



# MANUAL

# UNITY CHARGER

UNITY 150 - 360

ENV1.0

11/2023





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# 1 About this document

This document is the operating manual for the modular KOSTAD charging stations UNITY 150/180/240/300/360.

This document is part of the KOSTAD charging station and must be kept with the product.



Read this document before carrying out any work on the charging station.

Follow all safety instructions and instructions in this document.

This document is part of the KOSTAD charging station and must be kept in the immediate vicinity of the system.

---

## 1.1 Validity

This document is valid for all UNITY Chargers.

This document covers all life cycle phases of UNITY.

## 1.2 Version history

The following table lists the chronology of the versions of this document.

Version	Date	Released	Changes
V 1.0	16.11.2023	FM	Initial creation

Table 1: Version history

### 1.3 Related documents

The following table lists all related documents.

Document	Date
Maintenance_log_Unity50-360_EN_V1.0.pdf	19.09.2023
Unity150_360_DE_EN_Datasheet.pdf	25.09.2023
UNITY_OperatingInstructions_Release2023_EN_V1.0.pdf	31.01.2024

Table 2: Related documents

The documents are available digitally at <https://service.kostad.at>

### 1.4 Target groups

The target groups of this document are persons who are responsible for the following activities.

- Planning and preparation for installation and operation
- Installation
- Commissioning and decommissioning
- Operation
- Maintenance
- Troubleshooting



## 1.5 Conventions

This chapter deals with the conventions in this document. This shows how different information is displayed in this document.

The following conventions deal with safety instructions, pictograms, action steps and lists.

## 1.6 Safety instructions

This document contains instructions that you must observe for your personal safety and to prevent damage to property. The instructions for your personal safety are highlighted with a warning triangle, instructions for damage to property alone are without a warning triangle. Depending on the hazard level, the warnings are displayed in decreasing order as follows.

The safety instructions in this document always contain a signal word, a description of the type of hazard and instructions on how to avoid the hazard.

### Danger

#### DANGER

Imminent danger



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

- Instruction 1 to avoid hazards
  - Instruction 2 to avoid hazards
  - Instruction n to avoid hazards
- 

### Warning

#### WARNING

Potentially imminent danger



Indicates an imminent danger that can lead to death or serious injury if not avoided.

- Instruction 1 to avoid hazards
  - Instruction 2 to avoid hazards
  - Instruction n to avoid hazards
-

**Caution**

**CAUTION**

Potentially imminent danger



Indicates an imminent danger that can lead to minor injuries if not avoided.

- Instruction 1 to avoid hazards
  - Instruction 2 to avoid hazards
  - Instruction n to avoid hazards
-

## Hazards

The following hazards are identified in this document.








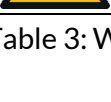
	<p>General warning sign</p> <p>Indicates a potentially hazardous situation and that the operator must consult the manual to ensure safe operation.</p>
	<p>Warning of electrical voltage</p> <p>Indicates potentially dangerous voltages that pose a risk of electric shock. Further safety information can be found in the manual.</p>
	<p>Warning of sharp object</p> <p>Draws attention to the risk of cutting yourself on pointed objects or sharp edges.</p>
	<p>Warning of sharp object</p> <p>Draws attention to the risk of cutting yourself on pointed objects or sharp edges.</p>
	<p>Warning of obstacles on the ground</p> <p>Indicates steps and edges in the work area that pose a tripping and falling hazard.</p>
	<p>Danger of falling parts</p> <p>Draws attention to the risk of being hit by falling parts.</p>
	<p>Warning of falling parts</p> <p>Draws attention to the danger of falling parts.</p>
	<p>Risk of slipping</p> <p>Indicates slippery surfaces.</p>

Table 3: Warning symbols

## Piktogramme





	Important information
	Reference to document Indicates that the manual must be read before starting work or commissioning the appliance.
	Focus Marking the center of gravity
	Forklift ban Marking of the points where a forklift truck is not allowed to pick up.

Table 4: Pictograms

### 1.7 Contents

This section deals with the conventions for instructions, lists, notations, figures and notes.

#### Instructions for action

Each step of an instruction is described individually in this document. The principle of "one step - one action" applies.

Instructions for action are shown in 2 columns. The written step is in the left-hand column, a figure (where available) in the right-hand column. The individual steps are separated from each other by black bars. The last step of an instruction is always followed by the statement that the action is complete.

1. Perform the first step.	[Figure]
2. Perform the first step.	[Figure]
3. Perform the third step.	[Figure]

The plot is complete.

## Lists

Ordered lists are displayed with numbering.

1. First element
2. Second element
3. Third element

Unordered lists are displayed with triangles.

- Element
- Element
- Element

## Brands

All designations marked with the ® trademark symbol are registered trademarks of KOSTAD Steuerungsbaue GmbH. The other designations in this document may be trademarks whose use by third parties for their own purposes may infringe the rights of the owner.

## Attention

Instructions marked with Attention are intended to prevent damage to property.

### ATTENTION

Material damage

Describes the risk of material damage.

This notice indicates possible material damage. This note is used to emphasize actions that are not associated with personal injury.

- Act to avoid property damage
-

## Notes

Notes contain important information in the context of the respective chapter.



Notes indicate important information about the product in connection with the manual.

- Information 1
- Information 2
- Information n

The safety instructions are supplemented by warning pictograms that indicate the source of danger and the type of danger.

## Notes

The following notes are used in this document.

Remark	Description
Cross-references	Cross-references are highlighted in blue
Button, HMI field	Buttons are shown in bold brackets - [Button]

Table 5: Notes

## Figures

This document contains n types of figures.

Figures in the text, figures in instructions, etc.

- Image from models
- Photos
- Screenshots of the user interface

### 1.8 Exclusion of liability

We have checked the contents of this publication for compliance with the hardware and software described. Nevertheless, deviations cannot be ruled out, so that we cannot guarantee complete conformity. The information in this publication is checked regularly and any necessary corrections are included in subsequent editions.

1.9 Abbreviations

The following abbreviations are used in this document.

AC	Alternating current
CCS	Combined Charging System
CHAdemo	Charge de Move
CPO	Charge Point Operator
DC	Direct current
EGB	Electrostatic sensitive components
HMI	Human Machine Interface
HW	Hardware
IK	Impact Protection
IP	Internal Protection
IP	Internet Protocol
LAN	Local Area Network
LED	Light Emitting Diodes
MID	Measurement Instruments Directive
NFC	Near Field Communication
NN	Normal zero point
OCPP	Open Charge Point Protocol
PPE	Personal protective equipment
RFID	Radio frequency identification
SIM	Subscriber Identity/Identification Module
SW	Software
WAN	Wide Area Network
WiFi	Wireless Fidelity

Table 6: Abbreviations

## 2 Safety

This chapter deals with safety and includes safety instructions, safety rules, earthing, intended use and foreseeable misuse as well as personnel qualifications and training.

The safety instructions in this document are based on the risk assessment according to EN14121-1 and EN13849-1.

### 2.1 Safety instructions

### 2.2 General

#### DANGER

##### Electric shock



Risk of electric shock due to residual charge in capacitors. Internal components are unsafe until the power source is disconnected and the capacitors are discharged.

- Wait at least five minutes after switching off
- Wear suitable PPE

#### WARNING

##### Electric shock



General risk of electric shock. Damaged cables, exposed wires, uncovered cables, electrical components inside the housing.

- Unity must be earthed via a fixed wiring system or an appliance earthing conductor.
- Safety stickers on protective covers and components.



**WARNING**

Electric shock



Danger of spark formation. The surrounding area must be free of flammable materials or gases. Sparks may occur during maintenance work.

- Plan the location accordingly.
  - Keep the area around the Unity free of any flammable materials.
- 

**WARNING**

Electric shock



Danger of electric shock when measuring the primary circuit - the primary circuit is at mains potential.

- Work with caution.
  - Wear suitable PPE.
- 

**WARNING**

Electric shock



Risk due to exposed cables during the measurement process ("inside" the housing).

- Follow the measurement procedures described in the documentation and the local regulations.
  - Wear suitable PPE.
- 

**CAUTION**

Person hit by equipment



Weight of charging cable and plug - drop the plug/cable on your feet.

- Pay attention to the warnings on the Unity.
-

## 2.2.1 Installation

**WARNING**

## Tilting the load



Danger of the wooden crate tipping over during transportation.

- Comply with proper lifting and transportation procedures.
- Pay attention to the warnings on the Unity.

**WARNING**

## Oscillating load

## Commuting risk



Danger of people being hit by the hanging, swinging Unity.

- Authorized personnel only.
- Restrict access to the workspace.
- Wear suitable PPE.

**WARNING**

## Squeeze



Danger of crushing the hand when placing the Unity on the foundation.

- The work must be carried out by at least 2 people.
- Ensure communication between the crane operator and assembly personnel.
- Wear suitable PPE.

**WARNING**

## Squeeze



Unity not correctly mounted on foundation - risk of falling over.

- Follow the instructions in the documentation for installation.

**CAUTION**

Cut injury



Risk of a cut injury

When inserting the cabling on the suspended load, cuts may occur on sharp edges.

- Fit the edge protection.
  - Wear suitable PPE.
- 

**CAUTION**

Cut injury



Risk of a cut injury

When drilling the anchor holes, cuts can occur due to improper handling of the drill.

- Use the tools correctly.
- 

**WARNING**

Squeeze



Risk of crushing

Crushing may occur when screwing the anchorage in place due to improper handling of the tool.

- Use the tools correctly.
- 

**WARNING**

Eye injury



Risk of an eye injury

The ends of protruding power cables can cause eye injuries.

- Wear suitable PPE.
-

**WARNING**

Electric shock

Wires were mixed up because the correct colors and/or the order of the connections were not known.

- Wear suitable PPE.

**WARNING**

Electric shock

Local network may not be earthed.

- Wear suitable PPE.

**CAUTION**

Cut injury

Risk of a cut injury

When inserting the cabling on the suspended load, cuts may occur on sharp edges.

- Fit the edge protection.
- Wear suitable PPE.

**CAUTION**

Cut injury

Risk of a cut injury

When drilling the anchor holes, cuts can occur due to improper handling of the drill.

- Use the tools correctly.

**CAUTION**

Electric shock



Danger of flashes - eyes - sparks due to incorrectly connected phases.

- Note the correct sequence of the phase connection.
  - Wear suitable PPE.
- 

**CAUTION**

Cut injury



Risk of a cut injury

Connecting the network cables can result in cuts to exposed cable ends.

- Wear suitable PPE.
- 

2.2.2 Commissioning

**WARNING**

Electric shock



Housing is live due to missing or insufficient earthing.

- Check earthing and associated resistance values.
  - Wear suitable PPE.
-

## 2.2.3 Operation

**WARNING**

Electric shock



Risk of electric shock if water is used to clean the appliance.

The ingress of water into the housing can lead to a short circuit.

- Do not use water to clean the Unity.
- Pay attention to the warnings on the product.

**WARNING**

Eye injury



Parts can splinter off the plug if dropped - splinters in the eye.

- Watch out!

**CAUTION**

Risk of tripping



Cables can cause injuries if they come loose while being "stretched" to reach a vehicle.

- Pay attention to the warnings on the product.

**CAUTION**

Cut injury



Injuries to fingers when removing and installing cables and measuring wires.

- Wear suitable PPE.

2.2.4 Maintenance

**WARNING**

Cut injury



Danger of cutting injuries on fans.

Maintenance work on the fans can result in cuts.

- Wear suitable PPE.

**WARNING**

Electric shock



Injury due to electric shock during various maintenance work.

- Wear suitable PPE.
- Carry out maintenance work according to the instructions.

**CAUTION**

Mechanical impact



Danger of being hit by a door swinging open.

- Lock the door in position before starting work.

**CAUTION**

Risk of slipping



Danger of slipping in a liquid.

Coolant may escape during maintenance work on the cable cooling system.

- Wear suitable PPE.

## 2.3 Safety precautions

Safety in the workplace depends on the attention, precaution and common sense of all persons who install, operate and maintain the machine.



In addition to observing the safety precautions listed, always exercise caution in the vicinity of the machine. Always pay attention to your safety.

---

Please also note the following to avoid accidents:

- General safety regulations of the respective country of use
- Specific regulations of the operator and the area of use
- Specific agreements made with the operator
- Separate safety instructions supplied with the machine
- Safety symbols and instructions on the machine and its packaging

### 2.3.1 The five safety rules

For your personal safety and to avoid damage to property, always observe these safety instructions and the following five safety rules in accordance with EN 50110-1 "Working in a de-energized state" when carrying out any work.

Apply the five safety rules in the order listed before starting work.

1. Unlock. Also enable the auxiliary circuits, e.g. switch cabinet heating.
2. Secure against restarting
3. Determine absence of voltage
4. Earthing and short-circuiting
5. Cover or cordon off neighboring live parts



On completion of the work, reverse the order in which the measures were taken.

---



### 2.3.2 Handling electrostatic sensitive devices (ESD)

Electrostatic sensitive devices (ESD) are individual components, integrated circuits, assemblies or devices that can be damaged by electrostatic fields or electrostatic discharges.

#### ATTENTION

Device damage due to electric fields or electrostatic discharge

Electric fields or electrostatic discharge can cause malfunctions due to damaged individual components, integrated circuits, assemblies or devices.

- Pack, store, transport and ship electronic components, assemblies or devices only in the original product packaging or in other suitable materials, e.g. conductive foam rubber or aluminum foil.
  - Only touch components, assemblies and devices if they are earthed using one of the following measures: Wear an ESD wristband, wear ESD shoes and ESD grounding strips in ESD areas with conductive flooring.
  - Place electronic components, assemblies or devices only on conductive surfaces (table with ESD support, conductive ESD foam, ESD packaging bag, ESD transport container).
- 

### 2.3.3 Earthing

For the necessary on-site potential equalization, which will be carried out differently depending on the grid supplier, the equalization line must be connected to the common earthing rail in the charging pole. A copper cable cross-section of 10 mm<sup>2</sup> is recommended.



The maximum permissible voltage drop is country-specific according to legislation. You must comply with the legal and normative regulations of the respective country when placing the product on the market. It may be necessary to increase the cross-section.

---

## 2.4 Residual risks

The machine manufacturer or system installer must take the following residual risks posed by the control system components into account when carrying out a risk assessment of their system in accordance with the relevant local regulations (e.g. Low Voltage Directive):

1. Uncontrolled power supply to a vehicle during commissioning, operation, maintenance and repair, e.g. due to:
  - HW and/or SW errors in sensors, control system and connection technology
  - Reaction times of the controller
  - Operation and/or ambient conditions outside the specification
  - Condensation/conductive soiling
  - Errors during parameterization, programming, wiring and installation
  - Use of radios/mobile phones in the immediate vicinity of the electronic components
  - External influences/damage
  - X-ray, ionizing and cosmic radiation
2. In the event of a malfunction, exceptionally high temperatures may occur inside and outside the components, including an open fire, as well as emissions of light, noise, particles, gases, etc., e.g. due to:
  - Component failure
  - Software error
  - Operation and/or ambient conditions outside the specification
  - External influences/damage
3. Dangerous contact voltage, e.g. due to:
  - Component failure
  - Influence of electrostatic charges
  - Induction of voltages
  - Operation and/or ambient conditions outside the specification
  - Condensation/conductive soiling
  - External influences/damage
4. Operational electrical or electromagnetic fields that can be dangerous for wearers of pacemakers, implants or metal objects, for example, if the distance is insufficient.
5. Release of environmentally harmful substances and emissions in the event of improper operation or improper disposal of components.

6. Interference with network-bound communication systems, e.g. ripple control transmitters or data communication via the network.
7. The connection of the charging station to the local Ethernet is only permitted after consultation with Kostad.

## 2.5 Intended use

The UNITY is intended for use as a stationary electric charging station for electric vehicles with direct current (DC) or alternating current (AC).

The UNITY charging station may only be used for charging electric vehicles.



Kostad products may only be used for the applications specified in the catalog and the associated technical documentation. If third-party products and components are used, they must be recommended or approved by Kostad. Proper and safe operation of the products requires proper transportation, storage, assembly, installation, commissioning, operation and maintenance. The permissible ambient conditions must be observed. Instructions in the associated documentation must be observed.



The device is only suitable for industrial applications. In a domestic environment, these devices can cause unwanted radio interference. In this case, the operator may be obliged to take appropriate measures.

---

## 2.5.1 Foreseeable misuse

Foreseeable misuses of the UNITY charging station include, but are not limited to, the following.

- Manipulation of the charging plugs.
- Charging devices that are not electric vehicles.

### **German calibration law**

The following must be observed for chargers that are operated in accordance with the German calibration law.

- Operation of a charger for electric vehicles without proper registration in the national register in Germany ("Bundesnetzagentur").
- Operation of a charger for electric vehicles without calibration.
- Operation of an electric vehicle charger after the calibration has expired.
- Operation of an electric vehicle charger with incorrect time zone setting (charging verification via time stamp in accordance with German calibration law).
- Operation of a charger for electric vehicles without legal end-user billing.
- Failure to retain calibration-related repair logs.

## 2.5.2 Conversions or modifications

Any changes to the charging station must be discussed with the manufacturer in advance and their approval obtained. All documentation, including these operating instructions, must be updated or extended accordingly.



Unauthorized modifications and changes to the system will void any liability and warranty of the manufacturer!

---

2.6 Qualifications of the staff

The product/system associated with this documentation may only be handled by personnel qualified for the respective task, taking into account the documentation associated with the respective task, in particular the safety instructions and warnings contained therein. Qualified personnel are able to recognize risks and avoid potential hazards when handling these products/systems due to their training and experience.

2.7 Information for the person responsible for the system

When using the charging station outside the European Community, please observe the country-specific regulations. Follow the local and industry-specific safety and installation regulations.

Those responsible for the system must ensure the following:

- Only qualified personnel may carry out planning and design work and all work on and with the machine.
- The operating instructions are always available for all work.
- The technical data and the information on the permissible installation, connection, ambient and operating conditions are consistently observed.
- The specific installation and safety regulations and the regulations on the use of personal protective equipment are complied with.



Use the support and services of the responsible Service Center for planning, installation, commissioning and service tasks.

---

### 3 Technical data

Designation	UNITY 150	UNITY 180	UNITY 240	UNITY 300	UNITY 360
Type of charge	DC fast charging & AC Type 2 charging				
Outputs	CCS, CHAdeMo, AC Type 2 Socket				
AC input power	C, CC, CJ: 232 A, 160 kVA @ 50Hz @ 400V  CCT/CJT: 264 A, 182 kVA @ 50Hz @ 400V (incl. AC optional)	C, CC, CJ: 278 A, 192 kVA @ 50Hz @ 400V  CCT/CJT: 310 A, 214 kVA @ 50Hz @ 400V (incl. AC optional)	C, CC, CJ: 364 A, 252 kVA @ 50Hz @ 400V  CCT/CJT: 396 A, 274 kVA @ 50Hz @ 400V (incl. AC optional))	C, CC, CJ: 460 A, 316 kVA @ 50Hz @ 400V  CCT/CJT: 492 A, 338 kVA @ 50Hz @ 400V (incl. AC optional)	C, CC, CJ: 546 A, 378 kVA @ 50Hz @ 400V  CCT/CJT: 578 A, 400 kVA @ 50Hz @ 400V (incl. AC optional)
Input voltage range	400 VAC +/- 10% (47-63HZ) -CE version				
DC output power	150 kW (1x150kW or parallel charging 1x90kW/ 1x60kW)	180 kW (1x180kW or parallel charging 2x90kW)	240 kW (1x240kW or parallel charging 2x120kW)	300 kW (1x300kW or parallel charging 2x150kW)	360 kW (1x360kW or parallel charging 2x180kW)
AC output power	22 kW				
DC output voltage	200-1000 VDC				
Number of vehicles charging at the same time	2; 3 (optional)				
Cable length from housing	3.5 m, optional: 4,5 / 5,5 / 6,5 / 7,5 m (+/- 10%)				
Max. Current of the CCS charging cable	400A (peak) / 500A liquid-cooled (optional)				
Max. Current of the CHAdeMO charging	125A				
EMC	Class B conducted emissions (residential) and Class B radiated emissions (residential) according to EN 61000-6-3:2007; EN61581-21-2				
Network type	TN-S, TN-C, TN-C-S, TT (requires external RCD)				
Mains connection	3P + PE / 3P + N + PE (AC optional)				
Protection class	Overcurrent, overvoltage, undervoltage, insulation monitoring, integrated overvoltage protection				
Overvoltage category	Type II				
Powerfactor (full charge)	> 0.97...0.99	> 0.96			
THDI	< 5 %	< 4,5 %			
Efficiency	> 95,5 % (peak)				
Standby power	120 W (incl. LEDs)				
Short-circuit voltage	< 50V / depending on mains				
Pre-charging current	< 1 A				
Energy measurement	Optional: MID measurement for AC & DC outputs Optional: Calibration-compliant design of the AC & DC outputs (Q4 2023)				
Network connection	GSM / 4G / LTE				

Table 7: Technical data - UNITY

### 3.1 Technical data User interface

<b>Designation</b>	<b>UNITY 150</b>	<b>UNITY 180</b>	<b>UNITY 240</b>	<b>UNITY 300</b>	<b>UNITY 360</b>
Connectivity	Internet access via 4G/3G/Ethernet (RJ45)				
User authentication	RFID; payment terminal (optional)				
User interface	15" LCD Touchscreen				
Communication protocols	OCPP 1.6/2.0 JSON				
RFID reader	ISO 14443 A + B to part 4 and ISO/IEC 15693, Mifare, NFC				
Emergency stop button	Yes				

Table 8: Technical data User interface

### 3.2 Configuration

<b>Designation</b>	<b>UNITY 150</b>	<b>UNITY 180</b>	<b>UNITY 240</b>	<b>UNITY 300</b>	<b>UNITY 360</b>
Softwareupdate	Over-the-air updates via Kostad German, English and more than 15 other languages available				
Control & configuration	Kostad HMI on the display configurator				
Languages	German, English and more than 15 other languages available				

Table 9: Technical data Configuration

### 3.3 General

<b>Designation</b>	<b>UNITY 150</b>	<b>UNITY 180</b>	<b>UNITY 240</b>	<b>UNITY 300</b>	<b>UNITY 360</b>
Operating altitude	2000 m (max. permissible geography above sea level)				
Operating temperature	-30 °C ... +50 °C				
Temperature derating	Ambient temperature up to 50 °C: 100% output power Ambient temperature above 50 °C: Power reduction (derating)				
Storage temperature	-40 °C ... +70 °C				
Air humidity	20 - 95 % (without condensation)				
Mounting type	Free-standing housing				
Dimensions (H x W x D) - net	2125 mm x 822 mm x 1168 mm				
Dimensions (H x W x D) - net pallet	2300 mm x 830 mm x 1200 mm				
Dimensions (H x W x D) incl. air freight packaging	2300 mm x 1000 mm x 1400 mm				
Dimensions (H x W x D) incl. sea freight packaging	2300 mm x 1000 mm x 1400 mm				
Weight - net	490 kg	520 kg	600 kg	630 kg	720 kg
Weight incl. transport pallet	515 kg	545 kg	625 kg	655 kg	745 kg
Weight incl. air and sea freight packaging	640 kg	670 kg	750 kg	780 kg	870 kg

Table 10: Technical data - General

## 3.4 Directives and standards

### 3.4.1 Guidelines

- 2014/30/EU Electromagnetic Compatibility (EMC) Directive
- 2014/35/EU Low Voltage Directive (LVD)
- 2014/53/EU Radio Equipment Directive (RED)

### 3.4.2 Standards

#### **IEC 62196**

- IEC 62196-1: 2014 - Part 1: General requirements for vehicle couplings and vehicle entrances
- IEC 62196-2: 2011 - Part 2: AC Type 2 charging protocol
- IEC 62196-3: 2014 - Part 3: Requirements for CCS2 connectors

#### **IEC 61851**

- IEC EN 61851-1: 2011 i EN 61851-1 :2019.)
- IEC 61851-23: 2014, IEC 61851-24 ed 1,

### 3.4.3 Standards relating to electromagnetic compatibility

- EN IEC 61000-6-1 2019
- EN 61000-6-4:2007+A1
- IEC 61851-21-2\_2021
- EN 301489-1 v1.9.2
- EN 301489-34 V1.4.1

### 3.4.4 IEC 15118

- DIN EN ISO 15118

### 3.4.5 Low Voltage Directive

- EN 61851-1:2011
- EN 61851-23:2014
- EN 61851-1:2010
- IEC 61851-1:2010
- IEC 61851-23:2014
- EN IEC 62311:2020



### 3.4.6 Equipment

- IP54 - Protected against ingress IEC 60529:1989+A1:1999+A2:2013
- IK 10 housing - impact protection in accordance with EN 62262
- IK 8 screen - impact protection in accordance with EN 62262

## 4 Description

This chapter deals with the product description of the KOSTAD charger.

### 4.1 UNITY product description

The UNITY is a multi-standard charging station that is used to charge electric vehicles using AC or DC charging standards.

The charging station can be configured with 2 or 3 charging points and charge 2 vehicles simultaneously.

The charging station is accessible from all sides and is screwed down with secure screws to prevent vandalism.

The control unit, including 24 V power supply, router, control unit, communication box, switch and data network connection, is installed separately from the power electronics (12-pulse supply and DC / DC power module) in the charging station.

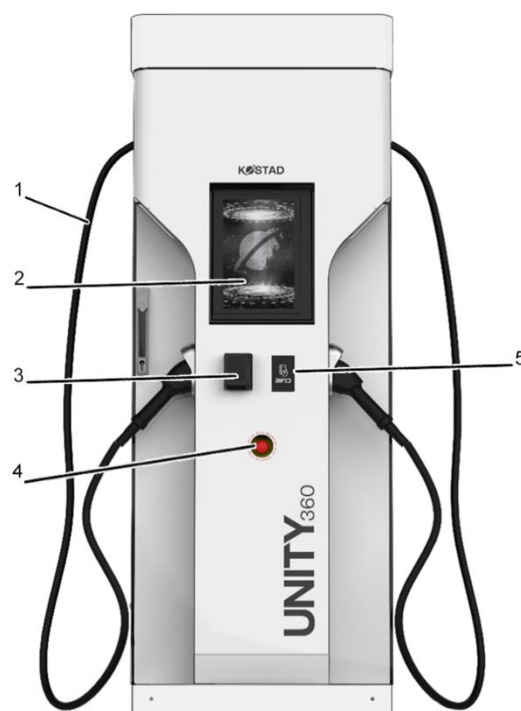


Figure 1: UNITY 360

1) Charging plug

2) HMI

3) Payment Terminal

4) Emergency stop button

5) RFID reader

## **Charging plug**

The charging station has 2 DC outputs with different or the same charging cables or plug types (CCS and/or CHAdeMO) and an optional AC socket with up to 22 kVA charging power.

UNITY offers the following connections:

- CCS Type 2
- CHAdeMO
- AC Type 2 socket

## **HMI**

The Human-Machine Interface is the user interface of the device. Interaction is possible via the screen.

## **RFID reader**

The user can authenticate via the RFID reader.

## **EMERGENCY STOP button**

An EMERGENCY STOP button is located on each charging station directly under the RFID card reader to enable charging processes to be terminated in dangerous situations. Pressing the EMERGENCY STOP button stops all charging processes immediately. The energy flow from the charging station to all connected vehicles is interrupted.

The EMERGENCY STOP button is recessed to prevent a user from accidentally triggering the EMERGENCY STOP button.

## **LED lighting**

The standard colors of the LED lighting show

- Free charging station: green
- Reserved charging station: violet
- Charging station in use: blue

The colors can be adjusted by the operator.

## 4.2 Charging points

The charging station supports the following relevant AC and DC charging standards to ensure the charging of various electric vehicles.



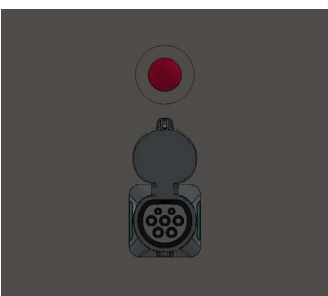
CCS Type 2  
Combined Charging System plug  
Up to 360kW charging power  
920 V max.  
400 A peak



CCS Type 2 Liquid cooled  
Combined Charging System plug  
360kW charging power  
920 V max.  
500 A



CHAdeMO JEVS  
G105 V0.9.x to 1.2  
50kW charging power  
500V max.  
125 A



(OPTION)  
AC Steckdose Type 2 Mode3  
22kW charging power  
400V  
32A

Charging a vehicle by the AC socket, you need a charging cable. Monitoring of the maximum current carrying capacity of the customer's charging cable in accordance with EN62196-2 (VDE-AR-E 2623-2-2) is integrated into the charging station if this option is selected. A phase imbalance monitor can also be selected in addition to this option in accordance with VDE-AR-N 4100.

#### 4.3 Authentication

Vehicle owners must authenticate themselves (various methods: RFID, mobile app, credit card via payment terminal, etc.) and select the required charging port so that the charging process can be started.

For a more detailed description of authentication, see document:

[UNITY\\_OperatingInstructions\\_Release2023\\_EN\\_V1.0.pdf](#)

#### 4.4 Variants and options

The following options can be configured for the UNITY.

- Compliant AC and DC metering and AC energy metering
- Compliant indirect AC and DC measurement
- Mains voltage and mains voltage tolerances
- Control cabinet lock or locking system (cylinder)
- Charging outlet type, cable length without/with cable cooling
- Payment-Terminals
- Backend connection and remote service
- AC charging

#### 4.5 HMI navigation

For information on the HMI and operation, see document:

[UNITY\\_OperatingInstructions\\_Release2023\\_EN\\_V1.0.pdf](#)

## 4.6 Network connection

The charging station has 3 network connections

- WiFi
- WAN
- Kostad service connection

The charging station can be connected to the Internet or a private network with the OCPP backend.

The communication components are password-protected by the manufacturer and therefore cannot be parameterized by the operator. To configure the routers and the corresponding firewalls according to the functionality, please contact Kostad Customer Support ([support@kostad.at](mailto:support@kostad.at)).

Copper cable-based Ethernet connections (RJ45 terminated) are optionally available for extended communication or for connecting the charging station to the customer's own LAN. The charging station can be equipped with fiber optic cable on request.

### 4.6.1 Wireless connection

The wireless connection is established via the modem and the customer's SIM card.

### 4.6.2 WAN Ethernet connection

UNITY can also be connected to the backend via an Ethernet connection.

### 4.6.3 KOSTAD service connection

The KOSTAD service connection is established via the integrated modem and a separate SIM card. KOSTAD can connect to UNITY via the service connection to perform the following tasks.

- Access to the UNITY charging station for service and maintenance
- Access to the UNITY charging station for software and firmware updates.

4.7 System labeling

Warning signs are mounted on the system to warn of residual risks, which cannot be removed by design.

**Type plate**

The charging station is identified by a type plate. The type plate is located on the left side panel of the charging station.

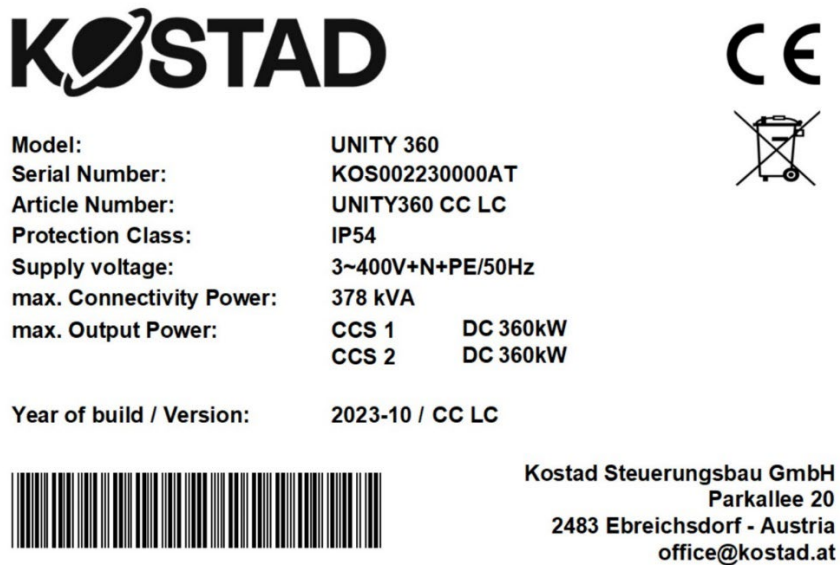


Figure 2: UNITY typeplate

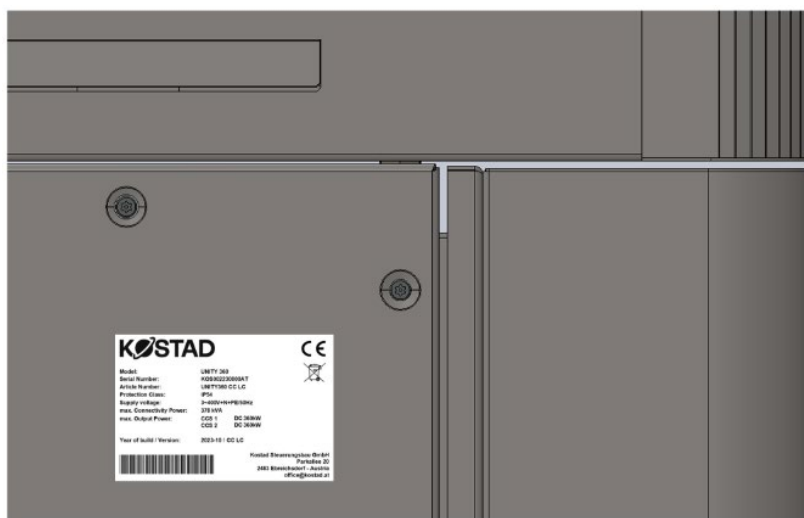


Figure 3: UNITY position typeplate (example Unity360)

## 5 Planning

This chapter deals with the planning of installation and operation.

UNITY must be installed on a suitable concrete base with special cable bushings for the mains power and LAN cabling.

This chapter includes

- Variants and options
- Transport and storage
- Planning installation location, AC power supply and network connection
- Authentication and payment

### 5.1 Variants / options

- Compliant AC and DC measurement method and AC energy metering for AC and DC charging outputs
- Compliant AC and DC measurement method
- Connector and cable
- Payment terminal
- Backend and service connectivity
- AC charging option
- Packaging, wrapping and color selection

You will find the relevant article number for your charging station on the type plate on the left-hand side panel in the upper front area.



The features and functions described below are order-dependent and therefore not available for all stations. They represent available options.

---

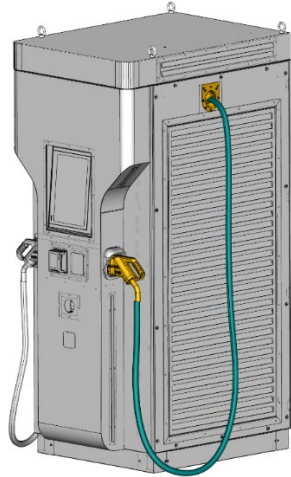


5.1.1 Calibration-compliant AC and DC measuring method

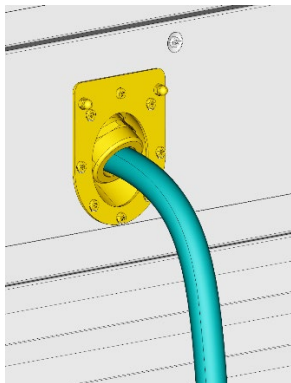
Various forms exist for the option "AC and DC measurement method and AC energy metering for AC and DC charging outlets in compliance with calibration law".

5.1.2 Connector and cable

---



Cable outlet



Cable outlet detail

---

### 5.1.3 Payment terminals

This option is another authorization procedure for starting a charging session. This is a pre-paid procedure based on credit card readers with or without a Tableau keyboard and/or NFC reader.

The standard version of the charging station is supplied without a payment terminal. The payment terminals that can be selected depend on the customer and the customer's specified cooperation bank.

### 5.1.4 Backend connections and remote maintenance

The standard protocol for communication with the backend is OCPP 1.6J. Support for OCPP 2.0 is also available.

Detailed information can be found in the software documentation

UNITY\_OperatingInstructions\_Release2023\_EN\_V1.0.pdf

### 5.1.5 AC charging option

Use this option to specify whether the charging station is to have an additional AC charging outlet in the form of a 22 kVA socket. This option is only available as an AC socket, for which a customer-side charging cable is required to charge a vehicle with AC. The safety technology to ensure the maximum current carrying capacity of the customer's charging cable is integrated into the charging station with this option.

This option also allows you to specify whether the AC charging output should be equipped with a phase imbalance monitor. These phase imbalance monitors or asymmetry relays are set to the legal requirements before installation and before the charging station is placed on the market. In Germany, a maximum permissible asymmetry between the individual phases in 3-conductor low-voltage networks of < 4.6 kVA is prescribed by law in the VDE-AR-N\_4100 implementation guideline.



Note the information on the on-site mains supply when using the AC charging socket in [chapter 7.3.1 Mains-side voltage and power supply](#).

---

### 5.1.6 Packaging, foiling and color selection options

Several options are available (packaging, foiling and color selection of the charging station).

If you have any questions, please contact the Kostad Customer Support Center ([support@kostad.at](mailto:support@kostad.at)).

## 6 Transportation and Storage

### 6.1 Storage

Store the charging station in clean, dry rooms. Observe the information in the technical data.



For longer periods of storage, you must protect the charging station from dirt and environmental influences by covering it or taking appropriate measures.

---

#### ATTENTION

Risk of material damage due to moisture and condensation.

Accumulated moisture or condensation inside the Unity may cause damage to the appliance when it is switched on.

- Store the charging station properly.
  - Pay attention to the markings on the packaging.
- 

#### ATTENTION

Risk of material damage due to incorrect storage.

Improper storage may result in damage to the appliance.

- Follow the storage instructions.
  - Pay attention to markings for correct handling.
-

---

## 6.2 Transportation

### 6.2.1 Safety instructions

The charging station is mounted on a wooden pallet as standard for transportation and covered with bubble wrap and plastic film. There are various packaging options for other types of packaging.

Observe the instructions on the packaging for transportation, storage and proper handling.

Secure the load to avoid the risk of tipping.

When unpacked, transportation is also possible using the transport lugs attached to the charging station. You must ensure that the load is evenly distributed.

#### ATTENTION

Risk of material damage to objects in the vicinity.

Moving Unity to the installation location may cause damage to other objects.

- Pay attention to surrounding objects, walls, ceilings, etc.
  - Plan the transportation route and method according to the conditions at the installation site.
- 

#### ATTENTION

Risk of material damage due to insufficient space.

When unloading and setting up the charging station, ensure sufficient distance from walls, ceilings and other objects.

- Pay attention to the surroundings.
- 

### 6.2.2 Transportation with forklift truck

It is not possible to transport the charging station with a forklift truck without a transport pallet.

### 6.2.3 Transportation by crane

For transportation by crane, 4 eyebolts M12 to DIN580 are attached to the top of the charging station for use as crane eyes. Only use suitable cranes to move and position the charging station. Only use suitable tools. Shackles, chains, straps, etc. Note the weight of the charging station. You can find information on this in [chapter 3 Technical data](#).

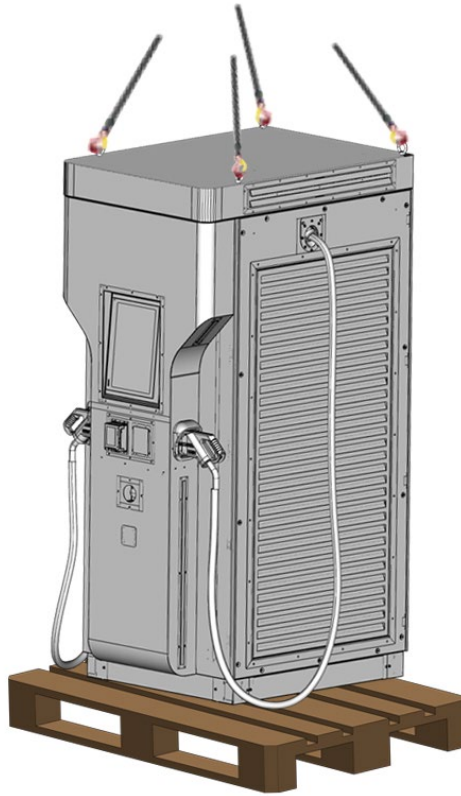


Figure 4: Transport by crane - lifting with crane eyelets

## 7 Site preparation for installation

### 7.1 Installation site, positioning

Choose a glare-free and shady installation location to ensure good visibility of the content on the HMI (touchscreen/screen).

The charging station has a glare shield installed. However, glare protection cannot guarantee unrestricted vision under all circumstances in special weather conditions (e.g. very low sunlight in the winter months).

To ensure maintenance-friendly access and proper air supply, you must observe the clearances as shown in the drawing below. Please refer to the information in [chapter 7.2.2.1 Cooling](#). If the selected locations do not meet the spatial requirements, you must contact the KOSTAD Customer Support Center ([support@kostad.at](mailto:support@kostad.at)) in advance.

## 7.2 Foundation

The foundation supports the charging station, supplies the charging station with power and the network connection and holds the spreader anchors.

To ensure the stability of the charging station, you must consider following aspects:

- The surface must be level and able to support the weight of the charging station without deformation.
- Concrete quality of the foundation and the installation surface: C30/37B5
- F4 expansion anchors, e.g. Würth M12-30-50/110 material W-FAZ/A4, are required for fastening: 5928 410 030, recommended.
- You can route the hose required for the cable feed lines into the ground at any position depending on the local conditions.

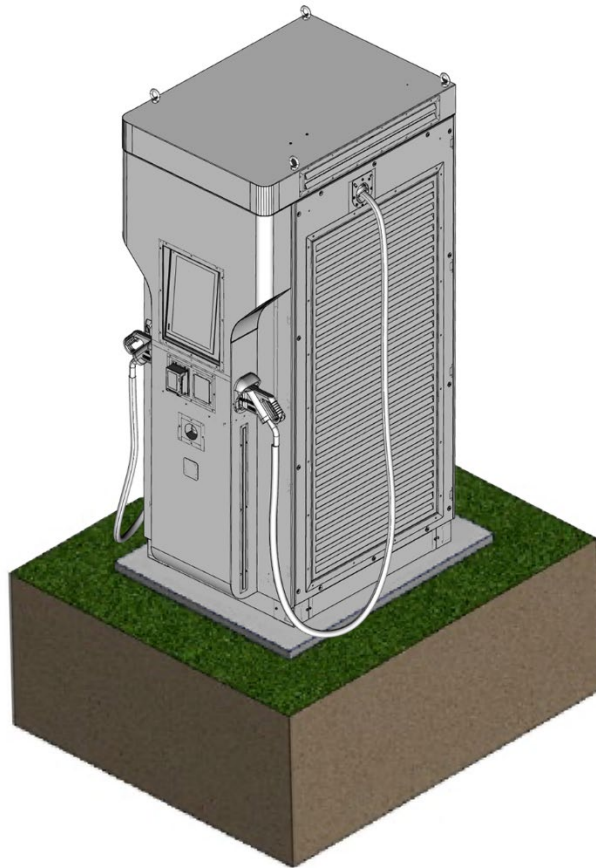


Figure 5: Charging station in the parking lot in the outdoor area

**Example of a foundation**

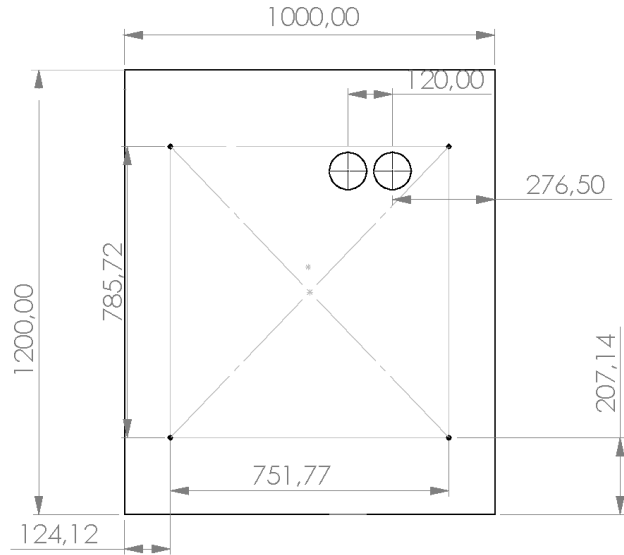


Figure 6: Mounting dimensions [mm] and cable entries for mains supply

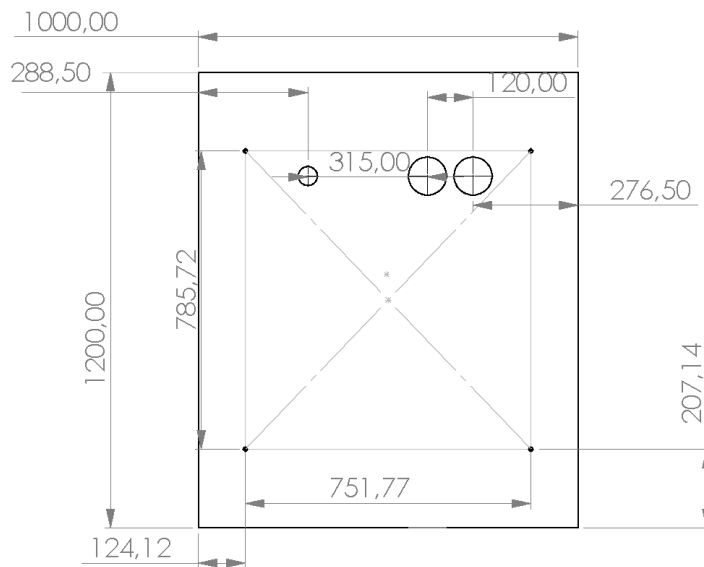


Figure 7: Mounting dimensions [mm] and cable entries for mains supply and LAN





The height of the concrete base must comply with local building regulations. The 800 mm dimension in the figure stands for installations in Austria/Germany and guarantees a frost-free foundation.

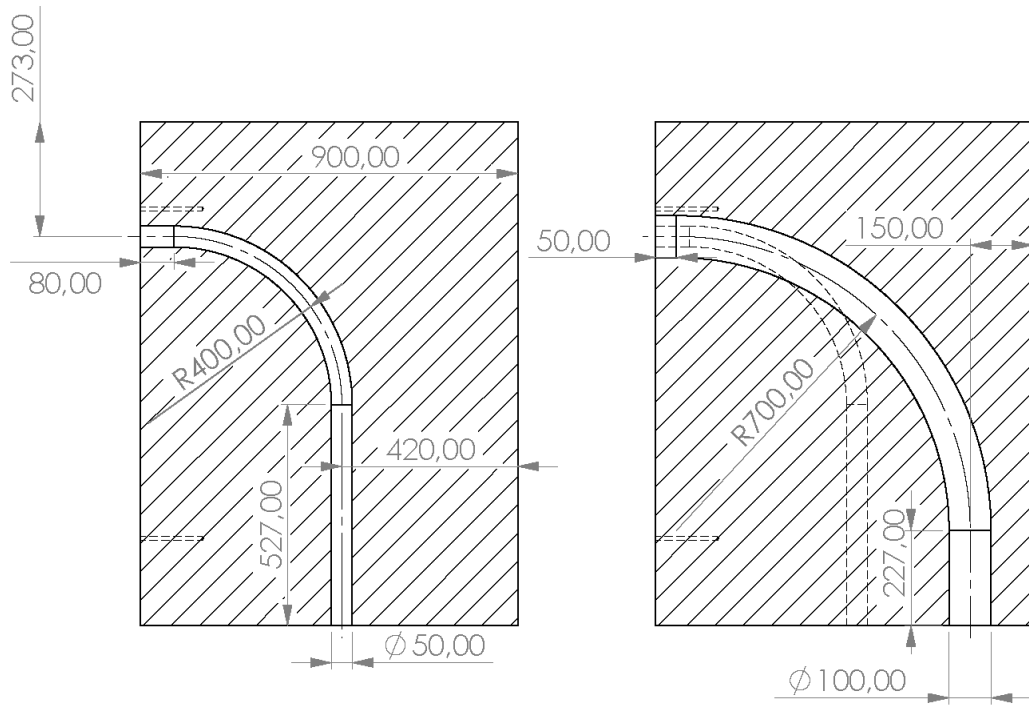


Figure 8: Hose for network supply (left) and cable feed (right)

Type E-YY 5 x 150 mm<sup>2</sup> is used here as an example. Cable cross-sections between 120 mm<sup>2</sup> - 150 mm<sup>2</sup> can be installed according to the power rating. The permissible bending radius for the 150 mm<sup>2</sup> cable is at least 610 mm.



Foundation with cable for mains supply



Base with cable for mains supply and optional Ethernet LAN cable

7.2.1.1 Expansion anchor

The charging station is attached to the foundation with 4 expansion anchors.

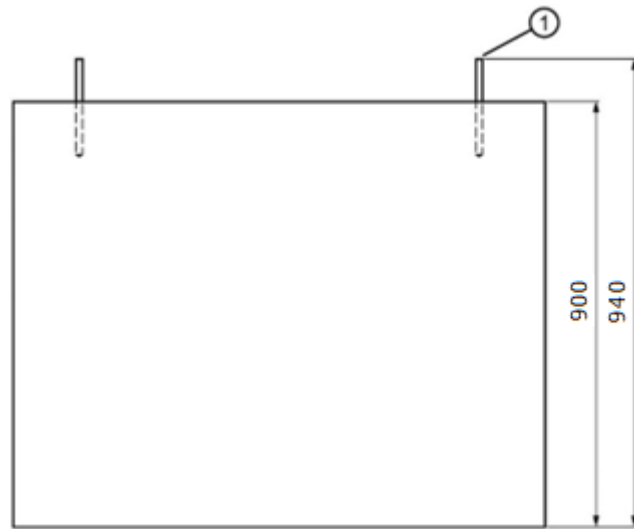


Figure 9: Concrete base [mm]

Article	Expanding anchor
Item number	Various
Manufacturer	Various
Comment	e.g. Würth M12-30-50/110 Material W-FAZ/A4

Table 11: Article information Expanding anchor

7.2.2 Distances

To ensure maintenance-friendly access and proper air supply, you must maintain the clearances as shown in the drawing below.

**ATTENTION**

Risk of material damage due to fire.

Cable fire in the housing due to blockage of the ventilation.

- The clearances around the Unity must be maintained to prevent overheating by blocking the ventilation.

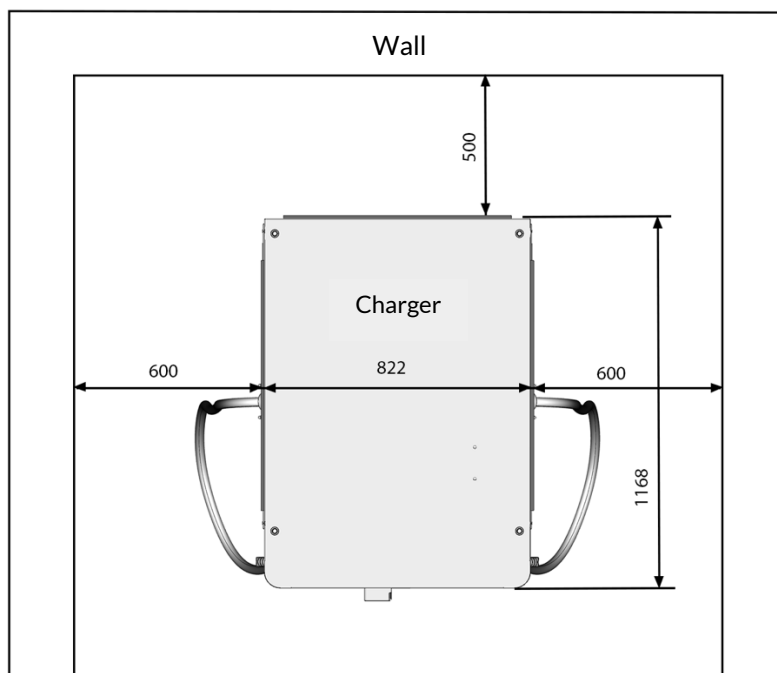


Figure 10: Free space for cooling and service access



If the selected locations do not meet the spatial requirements, you must contact the KOSTAD Customer Support Center ([support@kostad.at](mailto:support@kostad.at)) in advance.

#### 7.2.2.1

##### Cooling

The charging station has a central fan that is switched on when the set temperature is exceeded.

The airflow draws inwards from the right-hand side and cools the above-mentioned components. The power unit has its own air supply and uses internal, rotation speed-controlled fans.



The air inlet openings must not be covered by snow, garbage or dirt.

## ATTENTION

Risk of material damage due to overheating.

Risk of electrical components overheating due to ambient conditions.

- Plan the installation location according to the temperature and ventilation at the installation location.
- Protect the Unity from direct sunlight with a canopy or shade.

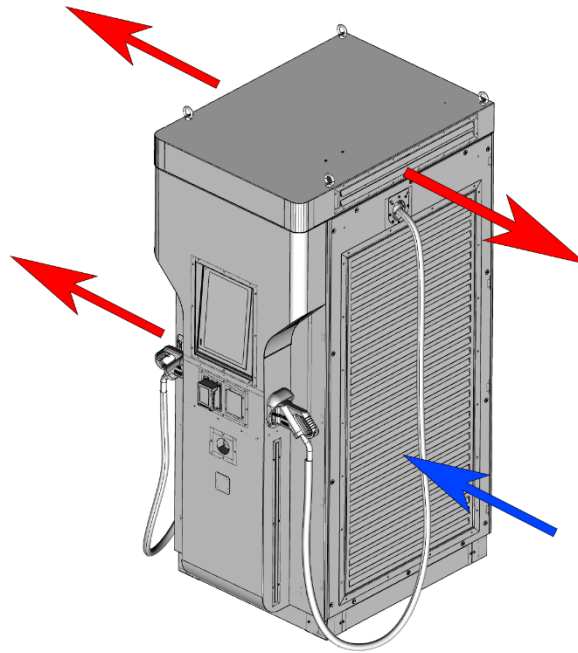


Figure 11: Position of the openings for ventilation and air extraction

### 7.2.2.2

#### Impact protection

In the case of free-standing low-voltage systems in public traffic areas, you must always provide impact protection unless contact by a motor vehicle can be avoided by other structural measures. The impact protection must not prevent the front door from opening properly.

If you have any questions about impact protection or possible design variants, please contact the Kostad Customer Support Center ([support@kostad.at](mailto:support@kostad.at)).

### 7.3 AC - alternating current connection

UNITY must be connected to a 3-phase power source via suitable copper cabling.

The installer is responsible for the electrical connection of the charging station. The electrical connection of the charging station must be made in accordance with the relevant regulations (such as conductor cross-section, fuses, earthing connection).

The power supply must be protected by a suitable circuit breaker.

To ensure proper internal cabling, the power cable must protrude at least one meter from the foundation. Bending radius, diameter etc. must be taken into account during planning.

#### 7.3.1 Mains-side voltage and power supply

The fuse protection must be complied with and verified by the installer in accordance with EN8101.

The type of installation, cross-sections, cable length etc. must comply with EN8101.

You may only use cables with flexible (wire marking: sm/rm) copper conductors.

Connection cables with a connection cross-section of at least 4 x 95 mm<sup>2</sup> are required.

If an AC charging point is installed, you will need an N conductor. This means that at least 5 x 95 mm<sup>2</sup> is required as the connecting wire cable and cross-section.

You must provide and install an on-site fuse combination or an adequately dimensioned on-site switch-disconnector in accordance with the currents specified above.

#### 7.3.2 Equipotential bonding on site

For the necessary on-site potential equalization, which will be carried out differently depending on the grid supplier, the equalization line must be connected to the common earthing rail in the charging pole. A copper cable cross-section of 10 mm<sup>2</sup> is recommended here.



The maximum permissible voltage drop is country-specific according to legislation. The legal and normative regulations of the respective country must be observed when placing the product on the market. It may be necessary to increase the cross-section.

---

#### 7.3.3 Connection concept

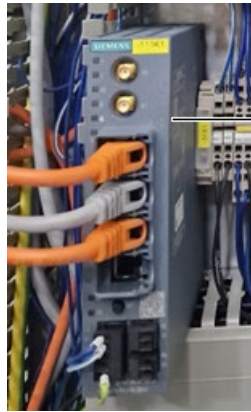
The connection concept is defined on site with KOSTAD. If you have any questions, please contact Kostad Customer Support ([support@kostad.at](mailto:support@kostad.at)).

### 7.3.4 Mobile connections (APN)

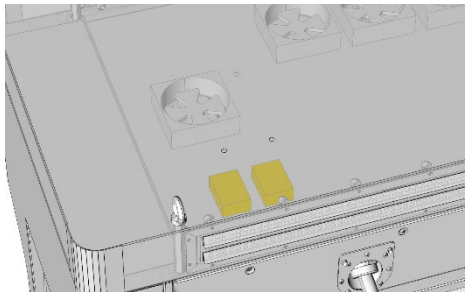
Standard communication with the operator backend (CPO) via OCPP takes place via secure GSM mobile connections (APN) and m2m SIM cards from the operator. The same applies to the optional remote maintenance connection to the manufacturer.



Position of the SIM card drawer on the inside of the door (for backend / CPO)



Position of the SIM card drawer on the back of the Scalance router (for remote maintenance)



Location and position of the GSM/ LTE antenna(s) for GSM network connections to the CPO (operation) and manufacturer (time synchronization / remote maintenance)



Please note that for the selected operating location of the charging station, stable and uninterrupted mobile phone communication from your selected mobile phone provider is required to ensure communication with the CPO/MSP and for the optional remote maintenance function.

### 7.3.5 LAN / WAN

When using LAN, the installation location must be prepared accordingly.

The LAN cable must be at least 800 mm long from the foundation.

### 7.3.6 Access with Sinema Remote and Smart Server

Information can be found in the following document:

[UNITY\\_OperatingInstructions\\_Release2023\\_EN\\_V1.0.pdf](#)



## 8 Installation

This chapter covers the installation of UNITY.

The installation includes the following tasks.

- Checking the installation location
- Unpacking and inspecting the charging station
- Installing the charging station
- Connecting the power supply
- Connect to network

At the end of this chapter, the charging station is installed and ready for commissioning.

### 8.1 Safety

See [Chapter 2.2.1 Installation](#)

### 8.2 Preparation

To carry out the installation, the installation site of the charging station must be prepared in accordance with [chapter 7](#).



Check the installation location before starting the installation.

---

#### ATTENTION

Risk of material damage due to condensation and corrosion.

Risk of damage to electrical components due to condensation and/or corrosion.

- Commission the charging station as soon as possible after installation to prevent condensation and corrosion.
- 

#### ATTENTION

Risk of material damage to objects in the vicinity.

Moving Unity to the installation location may cause damage to other objects.

- Pay attention to surrounding objects, walls, ceilings, etc.
  - Plan the transportation route and method according to the conditions at the installation site.
-

**ATTENTION**

Risk of material damage due to insufficient space.

When unloading and setting up the charging station, ensure sufficient distance from walls, ceilings and other objects.

- Pay attention to the surroundings.
- 

The following points must be checked before starting the installation.

- Foundation
- AC power supply
- Network connection

### 8.2.1 Foundation

The foundation supports the charging station, supplies the charging station with power and the network connection and holds the spreader anchors.

**ATTENTION**

Risk of material damage due to incorrect installation.

Incorrect installation of the Unity on the foundation can cause the charging station to tip over and cause damage.

- Assemble the charging station according to the specifications.
- 

Check the following points before starting the installation.

- Foundation in the correct position.
- Foundation dimensions match the planning.
- Foundation was carried out on site according to the drawing/planning.
- Position of the power cables correctly according to planning.
- Position of the network cable correctly executed according to planning.
- Position of the expansion anchors Drill holes correctly according to planning (or are they only drilled during installation?).

### 8.2.2 AC power supply

The AC power supply cables must be in the correct position and length to carry out the installation.

Check the following points before starting the installation.

- AC cables emerge from the foundation at the correct position
- AC cables are at least 950 mm long from the foundation

### 8.2.3 Network connection

The LAN cable of the network connection must be in the correct position and length in order to carry out the installation.

Check the following points before starting the installation.

- Network cable exits the foundation at the correct point.
- Network cable is at least 950 mm long from the foundation.
- Network cable is equipped with RJ45 connector (or during installation?).

### 8.2.4 Distances

To ensure air exchange and access for maintenance, minimum distances to surrounding objects must be maintained.

Check the following points before starting the installation.

- Minimum distances of 500/600 mm to surrounding objects were maintained.

#### ATTENTION

Risk of material damage due to fire.

Cable fire in the housing due to blockage of the ventilation.

- The clearances around the Unity must be maintained to prevent overheating by blocking the ventilation.
-

### 8.2.5 Impact protection

To protect the charging station from collisions, impact protection can be installed around the charging station.

Check the following points before starting the installation.

- The ram protection was correctly implemented at the installation site according to the planning.

### 8.2.6 Shading

It is recommended to provide shade for the appliance in hot or sun-exposed locations.

#### ATTENTION

Risk of material damage due to overheating.

Risk of electrical components overheating due to ambient conditions.

- Plan the installation location according to the temperature and ventilation at the installation location.
- Protect the Unity from direct sunlight with a canopy or shade.

### 8.3 Unpacking

Remove the packaging material and carry out a visual inspection of the charging station.

During visual inspection, pay particular attention to the following components.

#### ATTENTION

Risk of material damage due to improper unpacking.

The use of cutting tools to remove plastic can damage the Unity housing.

- Do not use cutting tools to open and remove the packaging.

- Cabinet
- Charging cable
- Charging plug
- HMI
- RFID field
- Emergency stop button
- Crane eyelets

8.4 Installing the foundation anchoring

The charging station is attached to the foundation with 4 expansion anchors.

Follow the product-specific information on nominal drill diameter, drill hole depth, etc.

**Material**

Article	Expansion anchor M12-30-50/110
Item number	5928 410 030
Manufacturer	Würth
Comment	Material W-FAZ/A4

Table 12: Article information Expanding anchor

See document Unity150-360\_Fundamentplan.pdf and Figure 7, Figure 8, Figure 9

---

1. Check the positions of the holes according to the drawing.

---

2. Drill holes for the expansion anchors in the foundation.

---

3. Drive in the expansion anchor. Follow the manufacturer's instructions.

---

The expansion anchors are installed in the foundation.

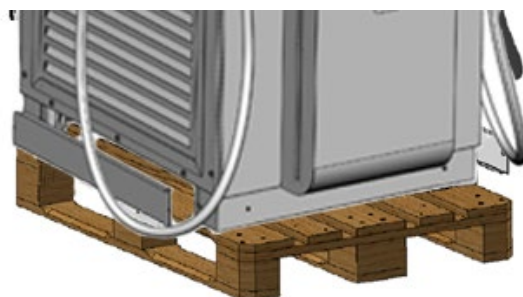
## 8.5 Dismantling the EPAL pallet

The UNITY is attached to the EURO pallet with 2 bolts.

You will need a special screwdriver for TX30-TR (pin) to remove the base covers.

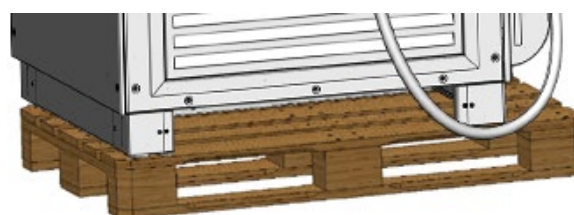
The following steps will guide you through the process of detaching the UNITY from the EUR pallet.

1. Unscrew the 4 screws of the two plinth panels.



2. Remove both base covers.

3. Remove both fastening screws.

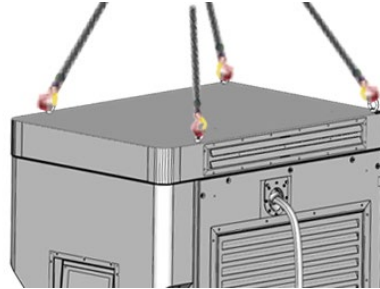


UNITY is detached from the EURO pallet.

## 8.6 Installing the charging station

The front door can be locked. The built-in locking system or the built-in cylinder lock depends on the type of appliance ordered. If no on-site lock or locking system has been ordered, the standard lock or a simple locking device for transportation purposes is installed. In these cases, use the keys supplied to open the door. On delivery, this key is located in the area of the EMERGENCY STOP button and is held securely in place with a cable tie.

- 
1. Attach the hoist to the crane eyelets.



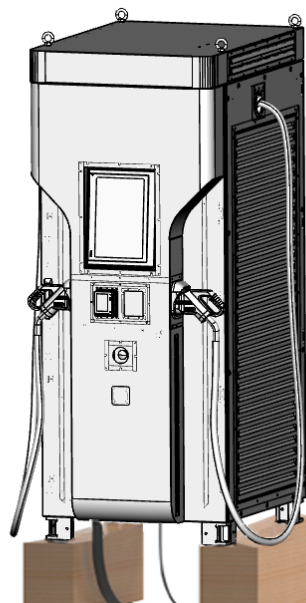
- 
2. Position the beam on the foundation.



Pay attention to the alignment / position of the UNITY in relation to the foundation.

---

3. Lift UNITY onto the beams.



4. Open/remove all doors.



You will need a special screwdriver for TX30-TR-(pin) to open the side doors and rear panel (access to the transformer unit) and to remove the base covers.

#### ATTENTION

Risk of material damage to doors and door hinges.

Improper handling may result in damage to the doors and door hinges of the appliance.

- Handle the device with care.

#### Achtung

Risk of material damage to the power cables.

Damage to the power cables may occur when inserting the cabling.

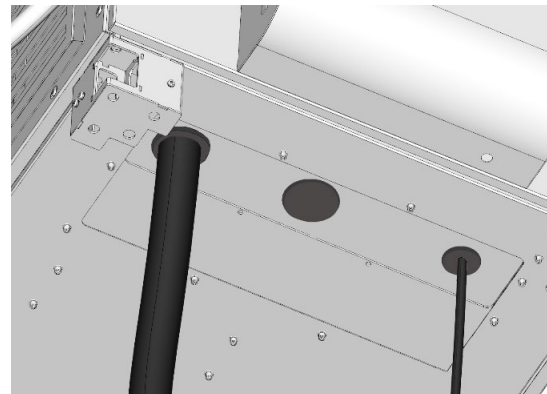
- Pay attention to the presence of the edge protection.



5. Remove the cover.



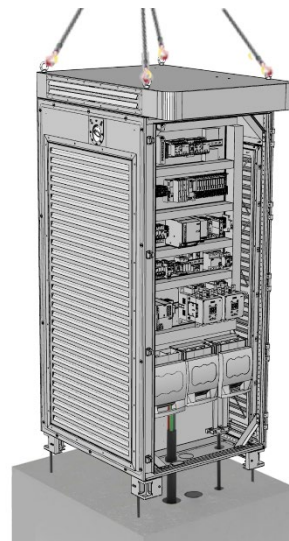
6. Feed the AC cable through the opening provided in the base of the UNITY / cable routing grommets.



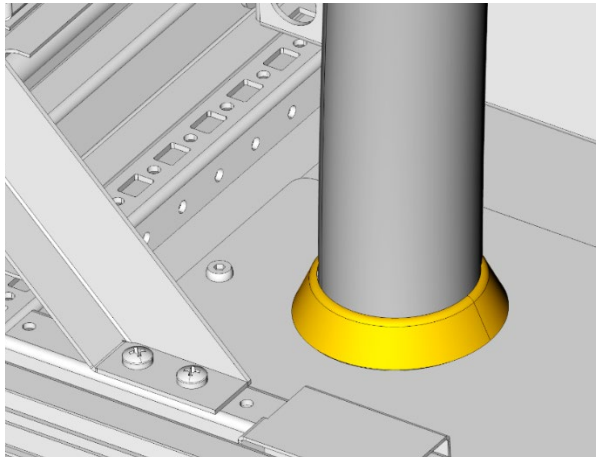
7. Raise UNITY a few mm.

8. Remove bars.

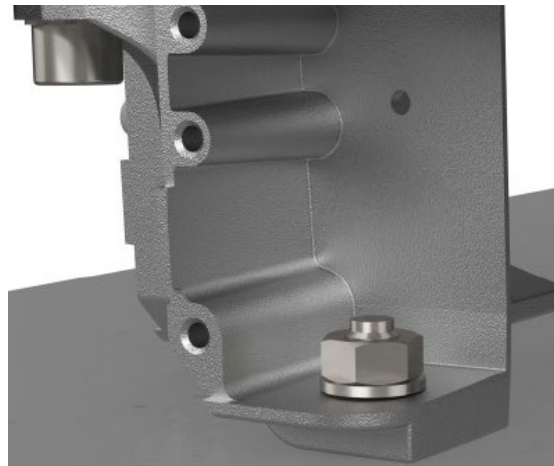
9. Lower the UNITY onto the expansion anchors on the foundation.



10. Check that the cable grommets are closed and tightly seated.



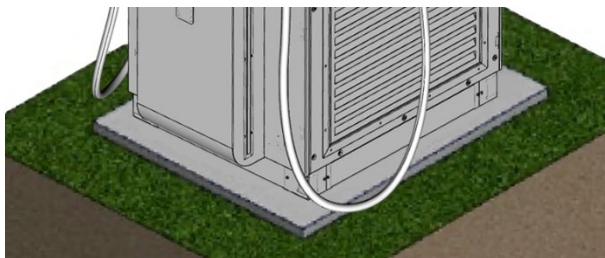
11. Fasten the charging station to each anchor using a washer and M10 nut.



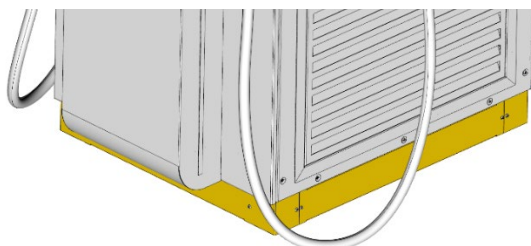
12. Tighten the 4 x M10 nuts to a torque of 35 Nm.

13. Detach the hoist from the 4 crane eyelets.

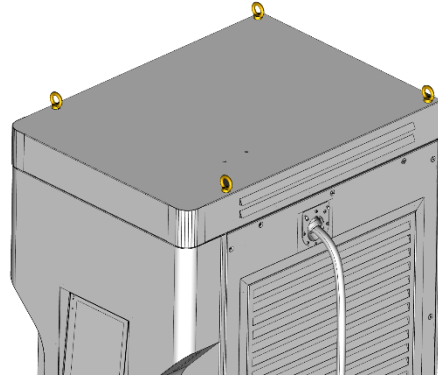
14. Mount the 4 plinth panels.



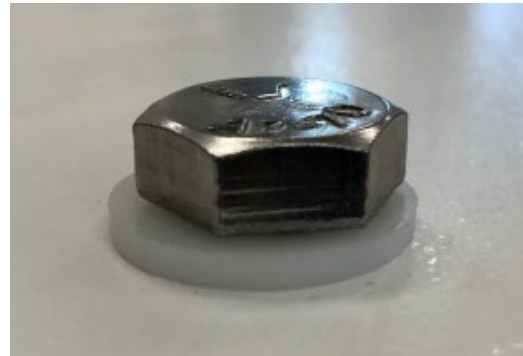
15. Fasten the 4 plinth panels with a torque of 4.7 Nm.



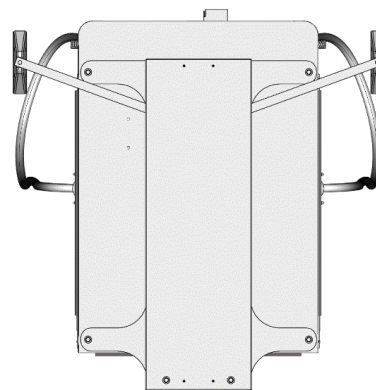
16. Remove the crane eyelets.



17. Fasten the screw plugs with the existing seals.



18. OPTION Cable management Install the cable management with locking screws.



---

The installation of the UNITY on the foundation is complete.

## 8.7 Connecting the power supply

The power supply should be connected directly after installation.

### ATTENTION

Risk of material damage due to overheating.

Incorrect torque at the AC terminals can lead to overheating at the terminals.

- Pay attention to the correct procedure for installing the terminals.
- Ensure correct torques when tightening.

### ATTENTION

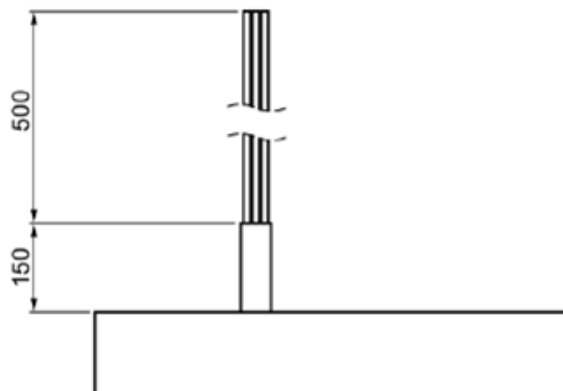
Risk of material damage due to incorrect cable termination.

Incorrect cable termination can result in damage to the Unity.

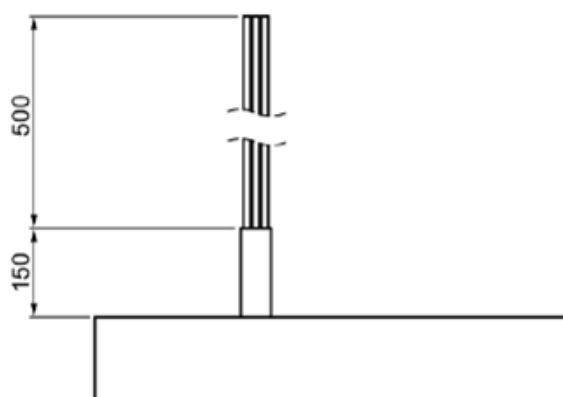
- Pay attention to the correct installation procedure.
- Pay attention to the corresponding guidelines for cable terminations.

The following steps will guide you through connecting UNITY to the power supply.

1. Shorten the cable to 650 mm from the foundation.



2. Strip 500 mm of the cables.

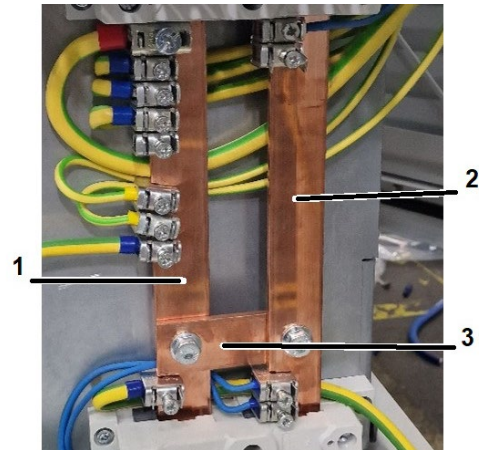




UNITY has 2 openings on the underside: Power supply and network cable.

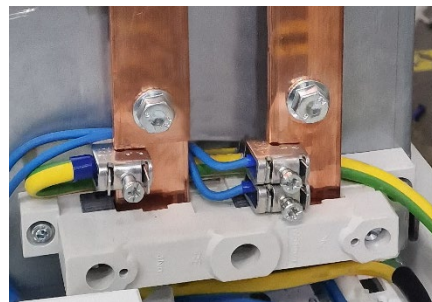
3. Assemble the cable ends.

4. Connect the PE conductor to the left busbar (1).

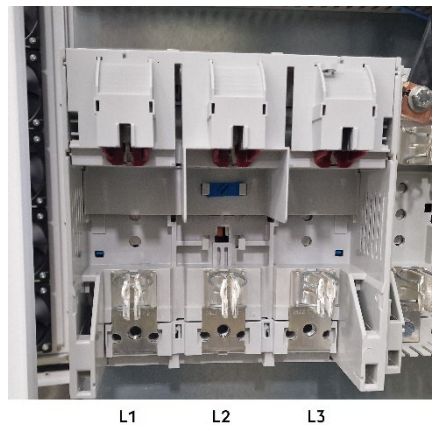


5. For OPTION with AC socket, connect the N conductor to the right busbar (2).

Jumper (3) must not be fitted to the AC socket.



6. Connect phases L1, L2 and L3 to terminals 1X1 (tightening torque 40Nm)



- 
- Put in the cover with the NH fuses.



---

The power supply cables are connected to UNITY.

### Testing the electrical system

Switch on the system and carry out a test.

The following tests must NOT be carried out:

- Insulation test (carried out by the manufacturer)

## 8.8 Connect to network

**ATTENTION**

Risk of material damage due to incorrect cable termination.

Incorrect cable termination can result in damage to the Unity.

- Pay attention to the correct installation procedure.
- Pay attention to the corresponding guidelines for LAN cable terminations.

**ATTENTION**

Risk of material damage due to improper handling.

Connecting the LAN cable to the router can cause damage to the router or the LAN cable.

- Make sure that the correct connection has been selected.
- Connect the cable without applying excessive force.

**ATTENTION**

Risk of material damage due to improper handling.

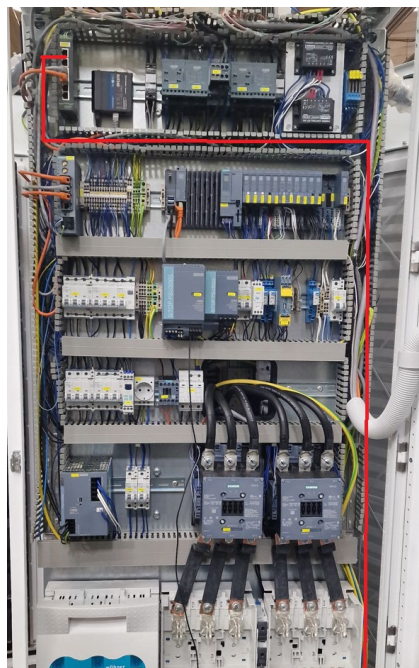
When inserting the SIM card, the card or the router may be damaged.

- Make sure that the card slot and card orientation have been selected correctly.
- Insert the SIM card without excessive force.

1. Connect the LAN cable to the LAN plug.



2. Lay the cable in UNITY as shown in the picture.



The network cable is connected.



## 9 Commissioning

### 9.1 Safety

See [Chapter 2.2.2 Commissioning](#).

### 9.2 Switching on for the first time

#### ATTENTION

Risk of material damage due to condensation and corrosion.

Risk of damage to electrical components due to condensation and/or corrosion.

- Commission the charging station as soon as possible after installation to prevent condensation and corrosion.
- 

#### ATTENTION

Risk of material damage due to incorrectly set operating parameters.

Incorrectly set operating parameters may result in damage to the appliance.

- Make sure that the configuration is carried out according to the specifications.
-

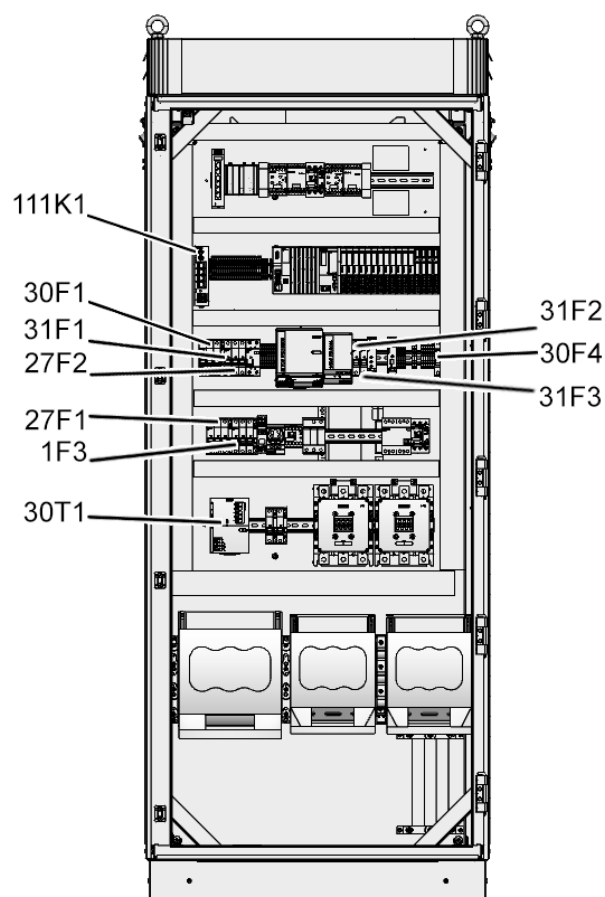


Figure 12: UNITY charging station -with door open - Switch on

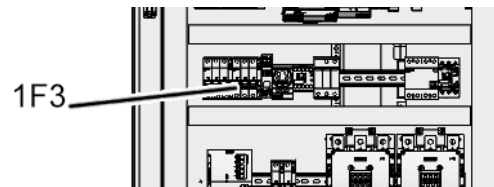
No.	Component	No.	Component
111K1	Router	30T1	SITOP PSU8600 40A
27F1	Fuse protection SITOP PSU300S (cable cooling)	1F3	Fuse protection Phase monitoring
27F2	Fuse protection socket cabinet	31F1	Fuse protection SITOP PSU300S
30F1	Fuse protection SITOP PSU8600	31F2	Fuse protection DC 24 V
30F4	Fuse protection DC 24 V SIMATIC ET 200SP Analog output module	31F3	Fuse protection DC 24 V

### Preconditions

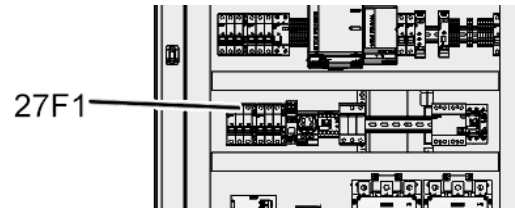
An inspection of the electrical system was carried out.

1. Open the cabinet door.

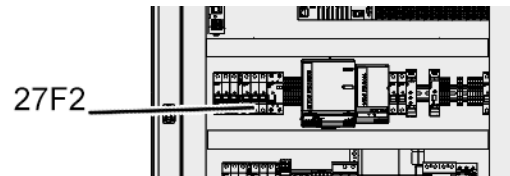
2. 1F3 Fuse protection Switch on voltage monitoring.



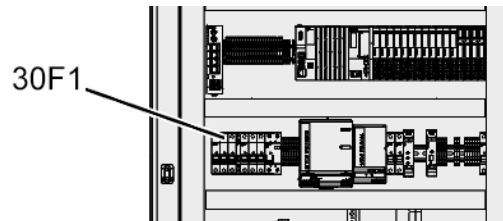
3. 27F1 Fuse protection Switch on cable cooling.



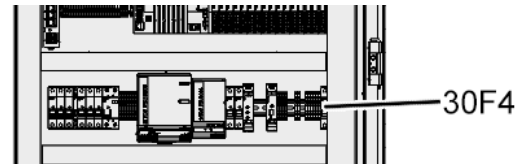
4. 27F2 Switch on socket outlet cabinet



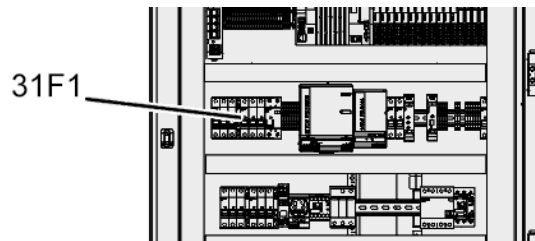
5. 30F1 Switch on fuse protection PSU6200.



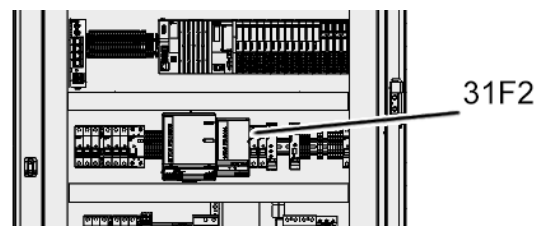
6. 30F4 Fuse protection DC 24 V Power supply unit 2 A switch on.



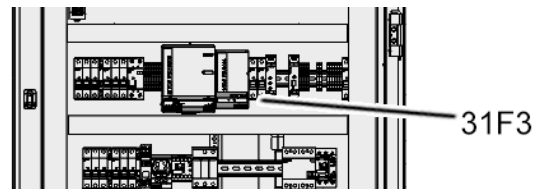
7. 31F1 Fuse protection DC 24 V Power supply unit 10 A switch on.



8. 31F2 Switch on DC 24 V fuse protection.



- 31F3 Fuse protection DC 24 V Power supply unit 20 A switch on.



- Switch on OPTION at AC socket 7F2.

The charging station is switched on.

### 9.3 Switching off the charging station

#### Preconditions

- No EV attached

The following steps will guide you through the process of switching off.

- Switch off OPTION for AC socket 7F2.

- 31F3 Switch off DC 24 V power supply unit 20 A fuse.



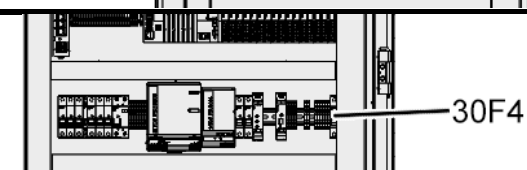
- 31F2 Switch off DC 24 V fuse.

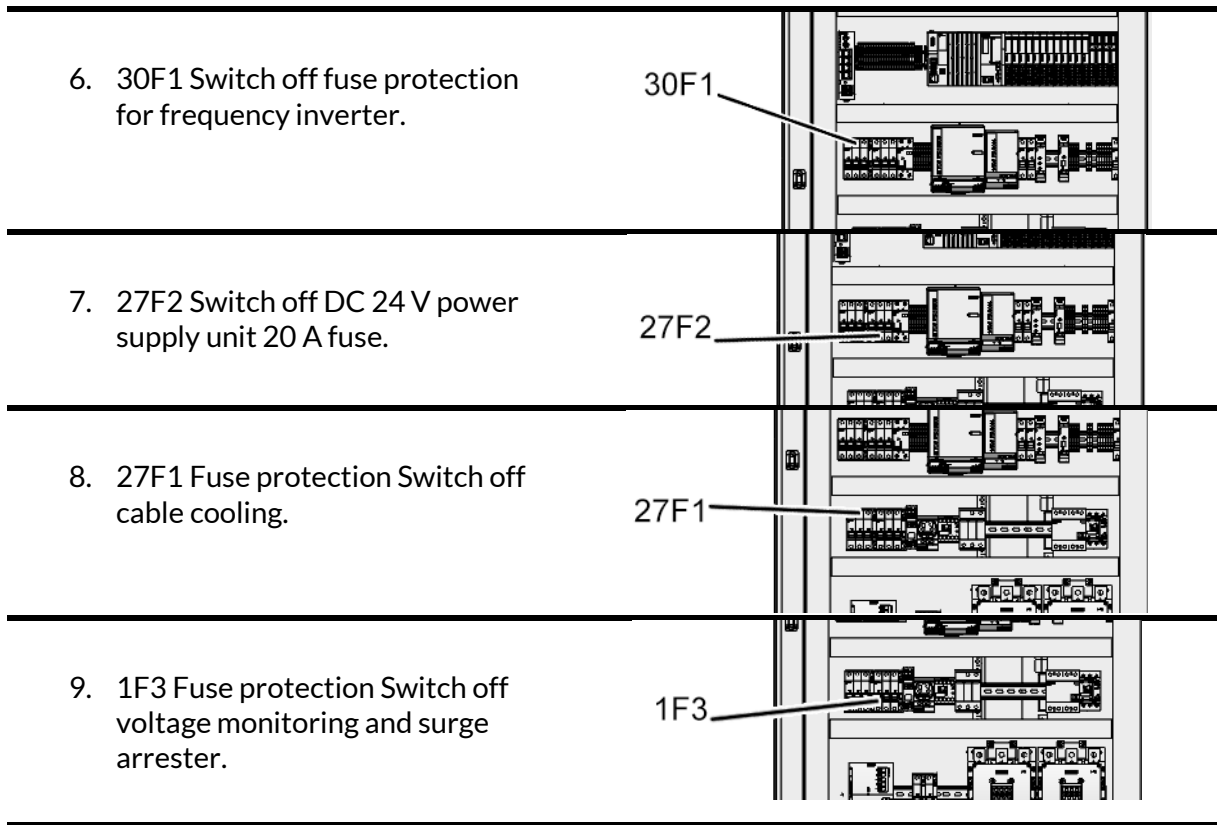


- 31F1 Switch off DC 24 V power supply unit 10 A fuse.



- 30F4 Switch off DC 24 V power supply unit 10 A fuse.





10. Close the cabinet door.

The charging station is switched off.

# 10 Operation

For the operation of the system, see document

UNITY\_OperatingInstructions\_Release2023\_EN\_V1.0.pdf

This chapter deals with the following:

- Safety

## 10.1 Safety

See [Chapter 2.2.3 Operation](#)

### 10.1.1 Notes on operating the charging cable/plug combination



During preparation for the charging process and the charging process itself, the plug is locked by the vehicle. This connection must never be severed by force. Do not remove the plug until the charging process is complete. Follow the instructions on the control panel.

---

#### ATTENTION

Risk of material damage to the charging cables.

Driving over the charging cables can damage them.

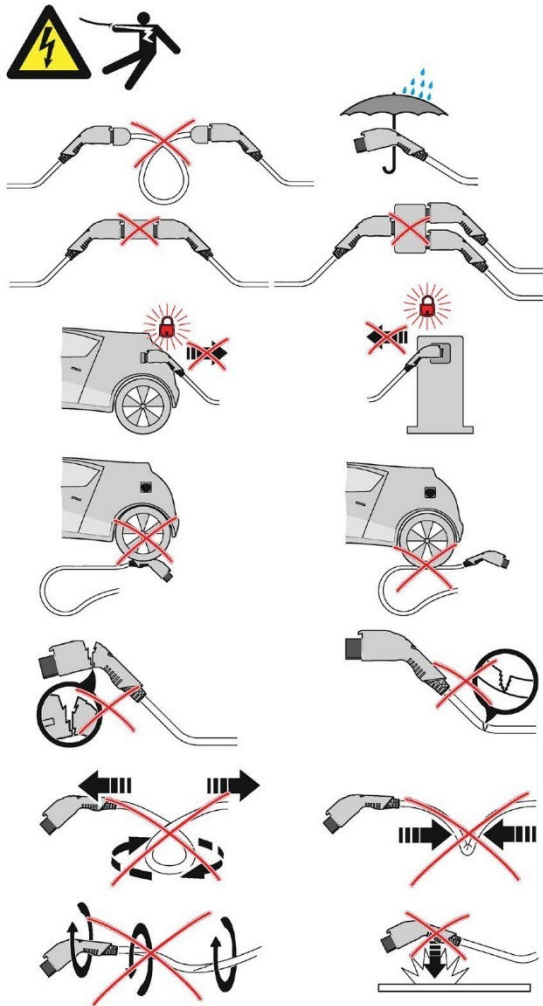
- Pay attention to the stickers on the Unity.
  - Be careful when handling the charging cables.
- 

#### ATTENTION

Risk of material damage to the vehicle.

Dropping the charging plug can cause damage to the vehicle if the plug hits the vehicle.

- Pay attention to the stickers on the Unity.
  - Be careful when handling the charging cables.
-



### Handling the charging cable

When handling the charging cable and plug, you must observe the manufacturer's instructions provided by the charging cable manufacturer, e.g. Phoenix.

Please note the schematic diagram (image source/copyright: PHOENIX CONTACT GmbH & Co. KG).

# 11 Cleaning

The charging station must be cleaned at least 3 times a year.

When cleaning, the safety instructions in [chapter 2.2 General](#) must be observed.

## ATTENTION

Risk of material damage due to water.

Risk of damage to Unity due to water penetrating the housing.

- Do not use water to clean the Unity.
- 

## ATTENTION

Risk of material damage due to penetrating liquids.

Cleaning the charging station with liquids can result in material damage.

- Do not use any liquids for cleaning.
- 

## ATTENTION

Risk of material damage due to unsuitable cleaning agents.

The use of unsuitable cleaning agents can cause damage to surfaces and components of the Unity.

- Do not use solvents for cleaning.
-



## Requirements

- The charging station must be switched off.

Pay attention to the following points when cleaning.

- Observe five safety rules.
- Remove the dust deposits inside the charging station with a brush and vacuum cleaner, in hard-to-reach places with dry compressed air (max. 1 bar).
- Ensure that the glass touchscreen and the coating of the touchscreen are not damaged during cleaning. Use a cleaning cloth and washing-up liquid or a foaming screen cleaner. Apply only a little pressure to the touchscreen.
- Remove coarse soiling by spraying lightly with tap water.
- Apply neutral or slightly alkaline cleaning solutions (pH value between 6 and 8). Allow the cleaning solution to take effect.
- Remove contamination with a nylon fleece hand cloth. Never use abrasive tools or scouring agents for cleaning.
- Rinse the charging station thoroughly with tap water.

## 12 Maintenance / Servicing

### 12.1 Safety

See [Chapter 2.2.4 Maintenance](#)

### 12.2 Annual inspection

The annual inspection includes visual and functional checks.

The annual inspection includes the following points.

- General visual inspection of the charging station
- Check EMERGENCY STOP circuit (door switch, EMERGENCY STOP button)
- Auxiliary relay earth fault
- Function test of the heating, ventilation and LEDs
- Check the filter mats
- If cooled cables are installed - check the recooling unit, cables and cable glands for leaks and possible leaks
- Visual check of the plug position, plug and cable insulation
- Check and document measured values according to the maintenance log
- Test charge, loop measurement, residual current circuit breaker and residual current circuit breaker
- Calibrating the HMI
- Check function of PT 100 (temperatures) in the service menu
- Tighten the clamping points
- Visual inspection for damage/vandalism (housing, charging cable, door lock)
- Contactor switching cycles
- Cleaning of the charging station (once per quarter)
- Apply sticker with date of inspection and next inspection

#### ATTENTION

Risk of material damage to doors and door hinges.

Improper handling may result in damage to the doors and door hinges of the appliance.

- Handle the device with care.

## General visual inspection

---

1. Carry out a visual check of the entire charging station. - Damage, dents, protection class given, ...

---

2. Carry out a visual check of all operating components (HMI, RFID reader, ...)

---

3. Carry out a visual check of the charging cable and charging plug.

---

4. Visually check the front door lock and the side and rear panels.

---

## Check EMERGENCY STOP circuit (button and door)

---

1. Press the EMERGENCY STOP button when the system is switched on.

---

2. Disconnect any connections to connected EVs.

---

3. Unlocking the EMERGENCY STOP button

---




The display returns to the main menu after a short time.

---

4. Set the charging station to "Normal operation" mode.

5. Open the cupboard door. - the charging station must switch to EMERGENCY STOP status

### Check auxiliary relay earth fault

1. Open the front door.

2. Check auxiliary relay earth fault (-8P1, -8P2 and -9P1, -9P2). replace if necessary.



### Heating, ventilation, LEDs

For tests, see document

UNITY\_OperatingInstructions\_Release2023\_EN\_V1.0.pdf

## **Charging cable**

---

1. Visually check the insulation of all charging cables.

Check for damage, cracks, foreign objects?

---

2. Carry out a visual check of all charging plugs and charging plug positions.

Check for damage, chipping, foreign bodies, ...

---

---

**Check measured values**

See document Maintenance protocol\_Unity50-360\_CPC50-150kW\_EN\_V1.0.pdf

**Further tests**

---

1. Carry out a test charge at the AC socket.

---

2. Carry out a test charge on the CCS charging plug.

---

3. Carry out a test charge on the CHAdeMO charging plug.

---

4. Perform loop impedance and short-circuit current measurement.

---

5. Test button of the residual current circuit breaker - Actuate -27F2

---

6. OPTION

Test button of the residual current circuit breaker

-85F1 with AC socket outlet

---

### **Control panel / HMI**

---

1. Carry out a visual check of the control panel. Check for damage, scratches, cracks, defective pixels
- 

2. Calibrate control panel

See document  
UNITY\_OperatingInstructions\_Release2023\_EN\_V1.0.pdf

---

### **System book**

---

1. Document system log/measurement logs

See document  
Maintenance\_log\_Unity50-360\_EN\_V1.0.pdf

---

### **PT 100 function test**

---

1. Open service menu
- 

2. Check PT100 for plausibility

See document  
Maintenance\_log\_Unity50-360\_EN\_V1.0.pdf

---

---

**Clamping points**

---

1. Check all clamping points and tighten if necessary
- 

---

**Contactor switching cycles**

---

- |  |   |
|--|---|
| <ol style="list-style-type: none"><li>1. Check contactor switching cycles. (number of charges CP1 - CP3)</li></ol> | See document<br>UNITY_OperatingInstructions_Release2023_E<br>N_V1.0.pdf |
|--|---|
- 

---

**Rough cleaning**

---

1. Rough cleaning of the charging station - should be carried out [4 x per year]
- 

---

**Inspection sticker**

---

1. Check the inspection sticker
- 

The annual inspection has been completed.



12.2.1 Maintenance

Maintenance includes tasks that must be carried out at intervals.

Maintenance includes the following tasks.

- Replacing the filter mats
- Replacement of the speed-controlled fan
- Replacing the fan cartridge of the power modules
- Replacing the charging cable with charging plug
- Replacing the AC socket

12.2.1.1 Replacing the filter mats

The UNITY has filter mats in the side panels.

Check the filter mats at regular intervals, at least once a year. If the soiling is so severe that a sufficient air supply is no longer guaranteed, you must replace the filter mats.



The replacement intervals are system-specific and depend on the location, operation and ambient conditions, so it is necessary to approach the actually required replacement intervals.

**NOTE**

Risk of shutdown due to overheating

Dirty filter mats obstruct the air supply and cause the charging station to switch off due to excessive temperature.

- ▶ Check filter mats regularly for soiling
- ▶ Replace soiled filter mats

**Material**

Article	Filter mat
Item number	M20FPF5K
Manufacturer	Fandis
Comment	Same filter mats for side panels

Table 13: Article information Filter mats

## 12.2.1.2 Replacing the filter mats on the left side panel

### Preconditions

The charging station must be switched off in accordance with [chapter 9.3 Switching off the charging station](#).

### Replacing filter mats

1. Open the left side panel.



2. Remove the hexagon socket screws.



The earthing cable is also screwed in.

3. Pull out the slide-in units.

---

4. Remove old filter mats.

---

5. Insert new filter mats.

---

6. Push in the extension.

---

7. Fasten screws with hexagon socket.



8. Close the side panel.

---

The replacement of the filter mats on the left side panel has been completed.

### 12.2.1.3 Replacing the filter mats on the right side panel

#### Preconditions

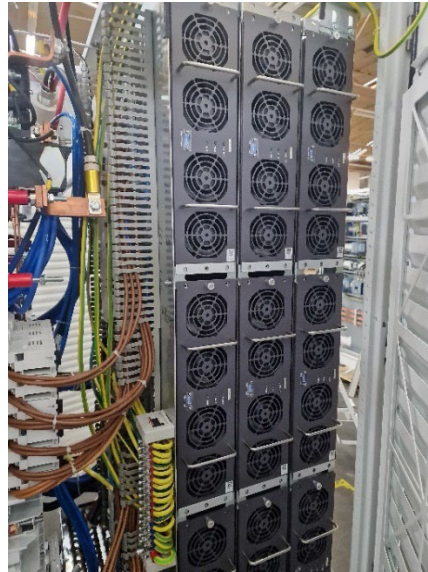
The charging station must be switched off in accordance with [chapter 9.3 Switching off the charging station](#).

#### Replacing the filter mats on the right side panel

The following steps will guide you through the replacement of the right-hand filter mats.

---

1. Open the right side panel.



2. Remove the old filter mat from the openings.



3. Insert the new filter mats through the openings and align them.
- 

4. Close the side panel.
- 

The filter mats on the right-hand side panel have been replaced.

#### 12.2.1.4 Replacing the rotation speed-controlled fans

The UNITY has integrated rotation speed-controlled fans. The fans must be replaced after 30,000 hours of operation.

#### Material

Article	Rotation speed-controlled fan
Item number	R2E225-RA92-09 / CGD15050H24B
Manufacturer	Ebmpapst /Alternative manufacturer
Comment	

Table 14: Article information speed-controlled fan

#### Preconditions

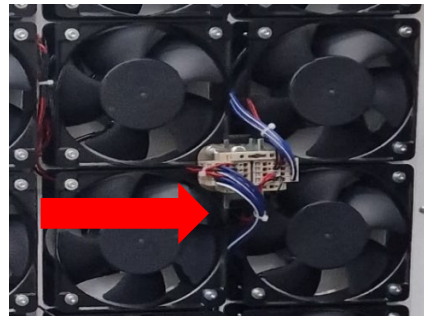
The charging station must be switched off in accordance with [chapter 9.3 Switching off the charging station](#).

## Replacing the fan

1. Open the left panel.



2. Disconnect the cable of the fan to be replaced.



3. Loosen the screws of the fan that has to be replaced.



4. Remove the old fan.

5. Insert the new fan.

6. Screw on the new fan.

7. Connect the cable of the new fan.

8. Close left panel.

The speed-controlled fan has been replaced.

12.2.2 Replacing the charging cable

The charging plugs have a natural service life of 10,000 mating cycles. You must replace the charging plugs once the specified mating cycles have been reached.

12.2.2.1 Replacing the CCS type 2 charging cable with / without liquid cooling



Before starting work, observe the operating instructions for working on the cooling system of the charging station.

**Material**

Article	Ladekabel CCS Type 2 mit/ohne Kühlung
Item number	6RY1801-5AA0
Manufacturer	Kostad
Comment	

Table 15: Article information charging cable CCS Type 2 without liquid cooling

**Preconditions**

The charging station must be switched off in accordance with [chapter 9.3 Switching off the charging station](#).

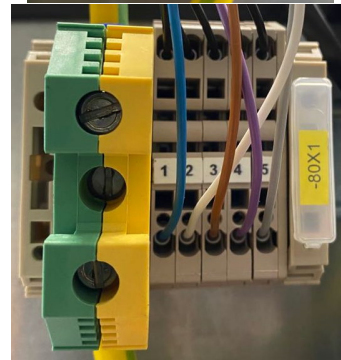
**Replacing the charging cable**

1. Open the side panel.

2. Loosen and remove the charging cable screw connection.

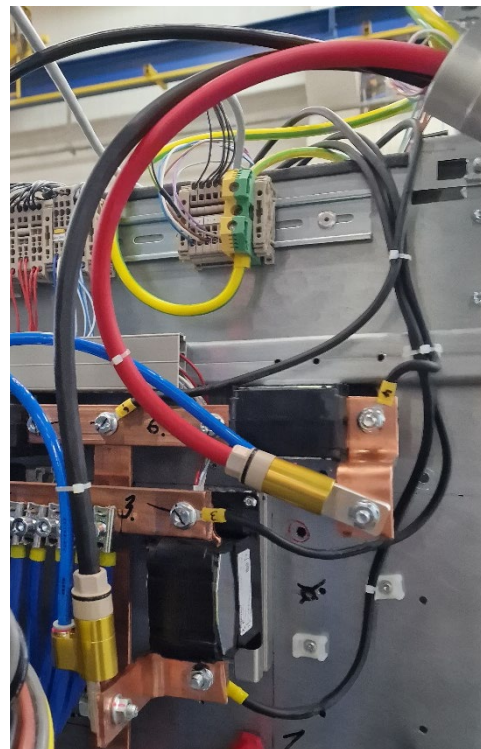


3. Disconnect [12345, earthing] from the terminals [79X1 LP 1 / 80X1 LP2].



4. Disconnect the cable from the DC contactor.

If present, also disconnect the cooling system.



5. Remove the charging cable.

6. Install new charging cable. Make sure that the wires of the charging cable are long enough to connect them back to the terminals provided for this purpose.



7. Connect the cable.

Connect cooling system if available

8. Reattach the screw connection.

9. Close the side panel of the charging station.

---

The charging cable has been replaced.

### 12.2.3 Checking the front door for standing water

#### **Preconditions**

The charging station must be switched off according to [chapter 9.3 Switching off the charging station](#).

1. Open the front door.

2. Open the inner door.

3. Check the compartment under the RFID reader for condensation.



- 
4. Check the drain for soiling, clean the drain if necessary.



- 
5. Close the inner door.

- 
6. Close the front door.

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The front door was checked for standing water.

## 13 Troubleshooting

For more information, see document

UNITY\_OperatingInstructions\_Release2023\_EN\_V1.0.pdf

# 14 Decommissioning and disposal

## 14.1 Decommissioning



Adhere to the respective country-specific legal regulations when disposing of the charging station or waste generated in the individual phases of the life cycle.

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### Prerequisites

### Preparation Dismantle charging station



Disassembly of the charging station must be carried out or supervised by qualified personnel with appropriate expertise.

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1. Switch off the charging station according to [chapter 9.3 Switching off the charging station](#).

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  2. Remove the SD card from the ET200 PLC and/or the vehicle controller.

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  3. Remove the GSM SIM card of the CPO / operator.

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  4. Disconnect all electrical connections and remove all cables.

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  5. Loosen the machine fastenings.

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6. Transport the charging station to a suitable place for disassembly.

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7. Dismantle the charging station according to the general procedure typical for machine construction.

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The decommissioning of the charging station is complete.

## 14.2 Disposal

Separate the components for recycling according to the following categories:

- Components
- Auxiliary materials and chemicals
- Packaging materials

Dispose of the respective categories in accordance with local regulations.

