

EV-SET-T2AC-ADV-RCM2-32ASE12 TWIN charging technology set with AC Infrastructure Socket Outlets

Quick start guide

UM EN EV-SET-T2AC-ADV-RCM2-32ASE12

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TWIN charging technology set with AC Infrastructure Socket Outlets

2017-05-11

Designation: UM EN EV-SET-T2AC-ADV-RCM2-32ASE12

Version: 00

This quick start guide is valid for:

Designation	Version	Order No.
EV-SET-T2AC-ADV-RCM2-32ASE12	00	1628082

Please observe the following notes

User group of this manual

The use of products described in this manual is oriented exclusively to:

- Qualified electricians or persons instructed by them, who are familiar with applicable standards and other regulations regarding electrical engineering and, in particular, the relevant safety concepts.
- Qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

Explanation of symbols used and signal words



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible injury or death.

There are three different categories of personal injury that are indicated with a signal word.

DANGER This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



This symbol together with the signal word **NOTE** and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.



This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

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1 Intended use

The TWIN charging technology set is designed for assembling a charging station for electrically driven vehicles (electric cars).

It consists of the following components:

- Infrastructure Socket Outlets
- Protective cover for Infrastructure Socket Outlets
- EV Charge Control Advanced AC charging controllers
- 2-channel residual current monitoring device (RCM)
- Voltage monitoring devices
- Measuring instruments
- Relay modules
- Accessory kit with connection accessories
- Documentation (circuit diagram, this instruction manual, documentation on the individual components)

Additionally required components are to be provided by the customer and can be removed, see Section 8.

Only operate the charging technology set in accordance with the information in this instruction manual. Do not make any changes, additions or alterations to the charging technology set which are not described in this document. The use of third-party products and components must be recommended and/or approved by Phoenix Contact. Third-party products must be installed in accordance with the associated technical documentation. The safety risks posed by the charging technology set must be verified and assessed following the installation of third-party products in the existing system/in the plant. Error-free and safe operation of the charging technology set can only be ensured through correct

- Transport,
- Storage,
- Mounting/setup,
- Installation,
- Startup,
- Operation and
- Maintenance

Observe the permissible ambient conditions.

At regular intervals, check the charging technology set according to the respective applicable national regulations, e.g.,

- “DGUV regulation 3 and 4 – electrical installations and equipment”
- German Ordinance on Industrial Safety and Health in association with TRBS 1201 and TRBS 1203
- “Electrical systems for electric road vehicles - Electric vehicle conductive charging system - Part 1: General requirements (IEC 61851-1:2010)”; German version EN 61851-1:2011 IEC 61851-1:2010

The operator is responsible for specifying the inspection interval.

Installation location

- The national laws, directives, ordinances, and regulations for the installation and operation of electrical equipment which are valid at the installation location must be observed.
- The charging technology set is intended for stationary use.

- The charging technology set is designed for fixed mounting in a suitable housing.
- The charging technology set must be freely accessible at all times in case of emergency, for operation, and for maintenance work.
- Protect the charging technology set from direct sunlight.
- Electromagnetic compatibility: this product is suitable for environment B. For the requirements for environments A and B, refer to the standard DIN EN 61439-1 as well as the following standards:
 - Environment A (industrial environments): EN 61000-6-2:2005 + AC: 2005
 - Environment B (residential, commercial, and light-industrial environments): EN 61000-6-4:2007 + A1: 2011

Only operate the charging technology set in the approved environment.



Important: read the instruction manual carefully before mounting, installing, and starting up the charging technology set. Pay particular attention to the safety notes. Keep the instruction manual and circuit diagram in a safe place for later use.



Make sure you always use the latest documentation for the individual components. The documentation can be downloaded at phoenixcontact.net/products.

2 General safety notes

Observe the country-specific installation, safety, and accident prevention regulations. During startup and maintenance work, proceed in accordance with the five safety rules of DIN EN 50110-1. Observe the rules in the specified order:

1. Disconnect safely.
2. Ensure power cannot be switched on again.
3. Verify safe isolation from the supply.
4. Ground and short circuit.
5. Cover or safeguard adjacent live parts.

Once the work is complete, perform the above steps again in reverse order.



WARNING: Dangerous contact voltage!

- Any work on the charging technology set may only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.
- The charging technology set or parts thereof are live. Maintenance work on live equipment may only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.
- Before working on the charging technology set, disconnect the power.
- During installation, observe the instructions on grounding in “Starting up the charging technology set” on page 26. The operator must ensure that suitable safety precautions have been taken.



DANGER: Faulty insulation

Risk of electric shock.

- Only use cables that satisfy the specified installation requirements regarding voltage, current, insulation material, load-carrying capacity, etc.

**NOTE: Electrostatic discharge!**

Electrostatic discharge (ESD) can damage or destroy the components of the charging technology set.

- When handling the charging technology set, observe the necessary safety precautions against electrostatic discharge (ESD) according to EN 61340-5-1 and IEC 61340-5-1.

**NOTE: When using a surge protective device, note the following:**

- Remove connectors and disconnect protective devices when performing insulation measurements.



Installation only in networks with grounded star point, e.g., in TT systems or in TN-S systems.

3 Transport

- Also observe the humidity specifications and the temperature range specified for transport (see Section “Technical data” on page 12).
- Secure the charging technology set during transport. The same applies when relocating, moving or returning the equipment. Internal transport is only permitted if the transported goods are adequately secured against slipping and falling.
- Never climb onto the devices or packaging.
- Protect devices and packaging against damage.
- When transporting the equipment or storing it temporarily, make sure that the packaged devices are protected from the elements and any external influences, and that they are kept dry and clean.

4 Scope of supply



Make sure you always use the latest documentation. The documentation for the individual components can be downloaded at phoenixcontact.net/products. To access the download area, enter the desired order number in the search field and confirm the entry. Then select the “Downloads” tab on the product page.

Overview of components

Number/designation/type	Order No.
2 x AC charging controller - EM-CP-PP-ETH	2902802
1 x residual current monitoring - EV-RCM-C2-AC30-DC6	1622451
2 x voltage monitoring device - EM-EV-CLR-12V	2903246
2 x measuring device - EEM-350-D-MCB	2905849
2 x Infrastructure Socket Outlet - EV-T2M3SE12-3AC32A-0,7M6,0E10	1405214
2 x protective cover - EV-T2SC	1405217
Accessory kit with connection accessories:	
2 x relay module - PLC-RPT-230UC/21	2900305
3 x feed-through terminal block - PT 16-TWIN N	3208760
2 x feed-through terminal block - PT 16-TWIN N BU	3208773
3 x protective conductor terminal block - PT 16-TWIN N-PE	3208786
6 x feed-through terminal block - PT 6	3211813
2 x feed-through terminal block - PT 6 BU	3211819
2 x feed-through terminal block - PT 6-PE	3211822
17 x feed-through terminal block - PT 2,5	3209510
5 x feed-through terminal block - PT 2,5 BU	3209523
2 x fuse terminal block - ZFK 6-DREHSI (5X20)	3025040
1 x plug-in bridge - FBS 2-12	3005950
2 x plug-in bridge - FBS 5-5	3030190
2 x end cover - D-ST 2,5	3030417
2 x end cover - D-PT 6	3212044
1 x end cover - D-PT 16-TWIN N	3208799
20 x end bracket - CLIPFIX 35-5	3022276
Available as download (see attachment with QR code):	
Documentation UM EN EV-SET-T2AC-ADV-RCM2-32ASE12	107842
Circuit diagram EPLAN-EV-SET-T2AC-ADV-RCM2-32ASE12-1628082_en_02 with wiring example	–

Checking the delivery

- Check the delivery for transport damage. Damaged packaging is an indicator of potential damage to the charging technology set that may have occurred during transportation. This could result in a malfunction.
- Submit claims for any transport damage immediately, and inform the manufacturer and/or your supplier as well as the shipping company without delay. Enclose photos which clearly document the damage to the packaging or delivery together with your claim.
- Immediately after delivery, refer to the delivery note to check the completeness of the contents of the packaging.
- Keep the box and packaging material in case it is necessary to return the product.

Packaging when returning equipment

We strongly recommend using the original packaging to return equipment. If the original packaging is no longer available, observe the following points.

- Observe the humidity specifications and the temperature range specified for storage and transport (see Section “Technical data” on page 12).
- If necessary, use dehumidifying agents.
- Protect components that are sensitive to electrostatic discharge and secure loose parts.
- Make sure that the packaging you select is large enough and sufficiently thick.
- Only use plastic bubble wrap sheets as wadding.
- Make sure that the goods cannot make contact with the outer walls of the cardboard packaging.
- If necessary, attach warnings to the transport packaging so that they are clearly visible.
- Observe the breaking load classes. Pack the least fragile parts at the bottom.
- Please be aware that the delivery note is to be placed inside the package in the case of packages that are to remain within the same country.
- If the package is being sent abroad, the delivery note must be placed inside a delivery note pocket and attached to the outside so that it is clearly visible.
- Take appropriate measures to secure bulky goods.

5 Additional accessories to be provided



NOTE:

The charging technology set is designed for fixed mounting on a mounting plate in a housing.

- The mounting plate must be sufficiently dimensioned and suitable for installation in the housing. Carefully read the manufacturer's instructions. Material recommended: steel plate.
- Use a housing that corresponds to the currently applicable national requirements for charging stations. The housing must be designed for the conditions at the installation location (see page 7) and due to the heat generation of components during operation, it must be sufficiently dimensioned.

6 Technical data

6.1 AC charging controller

General data	
Standard	IEC 61851-1
Charging mode and case	3 B, 3 C
Type of charging current	AC 3-phase
Dimensions (W x H x D in mm)	71.6 x 90 x 61
Device supply	
Supply voltage	230 V AC
Current consumption	max. 40 mA
Nominal power consumption	< 1 W (no load)
Frequency range	50 Hz ... 60 Hz
Inputs	
Number of digital inputs	4
Nominal current I_N	≤ 8 mA
Nominal input voltage U_N	24 V
Input voltage range	U1 (Off): -3 V ... 5 V U2 (On): 15 V ... 30 V
Digital outputs	
Number of digital outputs	4
Output current of digital output	Max. 0.5 A (total current for all outputs, internally supplied) Max. 0.6 A (per output, externally supplied)
Output voltage of digital output	Max. 30 V
Switching outputs	
Control of locking actuator	Relay output R1,R3, and R2,R4
Switching capacity	Min. 180 VA
Switching voltage	Max. 30 V AC/DC (external supply)
Switching current	Max. 6 A
Control of charging contactor	Relay output C1,C2
Switching capacity	Max. 1500 VA (external supply)
Switching voltage	Max. 250 V AC
Switching current	Max. 6 A
Data interfaces	
Number of data interfaces	1 x RS-485 (2-wire)
Data flow control/protocols	Modbus/RTU (slave)
Transmission speed	9.6 kbps (standard), 9.6 kbps ... 19.2 kbps (adjustable)

Connection data

Conductor cross section, stranded	0.2 mm ² ... 2.5 mm ²
Conductor cross section, solid	0.2 mm ² ... 4 mm ²
Connection method	Screw connection
Torque	0.5 Nm ... 0.6 Nm

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25°C ... 60°C
Ambient temperature (storage/transport)	-40°C ... 85°C
Permissible humidity	30% to 95%, non-condensing

6.2 Residual current monitoring device

General data

Standard	IEC 61851-1
Charging mode	3 C
Design	2-channel
Dimensions (W x H x D in mm)	36 x 90 x 70.5

Device supply

Supply voltage range	100 V AC ... 240 V AC (nominal voltage)
Current consumption	Max. 22 mA
Nominal power consumption	< 0.5 W (no load)
Frequency range	45 Hz ... 60 Hz

Switching outputs

Control of charging contactor	Alarm relay 1 I _{Δn} : AC and DC residual currents
Switching voltage	Max. 250 V
Switching current	5 A (1 N/O contact each)
Number of contacts as N/O contacts	1
Note regarding the switch contact	Closed-circuit current
Switching cycles	10000

Measuring current transducer

Connection method	Connectors
Supply	Via RCM module
Diameter of measuring coil	15 mm
Length of connecting cable, measuring current transducer	1.5 m

Residual current measuring range

Rated frequency	≤ 2000 Hz
Nominal residual current	± 300 mA (peak)
Current measuring range	50 A (45 Hz ... 50 Hz)
Residual current Id1, I _{Δn1}	30 mA
Residual current Id2, I _{Δn2}	6 mA

Residual current measuring range	
Rated current I_n	32 A
Tripping time for $I_{\Delta n}$	< 180 ms
Response time for $2 \times I_{\Delta n}$	< 70 ms
Tripping time for $5 \times I_{\Delta n}$	< 20 ms
Tripping time for I_N	< 500 ms
Reload function	3 switch-on attempts at intervals of 15 minutes
Connection data	
Conductor cross section solid/stranded	0.2 mm ² ... 2.5 mm ²
Connection method	Spring connection
Ambient conditions	
Degree of protection	IP20 (terminals) IP30 (inserts)
Ambient temperature (operation)	-25 °C ... 75 °C

6.3 Voltage monitoring device

General data	
Standard	IEC 61851-1, EN 61000-6-2, EN 61000-6-3
Charging mode	3
Charging standard	Type 2
Type of charging current	AC 3-phase
Dimensions (W x H x D in mm)	35.6 x 90 x 61
Device supply	
Supply voltage	12 V DC \pm 5 %
Supply voltage range	12 V DC \pm 5 %
Maximum current consumption	4 mA (in idle state)
Current carrying capacity	\leq 4 A
Digital inputs	
Number	1
Frequency range	50 Hz ... 60 Hz
Nominal power consumption	< 0.5 W (no load)
Nominal current I_N	Approx. 5 mA
Input voltage range	U1 (Off): -3 V ... 3 V U2 (Lock On): -30 V ... -10 V U3 (Unlock On): 10 V ... 30 V
Switching outputs	
Control of locking actuator	Relay output OUT +/-
Switching capacity	Min. 46 VA
Switching voltage	Max. approx. 11.5 V (operating/capacitor voltage minus the diode voltage of \sim 0.5 V)
Switching current	Max. 4 A
Current carrying capacity	\leq 4 A

Connection data

Conductor cross section, stranded	0.2 mm ² ... 2.5 mm ²
Conductor cross section, solid	0.2 mm ² ... 4 mm ²
Tightening torque	0.4 Nm ... 0.8 Nm
Connection method	Screw connection

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation/storage/transport)	-25°C ... 60°C

6.4 Measuring device

General data

Indicator	LCD, update: 750 ms
Dimensions (W x H x D in mm)	72 x 90 x 67

Device supply

Supply voltage range	Measurement voltage supply
Power consumption	≤ 12 VA (2 W)

Input CAT III (300 V against ground)

Measuring principle	True r.m.s. value measurement
Measurement value	AC sine (50/60 Hz)

Measuring input

Input voltage range	196 V AC ... 460 V AC (phase/phase) 113 V AC ... 265 V AC (phase/neutral conductor)
Overload capacity	460 V AC (continuous) 480 V AC (500 ms)
Accuracy	1% (phase/phase) 0.5% (phase/neutral conductor)

Current measuring input I1, I2, I3

Input current	10 A (scaled nominal current) 65 A (I _{max})
Overload capacity	1920 A (10 ms) 200 A (500 ms)
Accuracy	0.5%

Power measurement

Accuracy of effective and apparent power	1%
Real energy (IEC 62053-21) / reactive energy (IEC 62053-23)	Class 1 / class 2
Energy (EN 50470-3)	Class B

Digital input

Signal range	5 V DC ± 5 %
Control current maximum	> 10 mA

Data interface

RS-485 Modbus	RTU/JBUS
Transmission speed	4.8 kbps ... 9.6 kbps
Address range	1 ... 247
Parity	None
Stop bit	1

Electrical isolation

Rated insulation voltage (according to EN 61010-1)	300 V AC
Overvoltage category / pollution degree	III / 2

Connection data

Conductor cross section for measurement connection	2.5 mm ² ... 16 mm ²
Tightening torque	1.7 Nm ... 3 Nm
Conductor cross section for other connections	1.5 mm ²
Tightening torque	0.4 Nm ... 0.8 Nm
Connection method	Screw connection

Ambient conditions

Degree of protection	IP50 (front) IP20 (rear)
Ambient temperature (operation)	-25°C ... 55°C
Ambient temperature (storage/transport)	-30°C ... 70°C
Permissible humidity (operation)	< 90%
Permissible humidity (storage/transport)	0% to 90%, non-condensing

6.5 Infrastructure Socket Outlet with locking actuator

General data

Standard	IEC 62196-2, IEC 61851-1
Charging mode and case	3 B
Dimensions (W x H x D in mm)	See Section 7.1

Electrical properties

Charging power	Max. 13.8 kW
Number of phases	3
Number of power contacts	5 (L1, L2, L3, N, PE)
Rated current for power contacts	32 A
Rated voltage for power contacts	480 V AC
Number of signal contacts	2 (CP, PP)
Rated current for signal contacts	2 A
Rated voltage for signal contacts	30 V AC
Type of signal transmission	Pulse width modulation

Mechanical properties

Cable structure, power contacts	5 x 2.5 mm ²
Cable structure, signal contacts	2 x 0.5 mm ²
Insertion cycles	> 10000
Insertion/withdrawal force	< 100 N

Locking actuator

Power supply at the motor	12 V (typical) 9 V ... 16 V (possible power supply range)
Typical motor current for locking	200 mA
Reverse current of the motor	Max. 1000 mA
Dwell time with reverse current	Max. 1000 ms
Recommended adaptation time	600 ms
Voltage for locking detection	Max. 30 V
Insertion cycles	> 10000
Cable structure, actuator cable	4 x 0.5 mm ²
Cable length	500 mm

Ambient conditions

Degree of protection	IP44 (plugged-in) IP54 (with hinged cover)
Ambient temperature (operation)	-30°C ... 50°C
Ambient temperature (storage/transport)	-40°C ... 80°C

6.6 Protective cover

General data

Standard	IEC 62196-2
Charging mode and case	3 B
Dimensions (W x H x D in mm)	See Section 7.2

Mechanical properties

Cover mechanism	Self-closing
-----------------	--------------

Mounting

Possible mounting positions	Front mounting, screwed on the back
Required mounting screws	M5

Ambient conditions

Degree of protection	IP54
Ambient temperature (operation)	-30°C ... 50°C
Ambient temperature (storage/transport)	-40°C ... 80°C

7 Dimensions

7.1 Infrastructure Socket Outlet

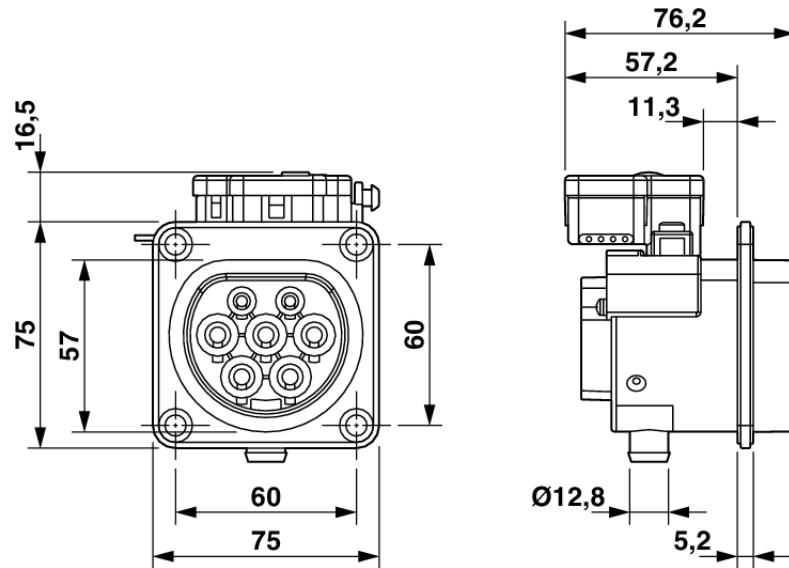


Figure 7-1 Infrastructure Socket Outlet - view of front and side

7.2 Protective cover

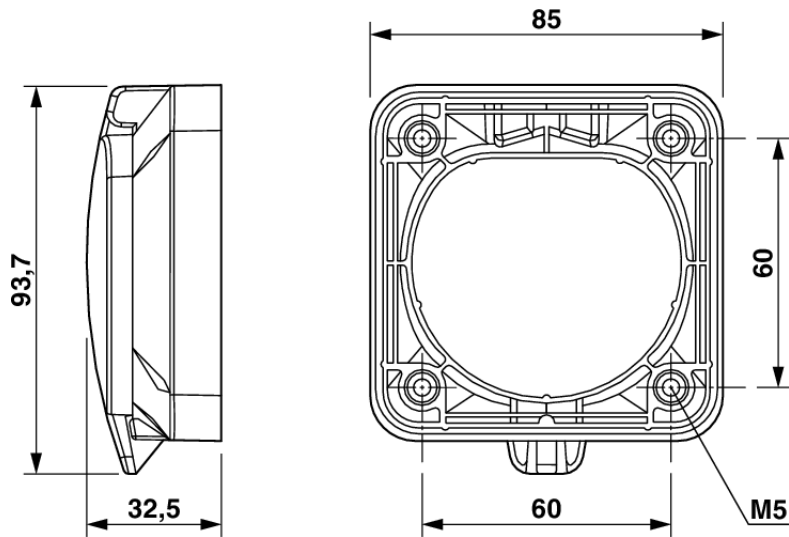


Figure 7-2 Protective cover - view of front and side

8 Mounting

8.1 Space limits

When working on the charging technology set, make sure that there is room to move. Also ensure that there is sufficient space available for mounting, operation, and maintenance.

8.2 Before mounting

- Make sure that the mounting location is free from contamination and humidity.
- Ensure that the charging technology set is not in the proximity of frequency inverters or devices with high power ratings.
- Heat generation and interference from neighboring devices can cause malfunctions. In order to counteract this, follow the requirements of DIN EN 61439 during mounting.
 - Make sure that the specified temperature limits for the installation location are observed (see Section “Technical data” on page 12).
 - Do not place the charging technology set directly next to heat sources.
 - The components are designed to be cooled by convection. Prevent the build up of heat, and make sure that none of the openings are covered, e.g., by adjacent cables.

8.3 Wiring example



The circuit diagram available as a download (see attachment with QR code) shows a wiring example for components on the mounting plate.

Other arrangements are possible depending on the actual application. However, do ensure that the components are sufficiently cooled by convection. To do so, refer to the information detailed in Section 8.2 and in the documentation of the individual components (can be downloaded at phoenixcontact.net/products).

8.4 Mounting the charging technology set



WARNING: Risk of injury

- Observe the information in “Intended use” on page 7 and “General safety notes” on page 8.
- Always wear your personal protective equipment during all work on the charging technology set.



NOTE: Reducing the degree of protection

- Avoid unnecessary openings in the housing, in which the charging technology set is mounted. Each opening that has not been produced and sealed properly may lead to a lower degree of protection.
- Place the corresponding or matching filler plugs in any unused openings.



Do not install the charging technology set on pulsating or vibrating machinery or equipment parts.



Protect bore holes and bare machining areas against corrosion. The charging technology sets must not be started up if the housing is damaged.

Procedure:

1. Mount the components of the charging technology set on a suitable mounting plate (see Section 5, “Additional accessories to be provided”. Wiring example available as download (see attachment with QR code):
 - Place the respective device onto a standardized NS-35 DIN rail from above.
 - Push the front of the device toward the mounting surface until it audibly snaps into place.
2. Mount the charging technology set in a housing that corresponds to the currently applicable national requirements for charging stations. Carefully read the manufacturer's instructions.
3. Perform the mounting and connection of the Infrastructure Socket Outlet according to Section 8.5.
4. Mount the housing to the wall. Carefully read the manufacturer's instructions.

8.5 Connecting and mounting the Infrastructure Socket Outlet



WARNING: Installation only by an electrically skilled person

- Installation may only be carried out by qualified specialist personnel. The relevant country-specific regulations must be observed.
- Always wear your personal protective equipment during all work on the charging technology set.
- The electrical equipment for your system must be implemented according to applicable national standards and directives, e.g.:
 - Low-voltage directive
 - EMC directive



DANGER: Danger of death, serious personal injury, and burns

Improper handling of the Infrastructure Socket Outlet can cause explosions, electric shock and short circuits.

The generally applicable safety precautions and the following information must be observed.

- The Infrastructure Socket Outlet is only suitable for installation in charging stations for electric vehicles.
- Never open the Infrastructure Socket Outlet or disassemble it.
- Operate the Infrastructure Socket Outlet only in combination with personal and over-load protection.

Also ensure that the locking of the locking actuator provided works appropriately.

- The contacts of the Infrastructure Socket Outlet have been assembled in the factory and may not be exchanged.
- Voltages exceeding 30 V and currents exceeding 2 A are not permitted at the signal contacts CP and CC acc. to IEC 61851-1.

Procedure:

1. Observe the dimensions of the Infrastructure Socket Outlet during mounting (see section 7.1 on page 18).
2. Maintain the permitted mounting position (see Figure 8-1). The Infrastructure Socket Outlet must not be installed upside down or on its side, as this would inhibit the water draining function. An upward- or downward-rotated position is possible however.

Mounting Infrastructure Socket Outlet

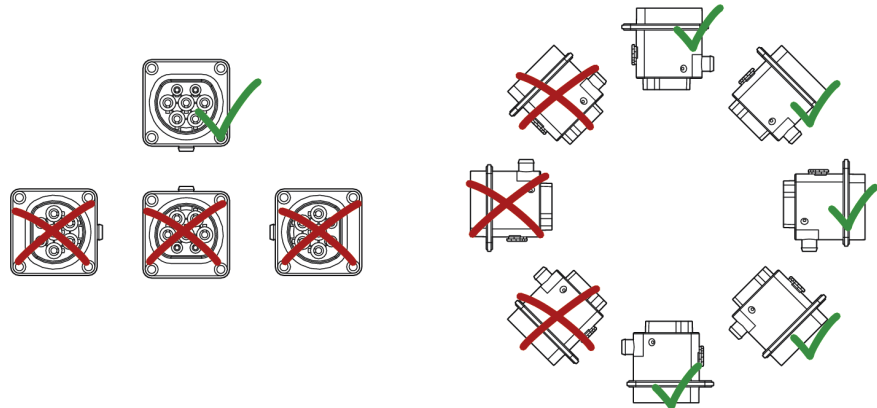


Figure 8-1 Mounting position and alignment

3. Create a panel breakthrough in accordance with Figure 8-2.

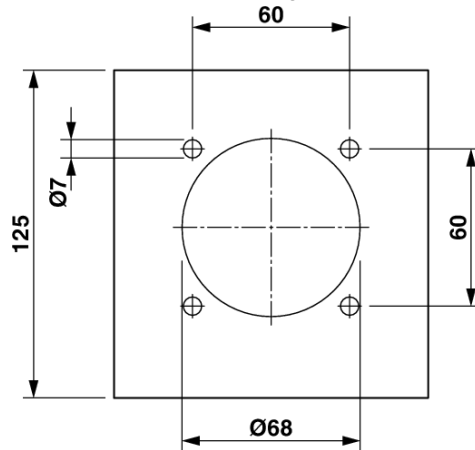


Figure 8-2 Panel breakthrough design

4. The Infrastructure Socket Outlet can be mounted on the housing panel of the charging station from both the front and the rear. We recommend mounting the Infrastructure Socket Outlet on a metal or plastic sheet housing panel.

Front assembly

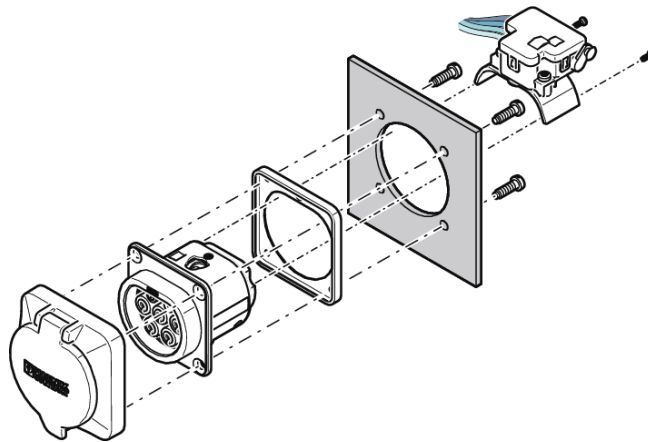


Figure 8-3 Front assembly design

- Only with an Infrastructure Socket Outlet without premounted locking actuator (EV-T2M3SE-...E0...).
- Panel thickness: 10 mm maximum
- Push the supplied sealing frame from the rear onto the Infrastructure Socket Outlet. Make sure that it contacts the housing wall flush with the flat side and completely surrounds the Infrastructure Socket Outlet.
- Insert the Infrastructure Socket Outlet into the breakthrough.
- Push the locking actuator from the rear into the provided latching. The locking actuator has to be flush against the flange.
- Fasten the locking actuator with the two supplied screws with 0.4 Nm.

Rear panel assembly

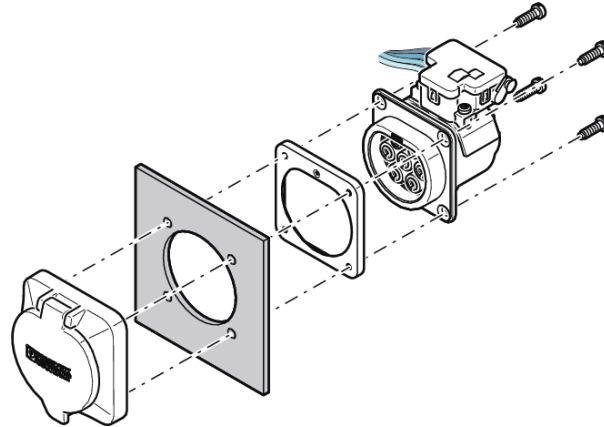


Figure 8-4 Rear panel assembly design

- Panel thickness: 5 mm maximum
 - Push the supplied sealing frame from the front onto the Infrastructure Socket Outlet. Make sure that it contacts the housing wall flush with the flat side and completely surrounds the Infrastructure Socket Outlet.
 - Insert the Infrastructure Socket Outlet into the breakthrough.
5. Screw the Infrastructure Socket Outlet tight from the rear with 1.2 Nm. We recommend M5 ISK flat mushroom head screws acc. to DIN 934 with M5 washers (screw length 15 mm + thickness of the mounting panel).
 6. Strip the single wires of the Infrastructure Socket Outlet accordingly:
 - for the supply voltage (L1, L2, L3, N, PE): 12 mm
 - for the signal contacts (CP, PP): 8 mm ... 10 mm
 7. Attach the stripped single wires to the terminal strip provided. When doing so, observe the information in the following table.

Connecting the Infrastructure Socket Outlet

Illustration	Marking	Wire color
	L1	BN
	L2	BK
	L3	GY
	N	BU
	PE	YE/GN
	CP	WH
	PP	RD

8.6 Checking the assembly

1. Check the Infrastructure Socket Outlet is securely fixed in the mounting location.
2. Check the secure positioning of the charging technology set in the housing.
3. Make sure that all of the retaining brackets are locked in place and the components are securely seated on the DIN rail.
4. Following mounting, check all devices and components for damage.
5. Make sure that the required clearance distances for mounting have been observed.

9 Installation and startup



WARNING: Startup only by electrically skilled persons

- Installation and startup may only be carried out by qualified specialist personnel. The relevant country-specific regulations must be observed.
- Always wear your personal protective equipment during all work on the charging technology set
- The electrical equipment for your system must be implemented according to applicable standards and directives, e.g.:
 - Low-voltage directive
 - EMC directive
- The charging technology set may only be started up following correct mounting (see Section 8).
- In the case of installation and operation in Germany, the charging technology set must be tested prior to first startup according to DGUV regulation 3 to ensure it is in good condition.



DANGER: Return of the supply voltage

Make sure that switching on the input voltage cannot lead to unexpected hazardous situations.
Any work on the charging technology set may only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.



DANGER: Dangerous contact voltage

With the EV-CC-...-HS DIN rail devices, parts with dangerous contact voltage can be accessed after the covering hood has been removed.
Only install, remove, and configure the device when it is disconnected from the voltage. The device may only be operated in a housing that corresponds to the currently applicable national requirements for charging stations.



DANGER: Please observe the following when wiring inside the charging technology set:

- Check the fuse protection in the charging technology set.
- If you have accessed the wiring for the charging technology set, check the following based on the circuit diagram:
 - The marking of the single wires
 - The equipment identification
 - The assignment of the contacts to the switches and all other equipment



Safety concept

In order to use the device described in this document, you must have drawn up an appropriate safety concept for your machine or system. This includes a hazard and risk analysis according to the corresponding directives (EMC and Low Voltage Directive) and standards, as well as a test report for validating the safety function.



NOTE: Observe the following notes regarding shielding!

- Only use shielded data cables with metallic or metalized connector housings.


9.1 Preparing cables and lines

For a reliable and touch-proof connection, use appropriate cable cross sections. Strip the cable ends according to the specifications in the table.

Components

Component	Solid conductor	Stranded conductor	Stripping length
AC charging controller	0.2 mm ² ... 4 mm ²	With and without ferrule: 0.2 mm ² ... 2.5 mm ²	7 mm
Residual current monitoring device	0.2 mm ² ... 2.5 mm ²	Without ferrule: 0.2 mm ² ... 2.5 mm ² With ferrule: 0.2 mm ² ... 1.5 mm ²	10 mm
Voltage monitoring device	0.2 mm ² ... 4 mm ²	0.2 mm ² ... 2.5 mm ²	7 mm
Measuring device	Measurement connection: 2.5 mm ² ... 16 mm ² Other connections: 1.5 mm ²	Measurement connection: 2.5 mm ² ... 16 mm ² Other connections: 1.5 mm ²	7 mm ... 10 mm
Relay module	0.14 mm ² ... 2.5 mm ²	0.14 mm ² ... 2.5 mm ²	8 mm

Terminal blocks

Terminal block	Solid conductor	Stranded conductor	Stripping length
Feed-through terminal block PT 16-TWIN N PT 16-TWIN N BU Protective conductor terminal block PT 16-TWIN N-PE	0.5 mm ² ... 25 mm ²	With and without ferrule: 0.5 mm ² ... 16 mm ²	18 mm
 Use a conductor with a cross section of at least 16 mm ² for the PE terminal of the supply terminal strip.			
Feed-through terminal block PT 2,5 PT 2,5 BU	0.14 mm ² ... 4 mm ²	With and without ferrule: 0.14 mm ² ... 2.5 mm ²	8 mm ... 10 mm
Feed-through terminal block PT 6 PT 6 BU PT 6-PE Protective conductor terminal block PT 6-PE	0.5 mm ² ... 10 mm ²	With and without ferrule: 0.5 mm ² ... 6 mm ²	10 mm ... 12 mm
Fuse terminal block ZFK 6-DREHSI (5X20)	0.5 mm ² ... 10 mm ²	With and without ferrule: 0.5 mm ² ... 6 mm ²	12 mm

9.2 Starting up the charging technology set

1. Make sure that the supply voltage is switched off prior to connection.
2. Open the housing in which the charging technology set is mounted.

Internal wiring of components

3. Lay the internal wiring of components (see Section 9.1) with the prepared cables. To do so, refer to the product documentation for the components (attached and can be downloaded at phoenixcontact.net/products):

Component	Order No.	Document type and title	Document order No.
AC charging controller EM-CP-PP-ETH	2902802	Packing slip "EV Charge Control (EM-CP-PP-ETH)" PACKB.EM-CP-PP-ETH	9057647
Residual current monitoring EV-RCM-C2-AC30-DC6	1622451	Packing slip "Residual current monitoring device" PACKB.EV-RCM-Cx-AC30-DC6	179174

Component	Order No.	Document type and title	Document order No.
Voltage monitoring device EM-EV-CLR-12V	2903246	Packing slip "EV Charge Lock Release" PACKB.EM-EV-CLR-12V	9060988
Measuring instrument EEM-350-D-MCB	2905849	Packing slip "Multifunction measuring device" PACKB.EEM-350-D-MCB	9066239
Relay module PLC-RPT-230UC/21	2900305	Packing slip "6.2 mm Interface Terminal PLC..." PACKB.PLC 1	9000635

**WARNING: Risk of fire**

If the AC charging controller and residual current measuring device is incorrectly connected, an electric or a fire may result.

- Only connect the devices with backup fuses (recommended: 6 A)

**Notes on connection to the terminal blocks**

The stripped conductors of the respective cables can be connected as follows to the terminal blocks provided:

Spring-cage terminal blocks:

- Open the terminal point with a screwdriver.
- Insert the stripped conductor into the clamping space.
- Remove the screwdriver. The conductor makes contact automatically.

Screw terminal blocks:

- Use a screwdriver to loosen the screw of the terminal block.
- Insert the stripped conductor into the clamping space.
- Tighten the screw with a torque of 0.5 to 0.6 Nm.

Push-in terminal blocks:

- Insert solid conductors or conductors with ferrules into the round opening of the terminal block without using a tool.
- For conductors with a small cross section or stranded conductors without ferrules, push in the orange push button and hold it down. This opens the spring, enabling you to insert the conductor in the clamping space. To connect the conductor to the clamping space, release the orange push button.
- To release the conductor from the terminal block again, push in the orange push button using a screwdriver. You can then pull the conductor out of the terminal block.

Inserting cables

4. Loosen the cable entries.
5. Guide the prepared cables (see Section 9.1) through the desired cable entry into the housing.
6. Place sealing plugs in unused cable entries.
7. Tighten the cable entries.

Grounding the charging technology set and connecting the supply voltage

8. Ground the mounting plate.
9. Make sure that all devices and metal components of the charging technology set are grounded.

10. Connect the supply voltage cable to terminal strip provided.

Check

- 11. For AC charging controllers, ensure that the “Preset Charge Current” rotary switch is set to 32 A so that the connecting cables to the charging station and the internal wiring are not overloaded. Please note that the set maximum current value can occur over several hours.
- 12. On the residual current monitoring device, ensure that the slide switch **S1** is above the LEDs at position “0” (default setting). Any error messages must be reset manually.
- 13. Check all conductive connections and tighten these as necessary with a torque screwdriver. When doing so, observe the information in the following table and documentation of the device manufacturer.

Designation	Torque
AC charging controller	0.5 Nm ... 0.6 Nm
Voltage monitoring device	0.5 Nm ... 0.6 Nm?
Measuring device	Measurement connection: 1.7 Nm ... 3 Nm Other connections: 0.4 Nm ... 0.8 Nm

- 14. Make sure that the supply line is protected by a miniature circuit breaker suitable for the supply (see “Technical data” on page 12).
- 15. Make sure that all components are connected.
- 16. Switch on the supply voltage.
- 17. Check the supply voltage.
- 18. Check and document the wiring.

Configuring the measuring device

19. Configure the measuring devices (see Section 9.3).

Configuring the AC charging controller

20. Configure the AC charging controller via the integrated web server for operation with the residual current monitoring device (see Section 9.4).

Completing startup

- 21. Carry out an I/O check and document the results. To do so, refer to the documentation for the components (can be downloaded at phoenixcontact.net/products).
- 22. Close the housing.

9.3 Configuring the measuring device



If the selector switch is in the position (lock), you can only access a number of configuration menus.

Procedure:

- To switch to configuration mode, press and hold down the round control lever for at least 3 seconds. In configuration mode, all measuring and checking functions are inactive. You can select the following areas of application:

APPLiCat	Application range	Explanation
E	Solar	Energy measurement with partial phase values
F	Industry	Energy measurement without phase values
H	Higher industrial level, energy supply	Energy measurement with complete phase values

- For further information on the configuration, refer to the corresponding documentation (see Section 9.5).

9.4 Configuring the AC charging controller

Configure the AC charging controllers via the operating elements on the housing and the integrated web server. The “ETH” communication interface is on the bottom right of the housing.

The following browsers can be used for configuration:

Browser	Version
Mozilla Firefox	From 17
Microsoft Internet Explorer	6.0.2900



Connecting to the device

DHCP access is set up on the system by default. If the system does not find a DHCP server on startup, it automatically sets the preset IP address “192.168.0.8”.

If a DHCP server is found, the system can be found using the MAC address specified on the rating plate or addressed using the device name if a DNS server is available. The preset device name is EVCC_1.

During operation in the network group, you must adjust the IP addresses accordingly to avoid conflicts. Refer to the information in the “EV Charge Control” user manual (Order No. 104924, can be downloaded at phoenixcontact.net/products).

Procedure:**DIP switch configuration**

1. By default, the DIP switches are preconfigured as follows.

Switch	Function	Item	Explanation
1	PX request	ON	PX request, case B, AC charging cable with plug on the charger
2	PX evaluation	OFF	Allow plug/cable with low current carrying capacity
3	PX selection	OFF	Reject 13 A and 20 A plug/cable
4	Locking	ON	Execute locking
5	Locking option (R4 at 0 V, R3 at ≤ 24 V)	ON	Locking mechanism option 1 DC motor: the locking motor is switched on briefly. For locking R1 to ≤ 24 V (R2 remains at 0 V) and for unlocking R2 to ≤ 24V (R1 remains at 0 V)
6	Locking confirmation	ON	Evaluate locking confirmation at input LD
7	Enable charging process	ON	Evaluate enable charging process input EN
8	Charging station availability	OFF	Do not evaluate charging station availability input XR
9	Manual locking	OFF	Do not evaluate manual locking input ML
10	Enable via ETH	OFF	Do not evaluate enable bit in Modbus register

- If required, you can adjust the configuration. Observe the detailed information in the associated documentation (see Section 9.5).

Modbus configuration

2. In terms of connecting the residual current monitoring device, configuration is required via Modbus or the integrated web server of the AC charging controller*.
 - Connect the PC to the “ETH” interface of the AC charging controller.
 - Call the user interface of the AC charging controller and select the “Configuration” tab.

* For further information on the configuration via the integrated web server, refer to the corresponding documentation (see Section 9.5).

- When doing so, observe the following information for the Modbus configuration:

Modbus register	Value	Function	
		Automatic resetting of error messages	Automatic EV-RCM device test
521*	3	Active	Inactive
	4	Inactive	Inactive
Recommended configuration: <ul style="list-style-type: none"> - Automatic reset "Active" - Automatic device test "Inactive" 			

* Register 521 is a 16 bit r/w holding register. The data format is "Integer".



NOTE: No automatic device test possible

Please note that an automatic device test by the AC charging controller is not possible in this application case.



In order to safely transmit the changes, you must click on the "submit" button within the request cycle (10 seconds). Otherwise, the original values will be restored.

3. For further information on the Modbus configuration, refer to the corresponding documentation (see Section 9.5).

9.5 Further information on the configuration

Further information on the component configuration can be found in the following documents (can be downloaded at phoenixcontact.net/products)

Type/description	Designation	Order No.
Packing slip "EV Charge Control (EM-CP-PP-ETH)"	PACKB.EM-CP-PP-ETH	9057647
"EV Charge Control" user manual	UM EN EV CHARGE CONTROL	104924
Application example "Application examples for the EM-CP-PP-ETH charging controller" (Application Guide EVCC Advanced - quick start guide for installing charging stations with the EVCC Advanced charging controller)	2017-01-11 EN Application Notes EV CC Advanced-Rev 03	-
Packing slip "Multifunctional measuring device - EEM-350-D-MCB".	PACKB.EEM-350-D-MCB	9066239
Data sheet "EEM-350-D-MCB - Energy meter certified according to MID directive"	DB EN EEM-350-D-MCB	106342

10 Operation



WARNING: Dangerous contact voltage!

- Any work on the charging technology set may only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.



DANGER: Danger of death, serious personal injury, and burns

Improper handling of the Infrastructure Socket Outlet can cause explosions, electric shock and short circuits.

The generally applicable safety precautions and the following information must be observed.

- Proper installation and commissioning at the charging station are necessary for using the Infrastructure Socket Outlet. Before commissioning, the manufacturer of the charging station must ensure that the charging process is shut down in case of a malfunction.
- Always check the Infrastructure Socket Outlet and the contacts for damage and contamination before using them.
- Never use a damaged Infrastructure Socket Outlet for charging.
- Never use contacts that are dirty or damp.
- Connect only suitable AC charging cables to the Infrastructure Socket Outlet. The AC charging cables have to be undamaged and dry.
- Do not use the Infrastructure Socket Outlet with an extension cable or an adapter.
- Once the charging process is completed, the AC charging cable can be disconnected. Never use force to disconnect it. Dangerous electric arcs could result in serious injury or death. Depending on the charging station and electric vehicle, the shutting down of the charging process and the duration of unlocking may vary.
- Never touch the AC charging cable or the Infrastructure Socket Outlet if the connector is smoking or melting. If possible, stop the charging process.
- Make sure that the Infrastructure Socket Outlet is out of the reach of children. The Infrastructure Socket Outlet may only be used by persons with a valid driver's license for motor vehicles.



NOTE: Degree of protection of Infrastructure Socket Outlet

Make sure that the Infrastructure Socket Outlet has at least IP24 acc. to IEC 62196 when not plugged in. Protect with the protective cover provided.

As an option, you can attach a drainage tube to the drainage below the Infrastructure Socket Outlet. Alternatively, you can seal off the discharge nozzle (seal EV-T2M3S-DRAINAGE-GASKET, Order No. 1621668).

IP44 protection is only ensured if the plug-in elements which are ready to operate are either made by Phoenix Contact or are standard-compliant products.



NOTE: Device test for residual current monitoring device

The device test is required prior to each charging process. During this, the device generates a testing current that triggers the two alarm relays. The regular testing increases the safety of the charging procedure and prevents long-term drift of the residual current measurement.

Procedure:

1. During operation, observe the instructions for the electric vehicle.
2. Turn off the vehicle. The vehicle must not yet be connected to the charging station.
3. Perform a manual device test of the residual current monitoring device at regular intervals:



WARNING: Warning of false alarm triggering

It is absolutely necessary that no residual current flows through the measuring current transducer during a device test. The charging procedure has to be deactivated.

- Ensure that the switches for the charging enable on the housing of the charging station are set to "0".

- Open the housing.
 - Briefly press the test button on the device (< 2 seconds). Both AL-LEDs light up.
 - In order to reset the device, press the test button subsequently > 2.5 s.
 - Close the housing.
4. For the charging enable, the switches of the charging technology set must be reset to position "1".
 5. Remove the protective caps from the AC charging cable.
 6. Plug the infrastructure plug into the Infrastructure Socket Outlet and plug the Vehicle Connector into the Vehicle Inlet. Make sure they are assigned correctly. Check whether the connectors have been correctly and completely plugged in.
 7. Start the charging process at the charging station. The Vehicle Inlet automatically locks the Vehicle Connector. Also observe the notes in the operating instructions of the connected vehicle.
 - 8.



DANGER: Death or serious injury caused by electric arc

The Infrastructure Socket Outlet is equipped with a locking actuator that locks the plugged-in Infrastructure Plug during the charging process. The Infrastructure Plug cannot be removed in this state.

- Do not under any circumstances disconnect the Vehicle Connector or the Infrastructure Plug by force. Dangerous electric arcs could result in serious injury or death.

Depending on the charging station and electric vehicle, the shutting down of the charging process and the duration of unlocking may vary.

When the charging process is completed, the Vehicle Connector and Infrastructure Plug are unlocked automatically and you can remove the Vehicle Connector.

9. Replace the protective caps on both sides of the AC charging cable immediately.
10. Make sure that the protective cover of the Infrastructure Socket Outlet is fully closed.

Charging time

The duration of the charging process depends on the capacity and the charging state of the high-voltage battery of the vehicle and the permissible charging power of the AC charging cable and the charging station. Very low and very high temperatures can impair the charging capacity.

11 Maintenance

As stipulated by the relevant standards and regulations, all electrical equipment must be kept in good condition. The applicable standards and regulations in Germany include, for example:

- DIN VDE 0105-100
- DGUV regulation 3 (electrical installations and equipment, previously accident prevention regulation BGV A3)
- DGUV rule 103-011 (working on live electrical installations and equipment)
- DGUV rule 103-012 (working on live electrical installations and equipment)
- “Electrical systems for electric road vehicles - Electric vehicle conductive charging system - Part 1: General requirements (IEC 61851-1:2010)”; German version EN 61851-1:2011

Observe the applicable national requirements at the installation location regarding the following points:

- Maintenance and cleaning
- Working on electrical installations and equipment
- Electrical safety
- Accident prevention

11.1 Maintenance interval

Check the charging technology set at regular intervals (at least once a year). The maintenance interval also depends on the operating and ambient conditions. Check parts and components that are subject to frequent use or loads at shorter intervals, as appropriate (e.g. residual current protective device).

11.2 In the case of defects

You must eliminate any defects on the charging technology set as soon as they are identified (see Section “Troubleshooting” on page 39). You must discontinue operation if a defective electrical system poses an immediate danger. If there is any risk of damage to equipment or personal injury, the charging technology set must be stopped immediately. Restore the charging technology set to a safe, correct condition before starting it up again.

11.3 Documenting maintenance

Document all maintenance steps performed. Example information:

- Date, serial or device number, equipment identification
- State of the object being checked
- Activity carried out
- Electrically skilled person carrying out the work



Note the points described in the following sections for maintenance of the charging technology set. You must also observe the requirements set out in the corresponding standards and directives.

11.4 Diagnostics and status indicators



WARNING: Dangerous contact voltage!

All maintenance work must only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.

The AC charging controllers, residual current monitoring device, and voltage monitoring devices include LEDs to indicate system states and faults.

In the event of an error, you can display additional information via the integrated web server of the AC charging controller (further information on the integrated web server can be found in the corresponding documentation (see Section 9.4).

11.4.1 AC charging controller

- Evaluate the LED status of the AC charging controllers using the following table:

LED	Color	Status	Explanation
Power	Green	On	Supply voltage present
		Flash- ing	System running
Error	Red	On	Error (status E or F)
Connect	Yellow	On	Plug locked
		Flash- ing	Plug inserted
Ready	Green	On	Vehicle is charging (contactor control between mains and vehicle)
		Flash- ing	Vehicle ready (status C or D)

11.4.2 Residual current monitoring device

- Evaluate the LED status of the residual current monitoring device using the following table:

LED	Color	Status	Explanation
AL1	Yellow	On	Error message at relay 1
AL2	Yellow	On	Error message at relay 2
ON	Green	On	Ready for operation
		Off	No LED lights up: supply voltage not applied. If AL1 and AL2 light up simultaneously: <ul style="list-style-type: none"> – Device error – No (or incorrect) measuring current transducer connected – Measuring range exceeded

11.4.3 Voltage monitoring device

When charging electric vehicles, the charging plug must not be disconnected while under load (IEC 61851-1). To avoid this, the charging plug can be locked in the charging station. This locking mechanism provides additional protection against theft and non-authorized interruption of the charging process by disconnecting the plug.

Usually, the plug is locked using an electric-powered actuator, e.g., DC motor or solenoid.

To be able to disconnect the cable in the event of a power failure or an error, the charging station requires a locking failure protection.

Procedure:

- Evaluate the LED status of the voltage monitoring devices using the following table:

LED	Color	Status	Explanation
Power	Green	On	Capacitor charged/ready to operate
Error	Red	On	Operating voltage < capacitor voltage

11.5 Maintenance and cleaning with the power supply disconnected



WARNING: Dangerous contact voltage!

Before carrying out any maintenance work, observe the five safety rules, as far as these apply to your application:

- Disconnect safely.
- Ensure power cannot be switched on again.
- Verify safe isolation from the supply.
- Ground and short circuit.
- Cover or safeguard adjacent live parts.

All maintenance work must only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.

Space limits, safe mounting, installation location

- Check the space limits at the installation location. The prescribed space limits for operation and maintenance must be observed to ensure safe use. Restore the space limits in the event of any deviation.
- Check that the charging technology sets are securely fixed in the installation location (e.g., screw connection in the case of wall fastening).
- Make sure that the charging technology set is suitable for the conditions at the installation location.

Housing and seals

- Check the housing for visible damage and corrosion.
- Clean the outside surfaces of the housing with a damp cloth. Remove any dirt with a soft brush. To avoid any damage to the surface, do not use any aggressive or corrosive cleaning agents, thinners, abrasive cleaners or hard objects.
- Check that the housing door opens and closes correctly. If necessary, lubricate the hinges.
- Check that the housing door locks correctly and also check the function of the lock.
- Check that the housing is sealed. Make sure that there is no condensation inside.
- In order to maintain the degree of protection offered by the housing, test and maintain all seals at regular intervals. Check the seals for deformation, cracks, and dirt.
- Condition all seals with suitable care products.

Infrastructure Socket Outlet

- Clean the Infrastructure Socket Outlet only when the charging station is switched off completely.
- Clean soiled contacts with a dry cloth.
- Never use abrasive cleaning agents, water jet or steam jet cleaners.
- Never submerge the article in liquids.

Cabling and components

- Check all components, cables, terminal points, conductor connections, and markings regularly.
- Check the strain relief of the cables.
- Check that all cable entries are fixed securely and sealed tight.
- Check the cable routing and bending radii. If cable ducts are available, make sure that the cables are guided through the cable ducts. An impermissible bending radius can result in damage to the cables. Avoid bending cables at excessively sharp angles.
- Check the cables, cable connections, and components for signs of overheating, e.g., discoloration or deformation. If you notice any problems, please contact your subsidiary to agree on further action. Subsidiary contact information is available at phoenixcontact.com. The source of overheating must be identified before the device can be started up again. The charging technology set may only be started up again once the component has been returned to a safe condition.
- Check the torque. Tighten any loose connections taking into account the maximum torque (see Section 6, “Technical data” as well as documentation of the components used).
- Check that all connectors are secure and functioning correctly.

Measuring device

- The measuring device is maintenance free. Repairs may only be carried out by the manufacturer.
- Switch off the device before cleaning. Only clean the device using a suitable damp cloth. Do not use abrasive cleaners or aggressive solvents.



Protective conductors

WARNING: Impairment of the protective conductor system following removal of components from the charging technology set

If a component is removed or replaced as part of a maintenance measure, the protective conductor system of the remaining components must not be adversely affected.

- Check the ground connection or PE protective conductor system and all grounding screws, bolts or rails.
- Make sure that all conductors are still connected reliably. Tighten any loose conductors.

Miniature circuit breakers

- The correct function of the miniature circuit breakers must be ensured at all times. Check the miniature circuit breakers at regular intervals.

Residual current protective devices

- Correct function of the residual current protective devices must be ensured at all times. Check the residual current protective devices at regular intervals.

11.6 Replacing the fuse of the voltage monitoring device



WARNING: Dangerous contact voltage!

Before carrying out any maintenance work, observe the five safety rules, as far as these apply to your application:

- Disconnect safely.
- Ensure power cannot be switched on again.
- Verify safe isolation from the supply.
- Ground and short circuit.
- Cover or safeguard adjacent live parts.

All maintenance work must only be carried out by qualified specialist personnel who are familiar with the necessary safety precautions.

Behind the top covers of the voltage monitoring devices, you will find a fuse of type 4 A M 20 x 5 mm, which if required can be replaced by a fuse of the same type.

Procedure:

1. Disconnect the power.
1. Open the housing in which the charging technology set is mounted.
2. Remove the cover from the top of the device.
3. Remove the fuse from the bracket using an appropriate tool, e.g., pliers.
4. Insert a functional fuse of the same type into the bracket.
5. Re-install the cover on the top of the device.
6. Close the housing.
7. Switch on the supply voltage.

11.7 Troubleshooting

**NOTE:**

The charging technology set must not be modified. Do not repair the charging technology set yourself. Repairs may only be carried out by the manufacturer.

Procedure:

1. Open the housing in which the charging technology set is mounted.
2. Perform a visual inspection.
3. Carry out troubleshooting inside charging technology set.
4. Evaluate the diagnostics via the status LEDs for the control components (see Section 11.4). To do so, also refer to the documentation for the components (can be downloaded at phoenixcontact.net/products).
5. If necessary, perform voltage measurements.
6. If equipment is faulty, please contact your subsidiary to agree on further action. Subsidiary contact information is available at phoenixcontact.com.

12 Dismantling, decommissioning, disposal

12.1 Dismantling

**WARNING: Risk of injury due to falling housing**

The housing with the charging technology set is screwed in place on the wall. If the housing is not dismantled correctly, it may fall down. This could result in serious injuries.

- During dismantling, always wear your personal protective equipment and make sure that there is sufficient space available.
- Take appropriate measures to secure the housing during dismantling.
- Releasing the screws fastening the housing to the wall should always be carried out as the final step.

Procedure:

1. Disconnect the power.
2. Open the housing in which the charging technology set is mounted.
3. Loosen the wires.
4. Loosen the cable entries and pull out the cables.
5. Close the housing.
6. Secure the housing to prevent it from falling.
7. Release the mounting screws and remove the housing.

12.2 Decommissioning and disposal

To decommission a system, only proceed in accordance with the procedures specified by the machine or system manufacturer.

During decommissioning, wear your personal protective equipment and make sure that there is sufficient space available.

When decommissioning the charging technology set or parts thereof, ensure that the components used:

- Are correctly reused in another system or
- Are disposed of in accordance with the applicable environmental regulations, and in this case can never be reused

13 Storage

The storage location must meet the following requirements:

- Dry
- Protected from unauthorized access
- Protected from harmful environmental influences such as UV light
- For temperature range and permissible humidity, see Section 6, “Technical data”