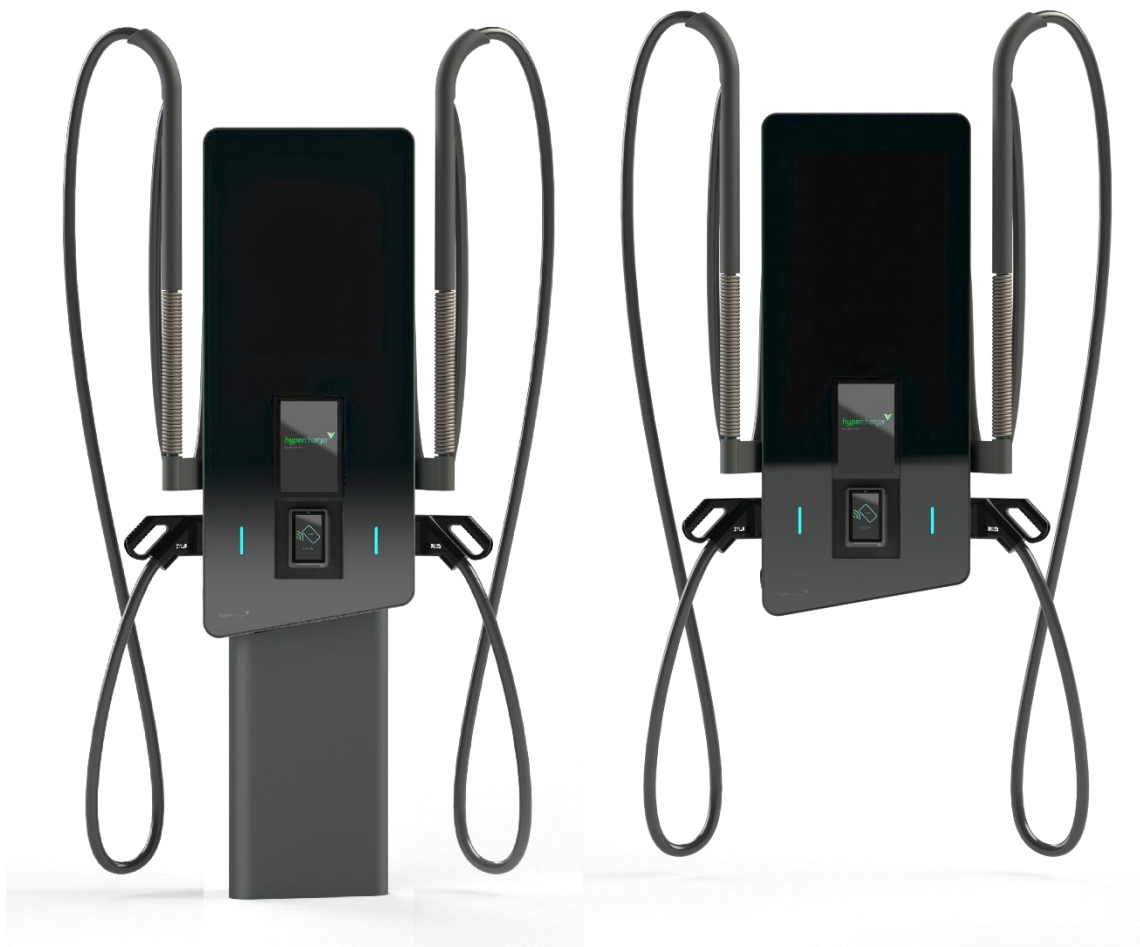




Operating and Installation Guide Hardware hypercharger HYC_50 (50 kW) Fast charging system for electric vehicles

for HW-Version 6.1



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HYC_50 Operating and installation instructions

Version

Version 1-8 of operating and installation instructions, January 2023

English translation of original German version

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Attention



Please note that all warranty claims become void if these operating and installation instructions are not observed.

If changes are made to the device that are not included in the evidence of the original manufacturer alpitronic Srl or have not been authorized and released by alpitronic Srl, the person concerned is considered the manufacturer of the switchgear combination and not alpitronic Srl.



Please note that for chargers, which were optionally and on customer request built in conformity with the MessEG/EV, the appendix A1 ("Technical documentation for the MessEG/EV") must be observed as further documentation.

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1-7	December 2022	Ch. Leimegger	Correction lettering Figure 10, addition to Table 7
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1. Safety instructions

This chapter contains the safety instructions that must be observed when installing, operating and maintaining the HYC_50 rapid charging system for electric vehicles. Improper operation due to non-observance of the operating instructions can lead to serious injuries or damage. These safety instructions must be read carefully before installing, operating and maintaining the unit.

1.1. Intended use

The HYC_50 rapid charging system for electric vehicles is intended for indoor and outdoor use to carry out rapid charging processes for electric vehicles.

Attention



The DC charging station is designed for fixed installation with attachment to the wall or with optional stand on the floor in an environment with a pollution degree class 4 and intended for locations with unrestricted access (operation by laymen).

The DC supply device for electric vehicles is supplied from an AC/ three-phase network and supports charging mode 4 (protection class I).

For the connection between the charging station (Electric Vehicle Supply Equipment, EVSE) and the electric vehicle (EV), no other DC cables are required apart from those supplied with the HYC_50. The charging cable must not be modified to extend or shorten the cable range.

Do not use adapters that are not approved by the vehicle manufacturer.

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

1.2. User

These operating and installation instructions are intended for people who are responsible for the installation, operation, maintenance and servicing of the HYC_50 rapid charging system for electric vehicles. These people should have at least a basic knowledge of high-power electrical systems and electric vehicles. Before carrying out any work, these instructions must be read carefully by both the operator and the technical personnel in charge.

1.3. Safety instructions for installation and maintenance

These warnings and instructions apply to all activities related to the installation, maintenance and servicing of the HYC_50.

Attention



Failure to follow these instructions may result in serious or fatal injury and severe property damage.



The installation and maintenance of the HYC_50 rapid charging system for electric vehicles may only be carried out by qualified personnel.

Before commissioning, check that the system and all connections have been properly installed.



Electrostatic discharge

The HYC_50 contains components and circuit boards that are sensitive to electrostatic discharge. Sufficient ESD measures should be taken during assembly and maintenance to protect the electronic components (e.g. wearing a grounding arm strap).

Warning notice

Warning of dangerous electrical voltage



Installation and maintenance of the HYC_50 may only be carried out with the supply voltage switched off. Before installing, dismantling, repairing or replacing components, the HYC_50 must be disconnected from the power supply and the main switch in the device must be switched off. In addition, carry out a voltage check to ensure that the electrical voltage is disconnected from the system.

Dangerous electrical voltages (up to 1000 VDC) can be present inside the HYC_50, even if all isolators are switched off.

Care must therefore be taken to ensure that unqualified persons keep away when the doors of the HYC_50 are open and the discharge time are observed.

Installation, dismantling, repair or replacement of components of the HYC_50 must only be carried out by technicians. The door of the HYC_50 enclosure must be properly closed and locked after installation, maintenance or repair work.

Warning of hot surfaces



Some components inside the HYC_50, such as the power unit, transformer and cables, may remain hot for a long time after the power supply has been disconnected.

Before dismantling, repairing or replacing components, ensure that all components have cooled down.



Heavy weight

Please note that the unit or the individual components of the unit can be very heavy.



Bruises

When assembling and disassembling components, please ensure that no persons or body parts are bruised.

Information



The main switch for switching off the unit is located in the lower part of the unit (see Figure 12 and Figure 14). Set the circuit breaker to position "0", this will switch off all internal components of the HYC_50.

Please note possible discharge times of DC link capacitors.

2. Product description

The HYC_50 from the hypercharger product family can be equipped with the following options:

Model	DC-Power	Options
		Charging interfaces
HYC_50	Power-Unit with 2x 25 kW → 50 kW	1 DC charging cable
		2 DC charging cable

Table 1: Overview DC Power and Options HYC_50

Classification according to DIN EN 61851-23

Depending on the configuration, the DC charging station supports up to two outputs for simultaneous operation while maintaining galvanic isolation between the mains and the vehicles and between the vehicles themselves. The design corresponds to circuit diagram 3 according to table GG.2 of the standard E DIN EN 61851-23:2018-03 (VDE 0122-2-3:2018-03).

The charging station does not support an optional ventilation function.

Figure 1 to Figure 4 show the HYC_50 which can be equipped with one or two DC charging cables.



Figure 1: HYC_50 with open front door (Example with one DC charging cables)

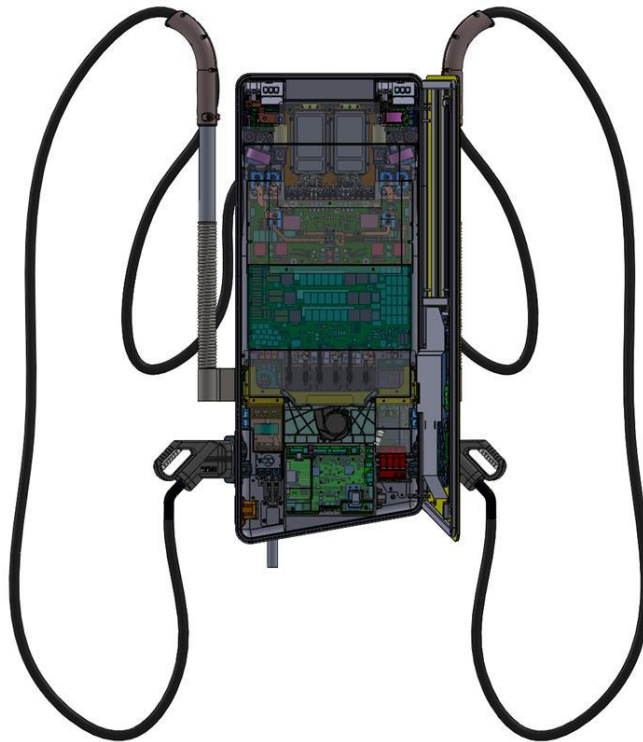


Figure 2: HYC_50 with open front door (Example with two DC charging cables)

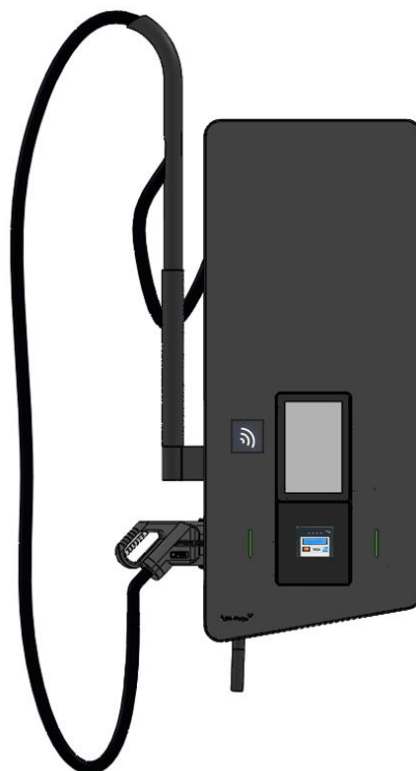


Figure 3: HYC_50 with one DC charging cables

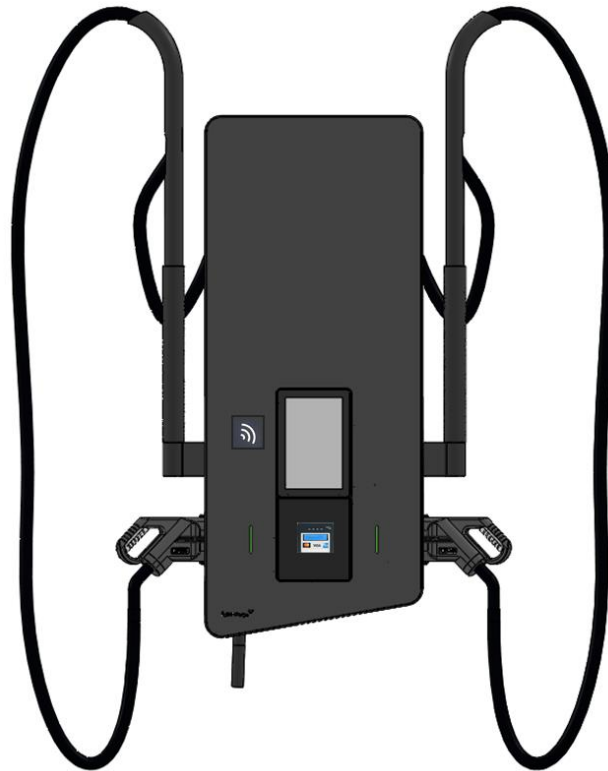


Figure 4: HYC_50 with two DC charging cables

The various possibilities and options for DC charging are described in chapters 2.1.

Information



As standard, the HYC_50 enclosure is supplied in "RAL Noir 2100". The front panel can be adapted to customized branding, making the column a flagship for your company.



Customs tariff number of the HYC_50: 85044055

2.1. Charging interfaces

The following charging interfaces can be selected for the HYC_50 in various combinations. Active cooling is not provided for any of the cable variants.

Charging Interface				
Charging interface	Voltage [V]		Current [A]	
	Min.	Max.	Min.	Max.
CCS1/2	150 V DC	1.000 V DC	6,5 A	150 A DC
CHAdeMO	150 V DC	500 V DC	6,5 A	125 A DC
GB/T	150 V DC	750 V DC	6,5 A	150 A DC

Table 2: Charging interfaces

Attention



The total power of the HYC_50 is limited to a maximal nominal current of 90 A.

Information



The CCS1 (US) and GB/T (China) options are special options for the automotive industry.

The following combinations are possible:

Charging interfaces	
Outlet 1 (right)	Outlet (left)
CCS1/2	N/A
CCS1/2	CHAdeMO
CCS1/2	CCS1/2
CCS1/2	GB/T
N/A	GB/T
N/A	CCS1/2
N/A	CHAdeMO

Table 3: Possible combinations of charging interfaces

2.2. DC-Power unit / Power outputs

A power module with two 2x 25 kW power outputs are used internally to supply the DC charging cables installed on the HYC_50. A power output can only supply one DC charging cable at a time. The HYC_50 power outputs can be connected in parallel to increase the power transmitted via a DC charging cable.

Information



The usable DC power of the HYC_50 is limited by the maximum current of the DC charging cable used.



The charging cables can be equipped with temperature sensors, which can lead to a derating of the maximum charging current provided when defined temperature limits are reached.

Figure 5 shows the DC power characteristics with one and two HYC_50 power outputs and different cable types (HYC_50 power stacks and different cable types (150 A GB/T, CCS1 and CCS2 cables, 125A CHAdeMO cable).

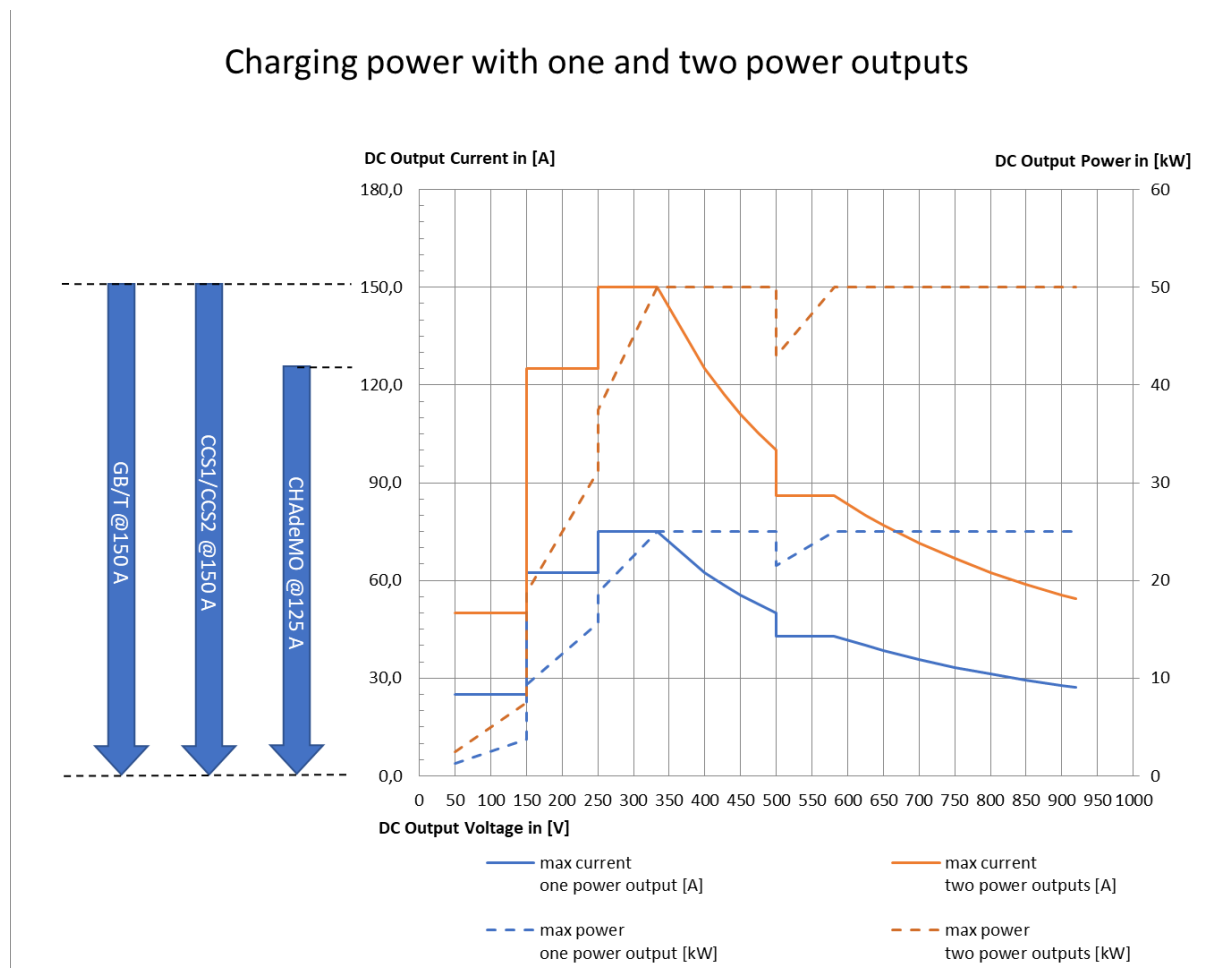


Figure 5: DC power characteristics in different configurations

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2.3. Type plate

Depending on the configuration of the charging station, the following type of plate (as an example) may be on the unit.

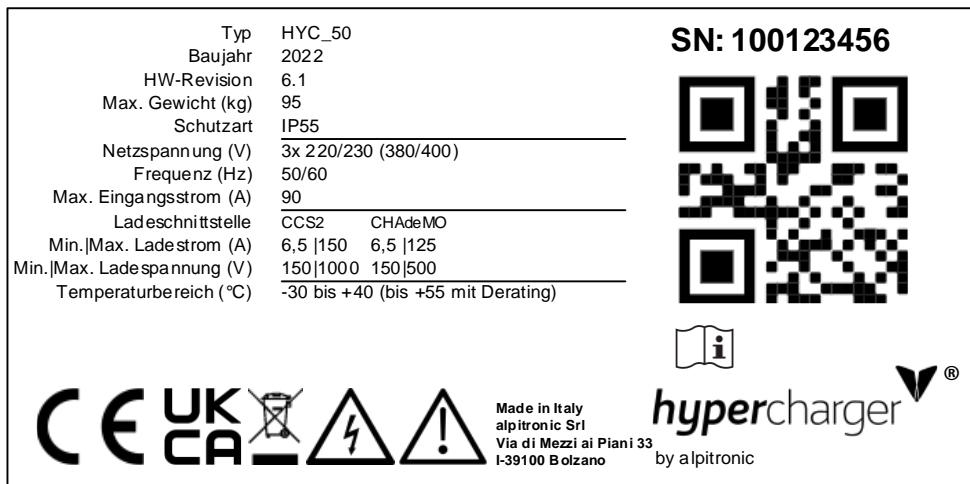


Figure 6: Example 1 of a type of plate without calibration conformity for HYC_50

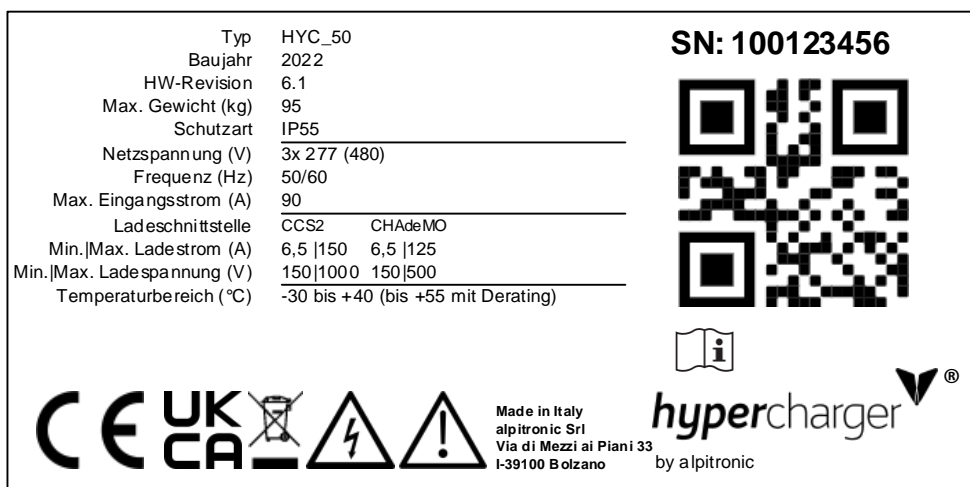


Figure 7: Example 2 of a type of plate without calibration conformity for HYC_50

2.4. Exterior view

The following Figure 8 shows the various elements of the unit from the outside.

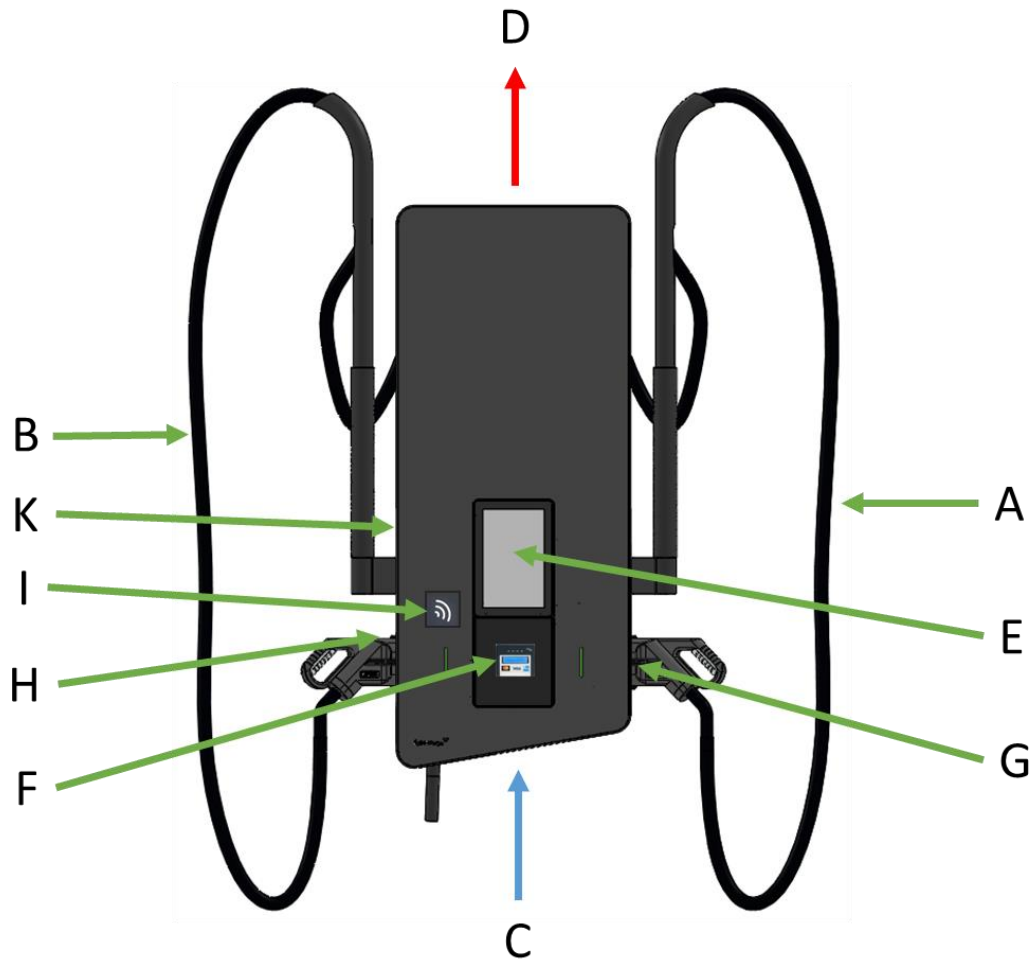


Figure 8: Elements of the HYC_50

- A DC charging cable 1 (depending on configuration)
- B DC charging cable 2 (depending on configuration)
- C Air inlet
- D Air outlet
- E Display / HMI
- F RFID card reader (optional position if I equipped with credit card reader)
- G Charging plug holder 1
- H Charging plug holder 2
- I RFID card reader or credit card reader (optional)
- K Type plate

2.5. Opening the HYC_50

The HYC_50 has a front door that can be opened via a locking lid on the left side (below the charging plug holder). This has two locking cylinders (10/30 mm profile half cylinder).

The locking cylinder on the left (see Figure 9) is the one for alpitronic support, the customer locking cylinder is on the right (empty on delivery).

Steps to open the inlet:

- turn the key 90° in the direction shown in Figure 9
- tilt the inlet forward and down.

Steps to close the inlet:

- insert the nose of the inlet into the opening at the bottom and
- push the inlet up into the center of the opening until it snaps into place



Figure 9: Locking lid of the HYC_50

After opening the locking lid, the front door lock can be released and the door opened.

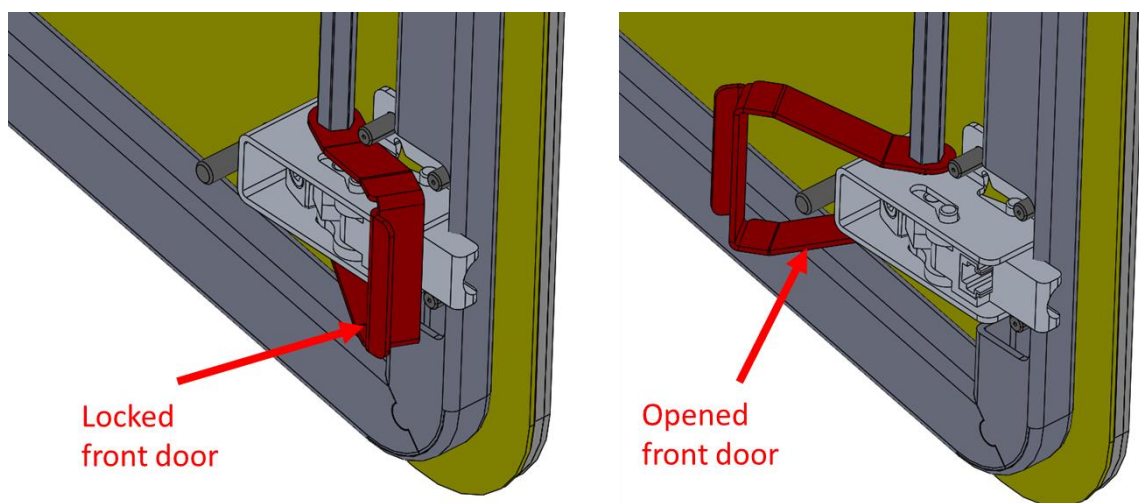


Figure 10: Front door locking mechanism

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Attention



Before closing the service hatch, make sure that the front door is properly locked again.

2.6. Door contactor

To detect the opening of the HYC_50 front door, door contact switches are installed as standard.

2.7. Interior view

Figure 11 and Figure 12 show the inside view of the HYC_50 in top view, Figure 13 and Figure 14 show the inside view of the front door.

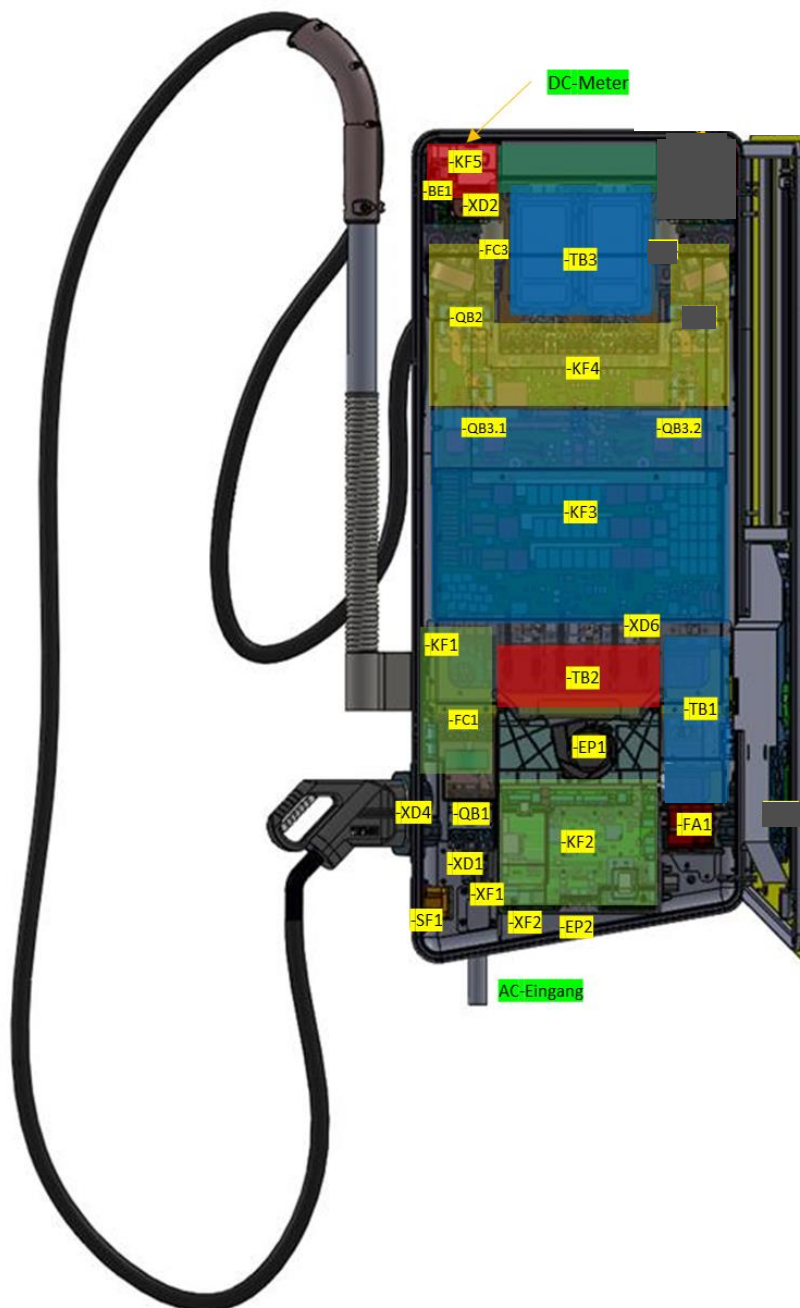


Figure 11: Interior view of the HYC_50 with one DC charging cable

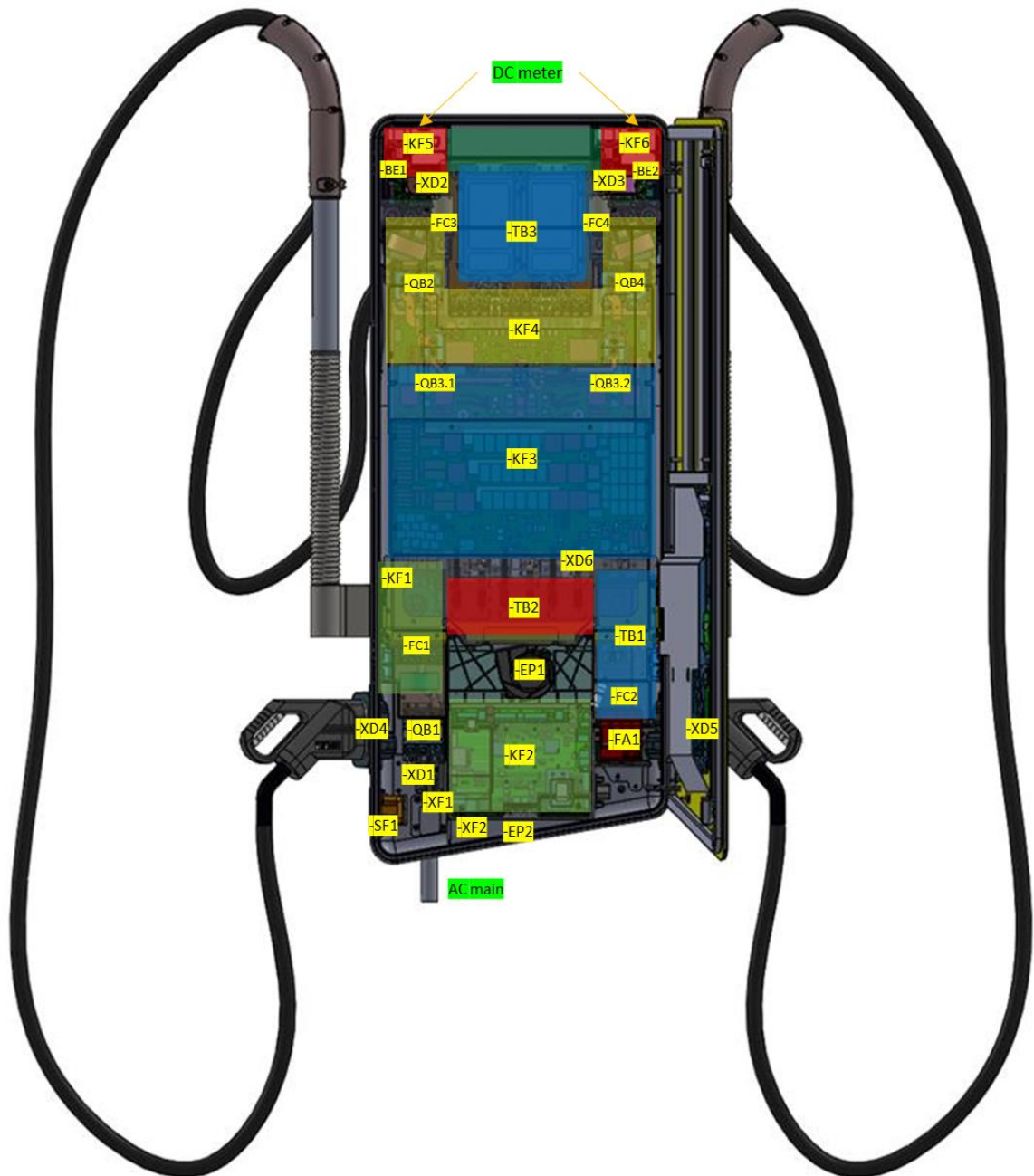


Figure 12: Interior view of the HYC_50 with two DC charging cables

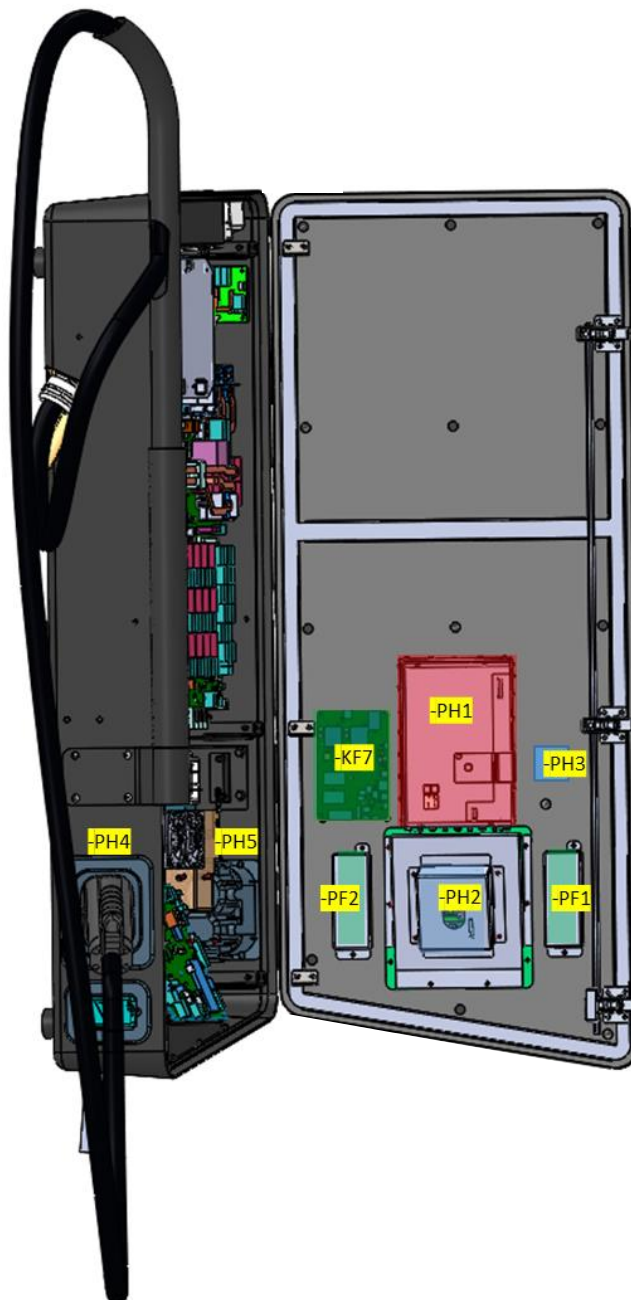


Figure 13: Interior view front HYC_50 (Backside with one DC charging cable)

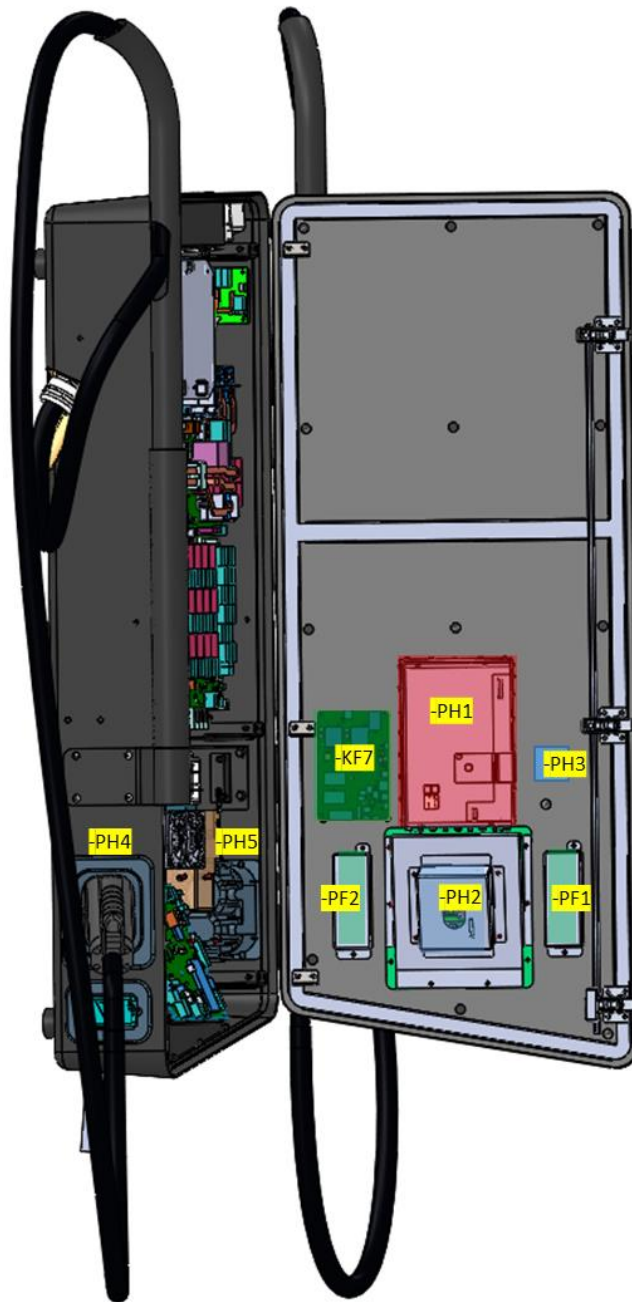


Figure 14: Interior view front HYC_50 (Backside with two DC charging cables)

Table 4 describes the individual components marked in the above figures:

Identifier	Spare part no.	Description
-BE1		DC meter charging point left
-BE2		DC meter charging point right
-EP1		Fan interior
-EP2		Blower
-FC1		Input fuses HYC_50 (135 A)
-FC2		HV-PSU fuse (4 A)
-FC3		Output fuse charging point left
-FC4		Output fuse charging point right
-KF1		GRID – Mains connection/fuse protection
-KF2		CTRL_CHRG – charging controller
-KF3		POWER_UNIT – AC/DC converter
-KF4		DC-output switchgear
-KF5		DC Block left
-KF6		DC Block right
-KF7		CON_FRONT – control front
-PF1		LED-strip left
-PF2		LED-strip right
-PH1		Touch display
-PH2		Card reader terminal (optional position)
-PH3		Terminal (RFID), antenna
-PH4		CTRL_DISPEXT_50 – Calibration law display charging point left
-PH5		CTRL_DISPEXT_50 – Calibration law display charging point right
-QB1		main switch / 3P
-QB2		DC-relay charging point left
-QB3		DC-relay parallel switching relay power modules
-QB4		DC-relay charging circuit right
-SF1		Door contact
-TB1		HV_PSU – 24V/48V auxiliary power supply
-TB2		PFC – coil
-TB3		Transformer
-XD1		Connection terminals Mains input
-XD2		DC busbar for vehicle line connection XD4 (DC output left)
-XD3		DC busbar for vehicle line connection XD5 (DC output right)
-XD4		DC charging connection left (depending on configuration)
-XD5		DC charging connection right (depending on configuration)
-XD6		DC link connector
-XF1		Ethernet network connector (service)
-XF2		Ethernet network connector (client-LAN)

Table 4: Components of the HYC_50

Information



The Ethernet connection XF1 can be used for load management.

2.8. Additional options

2.8.1. Colors HYC_50

The HYC_50 housing is delivered in “RAL Noire 2100” as standard. The front bezel can be customized with custom branding, making the column a statement of your business.

2.8.2. Credit card terminal

alpitronic installs contactless readers from various manufacturers and providers. Before installing the credit card terminal, the customer must conclude an agreement with a payment provider such as BS-Payone, Concardis or CCV. alpitronic then receives the CCV terminal configured on the payment provider, which is installed in the charging station. The provider's terminal ID is sent to alpitronic by the customer to alpitronic and played on the terminal (alternatively, this can also be configured by the customer after delivery of the hypercharger).

A credit card terminal provided by the customer can also be installed, provided it is a compatible model already used by alpitronic.

The credit card terminals usually support all common credit and bank cards, the payments made can be viewed in the backend with a time delay.

3. Packaging, transport, and storage

3.1. Packaging

Figure 15 shows the packaging of the HYC_50, in which it is delivered.



Figure 15: Packed HYC_50

3.2. Transport, handling, and storage

The device is delivered packed on a pallet. During transport and storage, max. 4 devices (pallet with packaging) may be stacked on top of each other.

Attention



The hypercharger must be stored in its original packaging in a dry environment from -40 °C to + 55 °C.

3.3. Unpacking the HYC_50

See attached Video.

4. HYC_50 Installation and commissioning

This chapter describes the mechanical assembly and electrical installation of the HYC_50. It is recommended to assemble and install the HYC_50 according to the following steps:

- Location selection (Chapter 4.1.3)
- Positioning mounting frame HYC_50 (Chapter 4.1.4)
- Connection area of the HYC_50 (Chapter 4.1.6)

4.1. Mechanical installation of the HYC_50

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

Attention



Before installation, compliance with all legal requirements for the installation site (e.g. tilt resistance, impact protection, frost exposure, etc.) must be checked.



Each loading outlet must be as close as possible to the car park to be served, taking into account ergonomics and mechanical impact protection.



In Norway, charging stations for electric vehicles must be located far enough away from a potentially explosive area so that charging cannot take place within the potentially explosive area.



When selecting the installation height of the charging station, please ensure that the plug holder of the charging station is at a height above the ground in the range of 0.5 m to 1.5 m.
For barrier-free installation, the height specifications in Figure 19 must be observed.

4.1.1. Mounting the Stand

The base of the HYC_50 can be fixed to the ground via 4 bolts M12 (see Figure 16). For this purpose, own foundation bases are optionally offered.

However, the installation can also be carried out on any own foundation. The sufficient mechanical strength of the foundation plate must be taken into account.

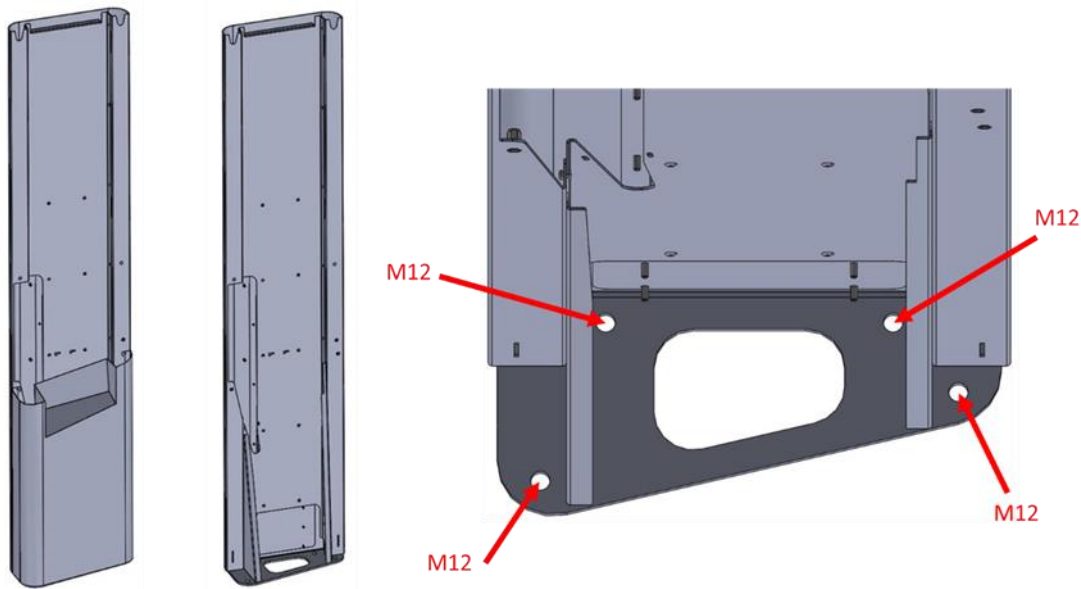


Figure 16: Mounting the Stand HYC_50

4.1.2. Charging cable lengths

In the standard configuration, the HYC_50 is equipped with a cable length of 2,7 m. If the optionally available cable management is selected, the cable length is extended to approx. 4,45 m. Figure 17 shows the operating radius (4.15m) of the cables for the two DC outputs of the HYC_50. Longer cable lengths can also be ordered as an option.

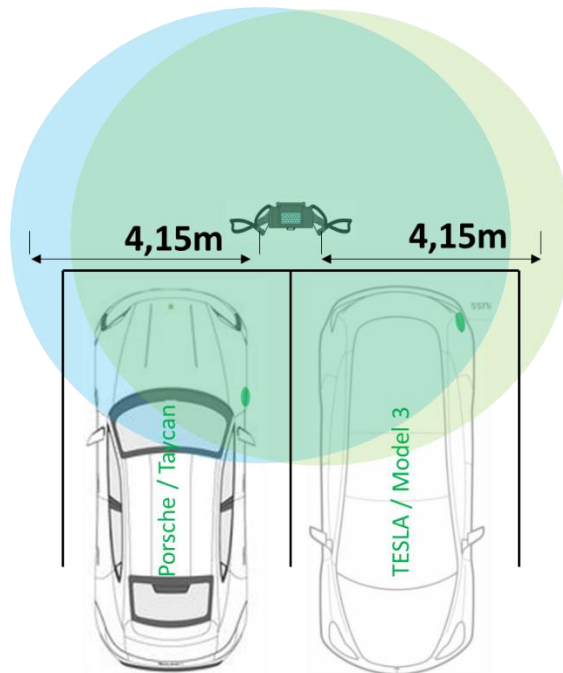


Figure 17: Cable length for the two DC outputs of the HYC_50 with cable management

4.1.3. Location selection

When installing the HYC_50, it must be ensured that a minimum distance to possible objects around the HYC_50 is maintained in order to ensure sufficient air flow and to have enough space available for possible service or maintenance work.

Attention



The position of the HYC_50 is to be selected, taking into account the impact protection that may be required, so that possible damage due to foreseeable circumstances is avoided.

Figure 18 shows the recommended minimum clearances to be provided when selecting a location for a HYC_50.

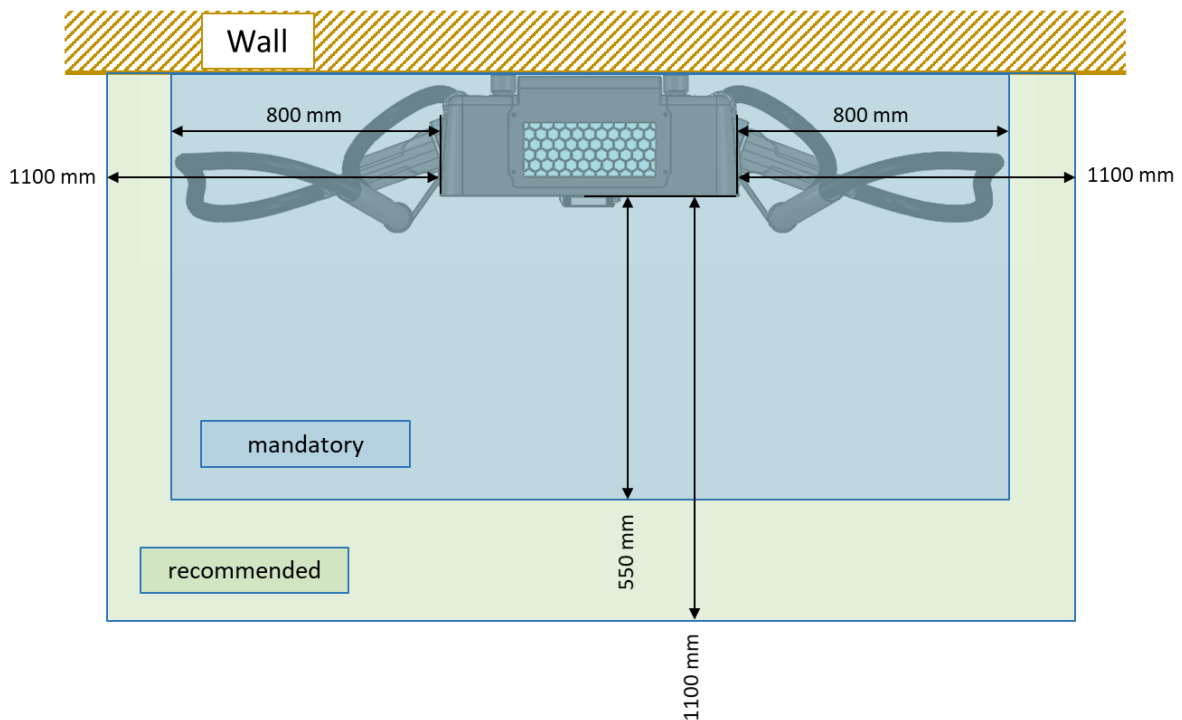


Figure 18: Recommended minimum distances for site selection

The recommended distances are designed for convenient maintenance of the HYC_50, the minimum distances represent the absolute minimum for maintenance work, e.g. to be able to exchange a power unit.

The ground conditions should be as flat and level as possible in the areas shown.

Attention



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



Before installation, compliance with all legal requirements for the installation site (e.g. tilt resistance, impact protection, frost exposure, etc.) must be checked.



Each charging cable must be located as close as possible to the parking space to be supplied, taking into account ergonomics and mechanical impact protection. In doing so, observe the cable radius (Figure 17)

Information



The ground conditions should be as flat and level as possible in the areas shown.

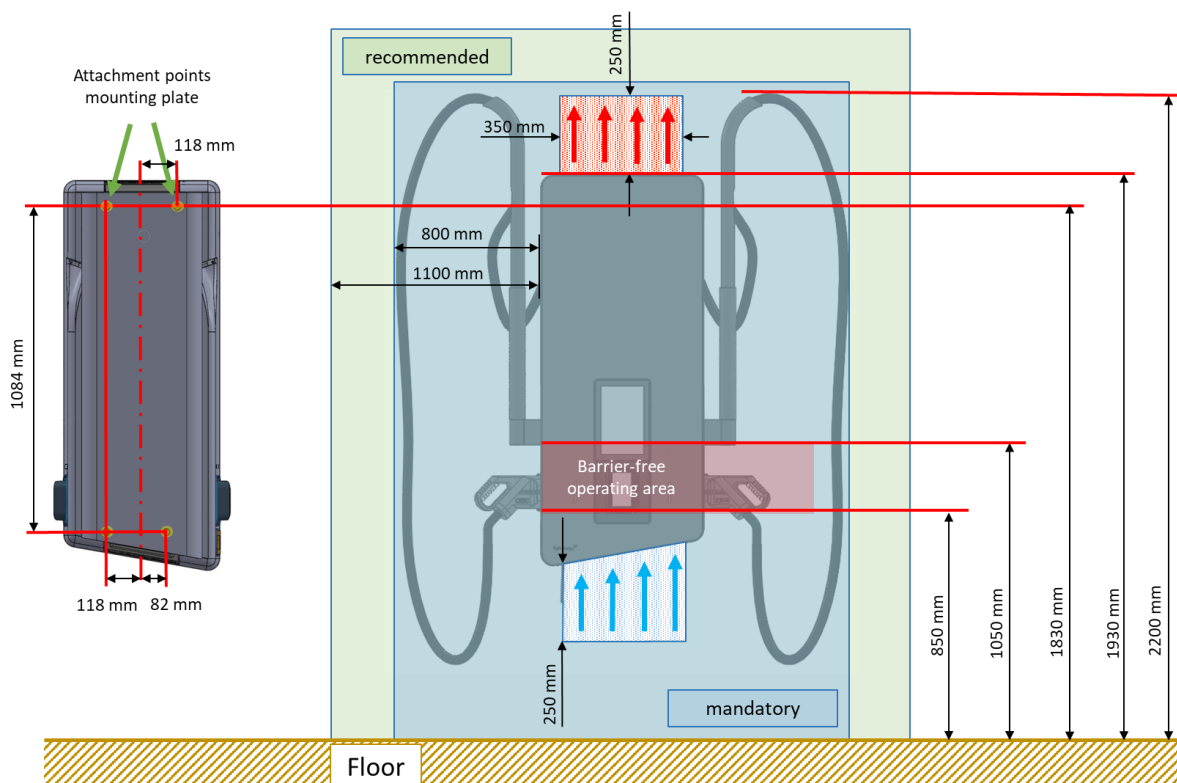


Figure 19: Installation height (barrier-free) and minimum distances for supply air and exhaust air

For an easy replacement of the modules, the suggested dimensions should be adhered to.

If HYC_50 is installed in a closed or even partially closed environment, the exhaust air must

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be prevented from being reintroduced into the supply air circuit. Impairments to the air circulation can lead to a reduction in the charging station's performance.

The minimum distances to obstacles in the supply and exhaust air areas specified in Figure 18 must be observed. If the charging pole is to be installed without barriers, the lower edge of the display must be within a range of 850 ... 1050 mm above the ground. This is the case when the uppermost fastening points of the fastening frame are at a height of 1830 mm above the ground.

The necessary mounting height of the mounting frame is shown in Figure 19.

The following information comes from a publication of the German insurers on loss prevention (VdS 3471):

- No highly flammable materials should be stored in the immediate vicinity of the charging pole.
- Charging stations are not permitted in fire-hazardous premises in accordance with VdS 2033, explosion-hazardous or explosives-hazardous areas (areas with e.g. explosives or pyrotechnics) due to the existing hazards.
- The installation of a fire alarm system is recommended - where appropriate - in order to detect a fire at an early stage and to fight it in time.
- When installing in garages, the garage regulations must be taken into account.
- An additional overvoltage protection device is recommended in the power supply circuit.

Attention



The outlet temperature of the charger's cooling airflow can reach temperatures up to 75°C

4.1.4. Positioning of mounting frame HYC_50

Figure 19 shows the mounting height for the mounting frame (center of topmost mounting points) if barrier-free installation is desired.

In this case, the lower edge of the display is at a height of 1020 mm above the floor and thus the touch buttons on the display are at a height of 1020...1050 mm.

To mount the HYC_50 on the stand as shown in Table 6, first hook the catch on the top into the retaining point provided. Then screw the bottom of the unit through the holes in the housing to the stand frame or mounting frame for wall mounting.

By adjusting the screw-on points, existing wall slopes can be compensated for up to an angle of approx. ± 0.8 degrees (15 mm).

To fix the mounting plate to the wall, M6 screws anchors/dowels with a length of 65 mm are recommended. A suitable fastening system from Fischer is shown in Table 5.

DuoPower										
Highest recommended loads ³⁾ for a single anchor. The given loads are valid for wood screws with the specified diameter.										
Type		5 x 25	6 x 30	6 x 50	8 x 40	8 x 65	10 x 50	10 x 80	12 x 60	14 x 70
Wood screw diameter	[mm]	4	5	5	6	6	8	8	10	12
Min. edge distance concrete c_{min}	[mm]	30	35	35	50	50	65	65	80	100
Recommended loads in the respective base material $F_{rec}^{2)}$										
Concrete $\geq C20/25$	[kN]	0.40	0.95	1.65	1.10	2.30	2.15	4.20	3.30	5.30
Solid brick $\geq Mz 12$	[kN]	0.30	0.50	0.55	0.62	0.69	1.20	1.45	1.30	1.35
Solid sand-lime brick $\geq KS 12$	[kN]	0.50	1.00	1.60	1.25	2.25	2.20	3.85	2.80	4.50
Aerated concrete $\geq AAC 2 (G2)$	[kN]	0.05	0.10	0.15	0.10	0.16	0.20	0.30	0.24	0.35
Aerated concrete $\geq AAC 4 (G4)$	[kN]	0.25	0.38	0.55	0.42	0.60	0.60	1.10	1.00	1.45
Vertically perforated brick $\geq Hlz 12 (\rho \geq 0.9 \text{ kg/dm}^3)$	[kN]	0.13	0.15	0.17	0.25	0.40	0.25	0.40	0.35	0.40
Perforated sand-lime brick $\geq KSL 12 (\rho \geq 1.6 \text{ kg/dm}^3)$	[kN]	0.40	0.60	0.60	0.70	1.00	0.70	2.00	0.75	1.50
Gypsum block $(\rho \geq 0.9 \text{ kg/dm}^3)$	[kN]	0.10	0.18	0.37	0.25	0.50	0.35	0.65	0.50	0.50
Gypsum fibreboard 12.5 mm	[kN]	0.24	0.33	0.35	0.35	-	0.50	-	-	-
Gypsum plasterboard 12.5 mm	[kN]	0.12	0.15	0.15	0.15	-	0.15	-	-	-
Gypsum plasterboard 2 x 12.5 mm	[kN]	0.13	0.15	0.24	0.20	0.32	0.30	-	-	-
Matte Forato Typ F8	[kN]	0.30	0.30	-	0.25	-	0.25	-	-	-
Tramezza Doppio UNI 19	[kN]	0.15	0.15	0.23	0.15	0.30	0.20	0.52	0.35	0.35
Sepa Parpaing	[kN]	0.30	0.45	0.25 ³⁾	0.45	0.45 ³⁾	0.45	0.45 ³⁾	0.60 ³⁾	0.60 ³⁾

Table 5: Load Table for Fischer dowels/anchors

4.1.5. Mounting the HYC_50

4.1.5.1. Mounting preparation

Before mounting the connection cable, the strain relief suitable for the cable diameter should be selected and the cable bushing should be cut off at the corresponding point of the sealing cone so that both parts can achieve their optimum functionality. The matching cable diameters (24 ... 35 mm) are stamped on the strain reliefs so that there is no risk of confusion.

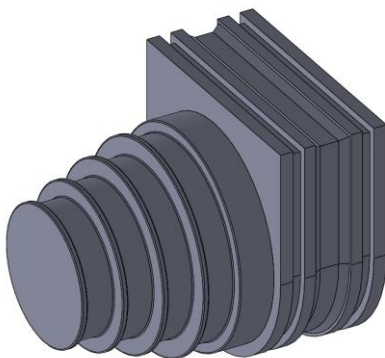


Figure 20: Cable bushing

Attention



Due to the existing sealing concept, only a sheathed cable with the specified outer diameter is permitted as a connection cable (only cable, no individual cables for outer conductor and protective conductor)



Figure 21: Strain relief for different cable diameters

The following tools are needed for assembly:





Scissors/knife to open the packaging	
Cordless screwdriver	
<ul style="list-style-type: none"> • TX10 Attachment for cordless screwdriver • TX20 Attachment for cordless screwdriver • TX30 Attachment for cordless screwdriver 	
Alternative to cordless screwdriver <ul style="list-style-type: none"> • TX10 Screwdriver • TX20 Screwdriver • TX30 Screwdriver 	

Table 6: Tools needed for assembly

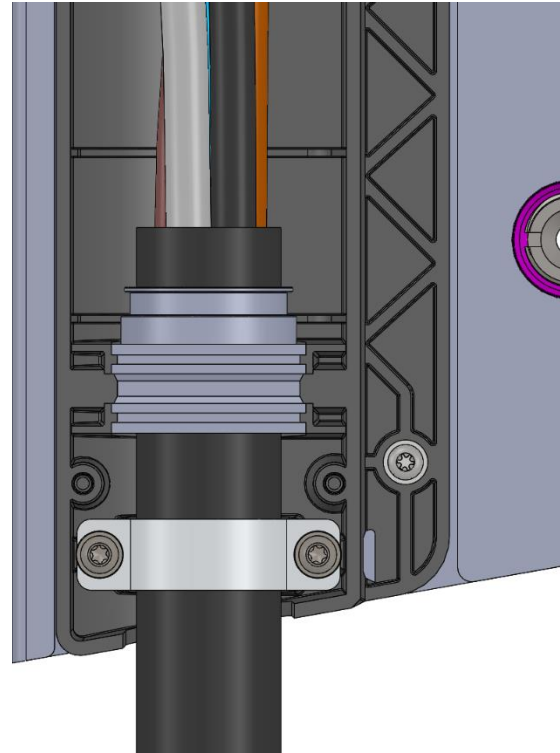
Attention



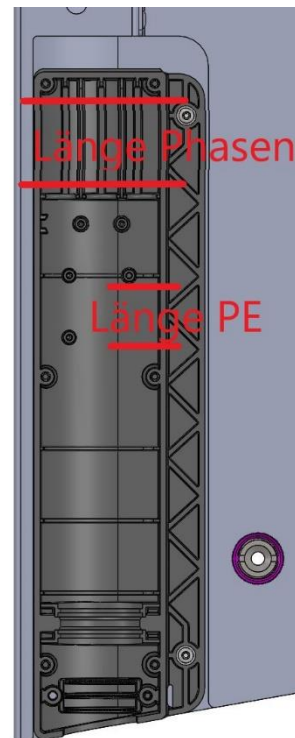
The housing and thus also the cable entry must comply with IP55 tightness!
Due to the design of the cable bushing, this can only be achieved if the supply line is designed as a sheathed cable. Cabling with individual conductors is not permitted.

4.1.6. installation of the connection cable in the cable entry

After the connection cable has been stripped and the phases have been roughly cut off, it can be fixed in the plastic half-shell of the cable entry with the installed cable bushing using the strain relief (TX20). Before this, the cable bushing must be cut off at the appropriate point for the cable diameter using scissors/knives. During installation, make sure that the sealing contour follows the existing sealing groove. The sealing cylinder points inwards (see picture).



The individual strands must be cut and stripped in the sections shown in the figure, so that contacting is possible. The length of the remaining insulation of the cable, which is inside the cable entry, must be selected so that the cable bushing still seals on it.



Contacting with clamps:

Clamps are used for contacting between the individual strands of the connection cable and the flexible cables; these should contact the two cables with each other as shown in the picture. The flexible cable is always on top.

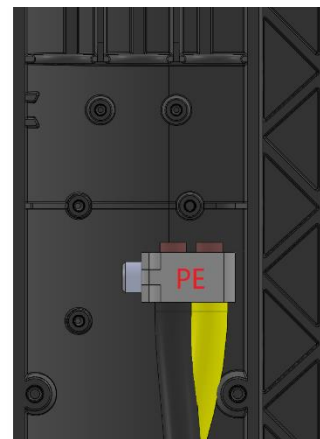
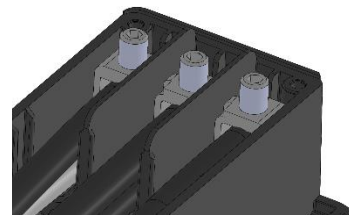
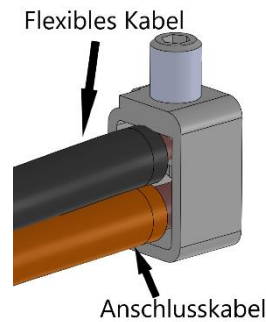
The clamp for the PE connection is attached turned 90°. The orientation of the clamps for the phases is given by the ribs in the connection area.

The flexible cable for the PE connection can be recognized by the fact that a cable lug is mounted at the other end.

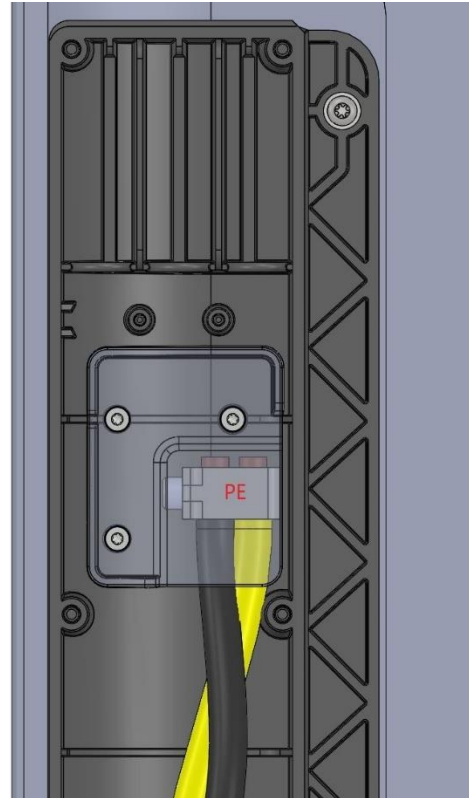
The connecting cable may have a cross-section of 25...50 mm².

Annotation:

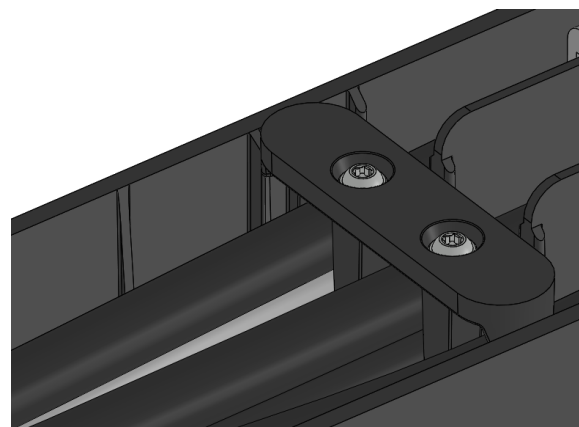
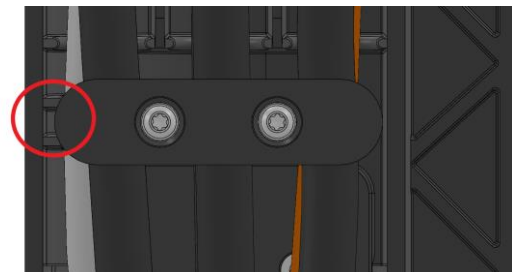
In the special case of using a fine-core sheathed cable with rectangular crimping (tool see figure on the right) a 3x50mm²+PE cable can be connected to the core ends.



To protect the cables of the phases, an intermediate plastic insert is mounted above the PE connection
Required tool: TX10

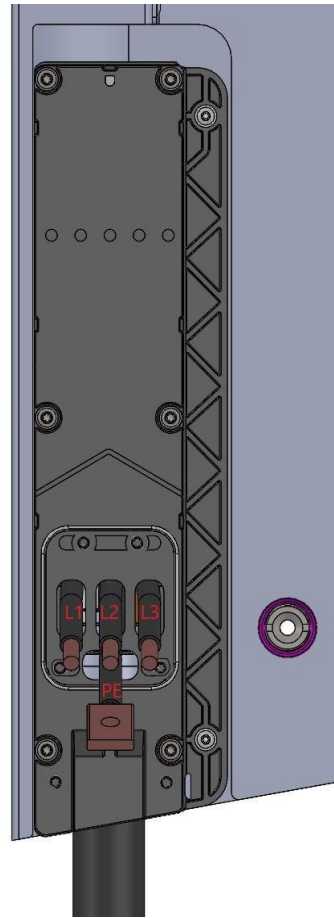


The remaining cables are held in position with the help of a cable fixation. To position them more easily, you can use the two ribs (shown in red) as a guide.
In this step, care must be taken that the insulation of the cables is not pinched between the plastic parts and thus damaged.
Required tool: TX10



The flexible cables must now be fed through the cutouts provided in the cover and the cover placed on the housing and fixed in place.

Required tool: TX20



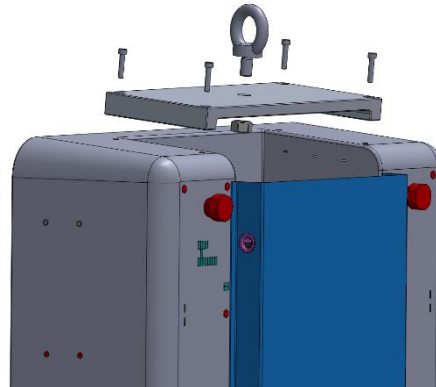
The unit can now be lifted onto the column or the back plate using the assembly crane.



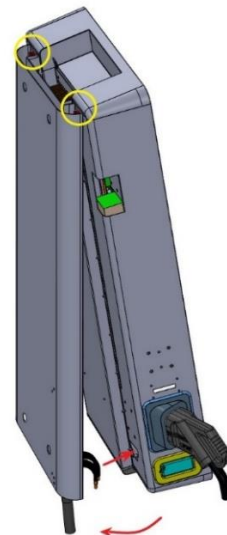
Please note that when lifting the device using a crane hook, only the specially provided crane plate (can be ordered as an option or is included in the scope of delivery of the assembly crane) may be used!



Under no circumstances should crane lugs with a thread be inserted into the 4 threaded bolts, since the transverse forces and bending moments that occur during lifting can impair the tightness of the housing!



As soon as the HYC_50 hangs securely on the two upper locking bolts, the cables can be routed inside the unit.



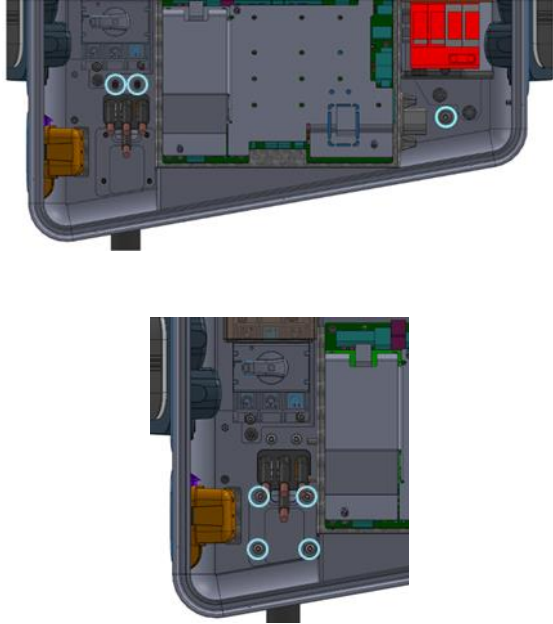
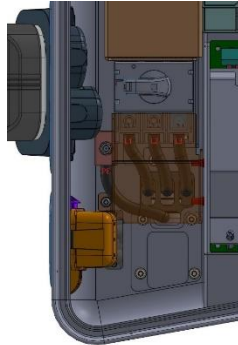
<p>Now the device only has to be fixed to the back plate at the marked points (TX20 and TX30). The M6x16 screw (TX30) on the right must be tightened with a sealing washer with a torque of 10 Nm. The two M4x16 screws (TX20) on the left must be tightened with a sealing washer with a torque of 4 Nm.</p> <p>It's crucial to mount the protection cover below the connection point of the three phases to the main switch (M4x16, Torque: 2,5 Nm).</p> <p>The three phases have to be connected to the main switch (Torque: 5,5 Nm) and the PE connection to the housing (Torque: 10 Nm).</p>	
<p>The mounting of the touch protection (Torque: 2 Nm) finishes the mounting process.</p>	

Table 7: Assembly steps HYC_60

4.2. Electrical installation

The dimensioning of the cables and the protective devices outside the HYC_50 must be carried out according to the local regulations and in compliance with the technical specifications of the HYC_50.

4.2.1. Circuit diagram HYC_50

Figure 22 shows the circuit diagram of the HYC_50.

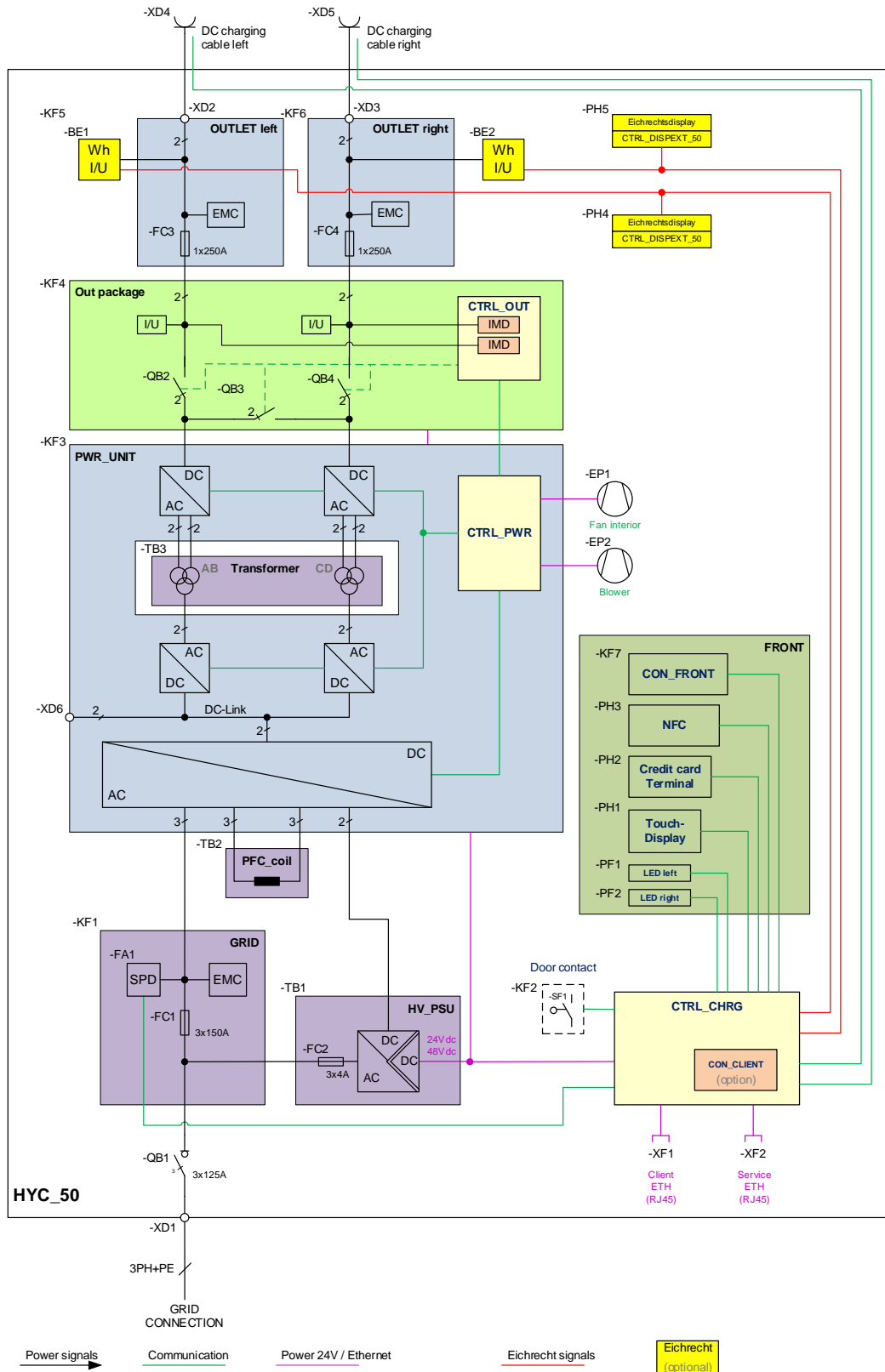


Figure 22: Circuit diagram of the HYC_50

4.2.2. Connecting the mains cables

The HYC_50 charging stations can be used in TT and TN-S, TN-C and TN-C-S type supply networks.

Attention



The necessary protective measures against electric shock and other country-specific requirements must be considered and implemented before commissioning the charging pole.



This product is designed for type A environments (interfering emissions), the immunity is equivalent to type A environments.



Depending on the mains voltage and the configuration of the HYC_50, a protective earth current of up to 30 mA may flow. This must be taken into account when designing the protective earthing and protective measures.



This product can cause a DC current $> 6 \text{ mA}$ in the protective conductor. Where a residual current-operated protective device (RCD) is used for protection against electrical shock, only an RCD of Type B or B+ is allowed on the supply side of this product. An $I_{\Delta N} = 100 \text{ mA}$ is recommended.



Any optionally connectable external signals may only be designed and connected as SELV signals.

After the HYC_50 has been mechanically installed (see Chapter 4.1), the mains cables can be screwed to the isolator at the input.

Recommended conductor cross-sections:

Model	Power supply connections	Conductor cross section
HYC_50	L1, L2, L3	1 x 25...50 mm ²
	PE (PEN)	1 x 25...50 mm ²

Table 8: Recommended cross-sections

Attention



The outer diameter of the connection cable must be in the range of 24 mm and 35 mm to ensure tightness at the cable entry seal.

Diameters larger than 35 mm cannot be mechanically accommodated.

4.2.3. Surge protection

The HYC_50 is equipped with a type 1+2+3 surge protection (3+1 circuit) as standard so that it is also suitable for a TT grid. This means that the charging pole can be installed in LPZ zone 0_A. The connection to a suitable earthing system, considering country-specific legal requirements, must be ensured.

4.3. Checks before switching on for the first time

Operation of the HYC_50 must be carried out in compliance with the test and inspection instructions described below. All instructions listed below are considered binding and must be carried out by the charging station operator before initial operation.

After transport and installation, check the following points:

Testing	Execution
Mechanical visual inspection	Mechanically sound condition of the installed unit.
Protection class	After connecting the cable connections, protection class IP55 must be ensured
Screw connections	Partial or complete check of tightening torques on terminals and mechanical screw connections.
Earthing system	Check the earthing, taking into account the site-specific conditions and the applicable standards.
Lightning protection for the supply cable	Check whether lightning protection is installed for the supply line in accordance with IEC 61439-2/-7 or country-specific requirements.
Selectivity	To ensure selectivity, make sure that series-connected overcurrent or residual current protective devices only trip the device that is located directly upstream of the fault location. The test shall be carried out on the basis of IEC 61439-2.
Operating conditions	Consideration of the operating conditions at the installation site (e.g. mechanical, chemical, corrosive stress) according to IEC 61439-2 /-7 as well as deviating country-specific standards.
Contact protection	Check whether the contact protection has been correctly mounted after the electrical installation has been completed.
Residual current device	Check whether a residual current circuit breaker outside the charging station is required for operation and, if so, whether it has been installed. The test must be carried out considering the site-specific conditions and the applicable standards.
Short-circuit resistance	Rated current and short-circuit strength of the main busbar system considering the upstream protective device according to IEC 61439-2 /-7
Automatic power supply cut-off	The requirements of IEC 60364-4-41, section 411 must be fulfilled.
Low-voltage electrical installations	The requirements of IEC 60364-7-722 must be fulfilled.

Table 9: Checks before commissioning

4.4. Commissioning

For the safe operation of the charging station, correct commissioning and the inspection of the safety devices are required.

All the points listed below are considered mandatory and must be carried out by the operator of the hypercharger (or the contracted installation company) **at the moment of commissioning**. Depending on the individual operating conditions of the hypercharger, further checks may be required. Therefore, the following list should not be considered as complete.

Commissioning checks	Description
External visual inspection	<ul style="list-style-type: none"> Housing condition IP degree of protection (IP55) Stability Accessibility
Inspection of charging cable and plug device	Inspect all cable components (cable sleeve, cable, cable connector, mating face, pins) to ensure they are not damaged (e.g. cable sheath is intact, no crimping or cracking, pins are not damaged, etc.)
Inspect threaded connection for input power cable	<ul style="list-style-type: none"> Visual inspection to ensure that the threaded connections for the input power cable are tight
Inspection of screws	<ul style="list-style-type: none"> Visual spot check of internal screw connections Spot check of tightening torques
Cleanliness inspection	Check level of cleanliness within the charging station
Condensation inspection	Check for the presence of condensation traces within the charging station
Inspection of filter mats	Inspection for sound condition
Check of protective measures	<ul style="list-style-type: none"> Visual inspection of the earthing system Test for earthing resistance Test for continuity of equipotential bonding connections
Supply line inspections	<ul style="list-style-type: none"> Test of the insulation resistance at the main switch (line-side) Information about the existing protective device Inspection of the fuse protection
Inspection of insulation resistances at DC charging outlets	Test of the insulation resistance of the pins for every existing DC charging outlet
Inspection of RFID reader	Function test of RFID reader
Test connectivity SIM cards	<ul style="list-style-type: none"> Check the connection to the alpitronic backend Check the connection to the customer backend
Inspection of the display elements	<ul style="list-style-type: none"> Touch screen function test Function test of screen display and, if necessary, touch screen for the credit card terminal
Inspection of LED strips	<ul style="list-style-type: none"> Function test of LED strips on the front
Material testing / inspection of components pertaining to calibration law (if present, for details see calibration law annex)	<ul style="list-style-type: none"> Nameplate Wiring pertaining to calibration law Adhesive seal Remote display units pertaining to calibration law

Table 10: Inspections to be carried out upon commissioning

Attention



Observe all hazard warnings in chapter 1



In order to be able to benefit from the contractually stipulated warranty period, the corresponding commissioning protocol incl. photo documentation must be completed and sent to support@hypercharger.it.



The warranty claim may expire if installation & commissioning are not carried out properly.

Remark



The commissioning protocol is available on the document platform "hyperdoc".

5. Diagnosis and parameterization

After successful mechanical and electrical installation of the HYC_50, the correct function of the device can be checked with a diagnostic and parameterization tool. The diagnostic web interface can be loaded via any browser with a standard IP address, see Table 11:

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

Table 11: Default IP address of the HYC_50

More information about the user interface is given in the software part of the HYC_50 operating and installation manual.

6. Operation of the HYC_50

6.1. Starting the charging process

6.1.1. Authentication

To be able to start a loading process, you must first authenticate yourself.

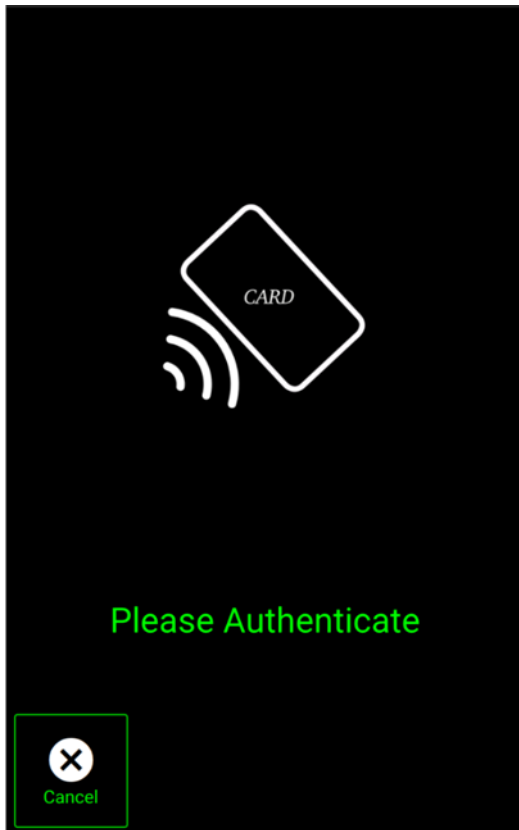


Figure 23: Authentication

There are several ways to authenticate yourself at the charging station:

Directly at the charging station:

- NFC¹ card: Hold your user card against the RFID reader, which is located to the left of the screen ("contactless" symbol). If the charging station has a credit card terminal, the RFID reader is located to the left of the screen (see Figure 8).
- Giro-e: If the operator supports this option, you can authenticate yourself by holding your Giro-e card up to the RFID reader.
- Credit card: If a credit card terminal is available, you can authenticate via credit card by holding it up to the credit card reader below the screen.

¹ NFC = "Near Field Communication"

About the backend system:

- **Backend:** The backend system interacts with the connected charging station via the "Remote Start Transaction", which is regulated by the OCPP protocol. This can be used to start and stop charging processes, among other things.
- **App:** If provided by the operator, start the operator app that is connected to the charging pole via the backend system and follow the instructions on your smart device.

About the vehicle:

- **Auto charge:** If the operator offers this option, authentication can also take place directly via the vehicle in the form of "auto charge". In this case, the vehicle is identified via the (VID² /EVCCID³) as soon as the connection has been established via the charging cable.
- **Plug & Charge:** Insert the charging plug into the vehicle. As soon as the vehicle is connected, it automatically authenticates itself on behalf of the driver at the charging station (using EMAID⁴), among other things, by sending a digital certificate to the back end.

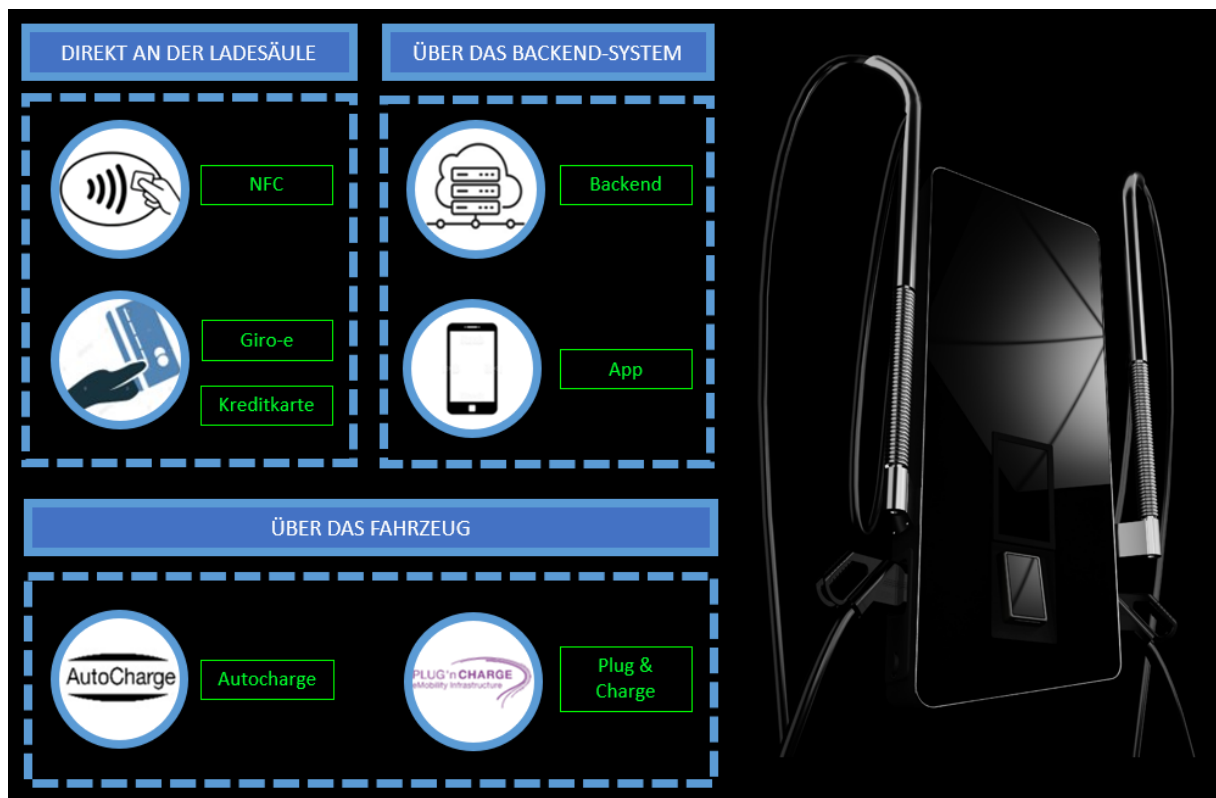


Figure 24: Overview of the authentication options

² VID = "Vehicle Identification Device"

³ EVCCID = "Electric Vehicle Communication Controller Identifier"

⁴ EMAID = "E-Mobility Identifier Account"

The following display appears during the authentication process:

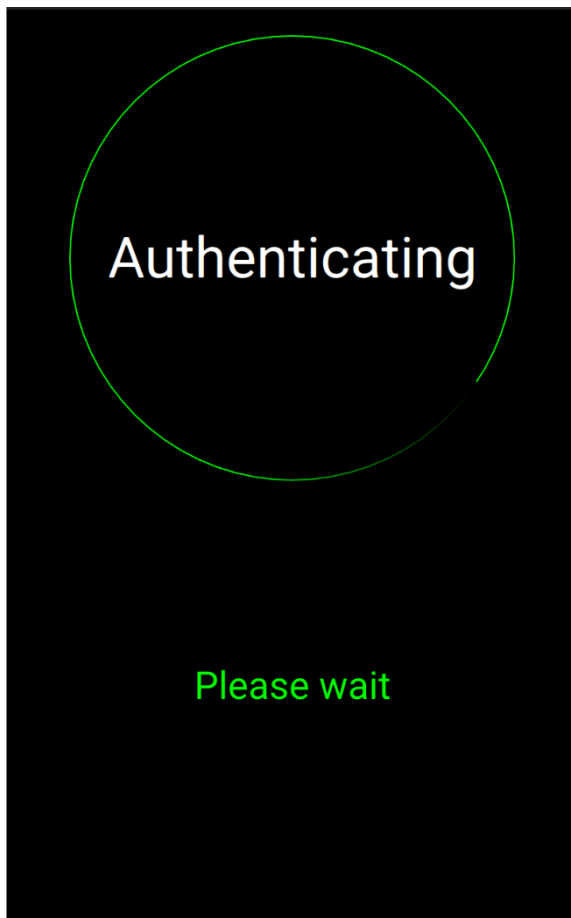


Figure 25: Authentication process

Information



Detailed user guidance for the entire charging process is displayed directly on the charging pole screen depending on the selected authentication medium and charging cable. An overview of the user guidance per authentication option can be found in Figure 26.



If the charging station is running in kiosk mode, no authentication is required. In this case you can directly start a new session by pressing the button below the "New Session" text on the screen.

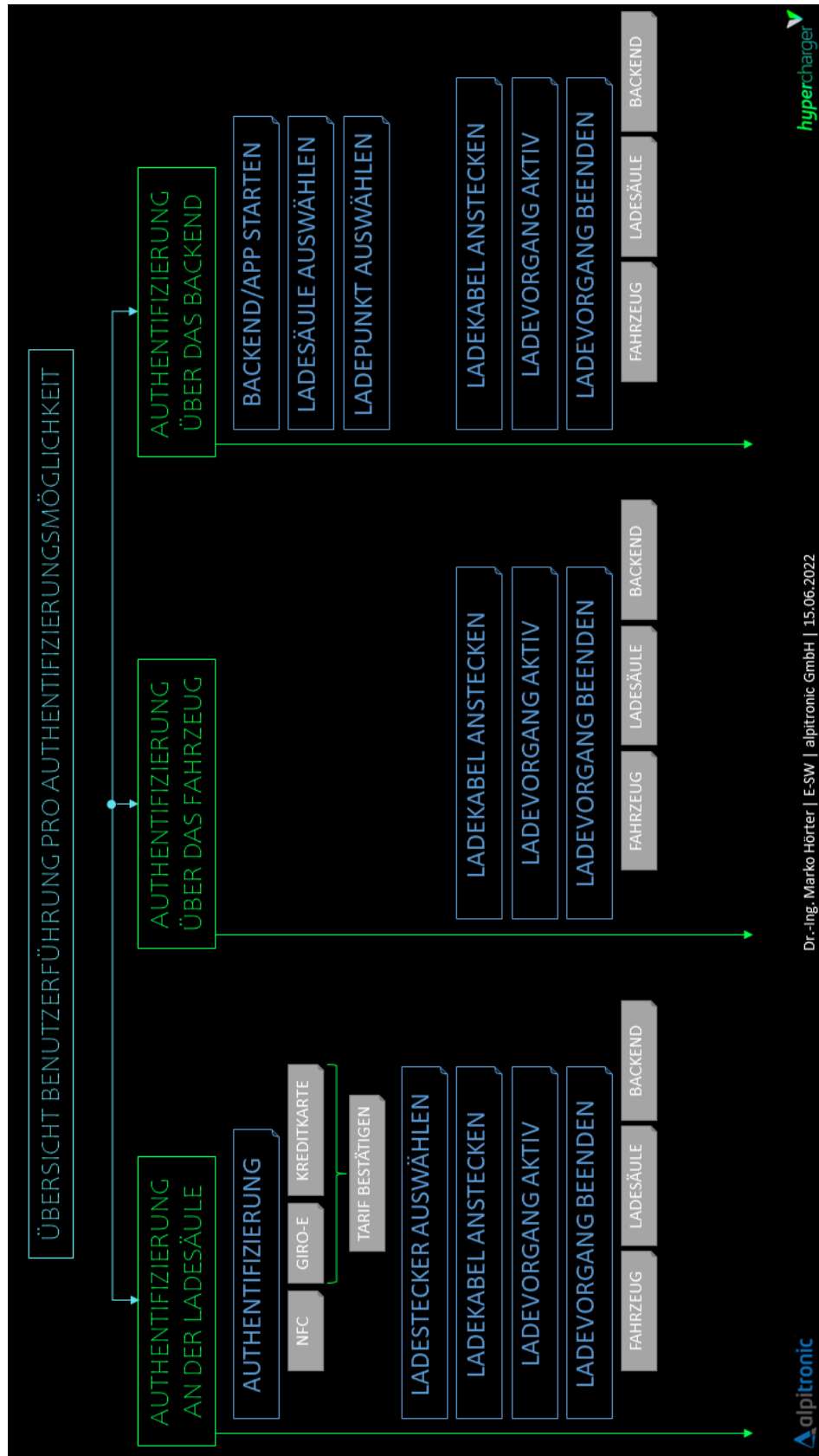


Figure 26: Overview user guide per authentication option

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6.1.2. Charging plug selection

Now select the charging plug with which you want to charge your vehicle. Navigation is performed by touching the respective controls on the touchscreen.

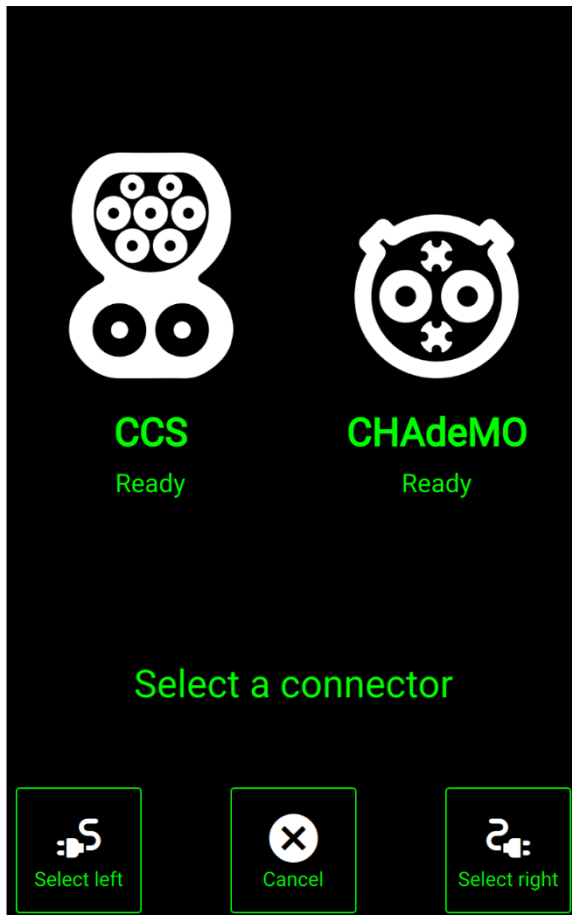


Figure 27: Charging plug selection

Information



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



When the connectors are free, the corresponding LED strips light up green.



To access the language selection, press the screen at the very bottom in the middle.



Figure 28: Language selection

6.1.3. Plugging in the charging cable

After you have selected the type of charging cable, the display will prompt you to plug the corresponding charging cable into the designated socket on your vehicle.

Information



The corresponding LED strip flashes blue as soon as the charging cable can be plugged in. As soon as the charging process has started, it stops flashing and remains solid blue.

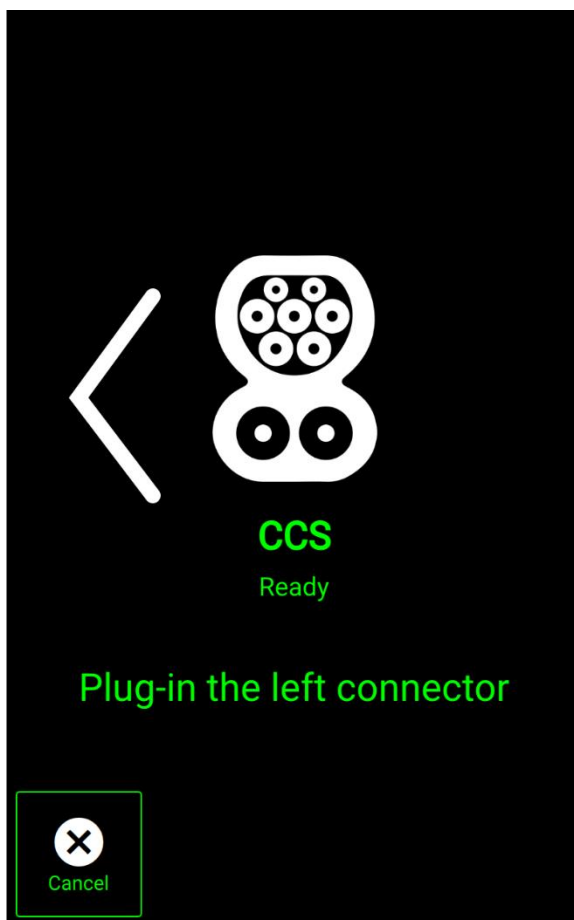


Figure 29: Plugging in the charging cable

Information



For CHAdeMO cables, make sure that they lock correctly.

While the charging station is connecting to your vehicle, the following display appears:

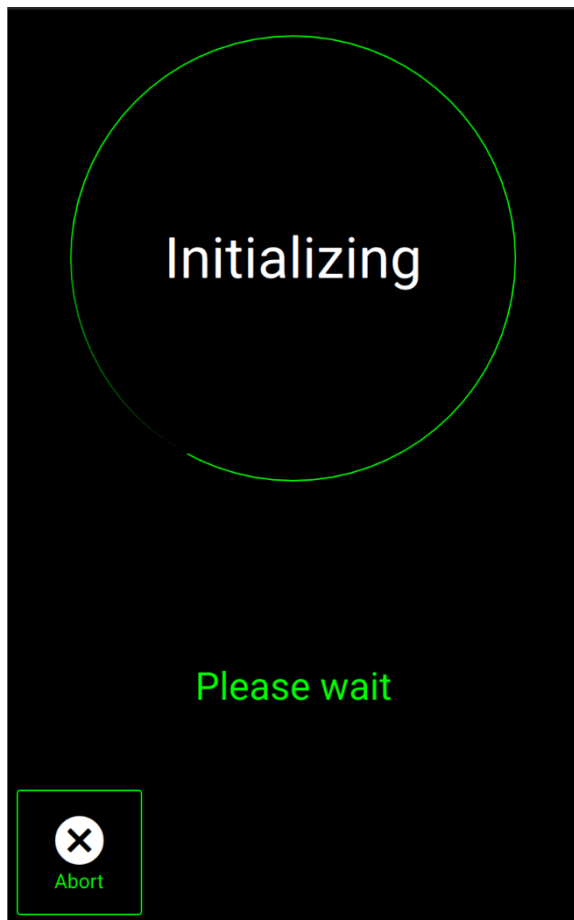


Figure 30: Initializing

6.2. During the charging process

6.2.1. Charging overview

Now an overview of the active loading process appears, which displays the following information:

- Current state of charge (in % and kW)
- Voltage (V)
- Charging current (A)
- Already charged energy (kWh)
- Charging time (hh:mm:ss)

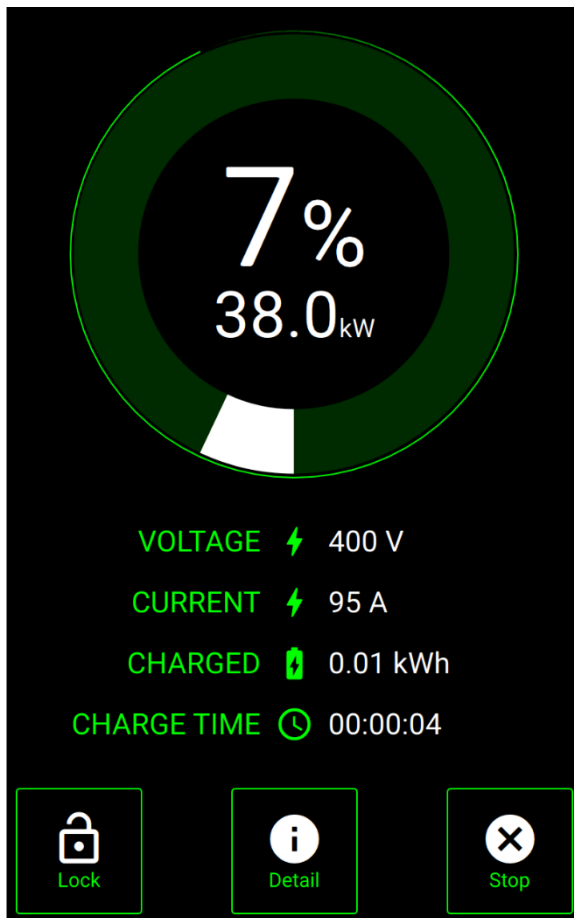


Figure 31: Overview of charging process

If you select the "Lock" menu item, the display is locked.

If you want to get additional information about the charging process, tap on the menu item "Details", an overview including charging curve will appear in the following.

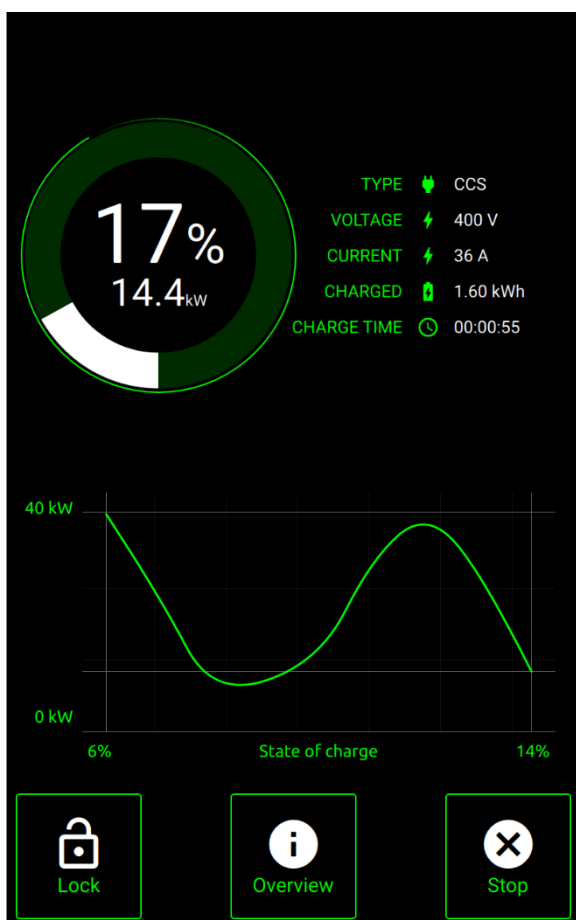


Figure 32: Detailed loading overview

Information



Note that the display information may vary from operator to operator. Certain charging station operators hide this information. In this case, the charging status can be checked in the vehicle.

It is possible to charge two vehicles at the same time. If a vehicle is already charging, you can select the free charging cable after you have successfully authenticated yourself.

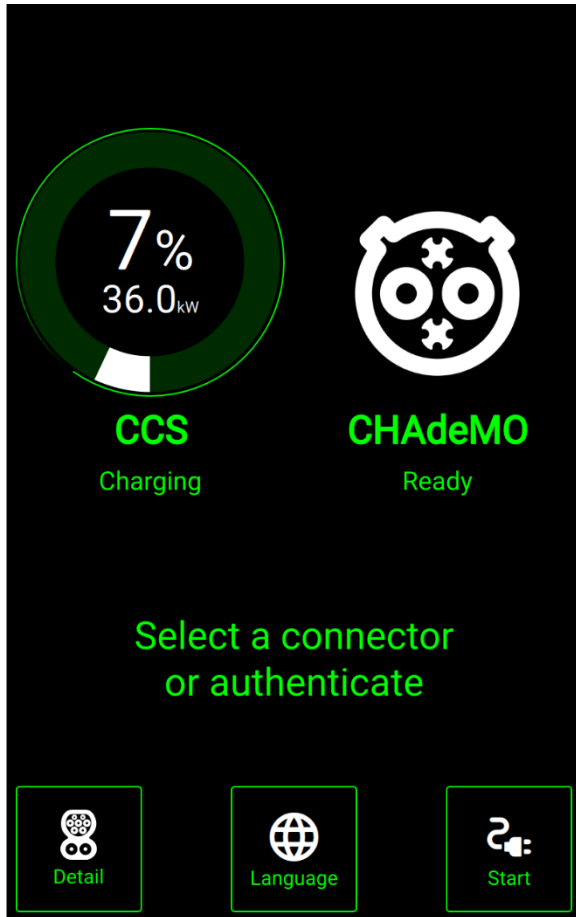


Figure 33: Load second vehicle

As soon as both vehicles are charging in parallel, the following overview appears:

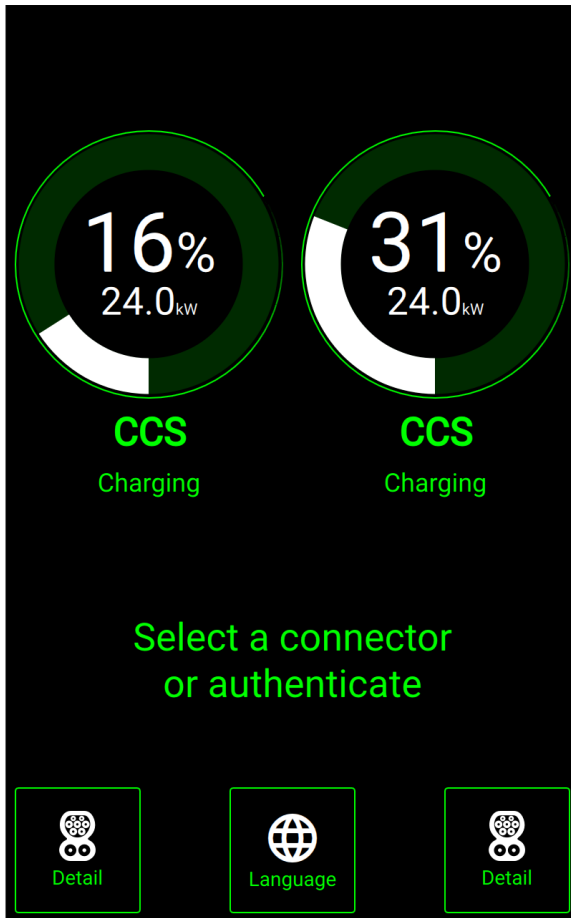


Figure 34: Charging overview with two active charging processes

To access the respective loading overview, click on the corresponding "Details" menu item.

6.3. Stop charging process

6.3.1. Wake screen

After a certain time, the screen saver activates. To return to the loading overview, tap the touchscreen.

6.3.2. Stop charging

In the lower section of the charging overview, you have the option of stopping the charging process at any time by pressing "Stop".

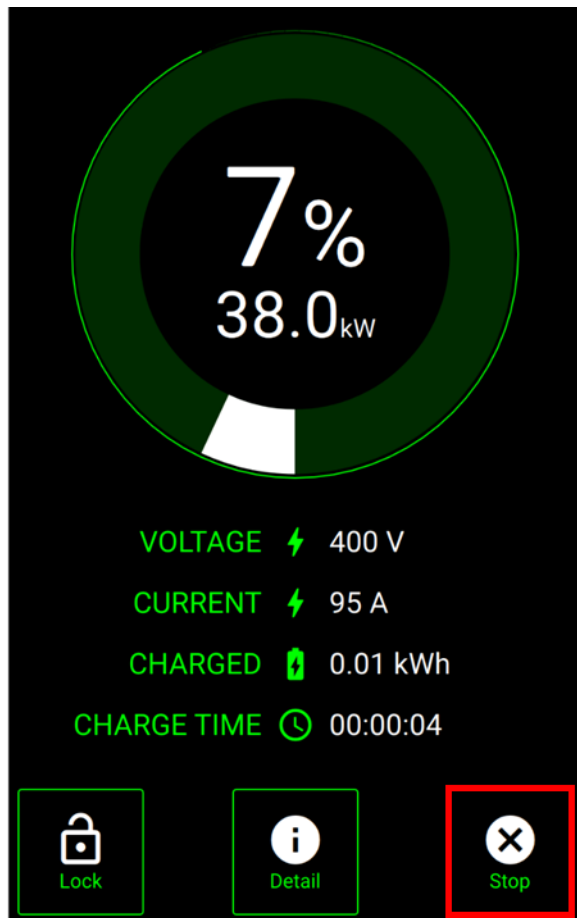


Figure 35: Stop charging

You must authenticate yourself again to cancel the charge.

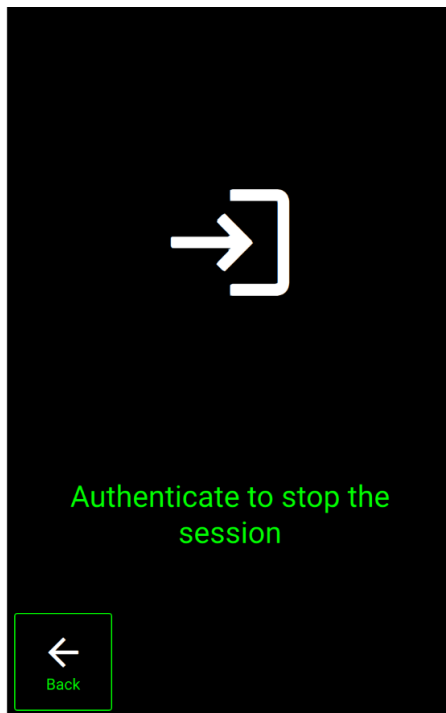


Figure 36: Authentication to stop charging process

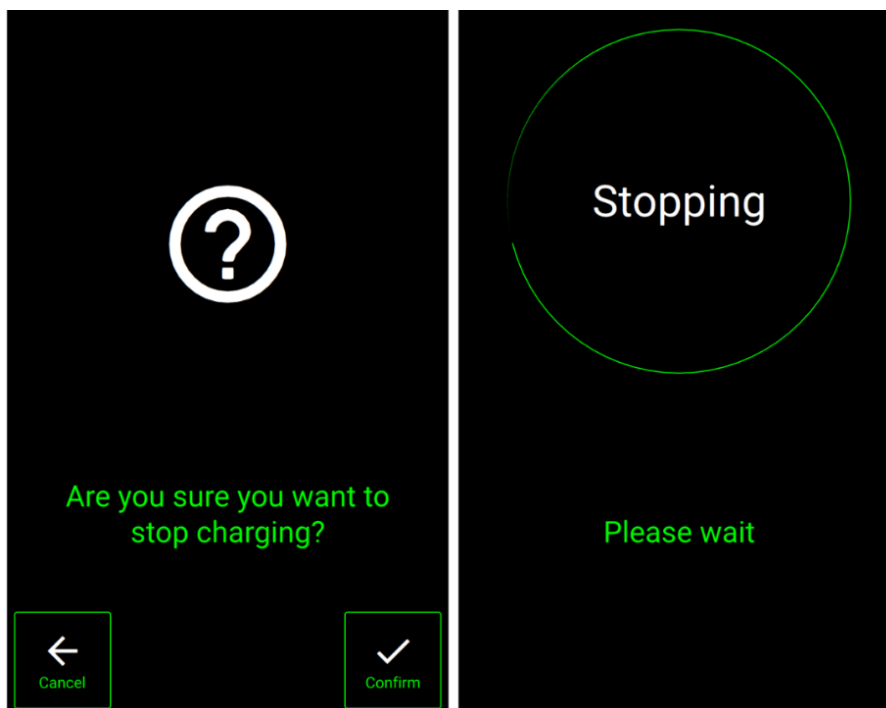


Figure 37: Process charging stop

Once you are authorized to stop charging, you will be prompted to unplug the charging cable from the vehicle. Plug it back in properly to the charging station's designated cable holder.

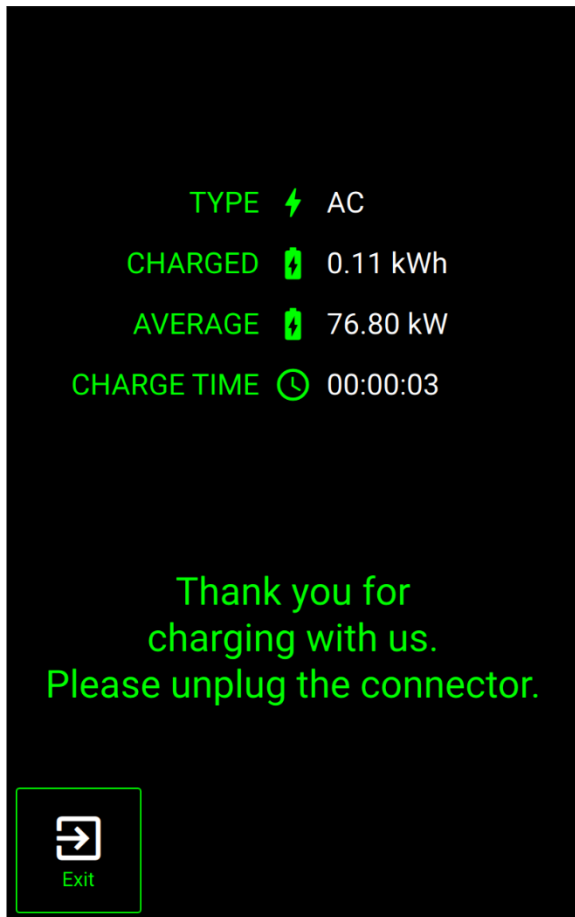


Figure 38: Unplug the charging connector

6.4 Procedure for error messages

6.4.1 Authentication failed

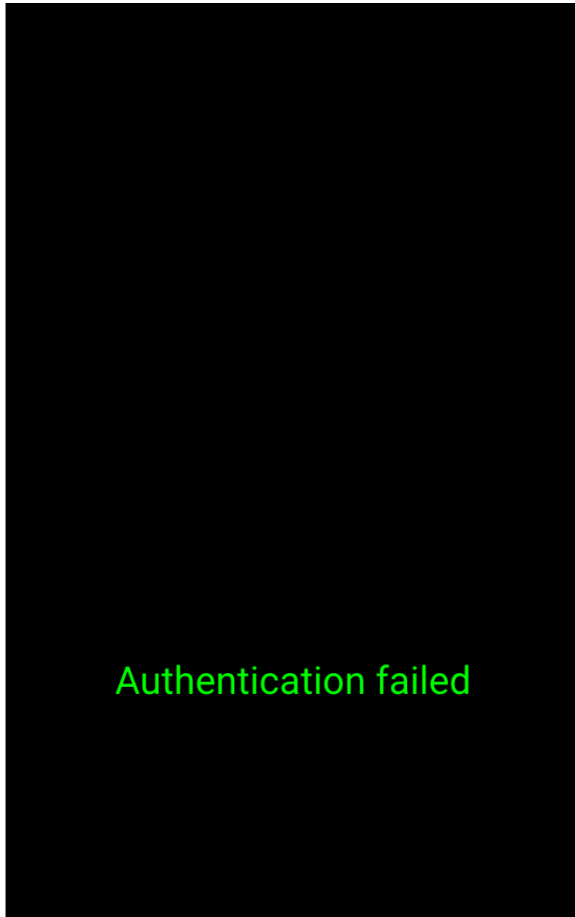


Figure 39: Authentication failed

If this error message appears, try the authentication process again.

6.4.2 Charging plug defective

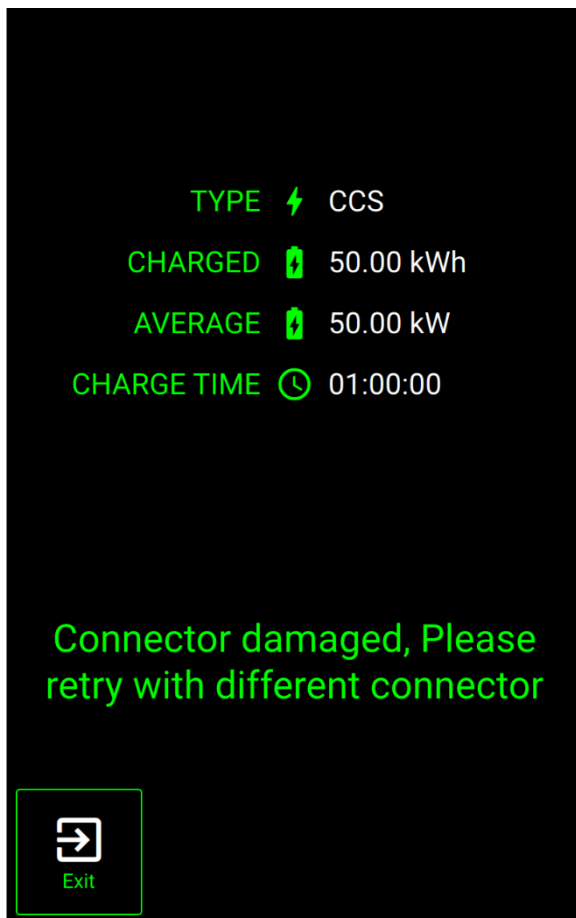


Figure 40: Charging plug defective

When this message appears, the operator has already been informed about the defect and will rectify the fault as soon as possible. In the meantime, switch to another charging plug if possible.

6.4.3 Error during communication setup

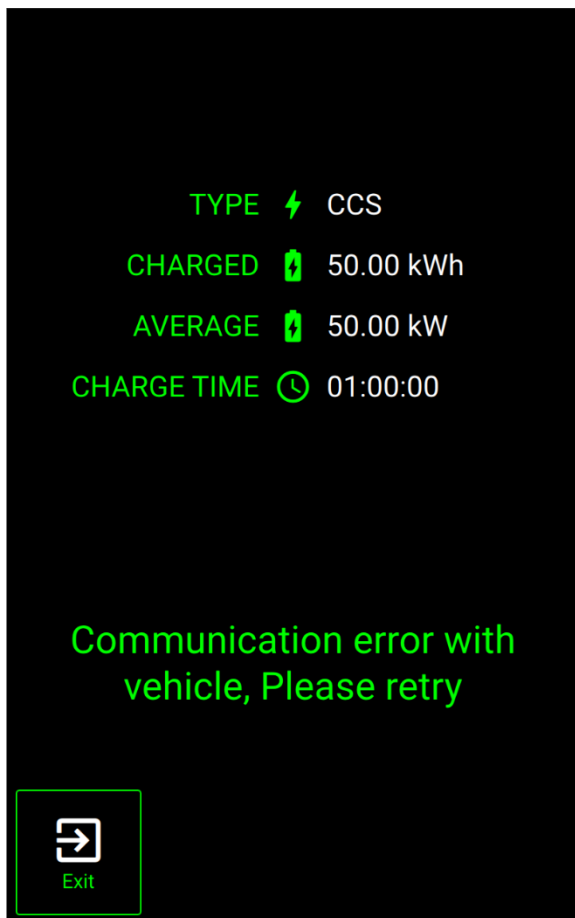


Figure 41: Error during communication setup

When this error message appears, the vehicle was unable to connect to the charging pole. Try to start a charging process again. If this does not work, try driving the vehicle a few meters forwards and backwards to reset the charging technology and wake it up from a possible standby.

6.4.4 Connector locking failed

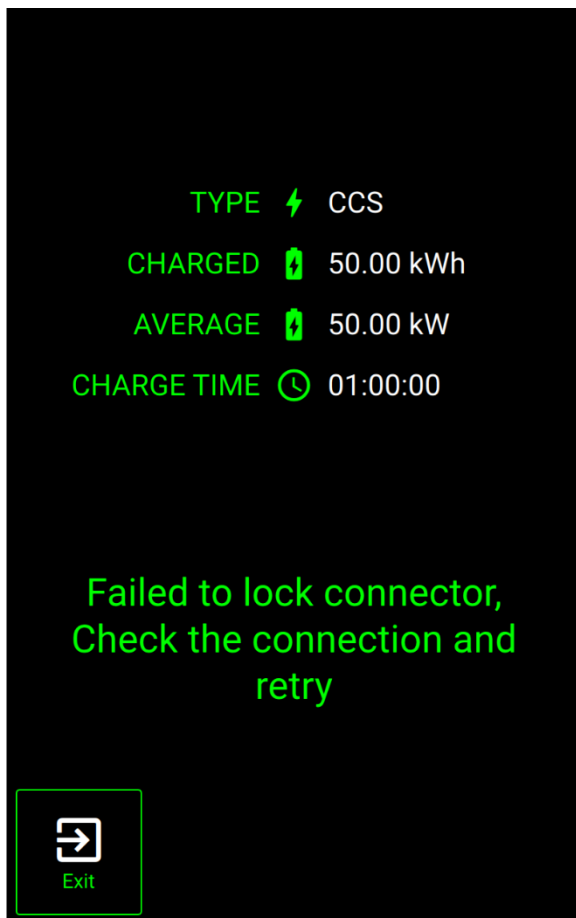


Figure 42: Connector locking failed

When this message appears, the connector could not be locked correctly. In this case, the plug could not be locked correctly. Hold the cable to the socket with your hand until you hear the locking mechanism of the car and the charging process is started.

6.4.5 The vehicle signals an error

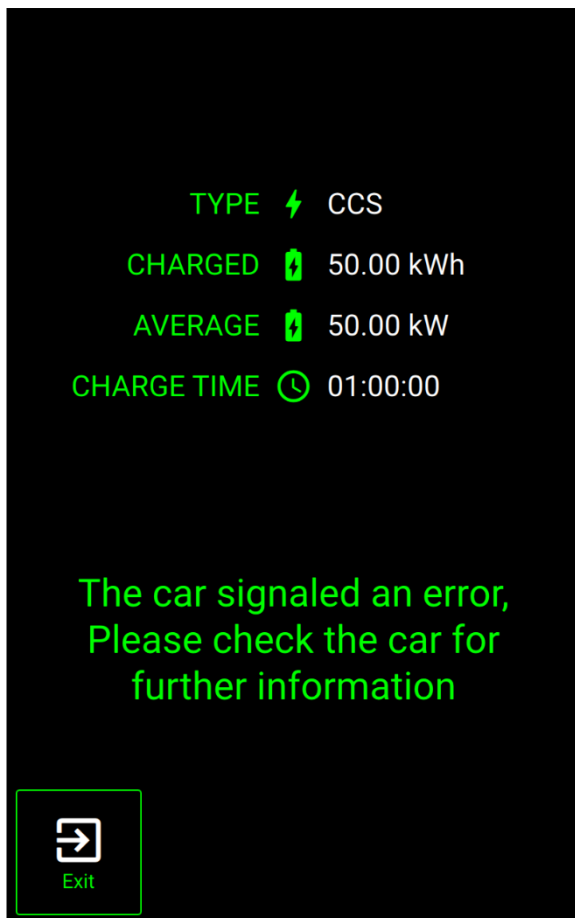


Figure 43: Vehicle error

If this message appears, the car signals a charging error. Try to start a charging process again. If this does not work, try driving the car a few meters forwards and backwards to wake it up from a possible standby.

Information



If you have any further questions or problems, please contact the column operator!

7. Fault description and correction

Attention



Observe all hazard warnings in chapter 1

Failure description	Possible cause	Troubleshooting
The display remains black	No power supply	Switch on the circuit breaker
The power level cannot be switched on	The circuit breaker (-QB1) is switched off	Switch on the circuit breaker
No communication to the backend	No connection via Ethernet or mobile network	Check the connection of the Ethernet network (-XF2). Start the charging station in diagnostic mode and use the diagnostic tool for further fault localisation.
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 fault localisation.

Table 12: Fault description and correction

8. Maintenance

For the safe operation of the charging station, regular maintenance or inspection of the safety equipment is required.

All the points listed below are considered mandatory and must be carried out by the operator of the hypercharger **on an annual basis**. Depending on the individual operating conditions of the hypercharger, further checks may be required. Therefore, the following list should not be considered as complete.

Maintenance work	Description
External visual inspection	<ul style="list-style-type: none"> Housing condition IP degree of protection (IP55) Stability Accessibility Credit card terminal (if available)
Inspection of charging cable and plug device	Inspect all cable components (cable sleeve, cable, cable connector, mating face, pins) to ensure they are not damaged (e.g. cable sheath is intact, no crimping or cracking, pins are not damaged, etc.)
Inspect threaded connection for input power cable	<ul style="list-style-type: none"> Visual inspection to ensure that the threaded connections for the input power cable are tight
Inspection of screws	<ul style="list-style-type: none"> Visual spot check of internal screw connections Spot check of tightening torques
Cleanliness inspection	Check level of cleanliness within the charging station
Condensation inspection	Check for the presence of condensation traces within the charging station
Inspection and replacement of filter mats if necessary	Inspection for sound condition and contamination
Check of protective measures	<ul style="list-style-type: none"> Visual inspection of the earthing system Test for earthing resistance Test for continuity of equipotential bonding connections
Supply line inspections (only if there is no IBN protocol in place)	<ul style="list-style-type: none"> Test of the insulation resistance at the main switch (line-side) Information about the existing protective device Check that the unaffected short circuit current I_{CP} at the charging station is limited to 25 kA (rms)
Inspection of insulation resistances at DC charging outlets	Test of the insulation resistance of the pins for every existing DC charging outlet
Inspection of overvoltage protection	Inspection of the optical defect display of the overvoltage protection
Inspection of the main switch	Functional test of the main switch QB1
Inspection of RFID reader	Function test of RFID reader
Test connectivity SIM cards	<ul style="list-style-type: none"> Check the connection to the alpitronic backend Check the connection to the customer backend
Inspection of display elements	<ul style="list-style-type: none"> Function test of screen display + touch screen Function test of screen display and, if necessary, touch screen for the credit card terminal (where available)
Inspection of LED strips	<ul style="list-style-type: none"> Function test of LED strips on the front

Material testing / inspection of components pertaining to calibration law (if present, for details see calibration law annex)	<ul style="list-style-type: none"> • Nameplate • Wiring pertaining to calibration law • Adhesive seal • Remote display units pertaining to calibration law • Recalibration of measuring instruments that conform to calibration law • If required, functional tests including accuracy tests
---	--

Table 13: Maintenance to be performed

Attention



Observe all hazard warnings in chapter 1



In order to be able to benefit from the contractually stipulated warranty period, the corresponding maintenance protocol incl. photo documentation must be completed and sent to support@hypercharger.it.



The warranty claim may expire if the annual maintenance is not carried out properly.

Remark



The maintenance protocol is available on the document platform "hyperdoc".

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 1961 333



Observe all hazard warnings in chapter 1



When the door is opened as far as it will go, make sure that no major forces act on the mechanical stop in order to avoid the damaging (bending) of the door hinges. In such a case, it must be checked whether the tightness of the door is still guaranteed.

Information



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 1961 333 or write an email 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.

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

Information



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

11. Technical data

General technical data and operating conditions:

Parameter	Nominal value
Protection class	IP55
Mounting location	Indoor and Outdoor
Humidity range for operation or storage	0...95 % rel. (non-misting)
Humidity range for operation	0...95 % rel.
Pollution degree	4
Storage temperature range	-40 °C ... +55 °C
Operating temperature range	-30 °C ... +40 °C (+55 °C with derating)
Mechanical impact resistance (IEC62262)	IK10
Mounting type	Wallmount or Stand
Accessibility	Without restrictions
Installation height	up to a maximum of 4,000 m.a.s.l.
Protection class	Class I (protective grounding)
Supported charging modes	Mode 4
Max. Air flow rate HYC_50	420 m³/h
Mechanical environmental conditions	M1
Electromechanical environmental conditions	E2
Accuracy class	A
Minimum order quantity	100 Wh

Table 14: Technical data

Type	Width [mm]	Hight [mm]	Depth [mm]	Weight [kg]
HYC_50	520	1300	220	95 ... 145 kg

Table 15: Mechanical Data

Electrical connection data HYC_50

Parameter	Nominal value
Operating voltage U_r	3x 220/230/277 (380/400/480) Vac +PE (+10%...-15%), see type plate
Mains type	TN-C, TN-S, TN-C-S, TT
Frequency	50/60 Hz ($\pm 5\%$)
Rated current I_r	90 A
Efficiency	95 % @ P_r (worst case)
Max. Backup-fuse / circuit breaker to be used (mandatory)	fuse 125 A gG (gL) circuit breaker 125 A (Type B or C)
Max. connection cross-section	50 mm² (see note in Table 7)
Permissible outer diameter of the supply line	24...35 mm
Max. rated peak withstand current I_{cp}	25 kA (rms)
Rated short-time withstand current I_{cw}	1,4 kA (rms) @1s
Contribution to the short-circuit current	I_r

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Overvoltage category	OVC III
Integrated surge protection (SPD)	Type 1+2+3

Table 16: Electrical connection data HYC_50

Standby power consumption

Type	Performance level	Display brightness	Power [W]
HYC_50	STANDBY	7/10	24.7
		10/10	27.0

Table 17: Idle power dissipation at 400V according to the display brightness

Wireless connections

The radio modem of the HYC_50 supports the following frequency bands:

Frequency band	Transmission level (max. rated 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 18: Frequency bands and transmission levels of the HYC_50

Attention



Observe all hazard warnings in chapter 1



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



Dangerous residual voltages

After disconnecting the HYC_50 from the power supply, the discharge time for hazardous voltages of 5 min must be observed before removing the touch guard in the device.



This product can cause a DC fault current $> 6 \text{ mA}$ in the protective conductor. Where a residual current-operated protective device (RCD) is used for protection against electrical shock, only an RCD of Type B or B+ is allowed on the supply side of this product.
An $I_{\Delta N} = 100 \text{ mA}$ is recommended.



During operation, increased temperatures are to be expected at the air outlets