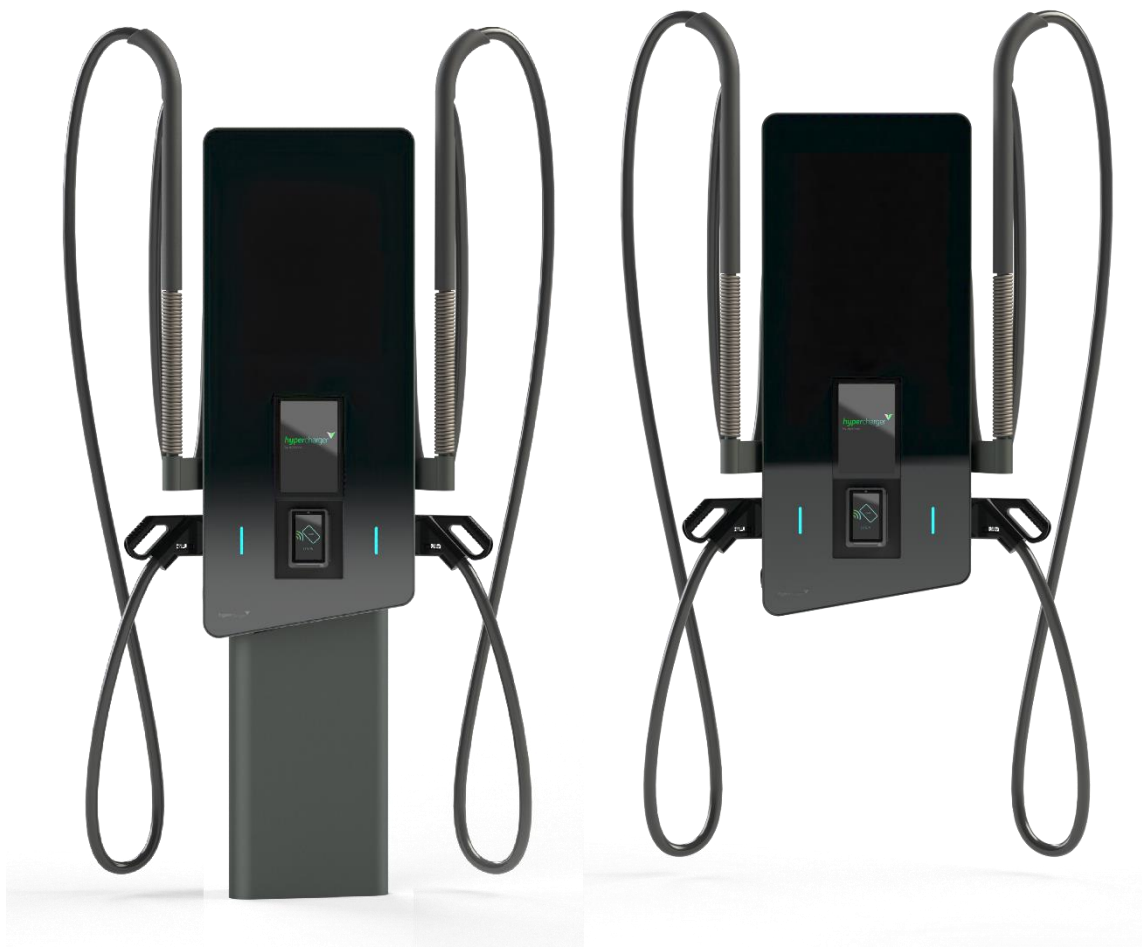




Operating and Installation Guide Hardware hypercharger HYC_50 (50 kW) Fast charging system for electric vehicles for HW-Version 5.6



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HYC_50 Operating and installation instructions

Version

Version 1-2 the operating and installation instructions, September 2022

English original document

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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 GmbH or have not been authorized and released by alpitronic GmbH, the person concerned is considered the manufacturer of the switchgear combination and not alpitronic GmbH.



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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Version history

Version	Date	Author	Description
1-1A	December 2021	Ch. Leimegger	First version
1-2	September 2022	Ch. Leimegger Dr.-Ing. M. Hörter M. Hofer A. Benetti	Extensive. Additions and adjustments

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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 8 and Figure 9). 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 and Figure 2 show the HYC_50 which can be equipped with one or two DC charging cables.

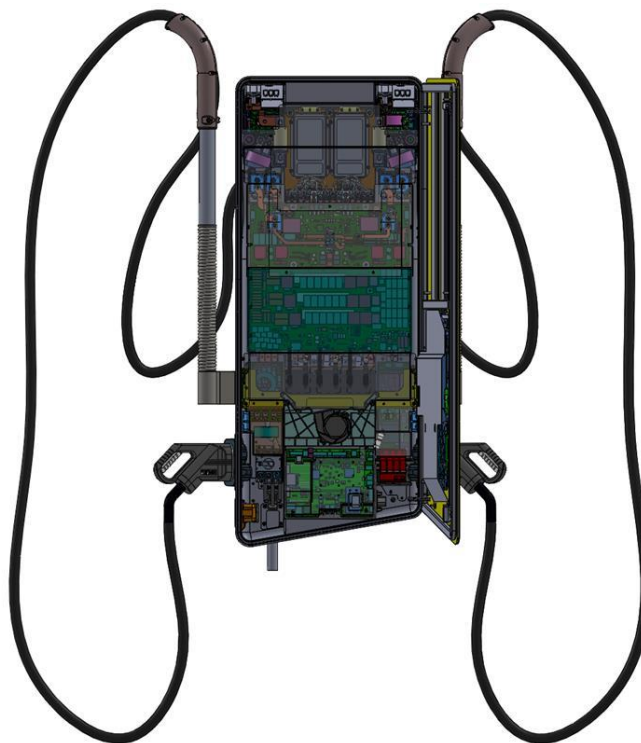


Figure 1: HYC_50 with open front door (Example with two DC charging cables)

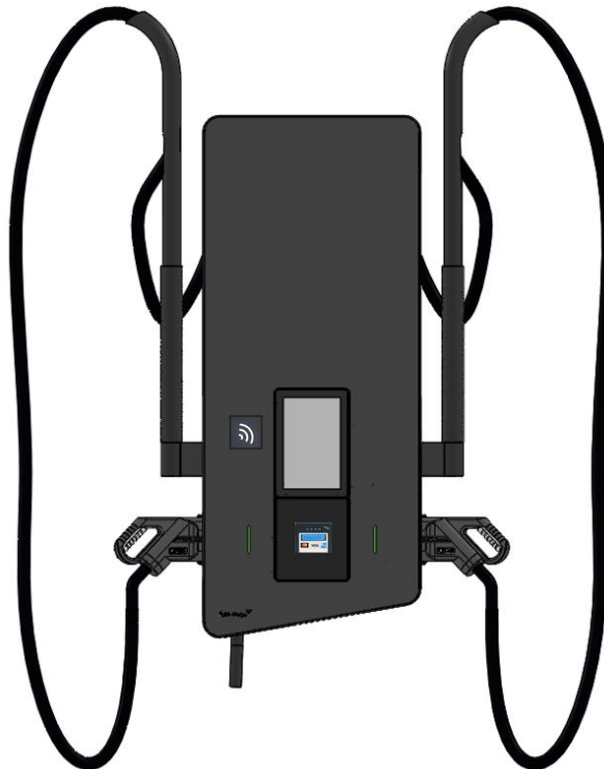


Figure 2: HYC_50 with two DC charging cables

The various possibilities and options for DC charging are described in chapters 2.1 and 0 describe.

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 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 3 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).

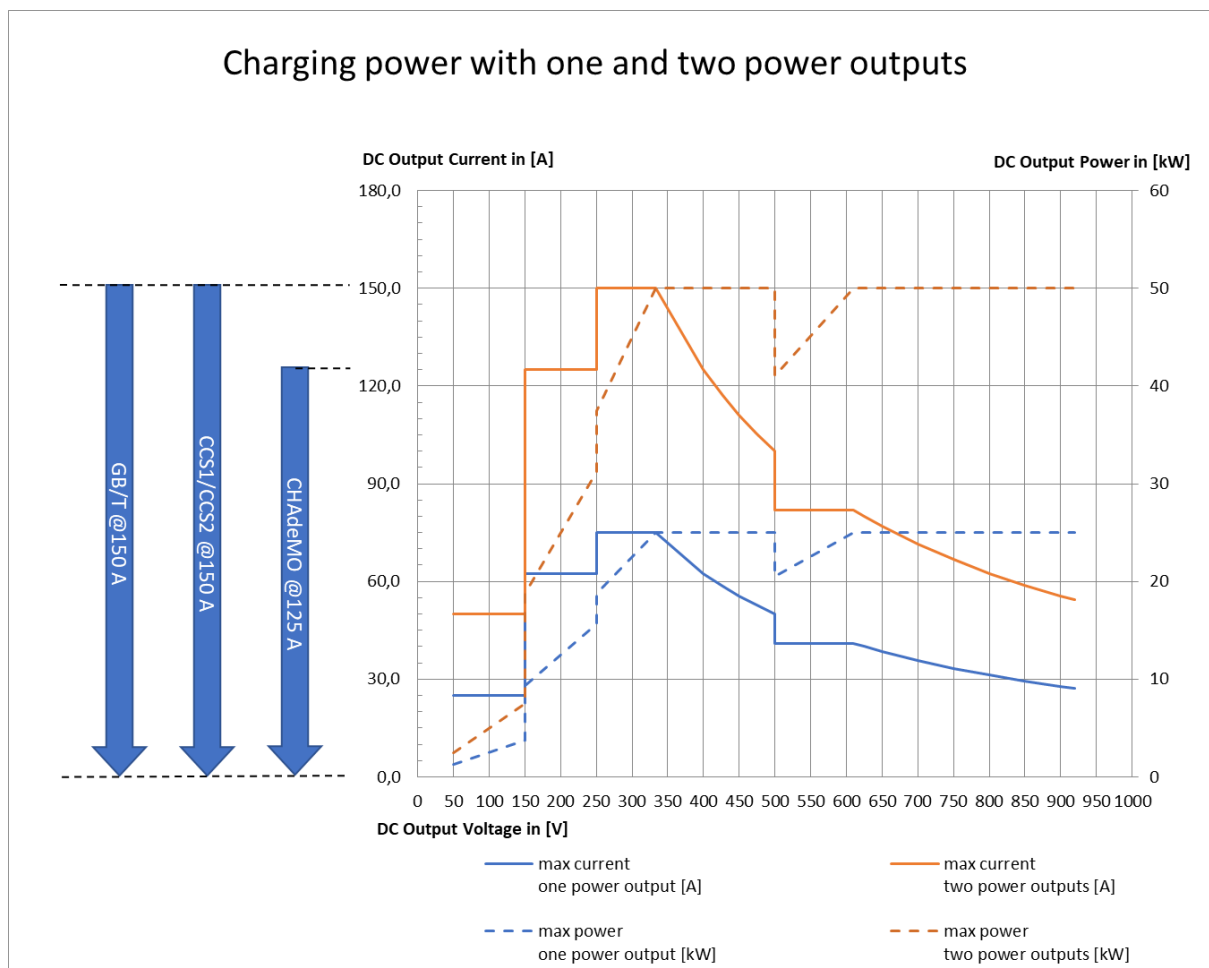



Figure 3: DC power characteristics in different configurations

2.3. Type plate

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

Typ	HYC_50	
Baujahr	2022	
HW-Revision	5.6	
Max. Gewicht (kg)	95	
Schutzart	IP55	
Netzspannung (V)	3x 230 (400)	
Frequenz (Hz)	50-60	
Max. Eingangsstrom (A)	90	
Ladeschnittstelle	CCS2	CHAdeMO
Min. Max. Ladestrom (A)	6,5 150	6,5 125
Min. Max. Ladespannung (V)	150 1000	150 500
Temperaturbereich (°C)	-30 bis +40 (bis +55 mit Derating)	

SN: 100123456



IEC 61439-7

hypercharger by alpitronic




CE UKCA    Made in Italy
alpitronic Srl
Via di Mezzi ai Piani 33
I-39100 Bolzano

Figure 4: Example of a type of plate without calibration conformity for HYC_50

2.4. Exterior view

The following figure 5 shows the various elements of the unit from the outside.

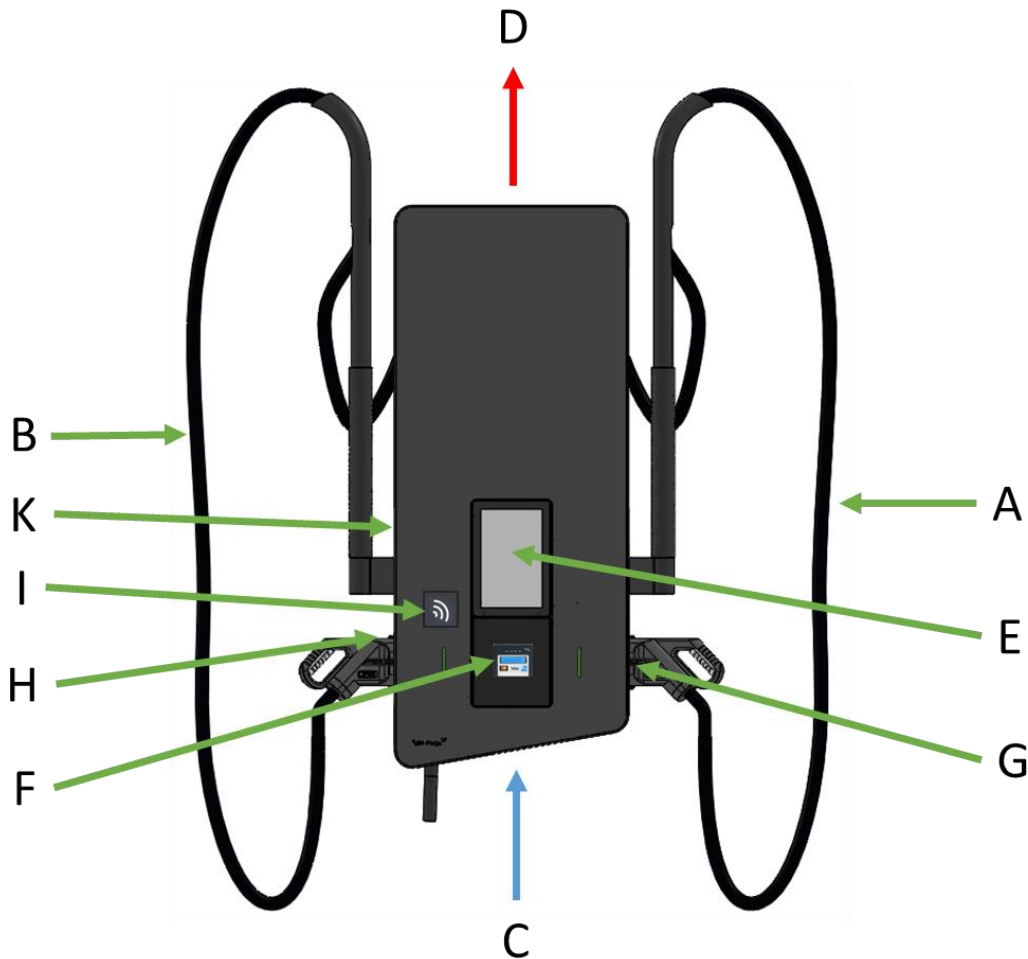


Figure 5: Elements of the HYC_50

- 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 6) is the one for alpitronic support, the customer locking cylinder is on the left (empty on delivery).

Steps to open the inlet:

- turn the key 90° in the direction shown in Figure 6
- 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 6: Locking lid of the HYC_50

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

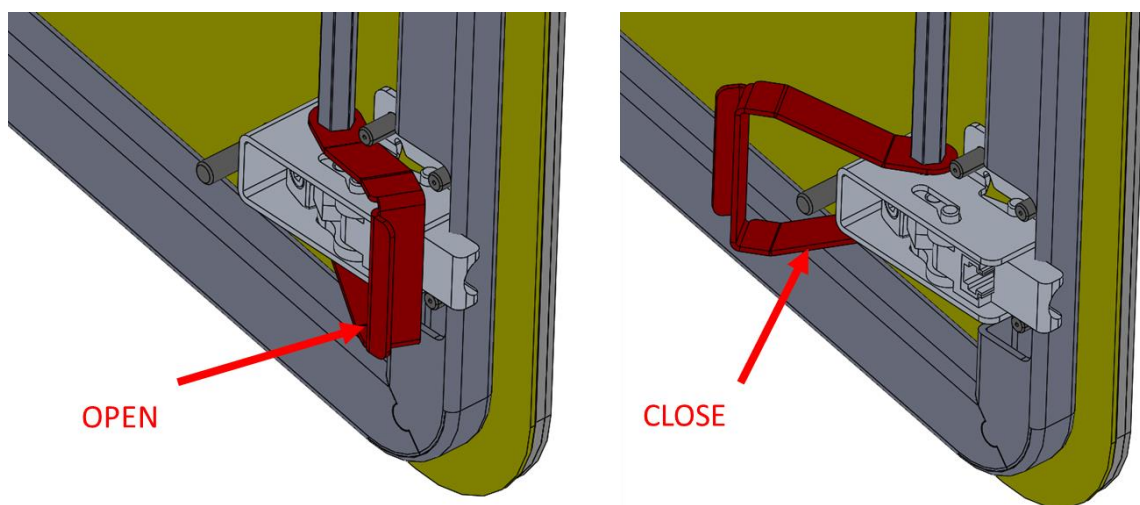


Figure 7: Front door locking mechanism

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 8 shows the interior view of the HYC_50. Figure 9 shows the interior view of the front door.

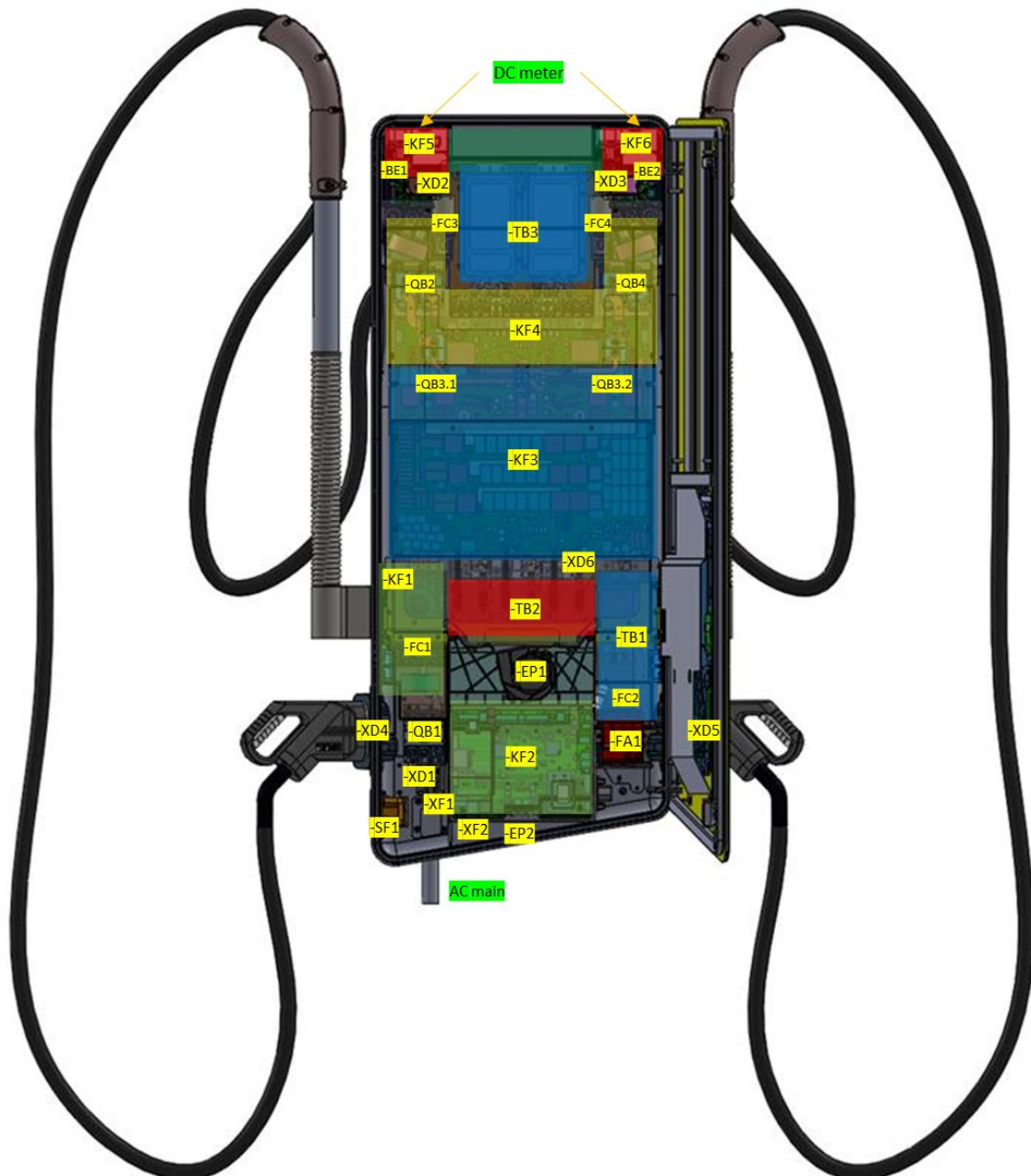


Figure 8: Interior view of the HYC_50

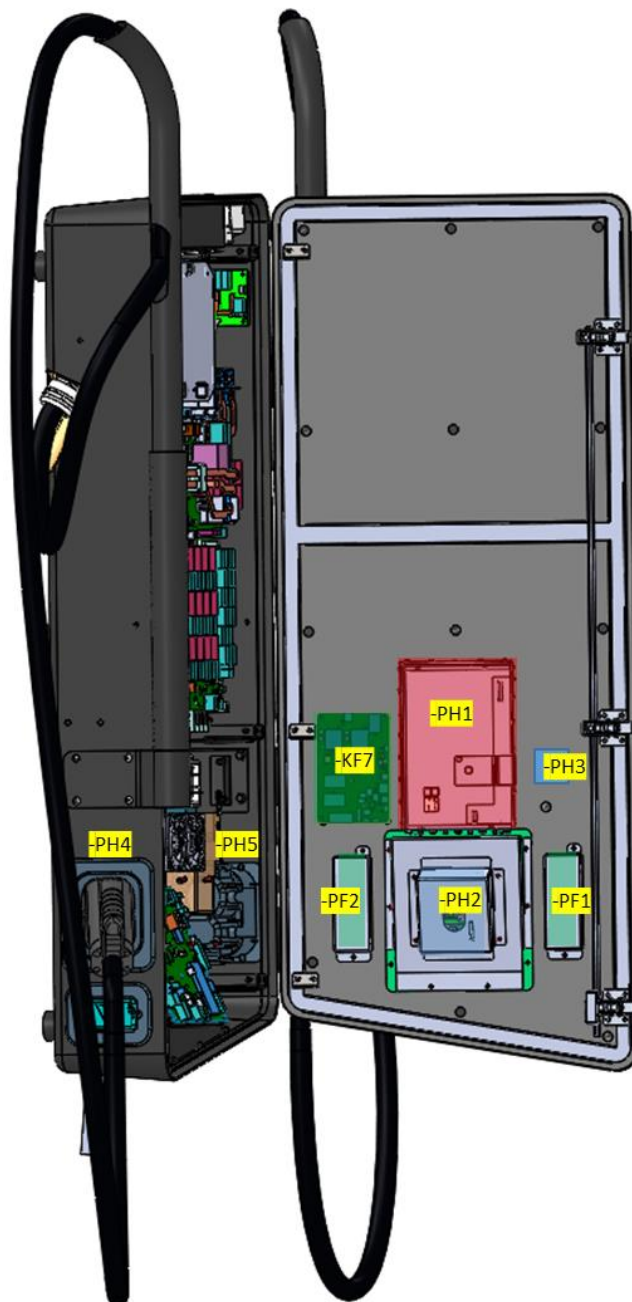


Figure 9: Interior view front HYC_50 (Backside)

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

Identifier	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 uses the COR A20 contactless reader with OPM-C60 controller from CCV Germany. 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 transmitted 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 as long as it is one of the models mentioned above.

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



Figure 10: Contactless credit card terminal (model COR A20)

3. Packaging, transport, and storage

3.1. Packaging

Figure 11 shows the packaging of the HYC_50, in which it is delivered.



Figure 11: 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 15 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 12). 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.

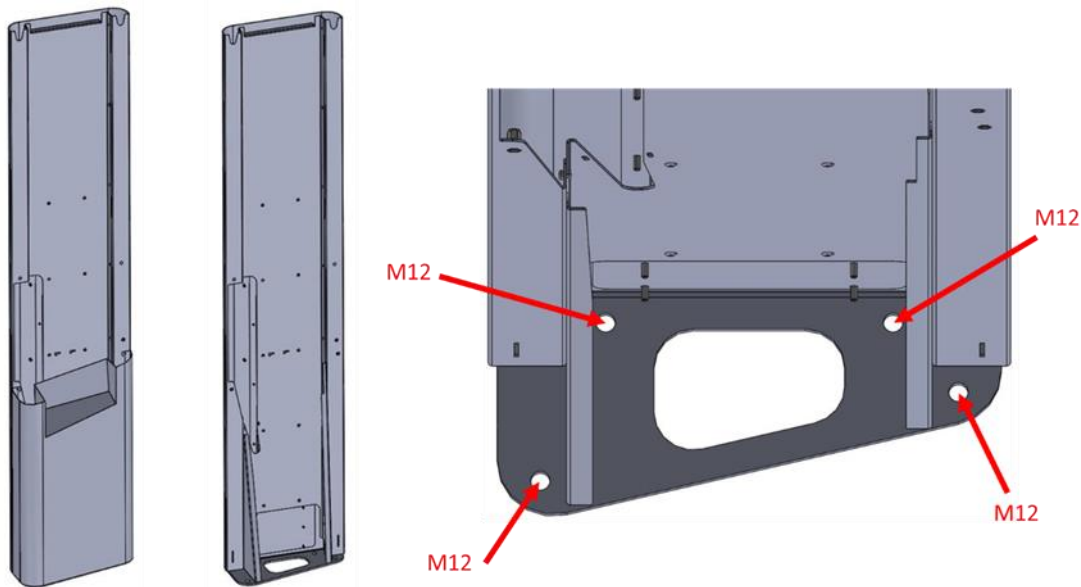


Figure 12: Mounting the Stand HYC_50

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 13 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.

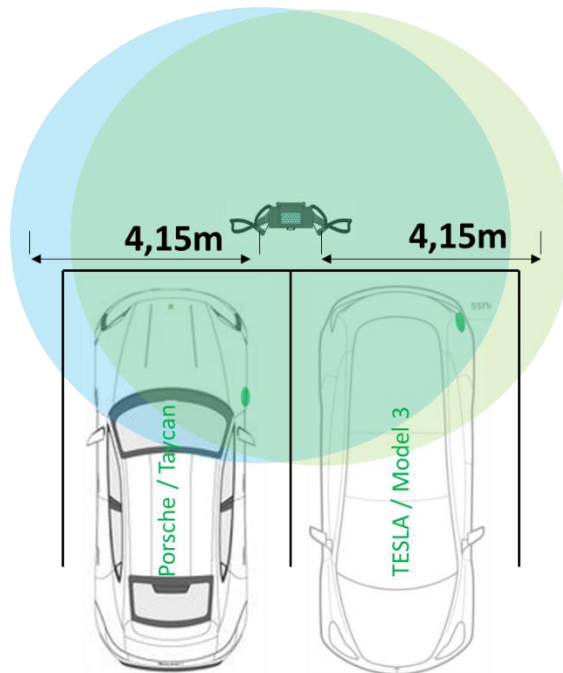


Figure 13: Cable length for the two DC outputs of the HYC_50 with cable management

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

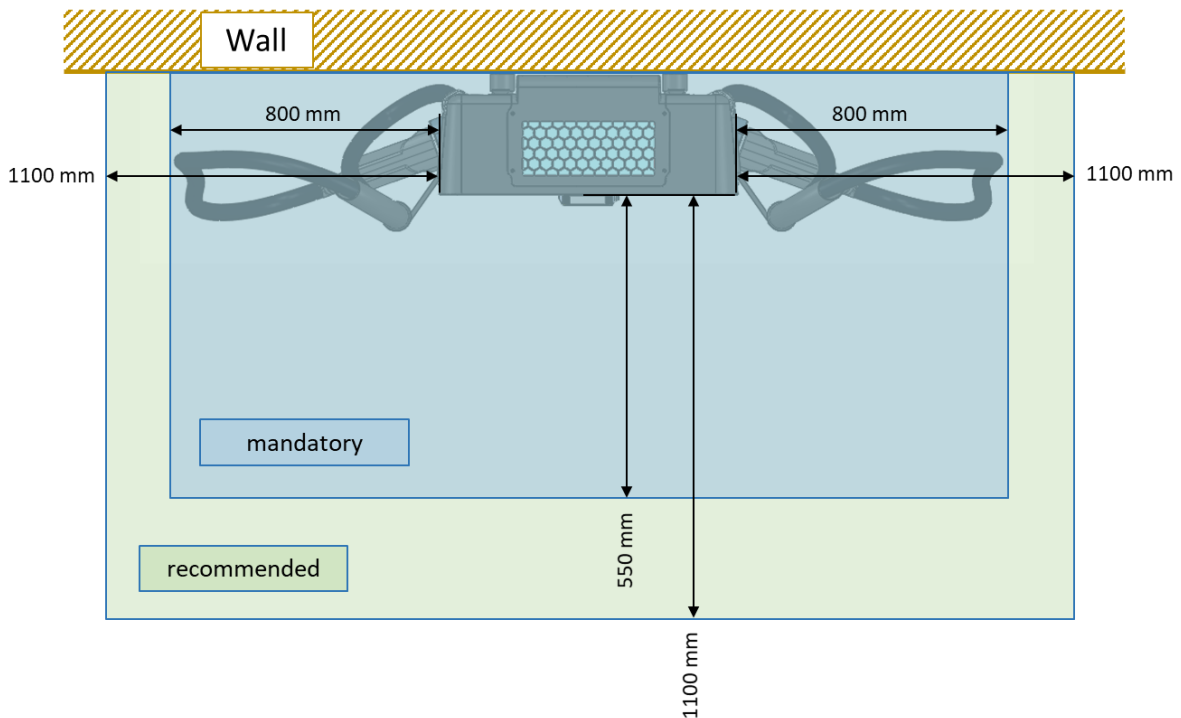


Figure 14: Recommended minimum distances for site selection

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.

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 14 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 15.

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 15 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	-	-	-
Mattone 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 gland 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 are stamped on the strain reliefs so that there is no risk of confusion.

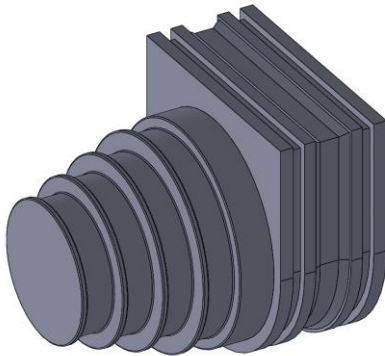





Figure 16: Cable gland



Figure 17: Strain relief for different cable diameters

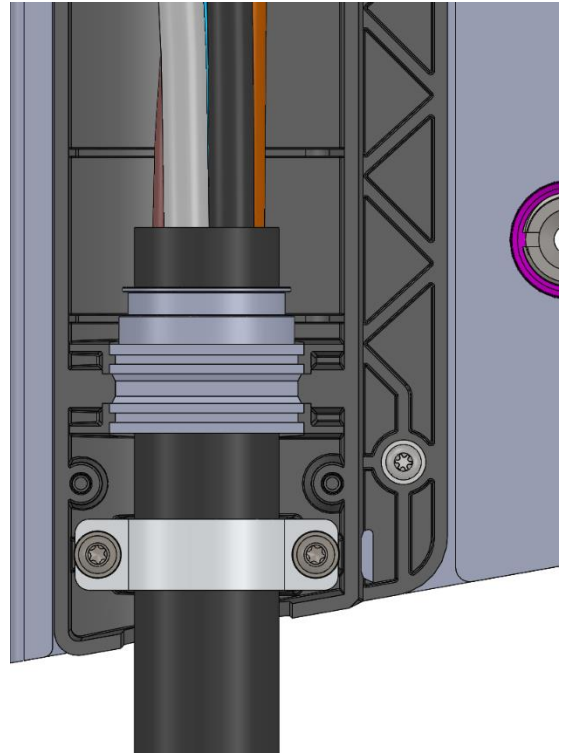
The following tools are needed for assembly:

Scissors/knife to open the packaging	
Cordless screwdriver	
-TX10 Attachment for cordless screwdriver -TX20 Attachment for cordless screwdriver -TX30 Attachment for cordless screwdriver	
Alternative to cordless screwdriver -TX10 Screwdriver -TX20 Screwdriver -TX30 Screwdriver	

4.1.6. installation of the connection cable in the cable inlet

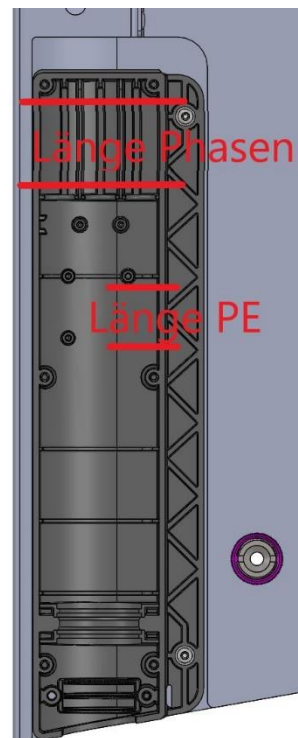
After the connection cable has been stripped and the phases have been roughly cut off, it can be fixed in the plastic half-shell of the cable entry with the installed cable bushing using the strain relief (TX20).

Before this, the cable gland 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.

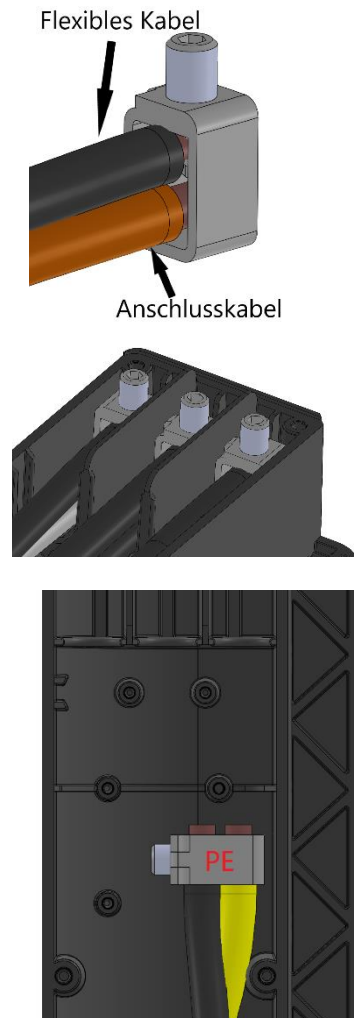


Contacting with clamps:

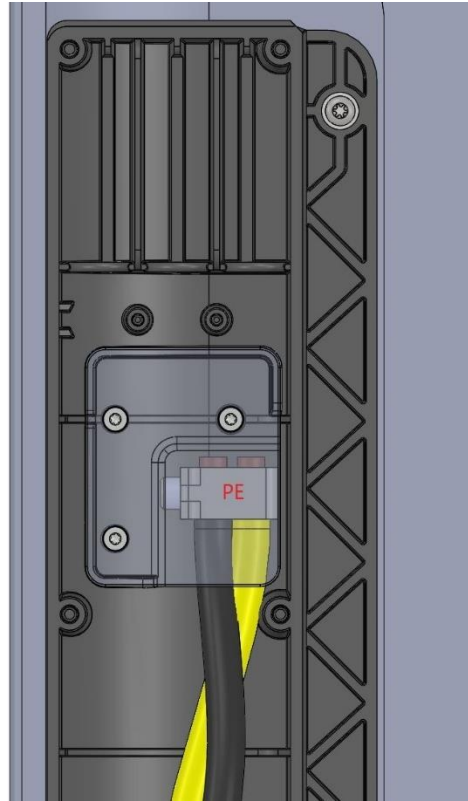
Clamps are used for contacting between the individual strands of the connection cable and the flexible cables; these should contact the two cables with each other as shown in the picture. The flexible cable is always on top.

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.

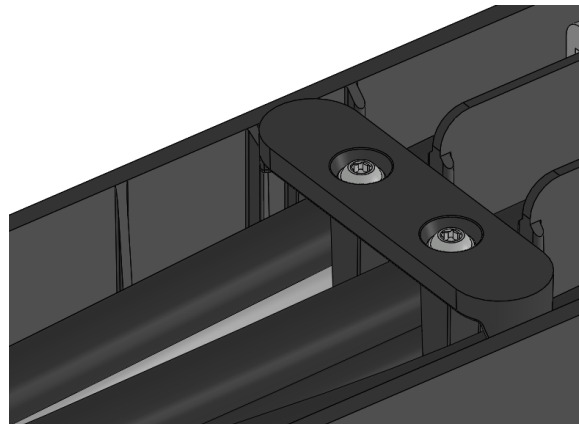
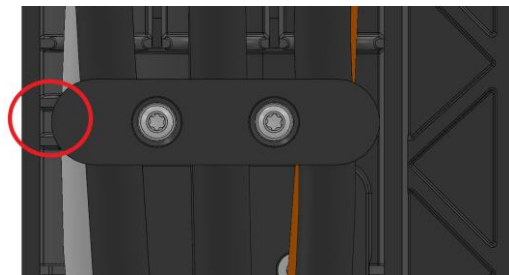
The flexible cable for the PE connection can be recognized by the fact that a cable lug is mounted at the other end.



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

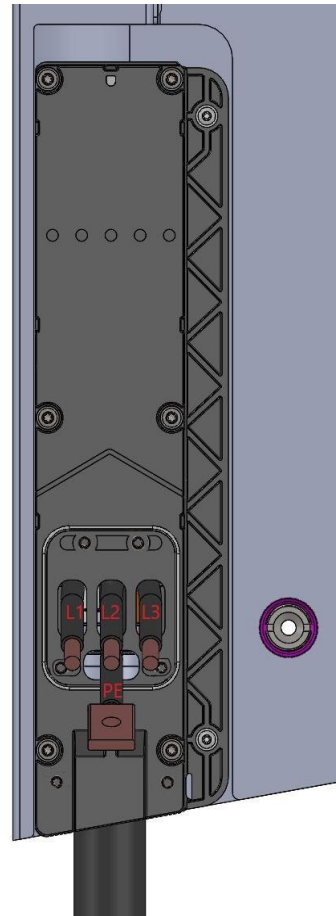


The remaining cables are held in position with the help of a cable fixation. To position them more easily, you can use the two ribs (shown in red) as a guide.
In this step, care must be taken that the insulation of the cables is not pinched between the plastic parts and thus damaged.
Required tool: TX10



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.



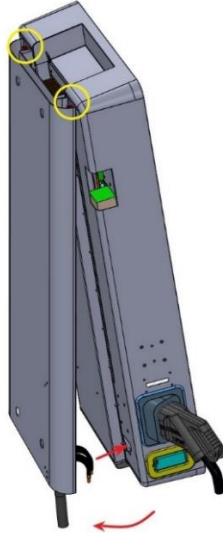
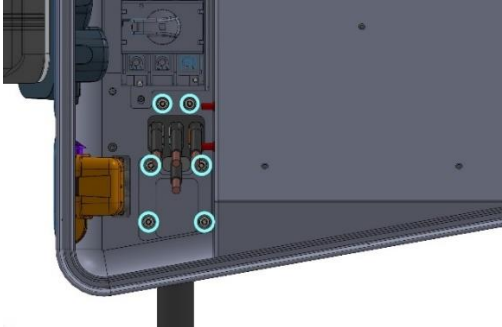

<p>As soon as the HYC_50 hangs securely on the two upper locking bolts, the cables can be routed inside the unit.</p>	
<p>Now the device only has to be fixed to the back plate at the marked points (TX20 and TX30), the phases have to be connected to the main switch and the PE connection to the housing.</p>	
<p>The mounting of the touch guard finishes the mounting process.</p>	

Table 6: 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.

Attention



The charger is not suitable for connection to the AC system via a plug for industrial use according to IEC 60309-1 and IEC 60309-2 or for private use according to IEC 60884-1.

4.2.1. Circuit diagram HYC_50

Figure 18 shows the circuit diagram of the HYC_50.

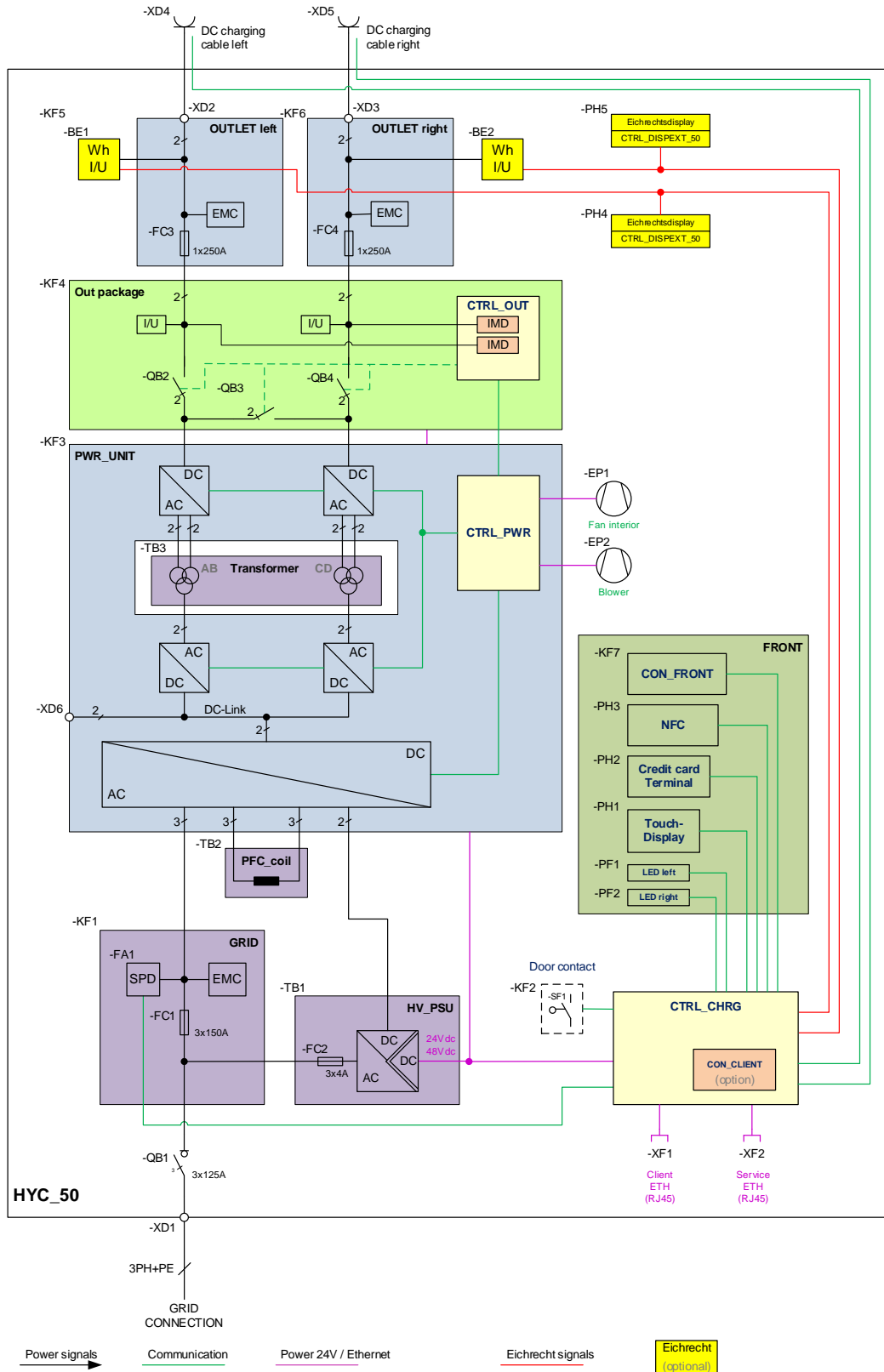


Figure 18: Circuit diagram of the HYC_50

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 taken into account 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 300 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 $I_{\Delta N} = 300 \text{ mA}$ 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 7: 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 8: Checks before commissioning

4.4. Commissioning protocol

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

Masterdata:

Customer		
Customer Column ID (EVSE-ID)		
Column serial number		
Maximum input power available at the site (kW)		
LoadManagement available	<input type="checkbox"/> Yes	Manufacturer/Model:
Locking cylinder	<input type="checkbox"/> alpitronic <input type="checkbox"/> Customer, description:	
Location type	<input type="checkbox"/> public <input type="checkbox"/> private	
Column address		
GPS coordinates	latitude:	longitude:
Installation company		
Name technician		
Date of commissioning		

Existing charging outlets (please tick):

	1	2
CCS2_150A		
CHAdeMO_125A		
GB/T		
CCS1		

Checks before first switch-on:

Check	Executed	Result
External visual inspection of the charging pole (damage, defects, protection class)	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Checking the stability	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Is the charging pole accessible?	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Checking the cable connections	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Check of the fuses	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Visual inspection of the screw connections (sealing wax present?)	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Remove and reinsert SIM cards	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Is the interior of the charging pole clean and free	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient

of traces of condensation?		
Check the air and creepage distances	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Check the filter mats	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Mains voltage correct?	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Functional check of the electrical protective devices	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Earthing system complete? Equipotential bonding connections complete?	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient

Possible remarks:

Checks at first switch-on:

Check	Executed	Result
Checking fan noise	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Functional check of the RFID reader	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Functional check of the screen touch function	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Functional check of the screen	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Functional check of the LED strips in the front	<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient

Possible remarks:

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

Charging test	Peak-Power	Charged energy	Executed	Result
Charging point 1			<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient
Charging point 2 (if available)			<input type="checkbox"/>	<input type="checkbox"/> OK <input type="checkbox"/> deficient

Possible remarks:

The following photos are to be enclosed:

- ☐ Front and closing hatch each closed and open
- ☐ Type plate (badge outside on the lower edge of the HYC_50)
- ☐ CTRL_CHRG with identifiable connections
- ☐ Type plate (badge outside at the bottom edge of the hypercharger)
- ☐ Cable connection area with recognizable connections
- ☐ Location photo

Test result:

- ☐ We confirm that the charging device complies with the applicable standards.
- ☐ In accordance with generally recognised technical rules, the safe use of the charging device is ensured when it is used as intended

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

If you have any problems of any kind, please feel free to contact our hypercharger support team at any time: +39 0471 096 333

Date, Signature:

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 9:

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

Table 9: 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.

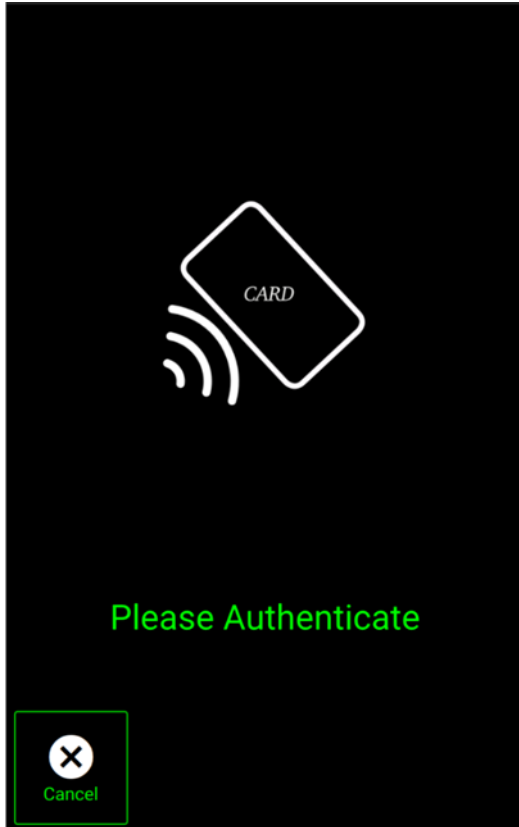


Figure 19: Authentication

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 5).
- 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.

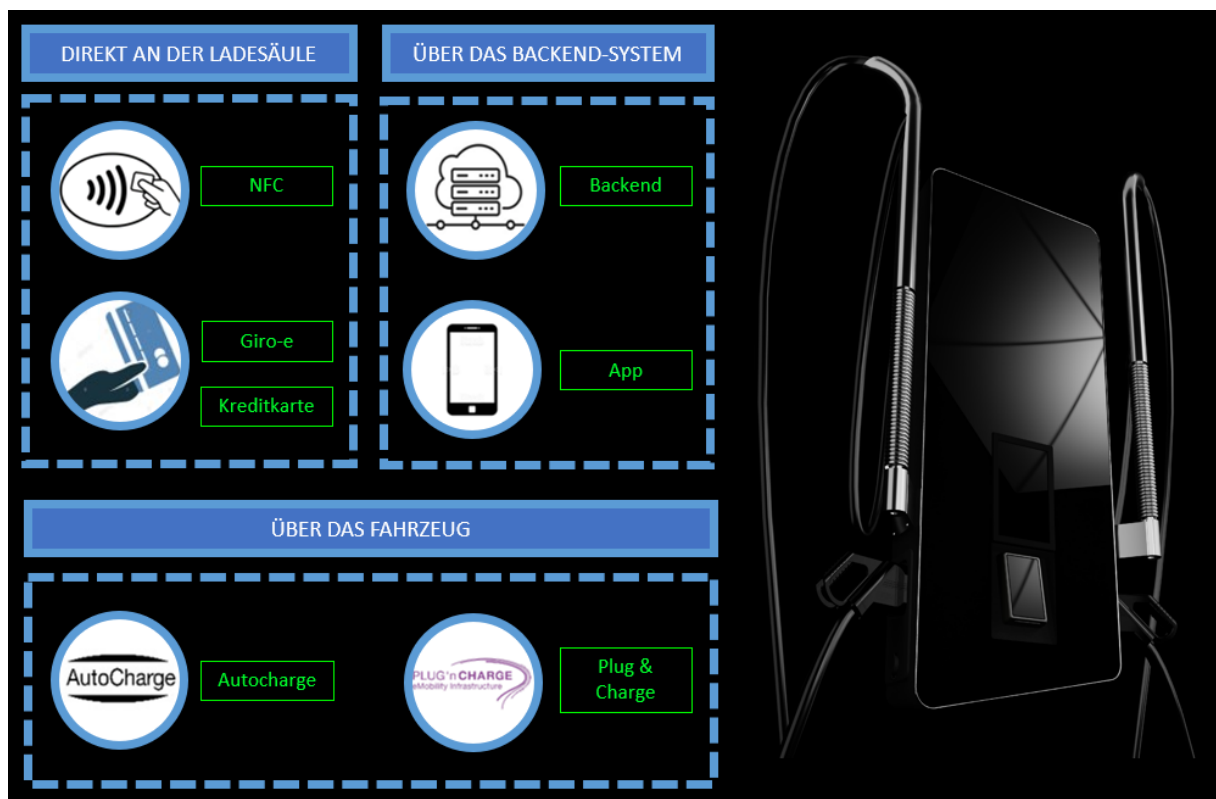


Figure 20: Overview of the authentication options

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:

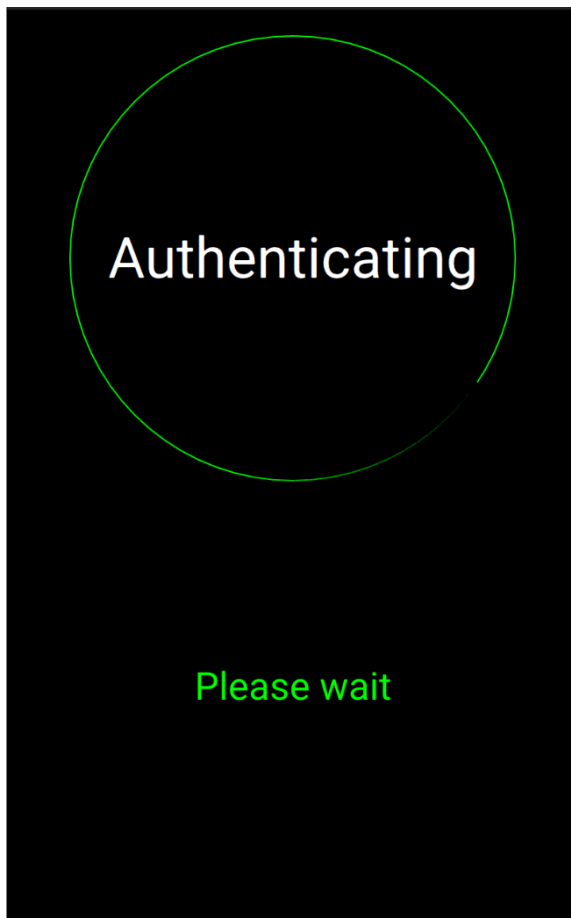


Figure 21: Authentication process

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 22.



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.

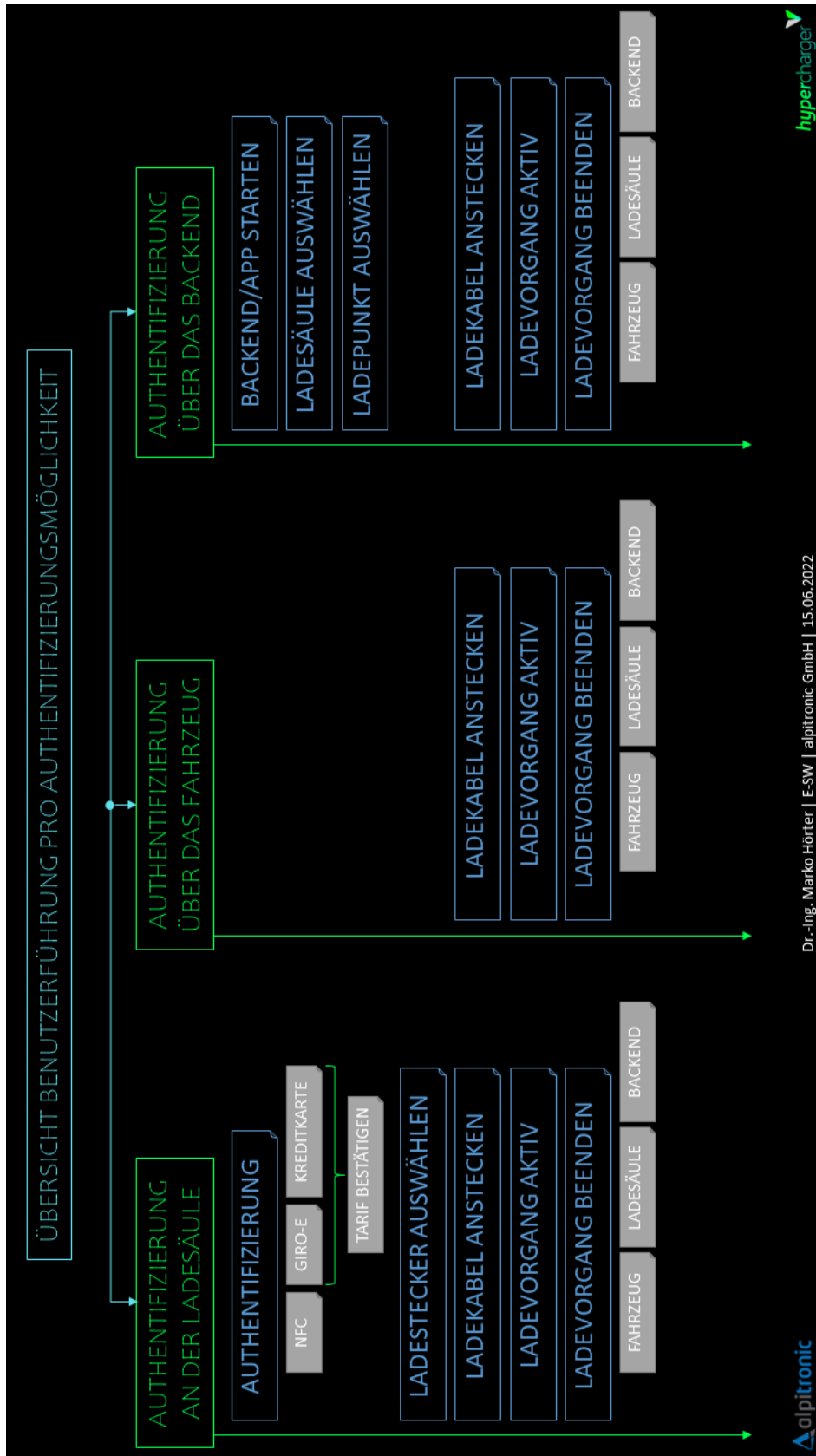


Figure 22: Overview user guide per authentication option

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.

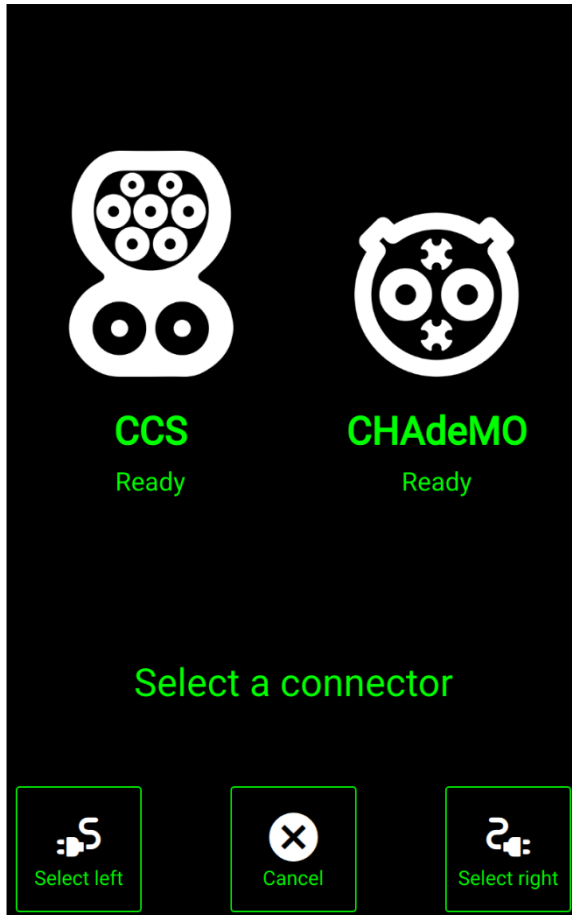


Figure 23: Charging plug selection

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 24: 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.

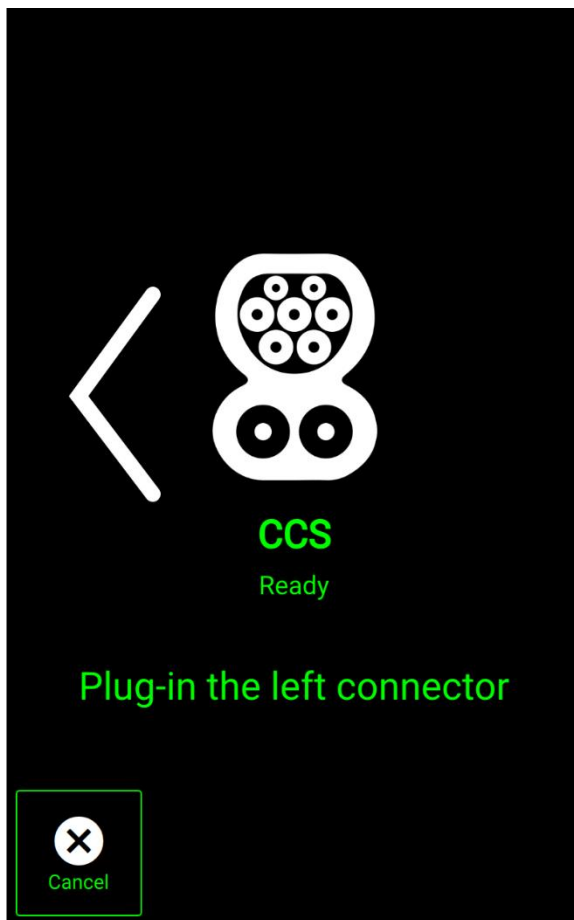


Figure 25: Plugging in the charging cable

Information



For CHAdeMO cables, make sure that they lock correctly.

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

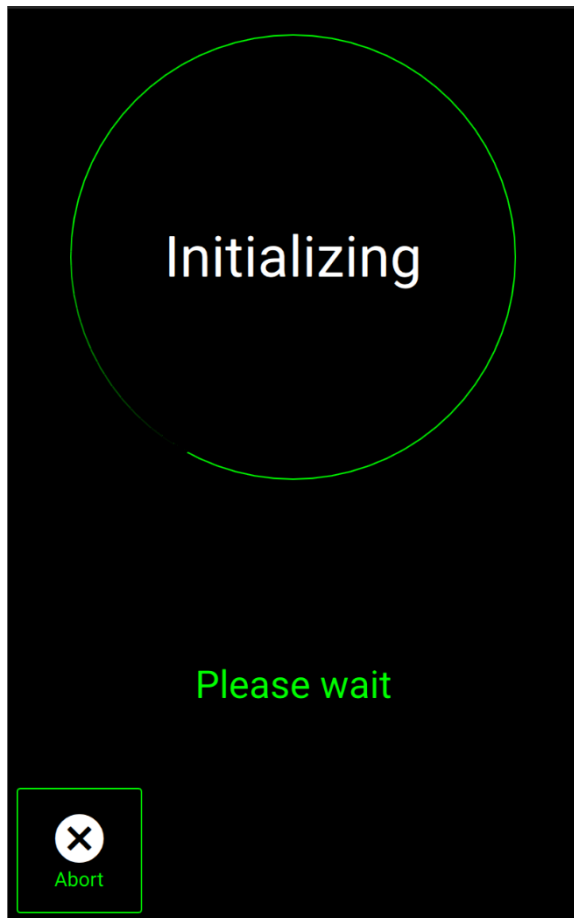


Figure 26: Initializing

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)

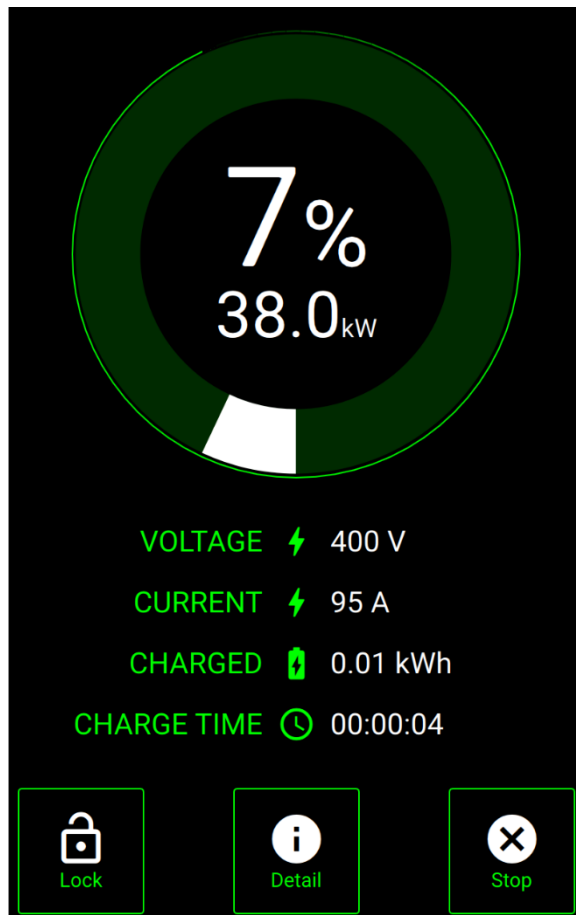


Figure 27: Overview of charging process

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.

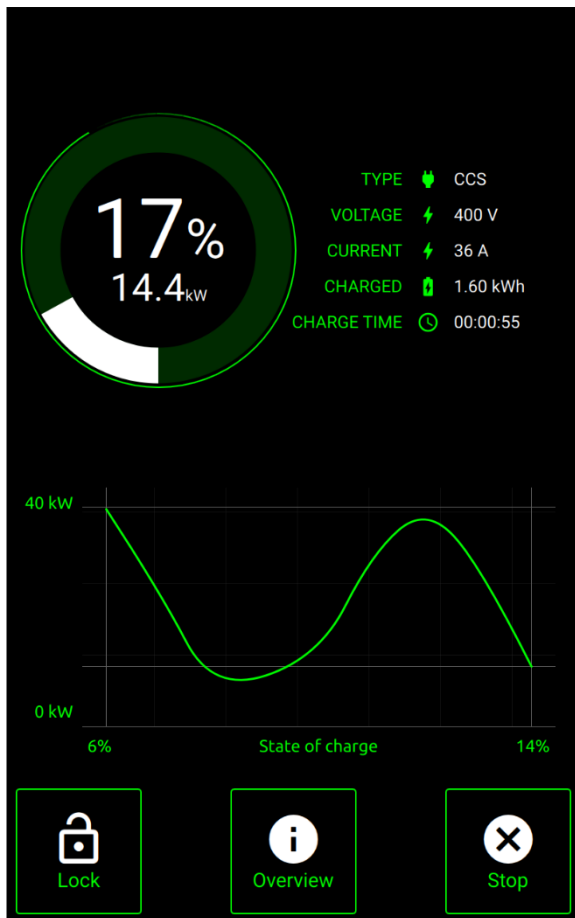


Figure 28: Detailed loading overview

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.

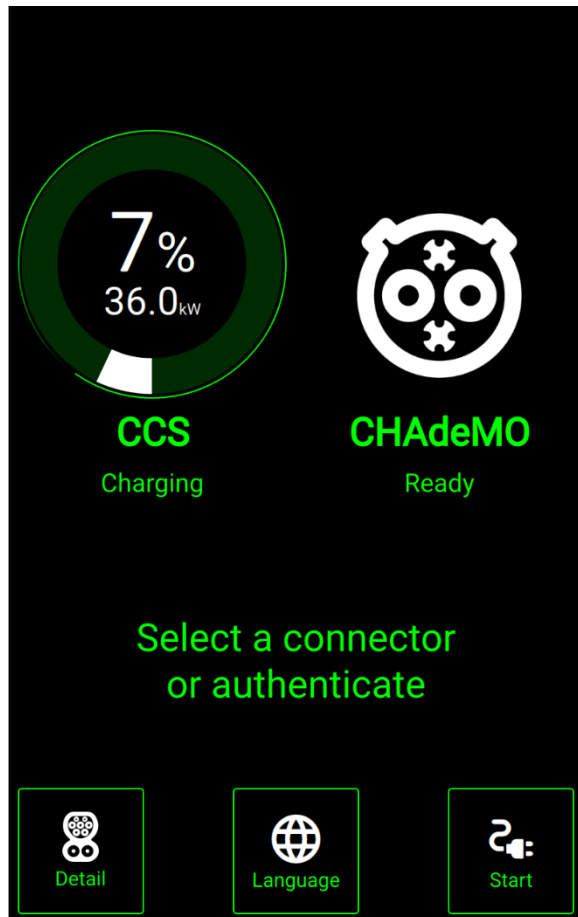


Figure 29: Load second vehicle

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

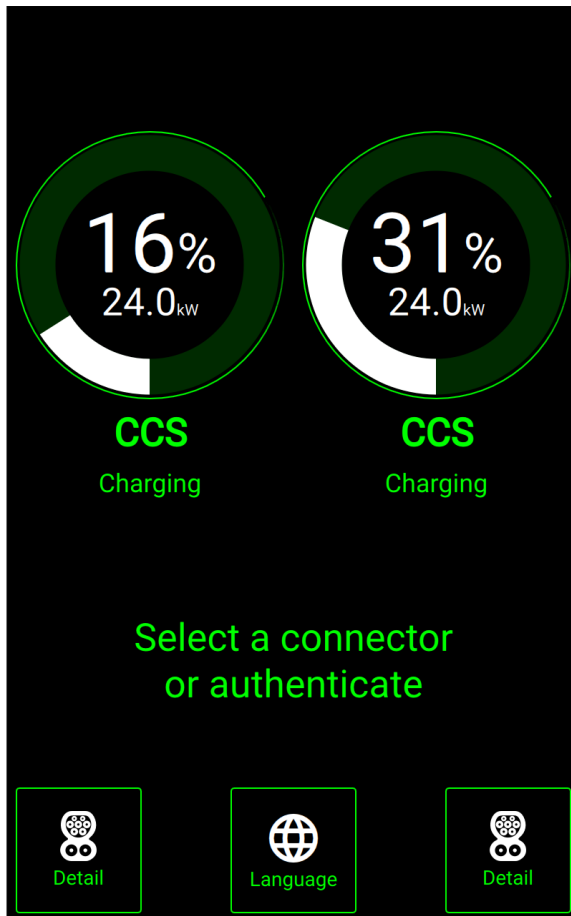


Figure 30: Charging overview with two active charging processes

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".

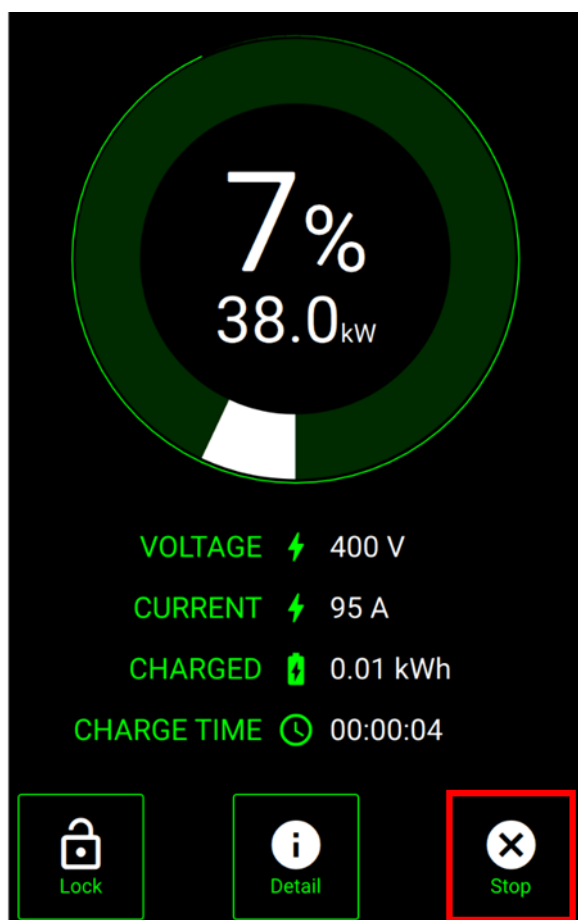


Figure 31: Stop charging

You must authenticate yourself again to cancel the charge.

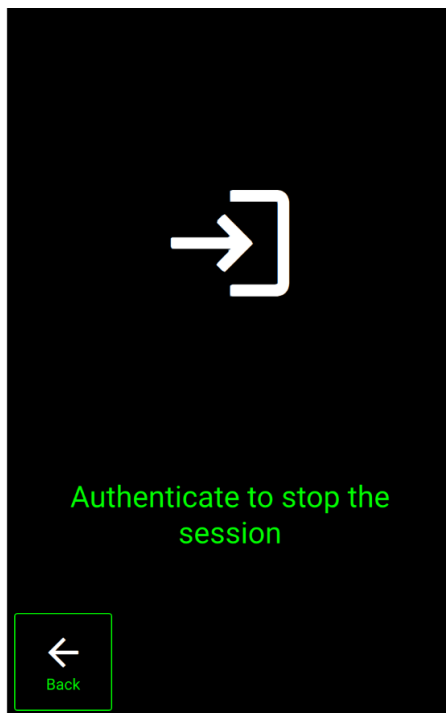


Figure 32: Authentication to stop charging process

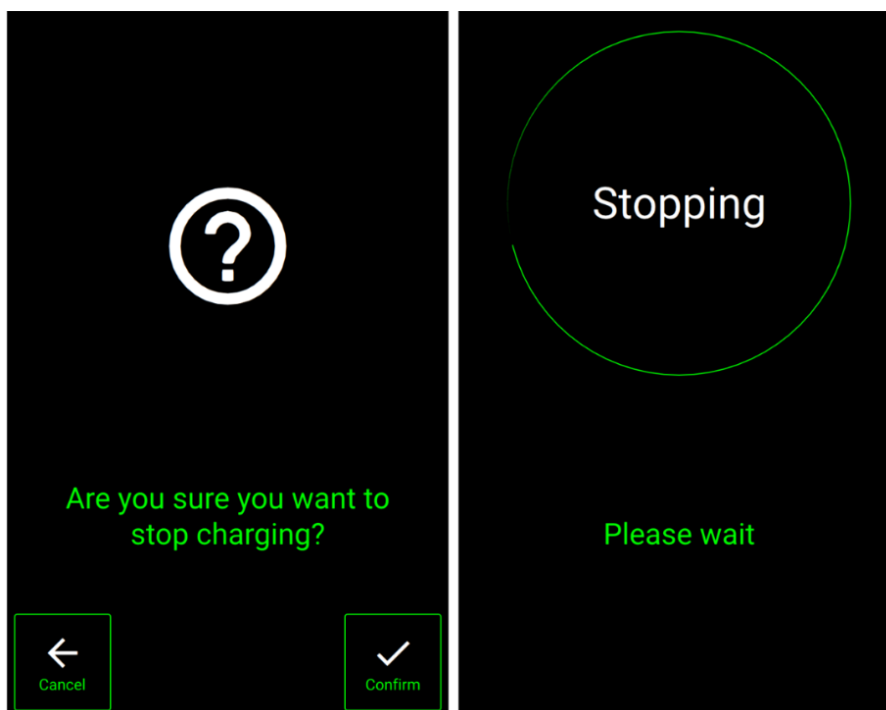


Figure 33: Process charging stop

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.

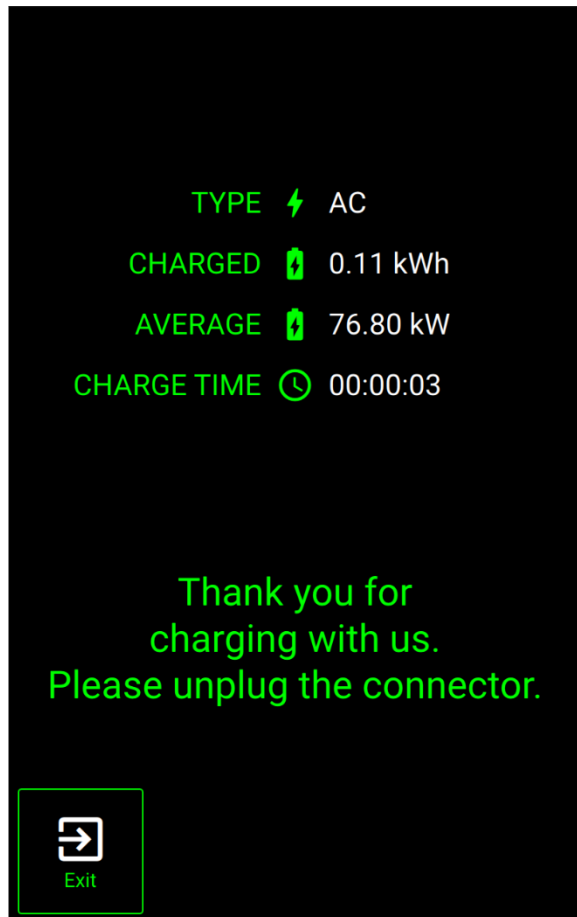


Figure 34: Unplug the charging connector

6.4 Procedure for error messages

6.4.1 Authentication failed

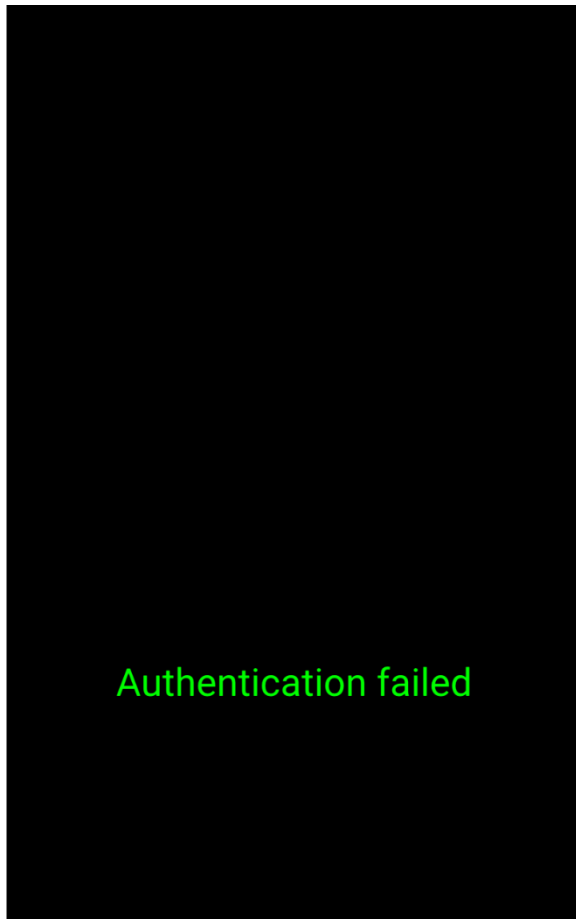


Figure 35: Authentication failed

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

6.4.2 Charging plug defective

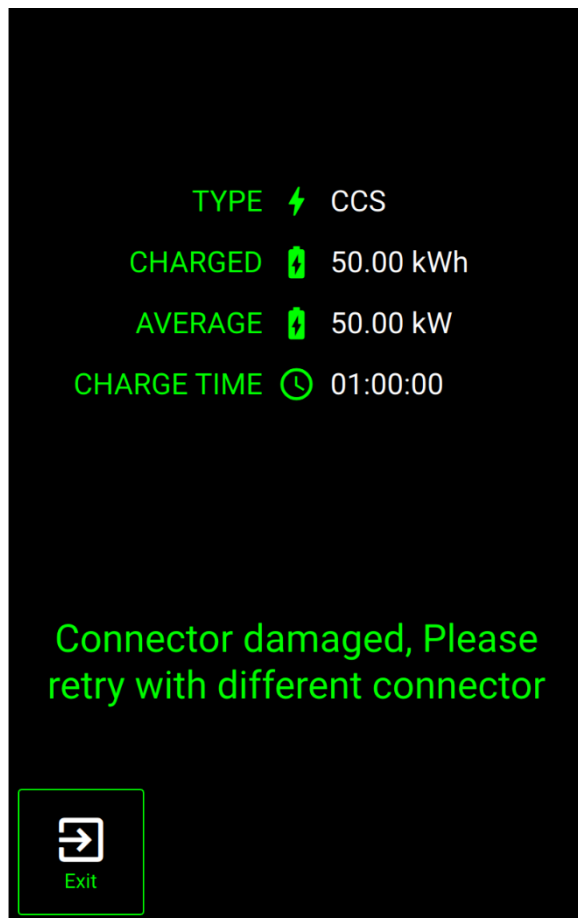


Figure 36: Charging plug defective

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

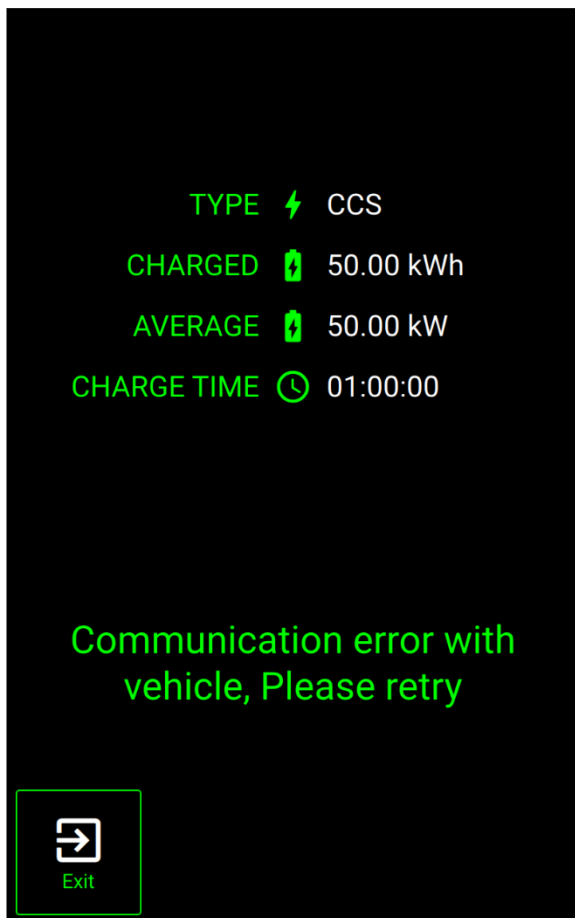


Figure 37: Error during communication setup

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

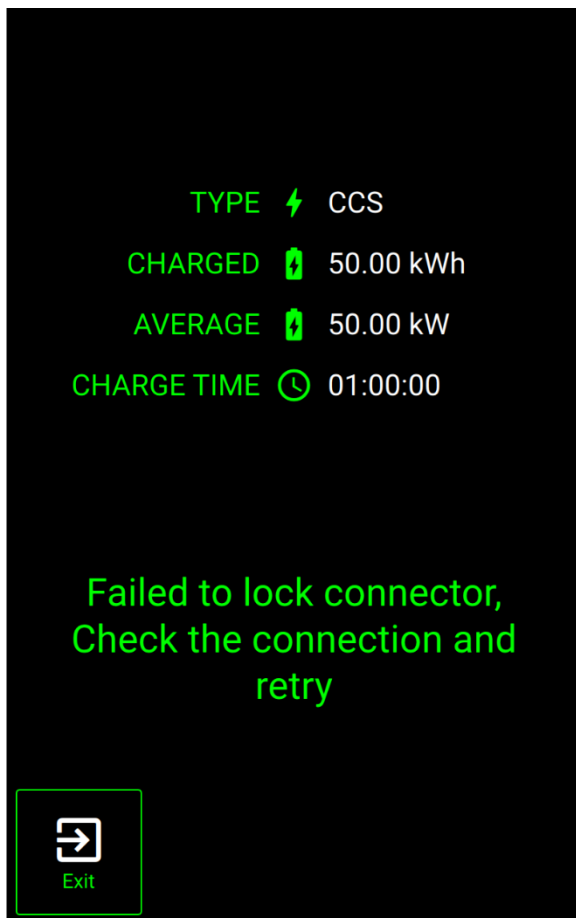


Figure 38: Connector locking failed

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

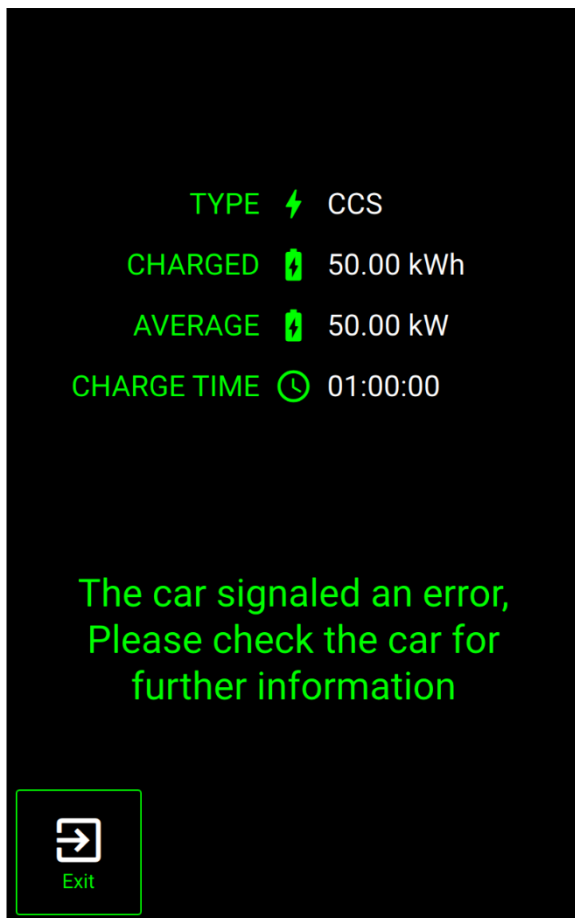


Figure 39: Vehicle error

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 10: Fault description and correction

8. Maintenance

Attention



Observe all hazard warnings in Chapter 1

8.1. Overview of the maintenance work

Regular maintenance or inspection of the safety equipment is required for safe operation of the charging station. All items listed below are considered mandatory and must be carried out by the switchgear operator at the intervals described.

Table 11 provides an overview of the scheduled maintenance work. Depending on the individual operating conditions of the HYC_50, further maintenance work may be required, or maintenance intervals may be shortened. Therefore, the list should not be regarded as complete.

Maintenance	Execute	Interval
Charging cable set	Replacing the plug contacts or the complete charging cable set.	after 10000 charging cycles
Plug contacts Charging cable set	Periodically check the plug contacts for contamination or traces of burns.	Half-yearly
Main switch	Check for correct function	yearly
Checking the protective measures	With the charging station switched off, check the resistance between the earth of the supply and all externally accessible, non-insulated cabinet parts (housing, attachments, screws).	yearly
Check for cleanliness and condensation	Check that the interior of the HYC_50 is clean and has no traces of condensation. Check the plug holders. Check seals for damage and correct position.	yearly
Screw	Random or complete testing of tightening torques on terminals and mechanical screw connections.	yearly
Ventilation filter	Replacing the air filter inserts.	yearly

Table 11: Regular maintenance work

8.2. Function test of the main switch

To check the main switch for function, it must be turned from position On to position Off. The secondary side must be tested voltage-free.



Figure 40: Main switch with connected cables

8.3. Review of the protective measures

For this check, it is mandatory to turn off the main switch (QB1) and have a digital multimeter ready.

Attention



Switch off the main switch beforehand!



Figure 41: Digital multimeter for voltage free testing

Check the resistance between the earth of the supply and all externally accessible, non-insulated cabinet parts (housing, attachments, screws).

8.4. Checking cleanliness and condensation

Check that the interior of the column is clean and shows no signs of condensation.

8.5. Checking the screws

Check the tightening torques on terminals and mechanical screw connections randomly or completely.

Assembly	Torque
PCB	1...2,5 Nm
Busbars	5 Nm

Table 12: Torque of components

Information



If you have any uncertainties regarding tightening torques, please feel free to contact our support team.
support@hypercharger.it or +39 0471 1961 333

8.6. Replacing the air filter inserts

Replace the air filter inserts regularly.



Figure 42: Air filter inlet



Figure 43: Air filter outlet

8.7. Plug contacts charging cable set

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



Figure 44: Charging plug side view



Figure 45: Charging plug contactors

8.8. Check overvoltage protection

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



Figure 46: Check of overvoltage protection

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

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.

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

Table 13: Technical data

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

Table 14: Mechanical Data

Electrical connection data HYC_50

Parameter	Nominal value
Operating voltage U_r	3x 380...400 Vac +PE (-15%...+10%)
Frequency	50 Hz ($\pm 5\%$)
Rated current I_r	90 A
Efficiency	95 % @ P_r (worst case)
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
Permissible outer diameter of the supply line	24...35 mm
Max. Rated short-circuit current I_{pk}	17 kA (peak)
Conditional rated short-circuit withstand current I_{cw}	1,4 kA (rms) @ 1s
Contribution to the short-circuit current	I_r
Overvoltage category	OVC III
Integrated surge protection (SPD)	Type 1+2+3

Table 15: 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 16: 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 17: 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 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 $I_{\Delta N} = 300 \text{ mA}$ is recommended.



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