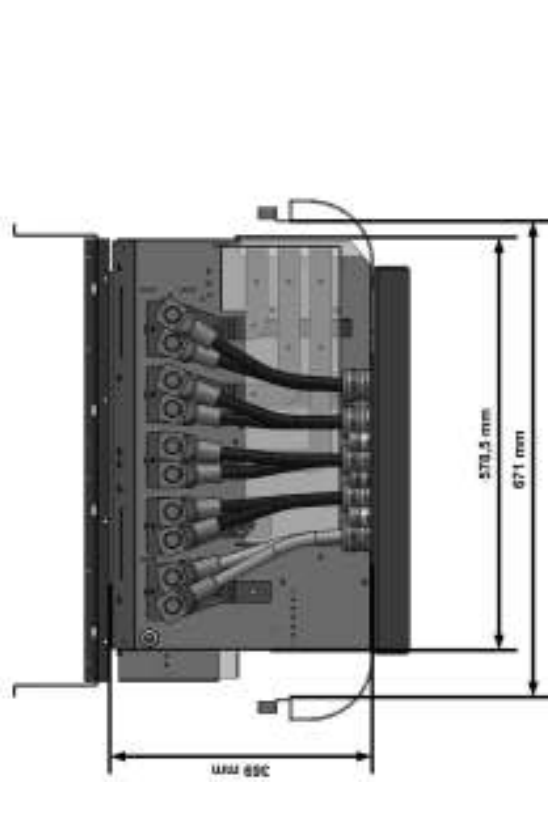


Figure 55: Available installation space in the hypercharger for HYC_300 (1)

4.2.4. Grid Connection

The hypercharger charging stations can be used in supply networks of the type TT, TN-S, TN-C and TN-CS.

- 

The necessary protective measures against electric shock and other country-specific requirements must be taken into account.
- 

This product is designed for Type A environments (industrial). Use of this product in Type B environments (residential, commercial, and small business) may cause unwanted electromagnetic interferences. In this case, the user may need to take adequate mitigation measures.
- 

Depending on the grid configuration and the configuration of the hypercharger (Quantity of Power-Stacks, quality of the mains voltage), the protective conductor current can reach currents up to 500 mA. Please take this into account when designing the protective earthing and protective measures.
- 

Due to the increased leakage current, a minimum protective conductor cross section of $\geq 10 \text{ mm}^2$ CU or $\geq 16 \text{ mm}^2$ AL is required
- 

The EMC measures of this product comply with the interference voltage limits class A $\leq 20 \text{ kVA}$ (IEC 61851-21-2:2018).

After the hypercharger is mechanically installed (see chapter 4.1), the main-side supply cables can be connected to the hypercharger input busbars.
Use M12 x 25 mm screws for this and tighten them with a torque of exactly 35 Nm.

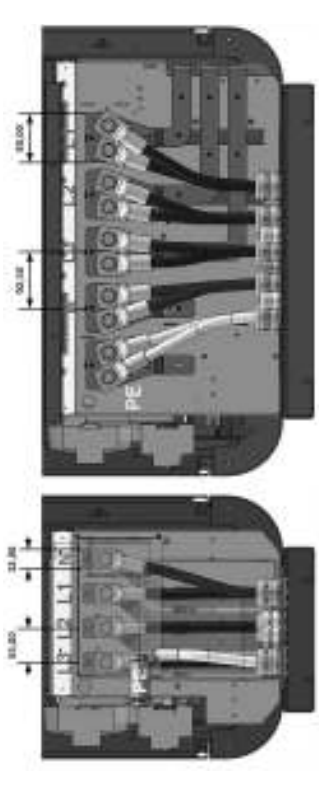


Figure 53: Connecting of the input busbars (HYC_150 left, HYC_300 right)

4.2.5. Overvoltage protection

The hypercharger is equipped with a type 1 + 2 + 3 surge arrester as standard. This means that the charging station can be installed in LPZ zone 0A. It is important to ensure connection to a suitable earthing system, taking into account country-specific legal requirements.

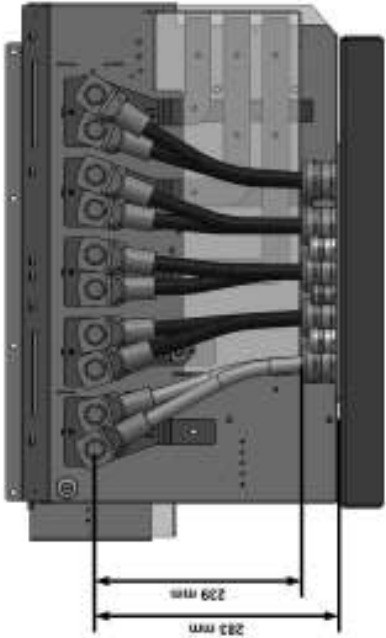


Figure 56: Available installation space in the hypercharger for HYC_300 (2)

Recommended conductor cross sections:

Model	Power supply connections	Conductor cross sections
HYC_150	L 1, 2, 3	1 x 150 or 180 mm²
	N	1 x 25 mm²
	PE (PEN)	1 x 150 or 180 mm²
HYC_300	L 1, 2, 3	2 x 150 or 180 mm²
	N	1 x 25 mm²
	PE (PEN)	1 x 150 or 180 mm²

Table 21: Recommended conductor cross sections

The conductor cross sections must be checked and designed according to the fuse protection and cable length.

Remark



Since only the current for the service socket (max. 10 A) and - if present - the current for AC charging (max. 32 A) flows via the neutral conductor, the conductor cross section can be smaller compared to the active conductors.
Especially with the HYC_300, one supply line for the neutral conductor is sufficient, the second cable gland can thus be closed.

4.4. Commissioning protocol

During commissioning, the following protocol can be used, which contains the most important check points:

Base data:

Client			
Client-Charger-ID (EVSE-ID)			
Serial number of charger			
Model	☐ HYC 150	☐ HYC 300	
Maximum input power available on site (kW)			
Load/Management available	☐ Yes	Manufacturer/Model:	
Lock cylinder	☐ alpitronic ☐ Client, description:		
Type of location	☐ Public ☐ Private		
Charger address			
GPS-Coordinates	Latitude:		Longitude:
Installation company			
Name of technician			
Date of commissioning			

Existing charging outlets (please tick the box):

	1	2	3	4
CCS2 HPC (cooled)				
CCS2_400A				
CCS2_250A				
CCS2_200A				
CHAdeMO_200A				
CHAdeMO_125A				
GB/T				
CCS1				
AC/Typ 2				

4.3. Checks before initial startup

The operation of this charging station must be carried out taking into account the test instructions described below. All instructions listed below are considered mandatory and must be carried out by the operator of the charging station.

After transport and installation, check the following points:

Check	Execution
Mechanical visual inspection	Mechanically perfect condition of all installed devices
Screw connections, tight fit	Random or complete testing of tightening torques at terminals and mechanical screw connections.
Earthing system	Check if the earthing considers the site-specific conditions as well as the valid standards.
Lightning protections for supply lines	Check if supply line has a lightning protection device in accordance with ISO 61439-2/-7 as well as country-specific norms.
Selectivity	It is necessary to test selectivity, by ensuring that only the device upstream from a fault is triggering the circuit breaker. This should be tested in accordance with ISO 61439-2 as well as other country-specific standards
Operating conditions	Consideration of the operating conditions at the installation site (e.g. mechanical, chemical, corrosive stress) according to ISO 61439-2/-7 as well as deviating country-specific standards
Protection cover	Assuring that the protective covers have been installed after connecting the main supply line.
Residual current protection device	Checking whether a residual current circuit breaker outside the charger is required/has been mounted, in accordance with the site-specific conditions and the valid standards.
Short circuit resistance	Rated current and short-circuit resistance of the main busbar system considering the upstream protective device according to ISO 61439-2/-7
Automatic shutdown of the power supply	The requirements of IEC 60364-4-41, section 411 must be met

Table 22: Checks to be carried out before commissioning

Checks before switching on for the first time:

Check	Carried out	Result
External visual inspection of the charger (damage, defects)	☐	☐ OK ☐ Deficient
Checking the stability	☐	☐ OK ☐ Deficient
Accessibility of the charging station granted?	☐	☐ OK ☐ Deficient
Inspection of the cable connections	☐	☐ OK ☐ Deficient
Inspection of the fuses	☐	☐ OK ☐ Deficient
Visual inspection of the screw connections (sealing wax present)?	☐	☐ OK ☐ Deficient
Remove and reinsert SIM cards	☐	☐ OK ☐ Deficient
If cooling unit available: Coolant level ok?	☐	☐ OK ☐ Deficient
Correctly connected?	☐	☐ OK ☐ Deficient
Is the inside of the charger clean and free from traces of condensation?	☐	☐ OK ☐ Deficient
Checking the air and creepage distances	☐	☐ OK ☐ Deficient
Checking the filter mats	☐	☐ OK ☐ Deficient
Mains voltages correct?	☐	☐ OK ☐ Deficient
Functional inspection of the electrical protective devices	☐	☐ OK ☐ Deficient
Earthing system complete? Potential equalisation connections continuous?	☐	☐ OK ☐ Deficient

Comments:

Checks when switching on for the first time:

Check	Carried out	Result
Check fan and pump noise (if applicable)	☐	☐ OK ☐ Deficient
Functional check of the RFID reader	☐	☐ OK ☐ Deficient
Checking the function of the screen buttons	☐	☐ OK ☐ Deficient
Checking the function of the screen	☐	☐ OK ☐ Deficient
Functional testing of the LED rings on the connectors	☐	☐ OK ☐ Deficient

Comments:

Charging tests must be carried out for each individual charging point:

Charging session	Peak-Power	Charged energy	Carried out	Result
Chargepoint 1			☐	☐ OK ☐ Deficient
Chargepoint 2			☐	☐ OK ☐ Deficient
Chargepoint 3			☐	☐ OK ☐ Deficient
Chargepoint 4			☐	☐ OK ☐ Deficient
AC (if available)			☐	☐ OK ☐ Deficient

Comments:

The following photos must be enclosed:

- ☐ Display door, cable door and service door. Each door closed and open
- ☐ Type plate (sticker outside at the bottom of the hypercharger)
- ☐ CTRL_COM with visible connections
- ☐ Output side of the output switchgear
- ☐ Possibly existing cooling unit(s)
- ☐ Location photo

Test result:

- ☐ We confirm that the charging device complies with the applicable standards
- ☐ According to generally recognised technical rules, the safe use of the loading equipment is guaranteed when used as intended

Please send the commissioning protocol including photo documentation to the following e-mail address: support@hypercharger.it

For problems of any kind you can contact our hypercharger support team: +39 0471 096 333

Date, Signature:

5. Diagnosis and parameterization

After successful mechanical and electrical installation of the hypercharger, the correct functioning of the device can be checked by means of a diagnostic and parameterization tool. The diagnostic web interface can be loaded via any browser with a standard IP address:

Default IP address	192.168.1.100
---------------------------	---------------

Table 23: Default Charging Station IP address

Additional information on the user interface can be found in the software-edition of this operation and installation guide.

6. Operating the hypercharger

6.1. Start charging session

6.1.1. Authentication

Please authenticate yourself with your user card by holding it against the RFID reader (contactless icon below the screen).

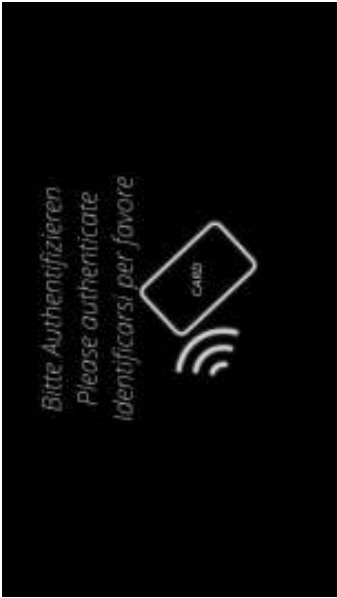


Figure 57: Authentication



Figure 58: Position of RFID reader

Remark



If the charging station runs in the so-called kiosk mode, no authentication is necessary. In this case you can directly start a new charging process by pressing the buttons below the "new session" label on the screen.

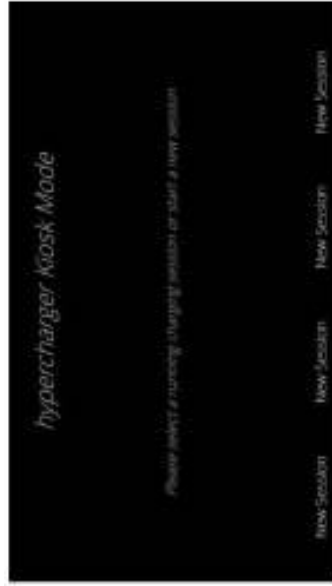


Figure 59: Kiosk Mode

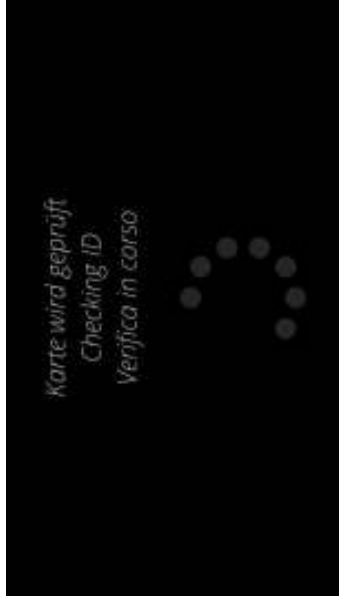


Figure 60: Checking ID

6.1.2. Select the charging plug

Please select the charging plug with which you would like to charge your electric vehicle. You can navigate in the menu by pressing the four buttons below the display window.

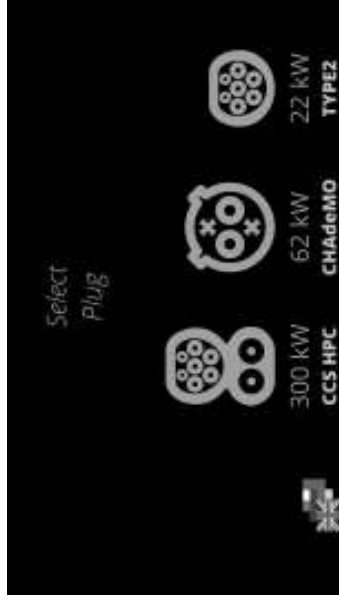


Figure 61: Select plug



Figure 62: Buttons for navigation

Remark



Depending on the configuration of the charging station, other symbols may be displayed, as other charging plugs are installed.



"HPC" refers to a liquid-cooled charging cable.



To get to the language selection, press the button on the far left.

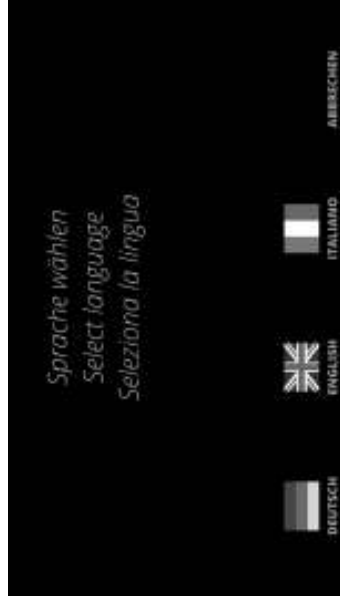


Figure 63: Language selection

6.1.3. Connect the plug

After you have selected the plug type, the display will ask you to connect the appropriate charging cable. Connect the charger cable, which begins to flash blue, to the socket provided on your vehicle.

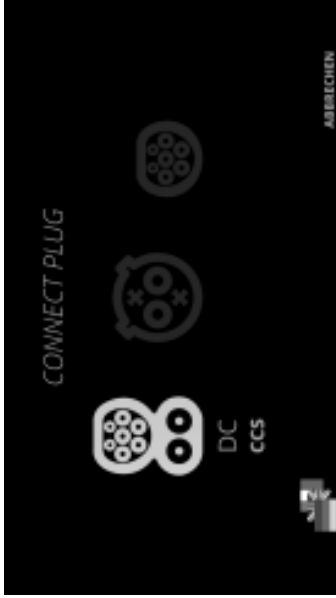


Figure 64: Plug connection

Remark



When using CHAdeMO cables, make sure that they engage correctly.



For CCS cables, make sure that the vehicle locks the charging cable correctly.

6.2.1. Charging overview

Now an overlay of the active charging process appears.

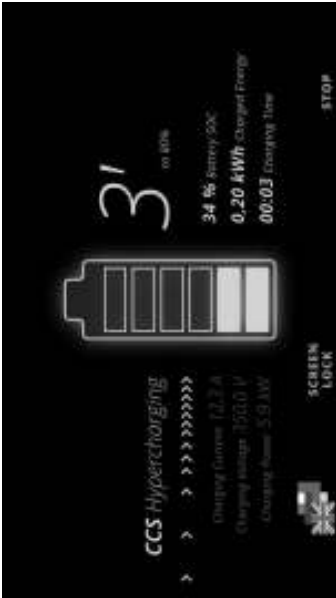


Figure 65: Charging overview

On the left half of the screen you will find information about the charging current, the voltage and the resulting charging power.

On the right half of the screen you can see the estimated time remaining until 80% (bulk state of charge) and later 100% (full SoC) is reached, as well as the current state of charge, the energy already charged and the charging time.



Figure 66: Charge overview with two active charging processes

Remark



Please note that the display may vary from operator to operator. Some operators hide this information. In this case you can check the SoC inside your vehicle.



6.3. Terminate charging session

6.3.1. Leaving screen saving mode

After a certain time the screen saver of the display is activated. To leave this mode, hold your user card again against the RFID reader (see chapter 6.1.1)

6.3.2. Charging stop

You can terminate the ongoing charging session at any time by pressing the Stop button at the bottom of the overlay.

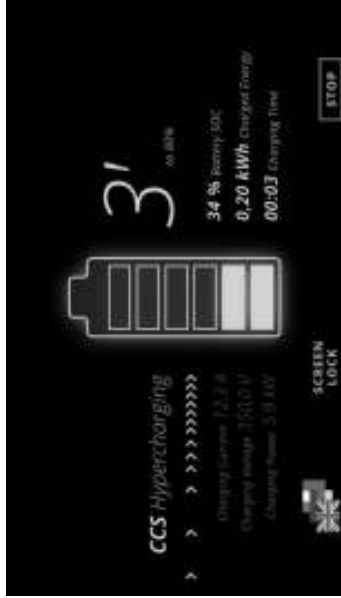


Figure 67: Charging stop

Once you have pressed the button, you need to unplug the charging cable from your car (see Figure 68). Please reconnect it properly to the cable plug holder of the charging station.

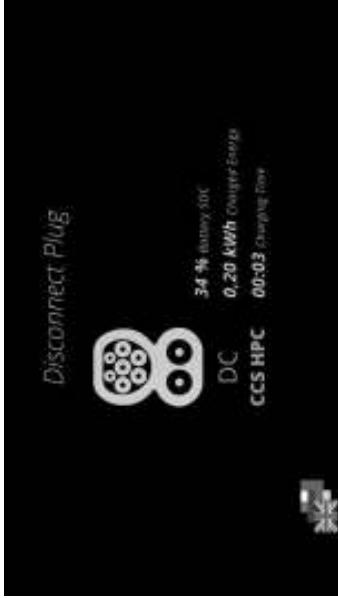


Figure 68: Disconnect Plug

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6.4. Procedure for error messages

6.4.1. Authorization failed

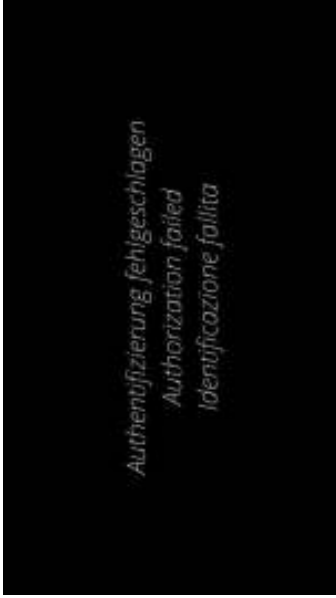


Figure 69: Authorization failed

If this error message appears, retry to hold your card against the RFID reader.

6.4.2. No connector available

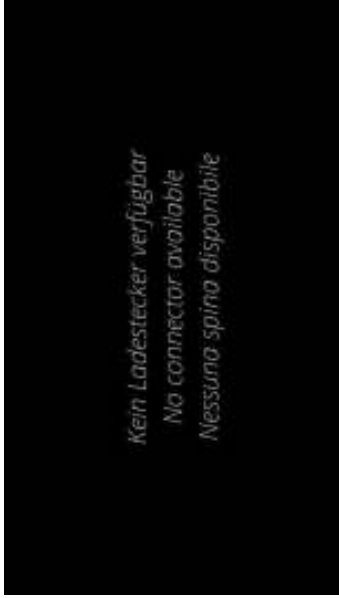


Figure 70: No connector available

All charging points are currently occupied. Please wait until a charging plug becomes free again.

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6.4.3. Connector damaged



Figure 71: Connector damaged

If this message appears, the operator is already informed about the defect and will correct the fault as soon as possible. In the meantime, if possible, switch to another charging plug.

6.4.4. Communication error with vehicle



Figure 72: Communication error

When this error message appears, the vehicle was unable to establish a connection to the charging station. Retry to start a charging session on the charger. If that won't help, try to drive the vehicle forward and backward a few meters to reset the charging technology and wake it up from a possible standby.

6.4.5. Failed to lock connector

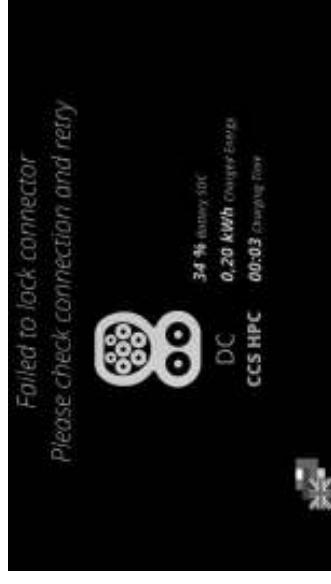


Figure 73: Failed to lock connector

In this case the connector could not be locked correctly by the car.

Attention



Hold the cable in the socket until you can hear the locking mechanism of the car and the charging process is starting!

6.4.6. The car signaled an error

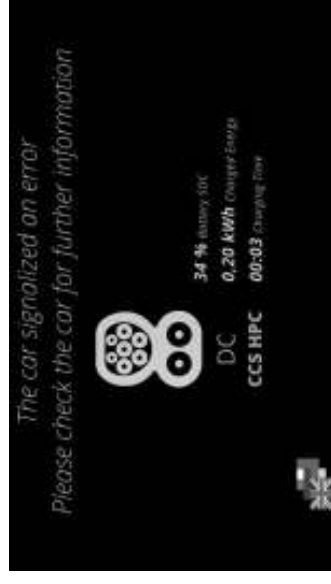


Figure 74: Vehicle Error

The car signals a charging error. Retry to start a charging session on the charger. If that won't help, try to drive the vehicle forward and backward a few meters to wake it up from a possible standby.

7. Error description and solution

Attention



Attention

Take note of all hazard warnings in chapter 1.3

Error Description	Possible error cause	Troubleshooting
Display stays dark	No power supply	Check if circuit breakers are switched on
Power-Stack cannot be turned on	The circuit breaker (-QA1-QA4) of the Power-Stack is switched off	Turn on the corresponding circuit breaker
No communication to the backend	No connection via Ethernet or mobile network	Check connection of the Ethernet network (-XF2) or/and antenna (-TF1)
No charge possible	Error in the configuration of the charging station	Boot the charging station in diagnostics mode and use the diagnostic tool for further fault localization Boot the charging station in diagnostics mode and use the diagnostic tool for further fault localization

Table 24: Error description and troubleshooting

6.4.7. Emergency Stop



Figure 75: Emergency Stop

Emergency button was pressed. Try to unlock the emergency button and to restart a charging session.

6.4.8. Charging station temporarily unavailable

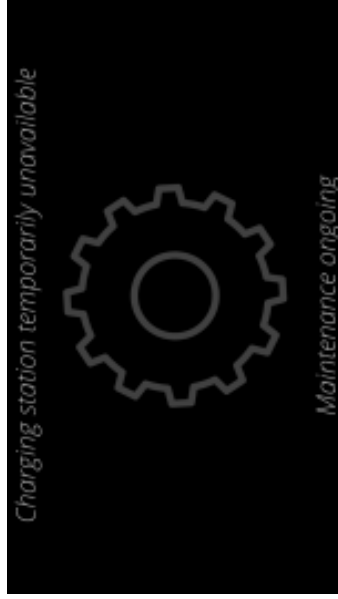


Figure 76: Maintenance ongoing

A software update is being carried out. After completion, the hypercharger will be available again.

8. Maintenance

Attention



Attention

Observe all hazard warnings in chapter 1.3

8.1. Overview of maintenance work

For the safe operation of the charging station, regular maintenance or control of the safety equipment is required. All the points listed below are considered mandatory and must be carried out by the operator at the intervals described.

Table 25 gives an overview of the required maintenance work. Depending on the individual operating conditions of the hypercharger, further maintenance work may still be necessary so the list below cannot be considered complete.

Maintenance work	Execution	Interval
Charging cable set	Replacement of the complete charging cable set	After 10000 charging cycles
Residual current devices	Function test of residual current circuit breaker	Yearly
Main switch, voltage release switch	Verify the correct function	Yearly
Verification of protective measures	With the charging station switched off, check the resistance between the ground of the supply and all externally accessible, non-insulated cabinet parts (housing, add-on parts, screws)	Yearly
Check for cleanliness and condensation	Check if the interior of the control cabinet is clean and without any traces of condensation. Check the water run-off on cable plug holder and AC-socket. Check the seal for damage and correct positioning.	Yearly
Screw	Random or complete testing of tightening torques at terminals and mechanical screw connections.	Yearly
Overvoltage protection	Check the surge arrester for full function	Yearly
Ventilation filters	Replacement of filters	Yearly
Level of cooling liquid	Check the cooling liquid level (fill level indicator)	Yearly
Concentration of cooling liquid	Check the concentration (test with refractometer) of the coolant liquid. If the concentration is below 50 %, this can be remedied by adding coolant concentrate.	Yearly
pH of cooling liquid	Check the pH (optimal value - pH between 8 and 9) of the coolant liquid. If the pH is below pH 7.7, replace the coolant liquid. Replacement of the majority of cooling liquid is sufficient to ensure protection.	Yearly

Table 25: Periodic maintenance work

8.2. Function test of circuit breaker

Turn to the **service door** and press the indicated button of the circuit breaker (label FB2) at the bottom of the charging station.



Figure 77: F function test of the circuit breaker

Attention



If there is a second circuit breaker (FB1), execute the same function test!

8.3. Function test of main switch

Please turn the main switch (label QB1) off. Wait until all LEDs of the stacks are turned off. Then turn the switch again on.



Figure 78: Function test of main switch

8.4. Verification of protective measures

In order to execute this check, turn off the main switch (label QB1, see figure above) and keep a digital multimeter at hand.

Attention



Please turn off the main switch!



Figure 79: Digital multimeter

Please check the resistance between the ground of the supply plug and all externally accessible, non-insulated cabinet parts like the housing, add-on parts and screws.

8.5. Check for cleanliness and condensation

Check if the interior of the control cabinet is clean and has no traces of condensation.

8.6. Check charging cable

Check if all charging cables are in perfect condition. Make sure that all cable parts (cable, connector, pins, cable sleeve, locking mechanism) are free from dirt, crushing, cracks, wear, burns or other damages. Also check that the insulation is intact and that all screws are tight.

8.7. Check screws

Execute a random or complete testing of tightening torques at terminals and mechanical screw connections.

Cables connected to the busbars of the input switchgear (L1, L2, L3, N, PE): **Torque of 35 Nm**

Input and output cable connections on the Stacks and their connections on the output switchgear: **Torque of 15 Nm**

Cables on cable screw joint in upper compartment of the cable door: **Torque of 15 Nm**

Remark



If you have doubts respective torques you can ask the support team for the manual "overview torques"
support@hypercharger.it or +39 0471 096 333

8.8. Check overvoltage protection

Check the function display marked in the following figure. Green indicates proper function, red indicates a defect.



Figure 80: Check of overvoltage protection

8.9. Connectivity of sim cards

With the charging station switched off, remove the sim cards from the respective slot and press the sim slot slightly together so that the contacts are better in contact later and connectivity is thus ensured.

Attention



Make sure to insert the sim cards back into the correct slots!



Figure 81: Compress the sim slot

8.10. Change filter mats

Please change the filter mats regularly.

Remark



Due to the increased pollen count in spring, the mats are particularly stressed during this time. Therefore it is recommended to change the filter mats afterwards.

The filter mats are in both **display and charging cable door**. There are ten filter mats in the HYC_300 and five in the HYC_150. The filters can be removed by pulling out the brackets (Figure 82: Replacement filter mats Figure 82, left). Replace the old mats with new ones and reattach the brackets (Figure 82, right).



Figure 82: Replacement filter mats

8.11. Check coolant

Turn to the cooling unit at the bottom of the **charging cable door**.

8.11.1. Check coolant level

Please check the level of the cooling liquid.

Remark



If you open the lid or use a flashlight it is easier to check the current level of the cooling liquid.



Figure 83: Checking the cooling liquid level

Remark



If the serial number of the cooler starts with 18B or 19B, please inform the hypercharger support team in case you refill the liquid:
support@hypercharger.it or +39 0471 096 333

8.11.2. Check coolant concentration

Please check the concentration of the cooling liquid using a refractometer. If the concentration is below 50%, this can be remedied by adding coolant concentrate.



Figure 84: Check the coolant concentration using a refractometer

8.11.3. Check coolant pH

Check the pH of the cooling liquid using standard test stripes. The optimal pH value is between 8 and 9. If the pH is below pH 7.7, replace the coolant.

Remark



Usually you don't need to replace the coolant completely, the change of the majority is sufficient to ensure protection again.



If the serial number of the cooler starts with 18B or 19B, please inform the hypercharger support team if you refill the liquid:
support@hypercharger.it or +39 0471 096 333

8.12. Close the hypercharger

After completing the maintenance work, make sure to close all doors properly again.



9. Repair and service

The hypercharger's modular design makes it easy to repair defective components.

Attention



Please note that any repair work on the hypercharger can **exclusively** be carried out by trained personnel and in compliance with the required legal and safety measures!



Please consult with hypercharger support before any repairs are made.
support@hypercharger.it or +39 0471 096 333



Observe all hazard warnings in chapter 1.3

Remark



More information on hypercharger trainings can be requested at training@hypercharger.it.



For spare parts orders you can contact sales@hypercharger.it.



Repair instructions can be requested from the hypercharger support.

The hypercharger support team is available from Monday to Friday from 08:00-12:00 and from 13:00-17:00. You can call +39 0471 096 333 or write a mail to support@hypercharger.it.



10. Disposal

Electrical and electronic equipment contains materials, components and substances that may be hazardous and present a risk to human health and the environment. Hence, the hypercharger and its components shall not be discarded together 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 by EU countries. Depending on the country, distributors and/or manufacturers must register and report the exported quantities of electrical and electronic equipment and pay a fee if necessary.

Wood and plastic packaging must be disposed of separately. Please contact your local municipality for suitable collection points.

Remark



For more information, please contact the hypercharger support or check directly with a dedicated WEEE advice center.



11. Technical specifications

General technical data and operating conditions:

Parameter	Nominal value
Protection class	IP54
Mechanical impact resistance (IEC62262)	IK10
Installation site	Indoors and outdoors
Type of installation	Floor mounting (base plate)
Accessibility	Unrestricted (also for laymen)
Installation altitude	Up to a maximum of 2.000 m.a.s.l
Humidity-range for transport or storage	0 – 95 % rel. (non-fogging)
Humidity-range for operation	0 – 95 % rel.
Degree of pollution	Pollution degree class 3
Overvoltage category	OVC III
Protection class	Class 1 (protective earthing)
Storage temperature range	-40°C – +55°C
Operating temperature range	-30°C – +40°C (+55°C with derating)
Supported charging modes	Mode 4 with optional 22 kW AC charging (Mode 3)
Max. air flow rate HVC_150	1800 m³/h
Max. air flow rate HVC_300	3600 m³/h

Table 26: Technical data

Type	Wide [mm]	Large [mm]	Height [mm]	Weight [kg]
HVC_150	854	420	2250	see Table 17 in chapter 3.1
HVC_300	854	732	2250	

Table 27: Mechanical data

Electrical connection data depending on the configuration:

HVC_150

Parameter	Nominal value
Operating voltage	400 Vac +N +PE (± 10 %)
Frequency	50 Hz (± 5 %)
Nominal current	max. 250 A
Connection terminals cross section	Busbar with M12 thread
Max. Rated peak withstand current I_{pk}	17 kA (peak)
Rated short-time withstand current I_{sw}	4 kA (rms)

Table 28: Electrical connection for HVC_150



HVC_300

Parameter	Nominal value
Operating voltage	400 Vac +N +PE (± 10 %)
Frequency	50 Hz (± 5 %)
Nominal current	max. 500 A
Connection terminals cross section	connecting bolt 2x12mm
Rated peak withstand current I_{pk}	17 kA (peak)
Rated short-time withstand current I_{sw}	4 kA (rms)

Table 29: Electrical connection for HVC_300

HVC_300_f

Parameter	Nominal value
Operating voltage	400 Vac +N +PE (± 10 %)
Frequency	50 Hz (± 5 %)
Nominal current	max. 500 A
Connection terminals cross section	connecting bolt 2x12mm
Prospective short circuit current I_p	48 kA (rms)
Rated short-time withstand current I_{sw}	4 kA (rms)

Table 30: Electrical connection for HVC_300_f

The hypercharger is designed for the direct connection to the mains supply.

Standby power consumption

The values from Table 31 refer to a 400 V supply network. Depending on the number of cable coolers, CTRL_IO boards and illuminated plug holders, the active power can additionally increase by up to 10 W.

Configuration	Quantity of Stacks	Stack Version	Reactive power	Active power without energy saving mode	Active power with energy saving mode
HVC_150 V3 / V4	1	V4	3,4 kvar	65 W	45 W
	2	V4	4,9 kvar	100 W	60 W
	1	V5	1,8 kvar	65 W	45 W
	2	V5	1,8 kvar	100 W	60 W
HVC_300 V3	1	V4	4,3 kvar	65 W	45 W
	2	V4	5,8 kvar	100 W	60 W
	3	V4	7,3 kvar	135 W	75 W
	4	V4	8,8 kvar	170 W	90 W
	1	V5	2,8 kvar	65 W	45 W
	2	V5	2,8 kvar	100 W	60 W
	3	V5	2,8 kvar	135 W	75 W
	4	V5	2,8 kvar	170 W	90 W

Configuration	Quantity of Stacks	Stack Version	Reactive power	Active power without energy saving mode	Active power with energy saving mode
HYC_300 V4	1	V4	2,9 kvar	65 W	45 W
	2	V4	4,4 kvar	100 W	60 W
	3	V4	5,9 kvar	135 W	75 W
	4	V4	7,4 kvar	170 W	90 W
	1	V5	1,4 kvar	65 W	45 W
	2	V5	1,4 kvar	100 W	60 W
	3	V5	1,4 kvar	135 W	75 W
	4	V5	1,4 kvar	170 W	90 W

Table 31: Standby power consumption

Radio communication

The radio modem of the hypercharger 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 32: Frequency bands and transmission levels of HYC 150 / HYC 300

[illegible]

