Charging technology for e-mobility

Solutions for electric vehicles and charging infrastructure

PHOENIX CONTACT

Welcome!

Along with clean power generation, e-mobility is a key element paving the way to the All Electric Society. With powerful charging technology, we will prepare you for the e-mobility of tomorrow – sustainable, networked, and practical.

We hope you'll be inspired by the product solutions presented in this brochure – let's shape the mobility revolution together!

Ralf Döhre and Michael Heinemann,
General Managers of Phoenix Contact E-Mobility GmbH

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Phoenix Contact E-Mobility
Your powerful and reliable partner

1

We have been the specialist for e-mobility charging technology within the Phoenix Contact Group since our founding in 2013. With more than 1,000 employees worldwide and 25 production lines over an area of 31,200 m², we offer more than 600 products for the development of a networked charging infrastructure and for the electrification of vehicles. As an IATF-certified company, we meet the high requirements of the automotive industry.

Our headquarters are located in Schieder-Schwalenberg, Germany. Internationally, we are represented with locations in China and Poland.

Product Management and Sales

Management

Reception

Administration

Development

Our parent company in Blomberg, Germany

Established in 1923, Phoenix Contact is now the global market leader for electrification, networking, and automation with 22,000 employees and a turnover of 3.6 billion euros.

Logistics

Test Laboratory and Quality Assurance

Production and Engineering

Marketing and Communication

Training and Education Center

Smart Charging Lab

Development and production in Nanjing, China

Established in 2015, more than 100 employees develop and produce charging cables and vehicle charging inlets in accordance with the Chinese GB/T standard at this 2,700 m² site.

Produktion in Rzeszów, Poland

Established in 2020, more than 450 employees produce charging cables, infrastructure charging sockets, and vehicle charging inlets for the European market at this 15,000 m² site.

Distribution of our products all over the world

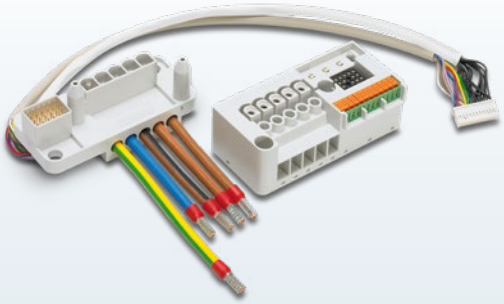
Over 50 sales companies worldwide provide expert and personal advice on site and ensure the reliable delivery of our e-mobility products.

Our history

Phoenix Contact realized very early on that the future of mobility lies in electricity. Thanks to this vision, our e-mobility division is already able to look back on over a decade of success. This is therefore the ideal time to take a look at the key milestones, successes, incorporations, and collaborations that have taken place over the years.

It is now impossible to imagine our roads without electric vehicles. We are proud to work together with our customers and partners on this transition.

2009 | 2010 | 2011

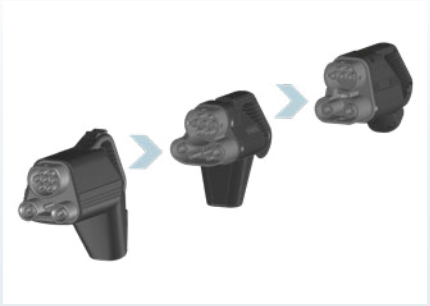


2009

The beginning
Development of a customer-specific connector with combined signal and power transmission for fast installation of AC home chargers.

2010

First series production
Infrastructure charging sockets in accordance with the preliminary GB/T standard are produced and supplied in large quantities for Chinese manufacturers of AC charging stations.



2010

Start of CCS standardization
Working together with leading automobile manufacturers, we develop and standardize a global charging standard for combined AC and DC charging (which will later become CCS).

2011

Battery exchange system for electric buses
We develop a connector that allows to exchange the batteries of electric buses. At the bus depot, the discharged batteries are automatically exchanged for charged batteries.

2013

E-Mobility GmbH founded
The new subsidiary in Schieder-Schwalenberg bundles all of the Phoenix Contact Group's e-mobility expertise under the management of Helmut Friedrich.

2015

New subsidiary in China
Phoenix Contact responds to the rapidly growing e-mobility market in Asia by founding its own E-Mobility subsidiary in Nanjing.

2012 | 2013 | 2014 | 2015 | 2016

2012

First charging cables and controllers
Charging station manufacturers are supplied with the first AC charging cables and controllers as well as prototypes of the combined charging cable (which will later become CCS) in accordance with the preliminary standard.

2014

Fast charging in accordance with the CCS standard
The IEC 62196-3 standard, which describes fast DC charging with CCS, is adopted. Series production of vehicle charging inlets and charging cables that comply with the standard begins.

© CharIN e.V.

2015

CharIN founded
Together with renowned automobile manufacturers, we form the Charging Interface Initiative to establish fast charging with the Combined Charging System.

CHARIN

Our history

2017

New management
Oliver Stöckl becomes the new General Manager. He succeeds Helmut Friedrich, who retired in late 2016.

2017

IATF certification
Phoenix Contact E-Mobility GmbH successfully attains IATF 16949 certification. This attests that we meet the high quality and process requirements of the automotive industry.

2018

High Power Charging market launch
The first HPC charging cables are delivered and installed in fast charging stations throughout Europe. In the FastCharge research project, we demonstrate together with BMW, Porsche, Siemens, and Allego that ultra-fast HPC charging is suitable for everyday use.

2016 2017 2018

2016

High Power Charging prototype
US President Barack Obama and German Chancellor Angela Merkel hold the future of fast charging technology in their hands at the Hannover Messe.

2018

Expansion of our capacity
Just five years on from our foundation, the administrative area in Schieder-Schwalenberg more than doubles. Production capacity is also expanded.

2019

Three design awards
Our AC charging cables CHARX connect comfort receive the German Design Award, the iF Design Award, and the Good Design Award for their modern styling and particularly ergonomic design.

2019

New management
At the beginning of the year, Michael Heinemann and Ralf Döhre take over the management of Phoenix Contact E-Mobility GmbH. The previous General Manager, Oliver Stöckl, leaves the Phoenix Contact Group for family reasons.

2020

New production sites
In order to keep pace with increasing demand, we expand our production capacity further. Our new plant in Rzeszów, Poland, is opened, and the production facilities at our headquarters in Schieder-Schwalenberg are also extended.

2022

Environmental and laboratory certification
We successfully pass the DQS audits for the certification of our environmental management system in accordance with ISO 14001 and the DAkkS accreditation of our test-and-release laboratory in accordance with ISO/IEC 17025.

2019 2020 2021 2022 2023

Photo: Uwe Erensmann/@uepress

2019

Innovator of the Year
Die Deutsche Wirtschaft (DDW) names us Innovator of the Year 2019 for our innovative HPC technology. Honorary laureate Dr. Wladimir Klitschko presents our General Manager Michael Heinemann with the business award.

DDW Innovator des Jahres 2019

CHARX
E-Mobility empowered by Phoenix Contact

2020

Launch of the CHARX brand
From now on, the new name bundles our broad portfolio of charging technology components for the electrification of vehicles as well as for the development of a networked charging infrastructure on the path to the All Electric Society.

2023

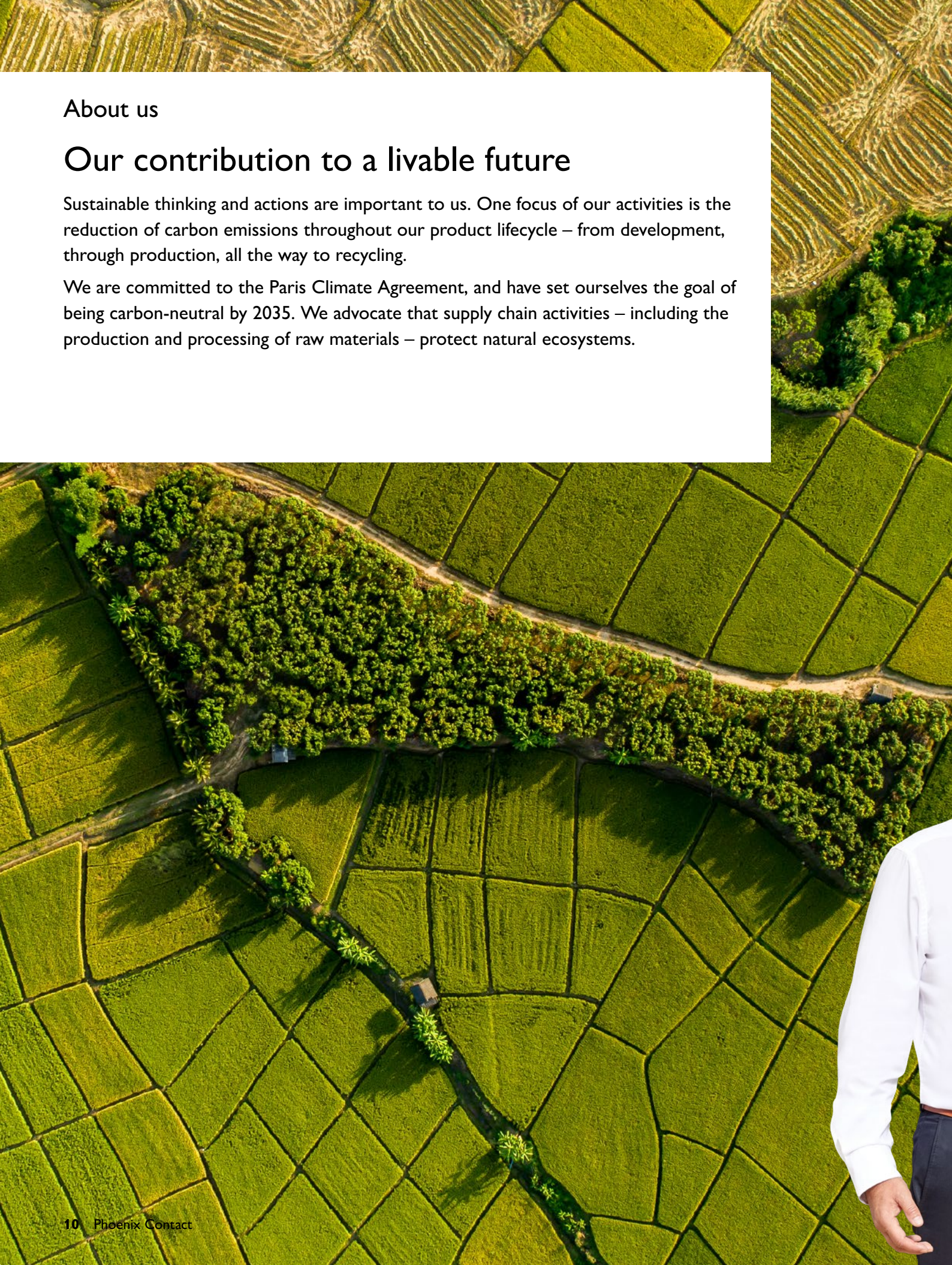
Ten year anniversary
We look back at a successful decade of rapid development. Starting out as a small start-up, we are now a global player – and all signs point to further growth.

Scan the QR code to watch our anniversary video on YouTube:

Our contribution to a livable future

Sustainable thinking and actions are important to us. One focus of our activities is the reduction of carbon emissions throughout our product lifecycle – from development, through production, all the way to recycling.

We are committed to the Paris Climate Agreement, and have set ourselves the goal of being carbon-neutral by 2035. We advocate that supply chain activities – including the production and processing of raw materials – protect natural ecosystems.



Our contribution on the path to the All Electric Society

A key to achieving the future vision of the All Electric Society is the transformation of the mobility sector to e-mobility. With our products, we are also making a crucial contribution to this transformation: By enabling practical and networked charging, we are removing hurdles and thus accelerating the switch to electric, climate-friendly mobility.

One example: Our intelligent charging controllers

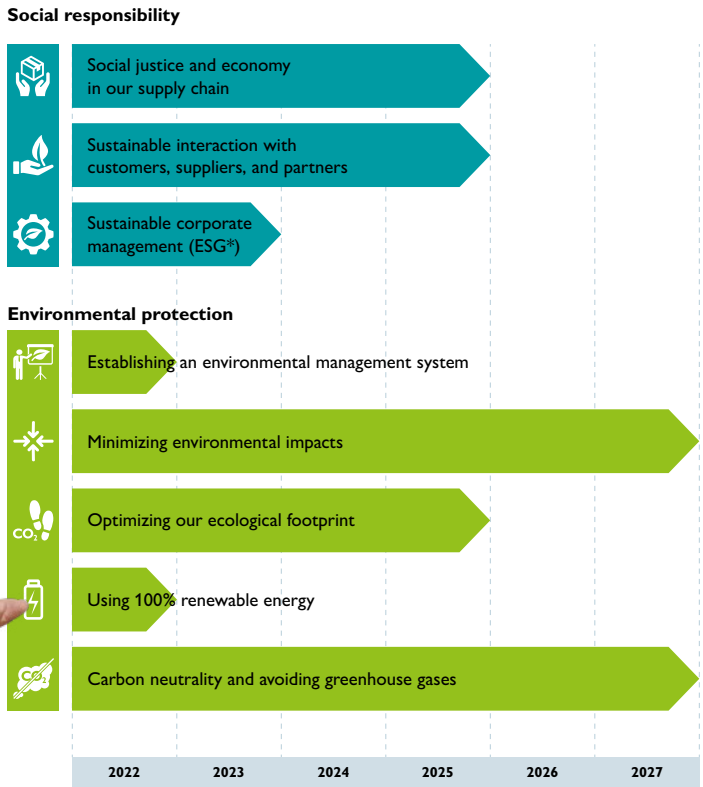
With our charging controllers CHARX control modular, electric car batteries can be charged intelligently. Moreover, they are also able to return electricity to the grid. This way vehicle fleets become profitable energy storage facilities. The technology behind this is called vehicle-to-grid. CHARX control modular already meets standard ISO 15118 and is thus ready for vehicle-to-grid.

Corporate responsibility for environmental protection

One focus of our sustainability activities is to reduce carbon emissions, which is why we have set ourselves the goal of being carbon-neutral by 2035. To achieve this, we have introduced an environmental management system in accordance with ISO 14001 and have committed ourselves to integrating environmental protection into all processes and thus reducing environmental impacts as far as possible.

"With leading e-mobility charging technology, we are making an important contribution to increased climate protection. With the help of our certified environmental management system, we have identified all environmental aspects within the company, are already carbon-neutral to the greatest possible extent, and are keeping all environmental impacts low – with the aim of reducing them further and further".

Kai Oliver Nickel, Director Quality and Environmental Management Representative



* Environmental Social Governance

Our technology and manufacturing expertise

Since its founding in 1923, Phoenix Contact has been driving the development of electrical connection technology forward and has continued to invest the expertise and experience gained back into new developments. This is also true of our e-mobility charging technology, which we have been continually developing for almost 15 years now.

For the successful and fast implementation of your product requirements, Phoenix Contact offers numerous in-house competencies and state-of-the-art manufacturing technologies from a single source.

Experience production and the test laboratory in a video now!

Scan the QR codes to see our modern charging cable production and our accredited test-and-release laboratory in more detail in our YouTube videos.

Production

Test laboratory

Development and engineering

We sometimes need to take a different route by developing our own production tools and processes.

Automated high-tech production

Digitalized, networked, and traceable – in this way, high quality requirements are reliably ensured with large batch quantities.

Accredited test laboratory

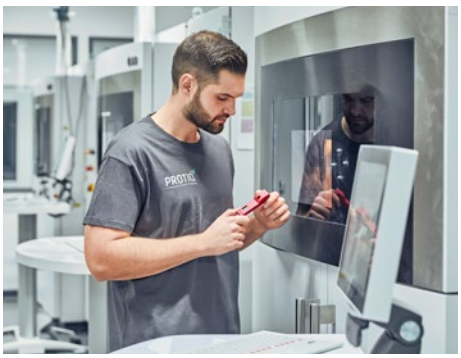
Tests accompanying development ensure the consistently high quality, safety, and reliability of our products.

IATF 16949 certification

We meet the high requirements of the automotive industry in terms of processes, product quality, and organizational structure.

Machine building

Phoenix Contact's machine building department employs over 400 people and supports all business units.



3D printing

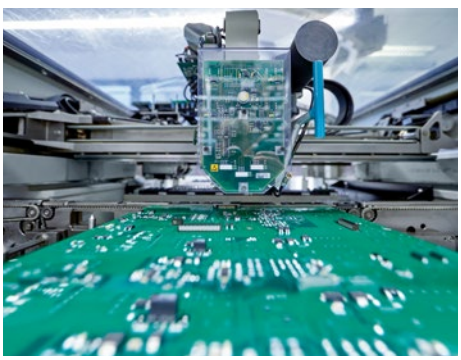
With our specialist Protiq, we meet individual customer requirements, such as rapid prototyping for subsequent series production.

Injection molding production

Phoenix Contact is able to produce plastic parts rapidly with its own injection molding production.

Production of turned, stamped, and pressed parts

Screws and stamped, pressed, and other metal parts are produced by Phoenix Contact itself – for high vertical integration.



SMD soldering technology

In our SMD production, surface mount devices are soldered directly onto the PCB through solderable contact pads.

About us

Setting the pace for norms and standards

We are a member of important e-mobility networks in order to strengthen the topic politically and economically together with customers, partners, and companions. But also to actively shape global standardization activities.

We played a key role in developing the Combined Charging System (CCS), the Chinese GB/T charging connector, and the Megawatt Charging System (MCS) for fast charging of utility vehicles with up to 3.75 megawatts. We are also involved in the standardization of ChaoJi, a new fast charging standard for the Chinese market.

CharIN

Alongside leading automobile manufacturers and the TÜV Süd certification body, we have been one of the founding members of the Charging Interface Initiative (CharIN) since 2015. The CharIN stands for the establishment of fast charging standards under the premise of interoperable charging infrastructure around the globe. With more than 320 members, the organization is the world's leading association promoting compatible and uniform charging standards such as the Combined Charging System (CCS), the North American Charging Standard (NACS), and the Megawatt Charging System (MCS) for all types of vehicles. In this context, cross-industry cooperation among all members is a key to success: CharIN paves the way for its members to compete and grow on the basis of uniform and jointly supported norms, standards, and regulatory frameworks.

BEM

We have been a partner of the German Federal Association for e-mobility (Bundesverband eMobilität (BEM)) since 2021. The tasks of the BEM include actively networking economy stakeholders for the development of sustainable and intermodal mobility solutions in order to bring about necessary changes in the infrastructure. Together with more than 450 members, the BEM works to promote e-mobility in Germany more strongly with the use of renewable energies and to strengthen the market environment by improving the legal framework and supporting the switch to emission-free drive types. To achieve these goals, the BEM currently has 19 working groups that between them deal with all the various aspects of the mobility transition.

An example: Standardization of the MCS

The Megawatt Charging System (MCS) is set to become an international standard for a fast charging system for heavy utility vehicles, based on the Combined Charging System. In 2018, a CharIN task force began work on establishing requirements and standards for the development of the Megawatt Charging System (MCS). From the very beginning, we have also been involved in the CharIN working group for the standardization of charging powers up to 3.75 MW for trucks. In the future, light electric aircraft, ferries, and other naval vessels will also be powered electrically. After all, climate-friendly mobility does not end with the electrification of cars – our goods must also be transported cleanly. The size and weight of freight transport vehicles require user-friendly High Power Charging to increase the acceptance of e-mobility in this sector as well. The findings of the working group are thus vitally important for the comprehensive transformation of mobility.

Charge better with CHARX

From the charging station to the electric vehicle – our powerful CHARX products have been specially developed for demanding e-mobility applications and cover all essential functions: connectivity, control, and power reliability.

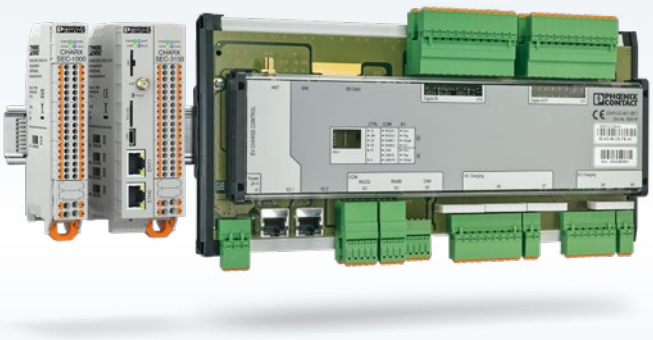
CHARX combines maximum safety, reliability, and robustness with sophisticated features and unrestricted user comfort. The uniform, modular product design also simplifies installation, commissioning, and maintenance.

CHARX connect

Charging cables and sockets

Vehicle charging connectors and inlets as well as infrastructure charging plugs and sockets for AC and DC charging in accordance with type 1, type 2, and GB/T – powerful, safe, and ergonomic.

More information
starting on page 36, 68, 78, and 94



CHARX control

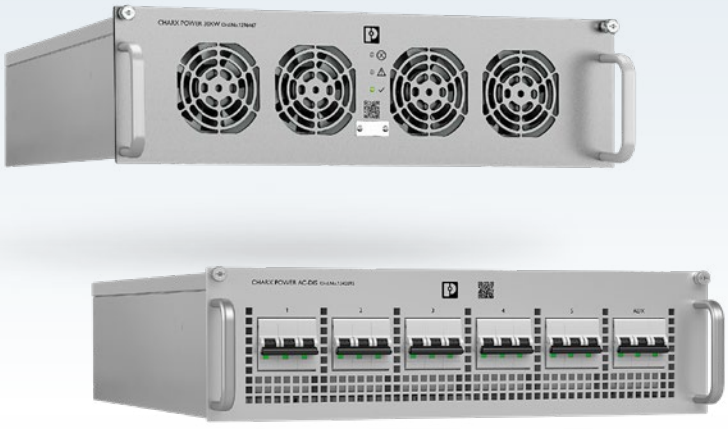
Charging controllers

AC and DC charging controllers with scalable range of functions for private, commercial, and public charging stations – communicative and flexible in configuration and programming.

More information starting on page 86
and 110

CHARX

E-Mobility empowered by Phoenix Contact



CHARX power

Power electronics and distribution

AC/DC and DC/DC converter modules and matching distribution modules for 19" rack mounting for stable supply of fast charging stations – highly efficient, scalable, and quick to install.

More information starting on page 116

CHARX protect

Surge protection

Special surge arresters for protecting charging stations and electric vehicles against damage due to lightning strikes and switching operations – for permanent availability.

More information starting on page 122

About us

High Power Charging

The technology for fast charging stations: with High Power Charging (HPC) from Phoenix Contact, long charging times are a thing of the past. This lets you charge electric vehicles for a range of 100 kilometers in just three to five minutes.

With this technology, we have set a milestone for the future of e-mobility, making recharging with HPC as convenient and suitable for everyday use as filling up at the gas station.

High Power Charging Technology

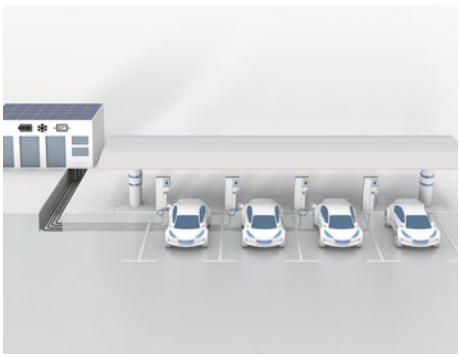
Designed by Phoenix Contact

Long range, extremely short charging time

With High Power Charging, fast charging will provide significant range and will become comparable to refueling a combustion engine vehicle.
This advanced charging technology makes it possible to charge electric car batteries with a charging power of 500,000 watts (half a megawatt) during a coffee break – without compromising on safety or manageability.
With HPC, we are revolutionizing fast charging technology.

Use in stand-alone charging stations with their own cooling system

High Power Charging can be used anywhere where electric vehicle drivers are in a rush.
A complete HPC system can also be installed in individual, stand-alone charging stations.
This means that the cooling system is integrated into the charging station to create an independent cooling circuit together with the charging connector and charging cable.



Use in charging parks with central cooling

Our HPC system is normally used in charging parks, where several charging stations are networked.
Here, the cooling system is located centrally, e.g., in a building. The distributed charging stations are supplied with coolant from there and are fitted with individual heat exchangers. All charging stations use a common cooling circuit.

The further development of the Combined Charging System

One of the greatest challenges faced when developing an HPC-capable CCS charging cable was how to design its cross-section as well as the size and weight of the charging connector to make handling as easy as possible.
This problem could only be overcome by developing an intelligent and efficient cooling system, as well as designing a carefully considered cable.

FastCharge research project demonstrates practicality

Together with BMW, Porsche, Siemens, and Allego, Phoenix Contact has created and launched the world's first High Power Charging station with a charging power of 450 kW as a part of the FastCharge research project.
Phoenix Contact supplied the cooled, CCS-compatible High Power Charging connector and the control technology.

Photo: Uwe Erensmann/@iepress

Innovator of the Year Award

Phoenix Contact was named Innovator of the Year 2019 for its advanced High Power Charging Technology.
Honorary laureate Dr. Wladimir Klitschko presented the DDW (Die Deutsche Wirtschaft) Award to our CEO Michael Heinemann, HPC project manager Robert Ewendt, and HPC developer Dirk Moseke at a ceremony in Düsseldorf.

Our portfolio for your High Power Charging application

The HPC system from Phoenix Contact consists of several coordinated components that span the entire charging process – from the technology in the charging station all the way to the vehicle charging interface.

High Power Charging Technology

Designed by Phoenix Contact

HPC-capable vehicle charging inlets

With conductor cross-sections of up to 120 mm² and optimized connection technology, our vehicle charging inlets CHARX connect universal enable safe HPC charging with 375 kW on a continuous basis, and even with up to 500 kW for short periods in Boost Mode. In addition to the type 1 and type 2 CCS charging inlets, GB/T versions are also available for the Chinese market.

More information starting on page 36

HPC charging cables

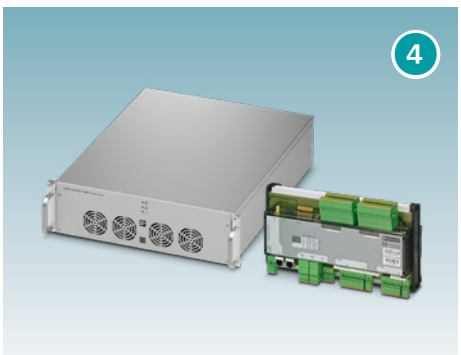
Our DC charging cables CHARX connect professional are used for electric vehicle fast charging. The power transmission requirements vary depending on the installation location and the application. Therefore, our portfolio includes uncooled and cooled versions for the globally established CCS type 1, CCS type 2, and GB/T charging standards.

More information starting on page 94

HPC cooling unit

Our passive cooling unit provides demand-oriented and efficient cooling for our liquid-cooled HPC charging cables CHARX connect professional. Temperature sensors on the power contacts of the charging connector measure heat generation during the charging process. This data is transmitted to the charging controller in real time, evaluated, and used to regulate the cooling output.

More information starting on page 109



DC charging controllers

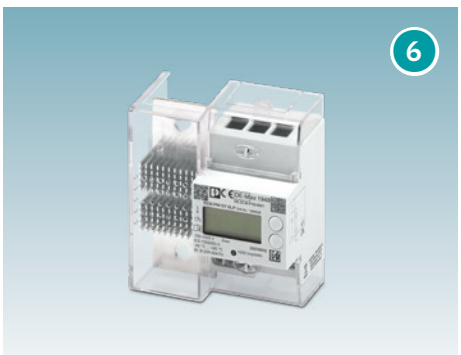
Our freely programmable DC charging controllers provide the intelligence for modern charging stations. CHARX control professional is designed for classic DIN rail mounting in HPC charging stations. CHARX control integrated combines all control and monitoring functions in 19" format.

More information starting on page 110

DC power electronics and distribution

Our power electronics CHARX power basic are available for converting AC mains current into direct current. Our distribution module CHARX power distribute coordinates with this. It supplies up to five fast charging modules in a 19" fast charging station with AC mains voltage.

More information starting on page 116



DC energy meters

Our MID-certified EMpro DC energy meters are suitable for the exact billing of HPC charging processes. The meters are optimized for e-mobility applications and are already preconfigured to our DC charging controllers.

More information starting on page 134

Charging standards and connector types

Originating in North America, Europe, and China, three charging standards with their own specific geometries for charging connectors and sockets have become established internationally. Whereas with type 1 and type 2, AC and DC charging takes place via just one CCS charging inlet in the vehicle, the Chinese GB/T standard requires two separate vehicle charging inlets.

With our broad CHARX portfolio, we cover all three charging standards. The world map shows the current prevalence.

As of: 08/2023

The Combined Charging System (CCS)

We have developed the Combined Charging System (CCS) together with leading automobile manufacturers. The special feature is the CCS charging inlet in the vehicle, into which both AC and DC charging connectors fit.

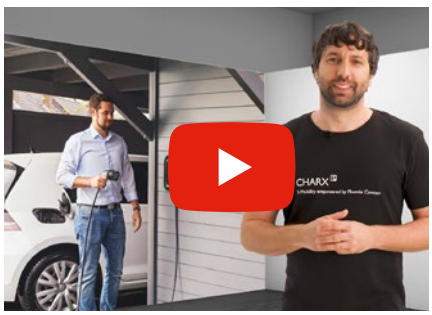
CCS type 2 was declared the official charging standard for all of Europe by the European Commission back in 2013. In the meantime, our goal of establishing CCS as the global fast charging standard has become a reality in large parts of the world. And more and more countries are adopting CCS.

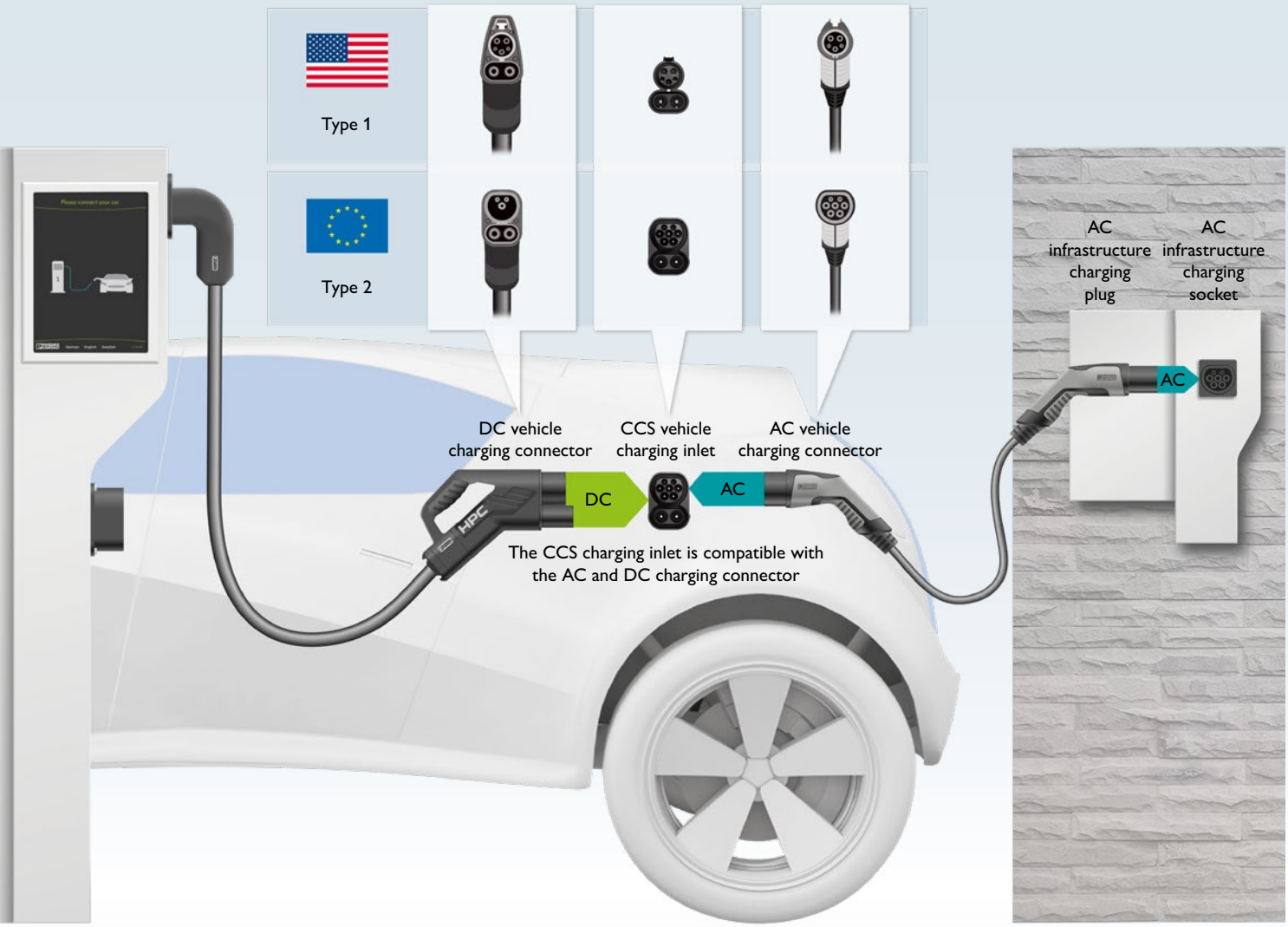
The advantages of the CCS

- ☑ Universal interface for AC charging and DC fast charging via just one charging inlet in the vehicle
- ☑ Maximum safety with charging connector locking and precise temperature monitoring
- ☑ High acceptance and prevalence in large parts of the world, which is continuing to grow
- ☑ Vehicle manufacturers save on components, space, and costs

Explainer videos: How does a charging station work?

Scan the QR code to go to the YouTube playlist containing our five explainer videos:





Fast charging with direct current (DC)

What happens during DC charging?

The alternating current from the supply network is already converted in the charging station into direct current, which the vehicle battery requires for charging. This AC/DC conversion is handled by the power electronics – a component that does not exist in AC charging stations. In addition, the power contacts and cross-sections of the DC charging cable are larger.

DC charging is therefore more complex and cost-intensive for this reason among others, and is predominantly used commercially. However, very high charging powers of up to 500 kW can be transmitted, which significantly reduces the charging time. DC charging is therefore recommended on long trips with short breaks to recharge the range in a few minutes, e.g., at highway service stations.

Charging with alternating current (AC)

What happens during AC charging?

The alternating current from the supply network first flows into the vehicle via the charging station and charging cable – controlled, but without conversion. An AC/DC converter installed in the vehicle, called the onboard charger, then converts it into direct current, which can be used to charge the vehicle battery.

Since AC charging stations therefore do not require power electronics, they are less expensive than DC charging stations and more attractive for private applications. Depending on the charging station, charging cable, and onboard charger, charging powers of up to 22 kW can be achieved. Due to these comparatively low powers, AC charging is gentler on the battery and is generally recommended for idle times longer than 30 minutes.

Charging modes: What are they and how do they differ?

AC charging with mode 1

The vehicle is charged with AC power from a household socket. Voltages up to 250 V may be applied in single-phase grids, and up to 480 V in three-phase grids. The maximum charging current is 16 A. There is no communication between the vehicle and the charging point. Fuse protection via a residual current device (RCD) is a mandatory requirement. As this is not always guaranteed in older installations, Phoenix Contact does not recommend this charging mode.

AC charging with mode 2

As per mode 1, but the maximum charging current here is 32 A and the charging cable is equipped with an in-cable control and protection device (IC-CPD). This device includes residual current safety equipment (RCD), communicates with the vehicle, and thus controls the charging process.

AC charging with mode 3

With mode 3, the vehicle is charged with AC power at a charging station or home charger in which the necessary residual current device (RCD) is already integrated. The charging station handles communication with the vehicle. The vehicle can be charged with up to 250 V in single-phase grids or up to 480 V in three-phase grids and with a maximum charging current of up to 63 A. Mode 3 is split into three cases:

Case A

In case A, a charging cable that is permanently connected to the vehicle is used. Therefore, it only has a connector unit at one end: the infrastructure charging plug that is plugged into the charging socket on the charging station. Although case A is described in the standards, it is hardly ever used in practice today.

Case B

Case B requires what is called a mobile AC charging cable that is kept in the trunk, for example. It has a connector unit at both ends. The end with the vehicle charging connector is inserted into the vehicle charging inlet. The other end with the infrastructure charging plug is plugged into the charging socket on the charging station. Case B is mainly used at public charging stations.

Case C

Case C is the opposite of case A, because in this case the charging cable is permanently connected to the charging station. The other end of the cable has a connector unit – the vehicle charging connector – which is plugged into the vehicle charging inlet. Case C is very often used in the private sector.

DC charging with mode 4

This mode is the only one that describes DC charging at fast charging stations. Increased safety requirements apply due to the high charging currents of up to 500 A. Therefore, the charging cable is always permanently connected to the charging station in this case. A plug-in connection is only provided on the vehicle side. Therefore, this mode is not split into three cases (as mode 3 is). Temperature monitoring of the power contacts in the charging connector and additional protective functions in the charging station, such as insulation monitoring, are also required.

Glossary: Technical terms and abbreviations clearly explained

Vehicles

EV: Electric vehicle: Collective term for all vehicles completely or partially powered by electricity.

BEV: Battery electric vehicle: Vehicle powered purely with electricity whose drive energy is stored in chemical form in batteries.

HEV: Hybrid electric vehicle: Vehicle that has both an internal combustion engine and a battery electric drive.

PHEV: Plug-in hybrid electric vehicle: Like HEVs, but the battery can also be charged externally via a charging connector.

Charging connectors and sockets

Inlet: Charging socket in electric vehicles into which the vehicle charging connector is plugged. Also called a vehicle charging inlet.

Connector: Charging connector that is plugged into the charging inlet in the electric vehicle. Also called a vehicle charging connector.

Plug: Charging connector that is plugged into the charging socket on the charging station. Also called an infrastructure charging plug.

Socket outlet: Charging socket in the charging station to which a vehicle is connected via a mobile AC charging cable and charged in accordance with charging mode 3, case B. Also called an infrastructure charging socket.

Charging types and standards

AC charging: Charging with single-phase or three-phase alternating current (charging mode 1, 2, or 3).

DC charging: Charging with direct current (charging mode 4).

CCS: Combined Charging System: Charging connection system for type 1 and type 2, which allows both AC charging and DC charging with just one vehicle charging inlet.

Combo: Obsolete designation for CCS.

Type 1: Charging connector geometry for North America and other regions, described in the SAE J1772 and IEC 62196-3 standards.

Type 2: Charging connector geometry for Europe and other regions, described in the IEC 62196-3 standard.

GB/T: National Chinese standards. The GB/T 20234 standard describes the charging connector geometry for China.

HPC: High Power Charging, also ultra-fast charging: DC charging with powers upwards of 150 kW. Currently, liquid cooling up to 500 kW is possible with CCS type 1 and CCS type 2.

MCS: Megawatt Charging System: Charging standard for the DC charging of utility vehicles with powers of up to 3.75 MW.

V2G: Vehicle-to-grid, form of bidirectional charging: The vehicle can be charged from the supply network and can also feed energy back into the grid as needed. In accordance with the ISO 15118 standard.

V2H: Vehicle-to-home: As per V2G, but the vehicle serves as the home battery. The energy fed in is not fed back into the grid; instead, it is used to maximize the autonomy (self-sufficiency) of the home.

Charging infrastructure

Charging point: Point for connecting and charging a vehicle. A charging station has one or more charging points.

Charging system: Interaction of all technical components inside a charging station (electromechanics, electronics, software) that are necessary for charging a vehicle.

Home charger: Wall-mounted charging system in a manufacturer-specific housing. Mostly for private AC charging in the home environment with up to 11 or 22 kW, e.g., in the garage or carport.

Charging station: Stand-alone charging system in a manufacturer-specific housing. Mostly for public or semi-public AC and/or DC charging including billing system, at hotels, or supermarkets, for example.

EVSE: Electric vehicle supply equipment: See home charger and charging station.

Charging park: Network of several public or semi-public charging stations, on highways or in parking garages, for example.

CPO: Charging point operator: The company or legal entity that operates individual charging points or charging parks and charges vehicle users for the charged energy.

Communication and control

CP: Control pilot: Signal contact or signal line in a type 1, type 2, and GB/T charging cable. Used to transfer control information between the charging station and the vehicle.

PP: Proximity pilot: Signal contact or signal line in a type 2 charging cable. Provides the vehicle with information that charging is taking place with a specific charging current so that the immobilizer is activated.

CC: Connection confirmation: Signal contact or signal line in a GB/T charging cable. Provides the vehicle with information that charging is taking place with a specific charging current to activate the immobilizer.

CS: Connection switch: Signal contact or signal line in a type 1 charging cable. Notifies the charging station when the locking lever on the charging connector has been operated so that the charging station interrupts the charging current.

IC-CPD: In-cable control and protection device: A control and protection device integrated into the charging cable. Enables single-phase AC charging in accordance with charging mode 2 at household sockets with powers of up to 3.6 kW.

Backend: Enables the CPO to operate its charging points on the software side. Includes user management, payment processing (usually via a third-party provider), and technical monitoring of the charging points via the cloud.

OCPP: Open Charge Point Protocol: Used for communication between the charging station and the backend.

PnC: Plug-and-charge: Simplifies the charging process by making authentication and billing run automatically in the background. In accordance with the ISO 15118 standard.

Charging interfaces for your electric vehicles

3

The mobility revolution presents new challenges for both automobile manufacturers and the utility vehicle, passenger transport, and transportation industry. Government targets will require us to switch from internal combustion engines to e-mobility in the coming years.

For electric vehicle users, however, seemingly long charging times threaten to undermine streamlined logistics and suitability for everyday use. With our vehicle charging inlets, we offer a High Power Charging interface that significantly reduces charging times for electric vehicles.

"Above all, the vehicles of tomorrow will have their own charging technology. Larger batteries for greater range and shorter charging cycles are needed. We see ourselves as empowering this vehicle generation – and are already researching charging technologies that provide significantly more power than our HPC products today, for example, for particularly large utility vehicles".

Johannes Held, Senior Director Market Segment Automotive

Your advantages

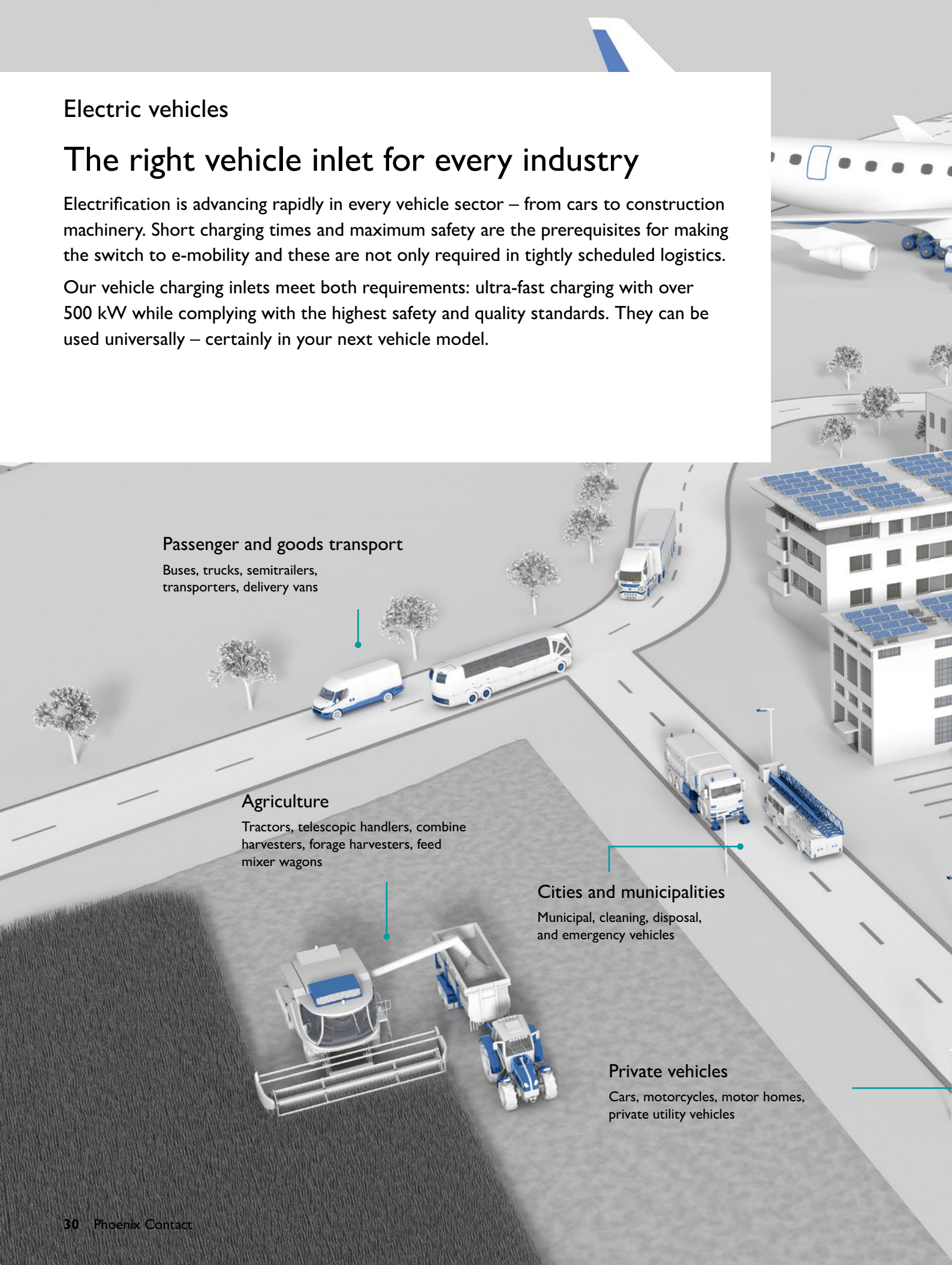
- ☑ Many years of experience as an automotive supplier
- ☑ IATF-certified quality for the most stringent requirements
- ☑ Innovative fast charging technologies suitable for everyday use
- ☑ Broad portfolio for all markets and vehicle types
- ☑ Safe charging technology from the co-developers of the CCS

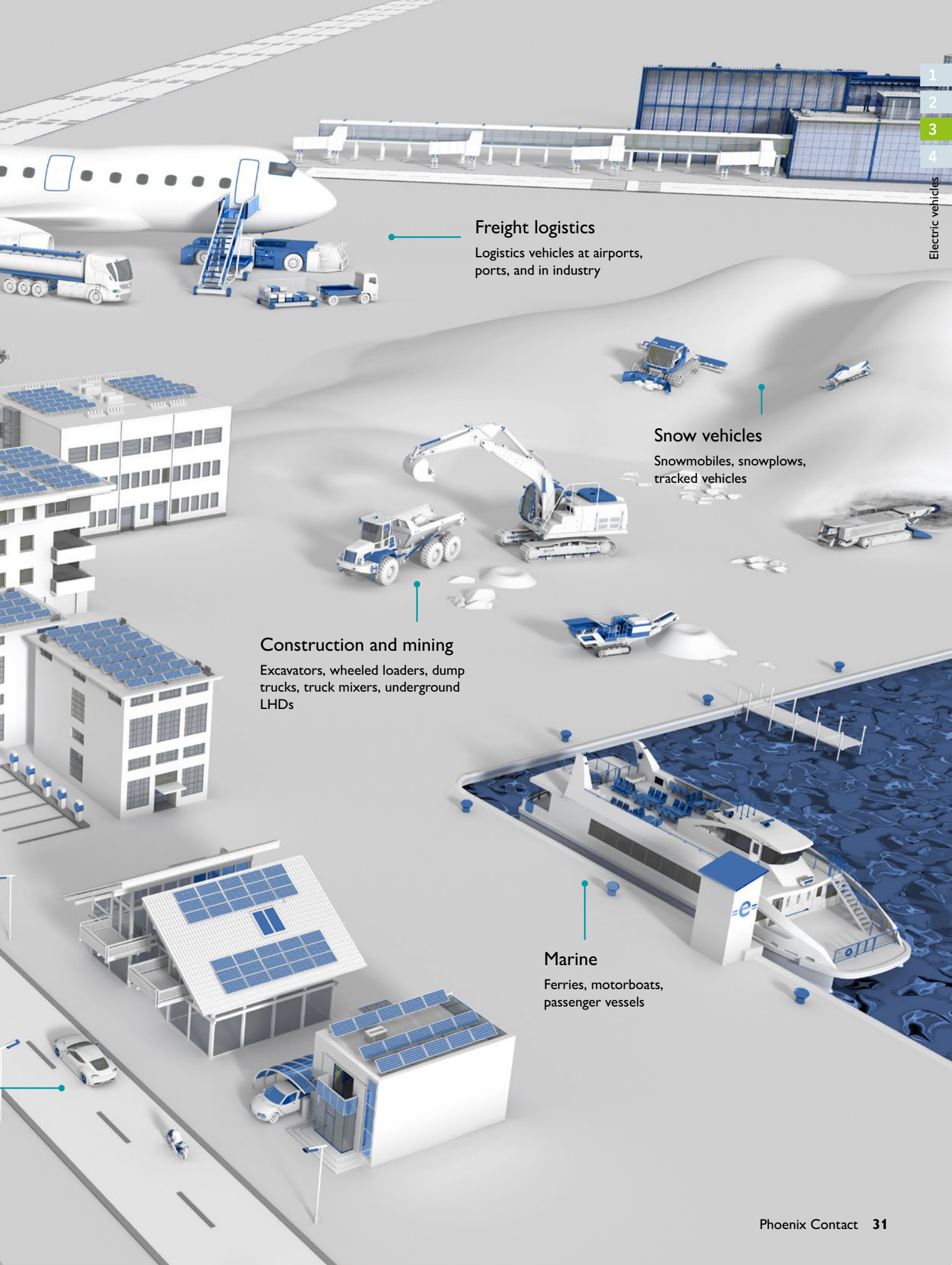
Electric vehicles

The right vehicle inlet for every industry

Electrification is advancing rapidly in every vehicle sector – from cars to construction machinery. Short charging times and maximum safety are the prerequisites for making the switch to e-mobility and these are not only required in tightly scheduled logistics.

Our vehicle charging inlets meet both requirements: ultra-fast charging with over 500 kW while complying with the highest safety and quality standards. They can be used universally – certainly in your next vehicle model.





Freight logistics

Logistics vehicles at airports, ports, and in industry

Snow vehicles

Snowmobiles, snowplows, tracked vehicles

Construction and mining

Excavators, wheeled loaders, dump trucks, truck mixers, underground LHDs

Marine

Ferries, motorboats, passenger vessels

Electric vehicles

Satisfied customers and vehicle manufacturers

Because our vehicle charging inlets meet the high quality and process requirements of the automotive industry in accordance with IATF 16949, numerous customers rely on our charging technology and expertise to implement their vehicle projects.

That is why our products are used not only by well-known automotive manufacturers, but also in motorcycles, utility vehicles, and in the electrification of mobile machines.

"We didn't want to choose just any supplier for our vehicle charging inlet. We made a conscious decision to go with Phoenix Contact – a proven and reliable partner providing high quality and many years of experience".

Alexander Perlik, Head of Production Control, EVUM Motors GmbH

EVUM Motors – robust electric transporters with all-wheel drive

Bavarian vehicle manufacturer EVUM Motors offers the aCar, a compact electric transporter for the municipal sector, agriculture, and forestry.

The stable, robust utility vehicle is equipped with our CCS charging inlet, which is ideally suited to the demanding fields of application due to its high IP protection class.

EVUM MOTORS


EVUM
MOTORS

Satisfied customers and vehicle manufacturers

Audi – sporty vehicles, high-quality workmanship, and progressive design

The German manufacturer is a technological pioneer and one of the most successful brands in Europe in the all-electric premium automobile segment.

Phoenix Contact has been a trusted partner since 2016. We supply Audi AG and all other brands of the Volkswagen Group with customer-specific charging inlets.

BMW Group – premium manufacturer of automobiles and motorcycles

The German automobile manufacturer is one of the leading providers of premium e-mobility and relies on powerful charging technology from Phoenix Contact.

Since 2017, we have been equipping the fully electric models of the BMW and MINI brands with our vehicle charging inlets to facilitate fast and convenient charging.

Ebusco – electric buses for sustainable passenger transport

Dutch manufacturer Ebusco produces electric buses, hundreds of which are now in use. In passenger transport as well, the market demands long ranges and the ability to recharge quickly on the move.

This is why Ebusco relies on our vehicle charging inlets, which can be used to charge at up to 500 kW on a short-term basis.

SUNCAR and KTEG – pioneering electrification of construction machinery

Swiss company SUNCAR specializes in the electrification of construction machinery and utility vehicles and also manufactures its own electric excavators.

Together with German construction machinery manufacturer KTEG, SUNCAR has electrified the KTEG ZE135 excavator. Our HPC-capable CCS charging inlet is used as the charging interface.

Normet – innovations for sustainable underground mining and tunnel construction

Normet, a global technology company headquartered in Finland, manufactures innovative battery-powered electric vehicles for tunnel construction and underground mining.

Normet SmartDrive vehicles are equipped with our CCS charging inlets for ultra-fast charging, for high utilization above and below ground.

Energica – leading manufacturer of electric sports motorcycles

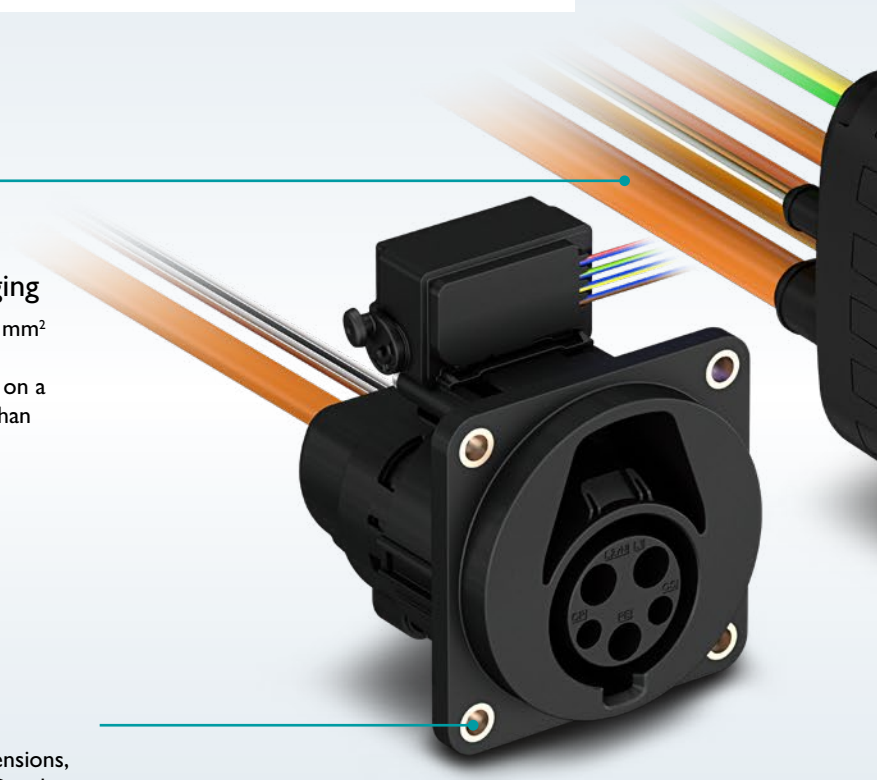
As the first Italian manufacturer of powerful and sporty electric motorcycles, Energica installs Phoenix Contact's universal CCS charging inlets in all of its models.

They enable the fast and safe charging of the motorcycles and support the company in its mission to achieve zero-emission e-mobility.

Universal vehicle charging inlets for electric cars, utility vehicles, and mobile machines

The vehicle charging inlets CHARX connect universal enable AC and DC charging – from low charging powers right through to High Power Charging. In addition to CCS charging inlets, GB/T versions are also available for the Chinese market.

Developed in accordance with IATF 16949 for the demanding requirements of the automotive industry, this robust and proven technology is now available for all types of electric vehicles.



Capable of High Power Charging

Conductor cross-sections of up to 120 mm² and optimized connection technology enable safe HPC charging with 375 kW on a continuous basis, and even with more than 500 kW in Boost Mode.

Easy design-in

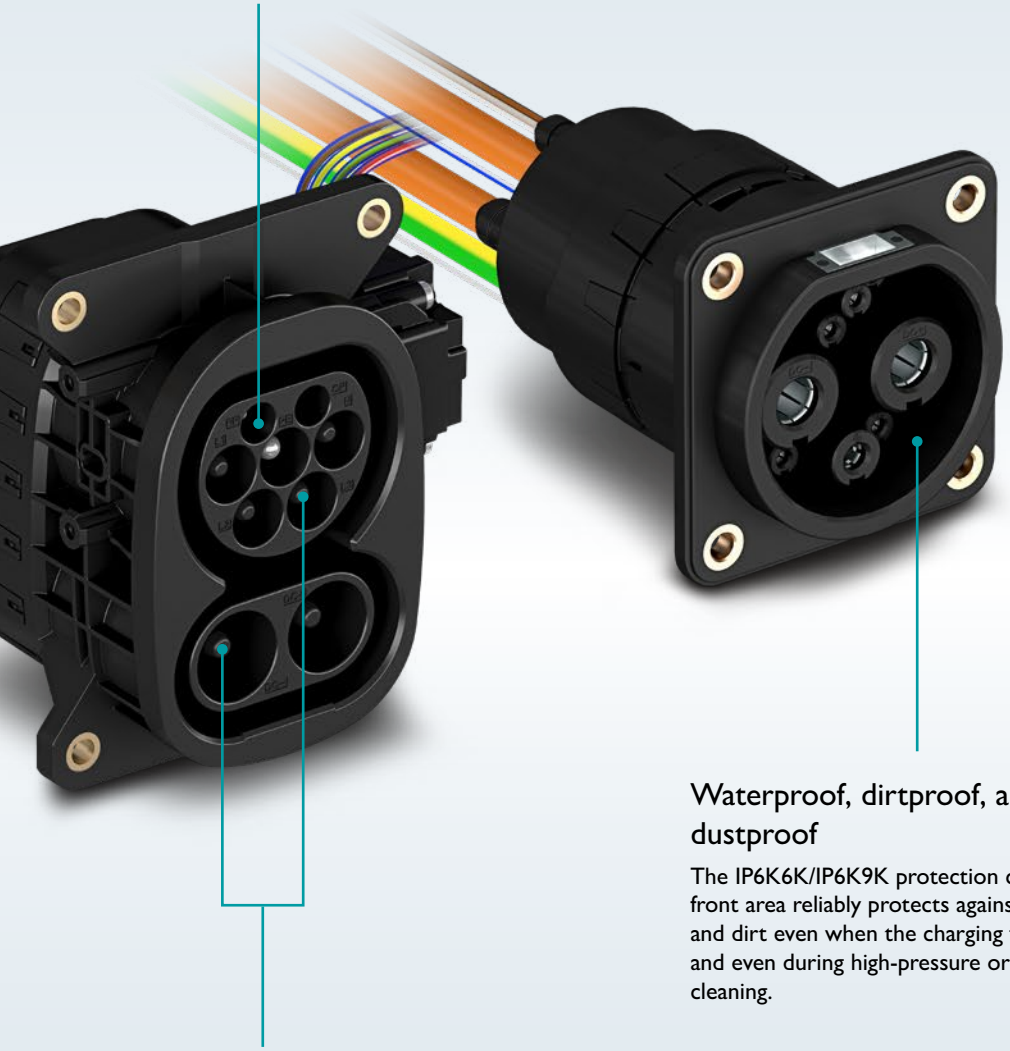
With the compact design, uniform dimensions, and identical screw-on points of the AC and CCS charging inlets, design-in is particularly easy.

CHARX connect

E-Mobility empowered by Phoenix Contact

Ready for vehicle-to-grid and plug-and-charge

The signal contacts and lines enable PWM communication in accordance with ISO 15118. This makes the charging inlets ready for vehicle-to-grid and plug-and-charge.



Waterproof, dirtproof, and dustproof

The IP6K6K/IP6K9K protection class in the front area reliably protects against moisture and dirt even when the charging flap is open, and even during high-pressure or steam-jet cleaning.

Integrated temperature sensor technology

With fast and precise temperature measurement at the AC and DC contacts, the charging inlets are safe from overheating.

Vehicle charging inlets CHARX connect universal

High Power Charging with up to 500 kW in Boost Mode

Our vehicle charging inlets now enable you to use High Power Charging (HPC) technology in your vehicle.

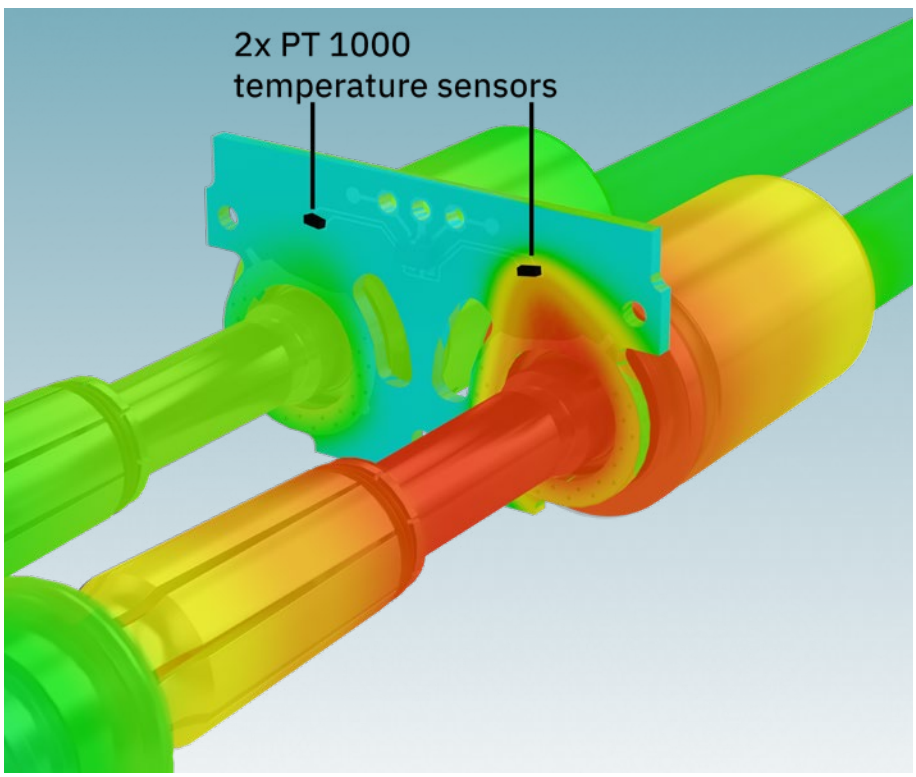
With conductor cross-sections of up to 120 mm², optimized connection technology between the DC contacts and the high-voltage cables, and high-precision temperature measurement, you can safely charge with 375 kW on a continuous basis.

Depending on conditions such as the ambient temperature, the routing of the cables in the vehicle, or the application-specific charging profile, you can even achieve significantly higher charging powers of more than 500 kW for short periods in Boost Mode.

Precise temperature sensor technology for maximum safety

PT 1000 sensor technology in the DC area
Our vehicle charging inlets are equipped with a PT 1000 sensor on both of the DC contacts, which can measure the temperature very quickly and precisely. Based on the evaluated measurement data, the vehicle can dynamically control the requested DC charging current. Immediate shutdown is initiated when a limit temperature of 90°C is exceeded at the power contact. The precise temperature sensor technology thus protects against overheating and ensures maximum safety during the charging process.

PTC sensor technology in the AC area
The temperature sensor technology in the AC area consists of a chain of PTC resistors, each of which is located at an AC contact. By detecting the respective resistance values, safe shutdown is enabled when a limit temperature of 110°C is exceeded.



Vehicle charging inlets CHARX connect universal

Waterproof, dirtproof, and dustproof due to high IP protection

With their optimized and clever sealing system, our vehicle charging inlets have been successfully tested in accordance with ISO 20653.

The entire charging inlet features comprehensive IP6K7 and IP6K5 degree of protection. Accordingly, it is protected from all sides:

- Protected against water when submerged to a depth of up to one meter
- Protected against splash water
- Protected against dust ingress
- Fully protected against contact

This applies both to the part inside the vehicle and to the front area outside, even when the charging flap is open and the charging connector is not plugged in.

In addition, the degree of protection of the front area has been tested in various situations. The degree of protection achieved in each case is shown in the following images.

Which IP degree of protection is achieved in the front area?

With vehicle charging inlet uncovered: IP6K6K/IP6K9K

The front area is:

- Protected against powerful jet water under increased pressure
- Protected against water during high-pressure or steam-jet cleaning
- Protected against dust ingress

With protective caps inserted: IP6K6K/IP6K9K

The degree of protection of the front area of the vehicle charging inlet in this state is the same as in the uncovered state in the image on the left.

With charging connector plugged in: IP44B/IP44D

Here, the degree of protection of the front area of the vehicle charging inlet corresponds to that of the plugged in and locked charging connector, which is specified as IP44 in the standard. The front area is:

- Protected against splash water on all sides
- Protected against solid foreign objects with a diameter ≥1.0 mm
- Protected against touching with a wire

Watch the product video on YouTube now!

Scan the QR code with your smartphone or tablet and find out more about the functions and features of the Vehicle charging inlets CHARX connect universal in the product video.

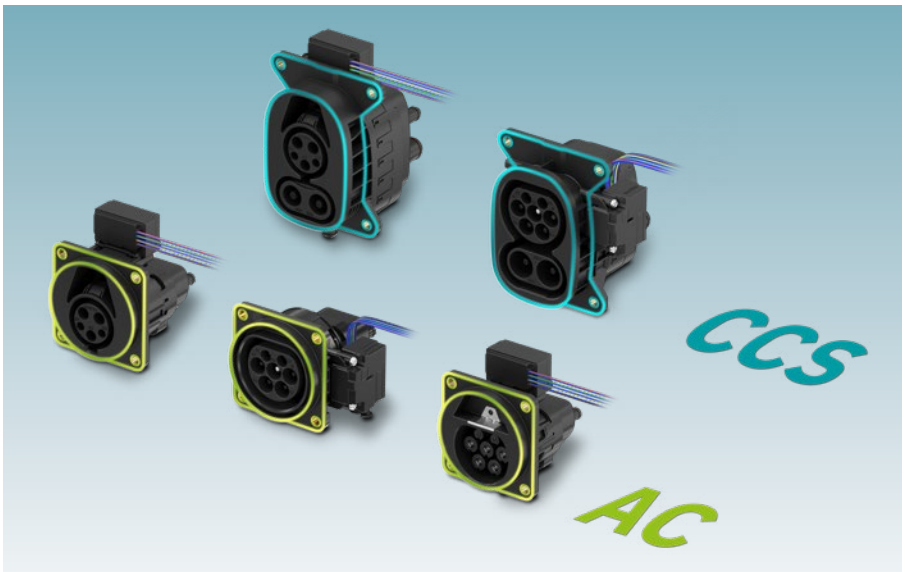
Vehicle charging inlets CHARX connect universal

Uniform geometries for easy design-in

All vehicle charging inlets have an extremely compact design.

In addition, the relevant external geometries and screw-on points of the CCS charging inlets and the AC charging inlets are identical.

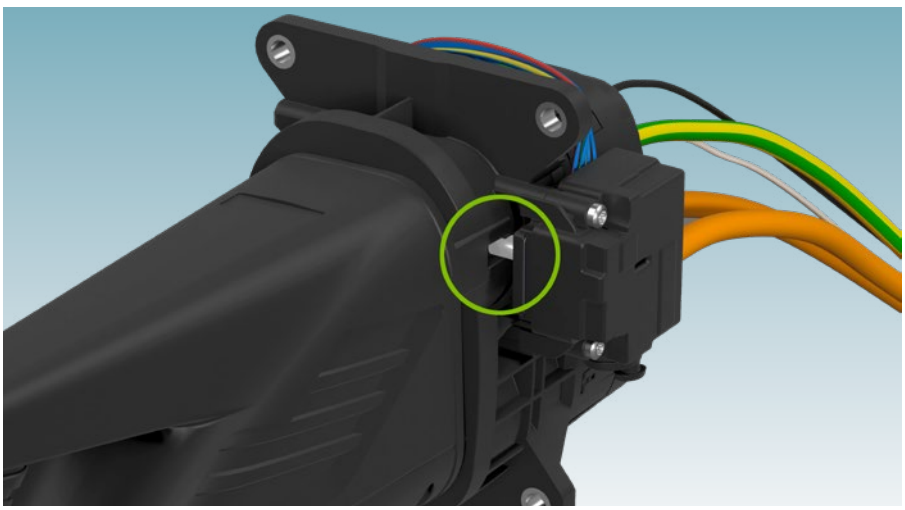
This allows you to plan for the same installation space for the design-in of the charging inlets in all vehicle models – regardless of the charging standard of the target market.



Charging connector locking for maximum safety

All vehicle charging inlets, with the exception of the GB/T DC charging inlet, are equipped with an electromagnetic locking actuator in accordance with standards. It locks the vehicle charging connector on the side of or directly on the locking clip in the mating face during the charging process.

The actuator bolt is designed to withstand high pull-out forces. It is therefore not possible to pull out the charging connector during the charging process.



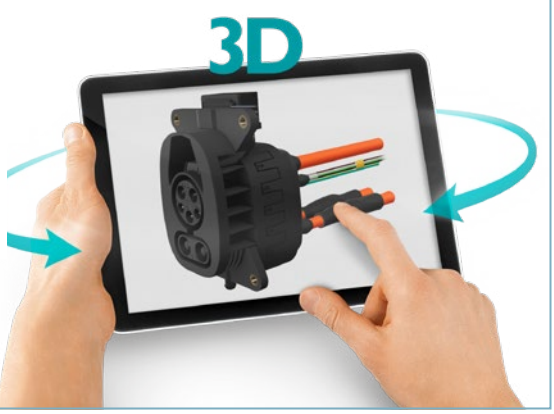
Experience it now in augmented reality (AR)!

Scan one of the QR codes with your smartphone or tablet and virtually place the CCS charging inlet in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

Type 1 CCS charging inlet

Type 2 CCS charging inlet



Customer-specific solutions for automobile manufacturers

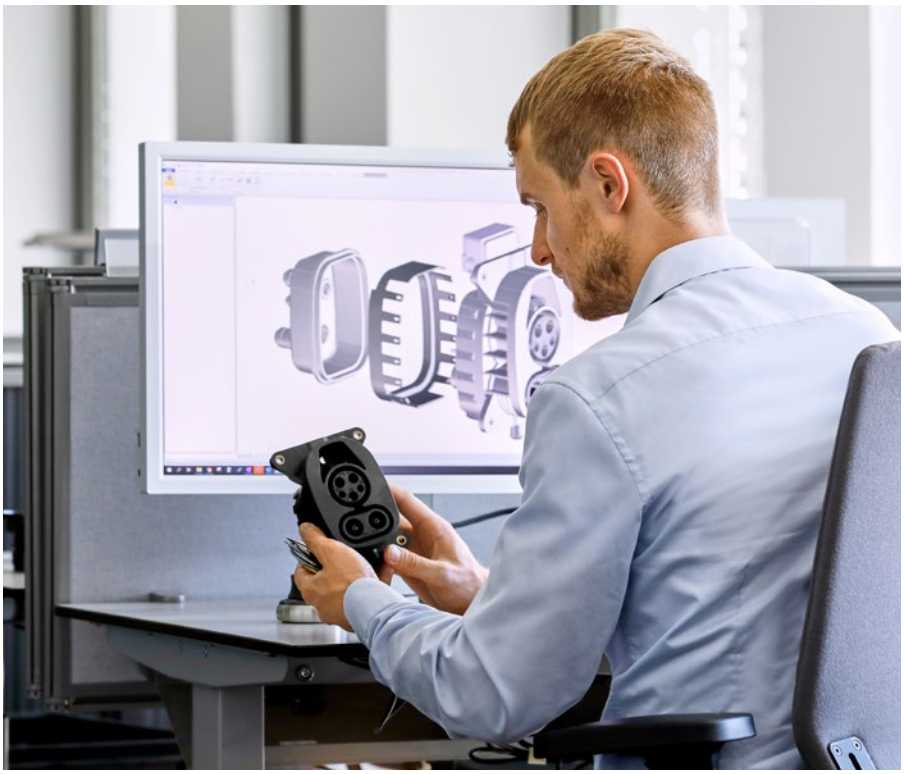
Custom charging inlets for your series vehicles

We have already developed custom vehicle charging inlets for many leading OEM automobile manufacturers that satisfy the stringent requirements of the automotive industry in accordance with IATF 16949.

We will integrate or develop features in line with the demands of your series vehicles, such as:

- Customized integration of the charging inlet in the vehicle installation space
- LED indicators and lighting
- Extra operating elements
- Charging connector and charging flap locking
- Integration of intelligent cooling concepts including high-precision temperature measurement to match the vehicle charging curve

Contact us for more information!



Mode 3 charging cable to equip your vehicles

Offer your customers an AC charging cable that matches the vehicle as part of the vehicle equipment or your range of accessories. Choose between the designer charging cables CHARX connect comfort and the inexpensive CHARX connect eco version.

A high-quality transport bag is available for transporting and safely stowing the charging cable in the trunk. On request, the charging cable and bag can be customized with your logo – to match the vehicle branding.

More information starting on page 70

Our product portfolio for your electric vehicles

CCS and DC vehicle charging inlets

			DC conductor cross-section			
			35 mm²	70 mm²	95 mm²	120 mm²
			DC charging power (continuous)			
			125 kW (125 A / 1000 V)	200 kW (200 A / 1000 V)	250 kW (250 A / 1000 V)	375 kW (375 A / 1000 V)
			DC charging power (Boost Mode) [1]			
Type 1 CCS	**AC charging power**	**Actuator voltage**	**200 kW (200 A / 1000 V)**	**500 kW (500 A / 1000 V)**		**>500 kW (>500 A / 1000 V)**
	12 kW 1-phase (48 A / 250 V)	12 V	1194398	1162178	1210902	1546168
	20 kW 1-phase (80 A / 250 V)		On request	1210900	1162163	1546446
	(DC only)		On request	1211595	1211606	1546442
Type 2 CCS						
	8 kW 1-phase (32 A / 250 V)	12 V	1270297	1162150	1162148	On request
		24 V	1211201	1211202	1211206	On request
	26 kW 3-phase (32 A / 480 V)	12 V	1270310	1162144	1162095	1547859
		24 V	1211210	1211212	1270301	1547864
	(DC only)	12 V	On request	1211221	1211222	1547857
		24 V	On request	1211217	1211220	1547854
GB/T DC						
	(DC only)	(No actuator)	1271834	-	1271833 [2]	-

All vehicle charging inlets shown with 2 m cable. Item versions with other cable lengths are also available on our website or on request.

[1] Boost Mode allows a higher charging power for a short period. The possible time span depends on numerous ambient conditions. Details can be found in the packing slip for the respective item, which you can download from our website.

[2] In accordance with standards, a DC conductor cross-section of 70 mm² is used for this GB/T DC vehicle charging inlet.

Our product portfolio for your electric vehicles

AC vehicle charging inlets

Type 1 AC	AC charging power	Actuator voltage	Item no.
	12 kW 1-phase (48 A / 250 V)	12 V	1271960
	20 kW 1-phase (80 A / 250 V)		1271836
Type 2 AC			
	8 kW 1-phase (32 A / 250 V)	12 V	1271830
		24 V	1271835
	26 kW 3-phase (32 A / 480 V)	12 V	1271966
		24 V	1271965
GB/T AC			
	8 kW 1-phase (32 A / 250 V)	12 V	1271832
	23 kW 3-phase (32 A / 415 V)		1271831

Protective caps as replacement parts

			
Type 1 CCS	**Type 1 AC**	**Type 2 CCS**	**Type 2 AC**
1305482	1550141	1305486	1550144

Locking actuators as replacement parts

		
Type 1 CCS and AC	**Type 2 CCS and AC**	
12 V	**12 V**	**24 V**
1331528	1331532	1331524

For the complete portfolio of **vehicle charging inlets**, enter the web code on our website or scan the QR code.

Web code: #2090

Everything for your networked charging infrastructure

4

Equip your charging points with CHARX from Phoenix Contact: As a component manufacturer, we supply all the equipment for your charging stations and home chargers – from the CCS charging cable to the charging management solution. Our broad portfolio thus forms the basis for powerful and networked charging infrastructure.

Our experts will support you in designing and planning your charging solution – whether it is an AC home charger or an HPC fast charging park. If needed, we will also develop customer-specific solutions or even new technologies.

"To ensure that sufficient energy for charging is available in the right place at the right time, generators, grids, and electric vehicles have to communicate with each other. Our cloud- and communication-capable products with intelligent software are the foundation for this. Powerful charging technology then transports the energy into the vehicle quickly and safely".

Joachim Pucker, Senior Director Market Segment Infrastructure

Your advantages

- ☑ The fast way to your individual charging solution
- ☑ Easy installation, commissioning, and maintenance
- ☑ Fast, safe, and highly available charging stations
- ☑ Smart charging management and maximum transparency
- ☑ Future-proof investment and flexible extension

Your advantages in detail

The fast way to your individual charging solution

We will assist you in developing your charging infrastructure project: with a complete portfolio, professional advice, and expert know-how. We are there for you worldwide, also in your vicinity.

Our services and support services at a glance:

- Professional product selection and engineering consultation
- Provision of practice-based example documentation for typical charging stations
- Support for connection to backend, building management, and energy management systems
- Support for grid integration and the use of renewable energies for environmentally friendly charging
- Production of charging connectors with your logo – for the consistent branding of your charging stations
- Preparation of the charging cable in accordance with your requirements – with a step cut, assembled, or compacted
- Development of customer-specific solutions or new technologies if needed

Easy installation, commissioning, and maintenance

The uniform, modular product design and the tool-free Push-in connection technology allows you to install and wire the components in the charging station in a quick, convenient, and space-saving way.

A special panel feed-through ensures easy installation of the HPC charging cable. With maintenance-friendly and replaceable product components, you will save both time and money during service calls.

Fast, safe, and always available charging stations

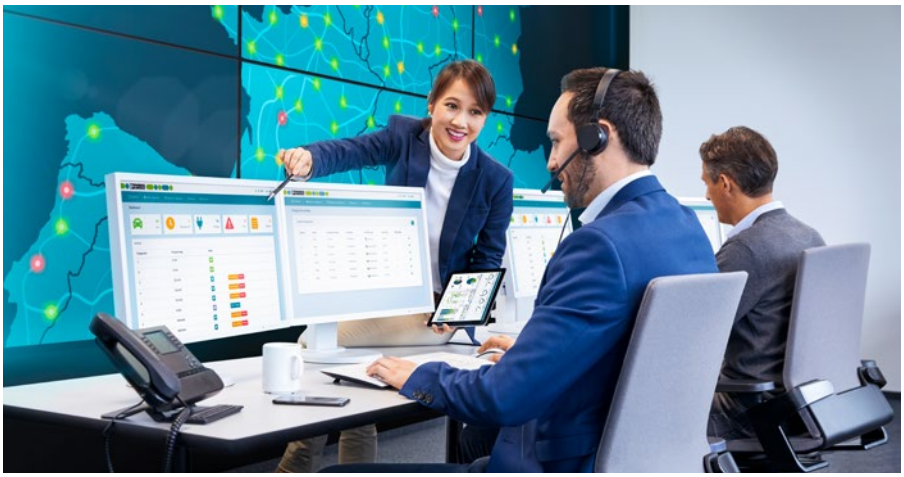
As the pioneers of fast charging technology, we develop future-oriented technologies such as High Power Charging (HPC) and, with that, enable short charging times that are suitable for everyday use.

Reliable charging connection systems and charging controllers as well as high-performance power supplies, protective devices, and cybersecurity products guarantee safe, economic 24/7 operation of your charging infrastructure.

Smart charging management and maximum transparency

Network your charging points with communicative products, open standard protocols, and established interfaces such as Modbus/TCP, REST, MQTT, or OCPP (Open Charge Point Protocol).

Realize the convenient control and transparent monitoring of your charging park including dynamic load management as well as seamless connection to building management and backend systems. Charging connector status and usage data also allows preventive planning of maintenance when it comes to wear and tear.



Future-proof investment and flexible extension

Depending on the number, charging power, and scope of functions of your charging points, you can choose the appropriate product combination from our scalable portfolio.

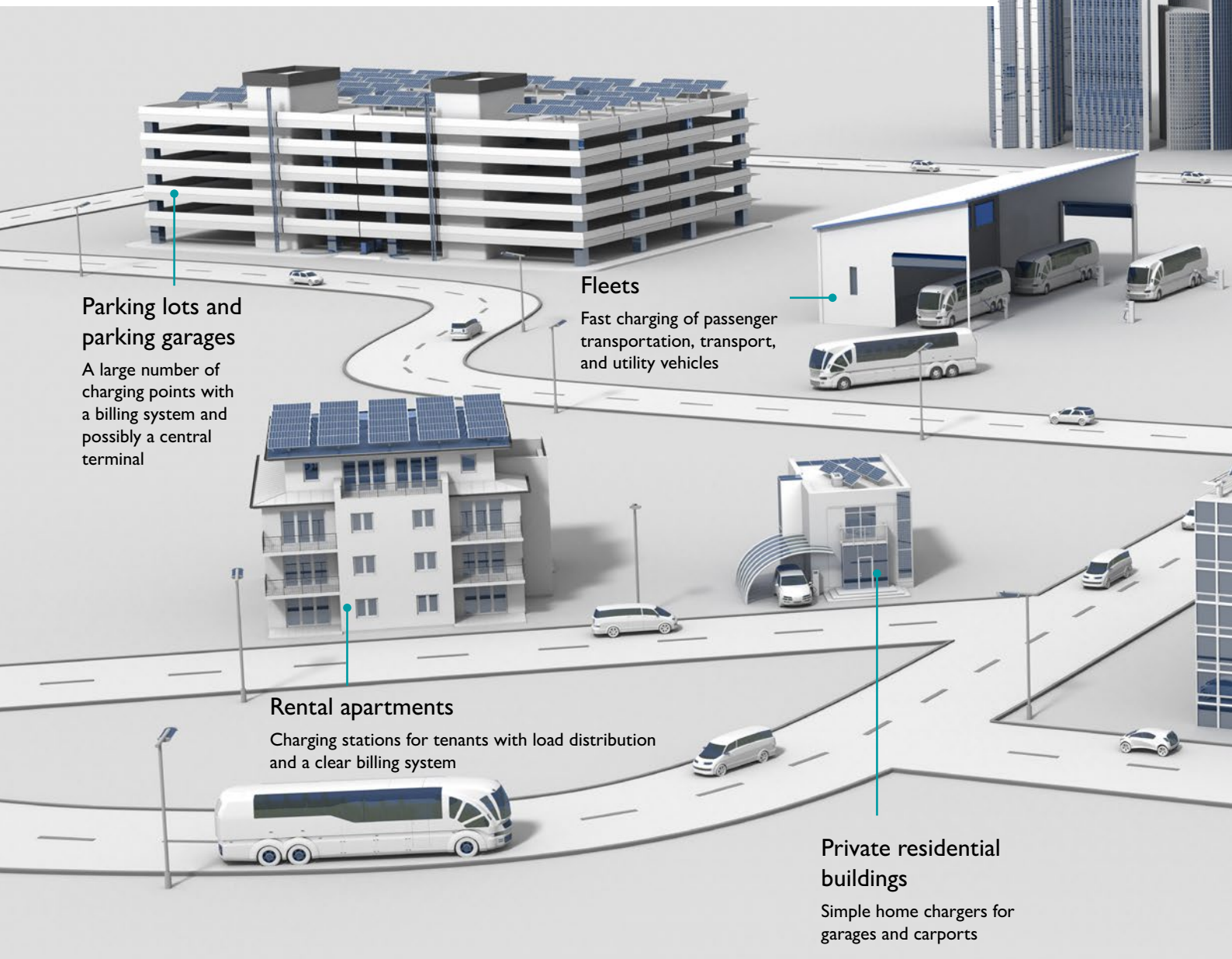
With modular charging controllers and power electronics as well as graded software licenses and over-the-air updates, you are well prepared for future developments and extensions of your charging park.

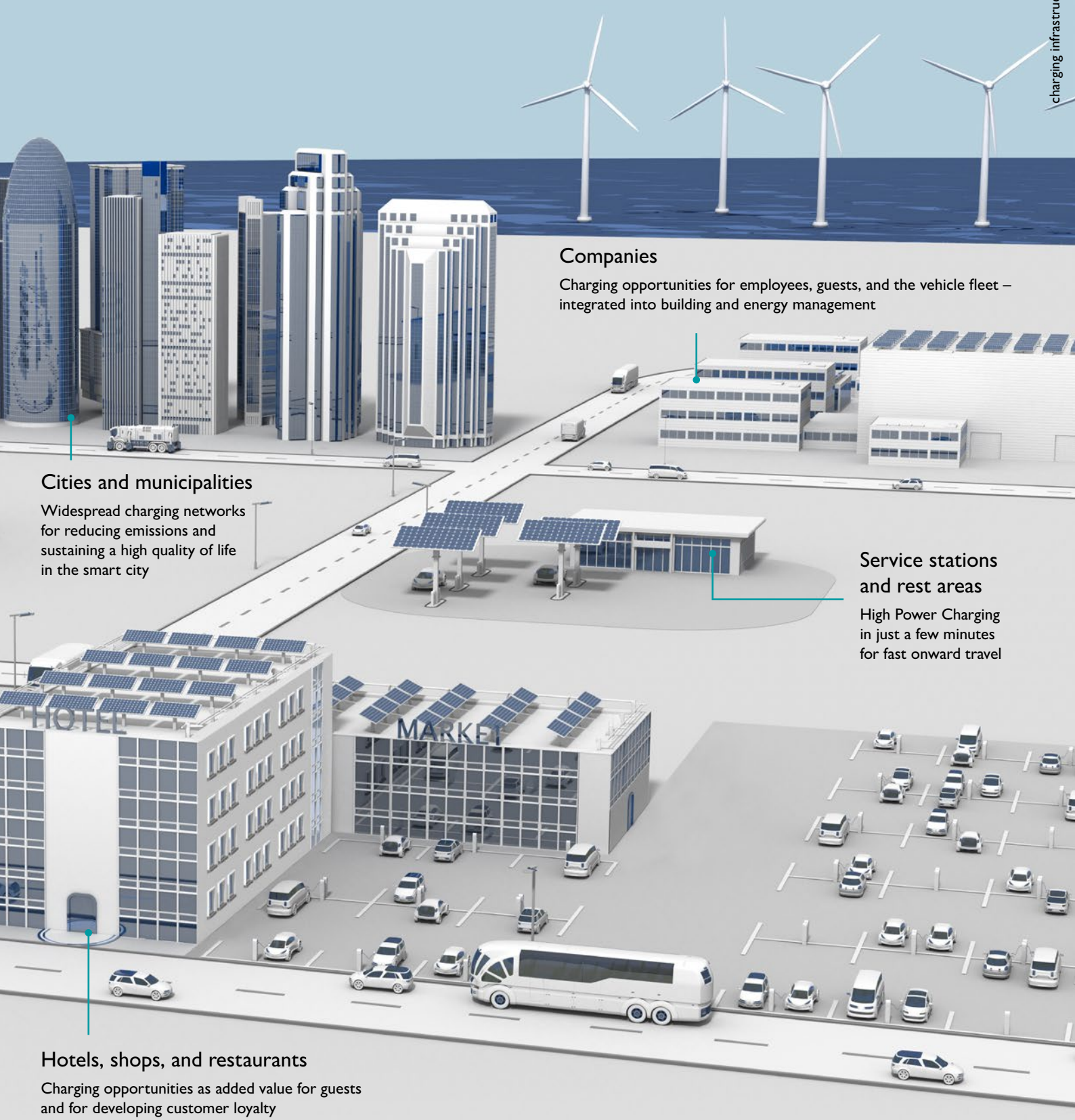
Charging infrastructure

We understand your application

From a simple home charger for a private residential building to a fast charging park on the highway – every charging solution has different requirements in terms of performance and the scope of functions.

With our broad, scalable portfolio, we can create an optimized and coordinated package of components and software for you – and support you in the planning and implementation of your charging infrastructure project.





Companies

Charging opportunities for employees, guests, and the vehicle fleet – integrated into building and energy management

Cities and municipalities

Widespread charging networks for reducing emissions and sustaining a high quality of life in the smart city

Service stations and rest areas

High Power Charging in just a few minutes for fast onward travel

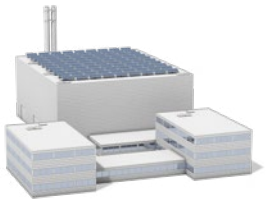
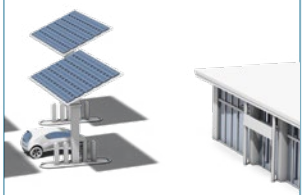
Hotels, shops, and restaurants

Charging opportunities as added value for guests and for developing customer loyalty

Typical charging infrastructure applications and their requirements

			
Functions	**Private residential buildings**	**Rental apartments**	**Hotels, shops, and restaurants**
AC charging	✓ (11 kW)	✓ (11 kW)	✓ (11 kW)
DC charging	Optional (22 kW)	Optional (22 kW)	Optional (50 kW)
Touch display or button operation			✓ (At every charging station)
User authorization, e.g., via RFID		Optional	✓
Load management		Optional	✓
Billing via OCPP		Optional	Optional
Remote maintenance via DSL or cellular communication			Optional
Integration into building or energy management systems	Optional	Optional	Optional

The charging powers and functions specified are application-typical recommendations and must be re-evaluated on a case-by-case basis depending on the customer requirements.

				
Companies	**Cities and municipalities**	**Parking lots and parking garages**	**Fleets**	**Service stations and rest areas**
✓ (22 kW)	✓ (22 kW)	✓ (22 kW)	✓ (22 kW)	✓ (22 kW)
✓ (150 kW)	Optional (150 kW)	Optional (22 kW)	✓ (400 kW)	✓ (400 kW)
✓ (At the central terminal)	Optional (At every charging station)	✓ (At the central terminal)	✓ (At every charging station)	✓ (At every charging station)
✓	✓	✓	✓	✓
✓		✓	✓	✓
Optional	✓	✓	Optional	✓
Optional	✓	✓	✓	✓
Optional		✓	✓	✓

Charging infrastructure

Successfully completed customer projects

With their dedication and application expertise, the work performed by our experts is often pioneering. After all, the e-mobility industry is still relatively new, and no two projects are ever the same.

The following examples demonstrate how we, in collaboration with charging station manufacturers, infrastructure providers, transport companies, system integrators, and automobile manufacturers, have successfully completed exciting projects satisfying a wide range of different requirements.

GP Joule – charging park with intelligent load management

The German specialist for renewable energies has equipped its on-site charging park with a load and energy management system. The objective: to charge the company's fleet of 28 electric cars, making optimum use of self-generated biogas and solar power.

Everything is controlled via a central control cabinet equipped with AC charging controllers, energy meters, and software from Phoenix Contact.

"With CHARX, our charging solutions can be used flexibly in different environments in charging parks. We can use it to offer our growing customer base a comprehensive solution, from analysis, planning, and implementation all the way to operation".

Jonas Elbroend and Piet Gömpel, Product Developers, GP Joule GmbH

Successfully completed customer projects

Evtec – bidirectional charging

The Swiss expert in charging technologies relies on bidirectional charging for its latest charging stations. This allows the electric vehicle to be charged via self-generated solar power and for power to be fed back into the building at night.

Our CCS charging cables CHARX connect compact, which were developed specifically for DC charging in the home environment with lower charging powers of up to 80 kW, are used here.

hesotec electrify – sustainable designer charging stations made of stainless steel

German family-owned company hesotec electrify not only focuses on quality and design, but also sustainability. With its timeless designer charging stations made of stainless steel, the company offers recyclable AC charging solutions for sophisticated requirements – from both a visual and technical point of view.

Our multi-award-winning designer charging cables CHARX connect comfort and our charging sockets CHARX connect modular are the perfect match.

Ingeteam – Southern Europe's largest HPC charging park

Ingeteam is a company empowering e-mobility – and not just in Spain, where the company has been working toward the electrification of a sustainable future for the past twelve years.

At a transport hub in southern Spain, Ingeteam's fast charging stations with a nominal power of 4 MW enable a vehicle to be charged in around five minutes. The company uses the HPC charging cables CHARX connect professional from Phoenix Contact for this.

FastCharge – research project enables ultra-fast charging

Together with BMW, Porsche, Siemens, and Allego, we have developed, created, and launched the world's first HPC charging station with a charging power of 450 kW as a part of the FastCharge research project.

The project demonstrated that ultra-fast charging works in practice to promote widespread acceptance of e-mobility. We supplied our liquid-cooled HPC charging cables CHARX connect professional, as well as the control technology for this project.

E-GAP – the first on-demand mobile fast charging service

With a mission to provide green energy for all, everywhere, Italian company E-GAP is present in several major European cities, supplying electric car owners with the amount of energy requested via an app.

The modular charging system in the E-GAP vans contains everything for AC and DC charging of electric vehicles with up to 80 kW and is equipped with charging technology, energy meters, and connection technology from Phoenix Contact.

Velocity – charging stations with a remarkable CO_2 balance

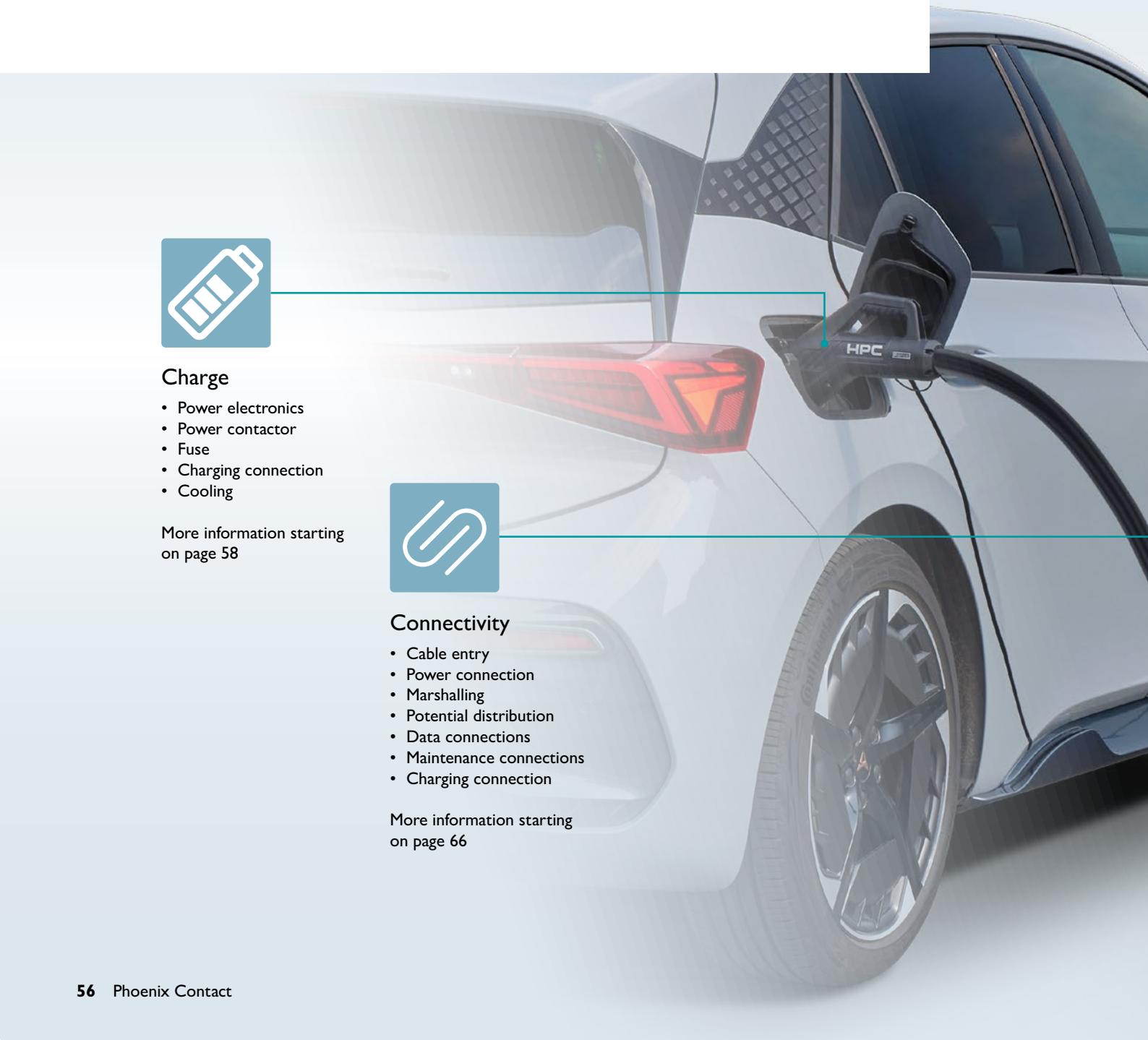
The German provider of rental mobility systems has developed a charging solution for its electric cars and bikes together with Pion Technology. The concrete material used for the charging station housings filters particulate matter out of the surrounding air and therefore achieves a remarkable ecological balance.

Along with our AC charging technology and power supplies, Pion Technology also uses our communication technology for cloud-based billing.

The functional areas of a charging station

Modern charging stations and home chargers have to meet high requirements in terms of availability, safety, and convenience based on the field of application. Complex structures made up of numerous individual components are not unusual. Developers, designers, and engineers are therefore often faced with technical challenges and issues.

To keep things simple, we have divided a complete charging station into five functional areas to give you a function-oriented overview of our extensive product portfolio.



Charge

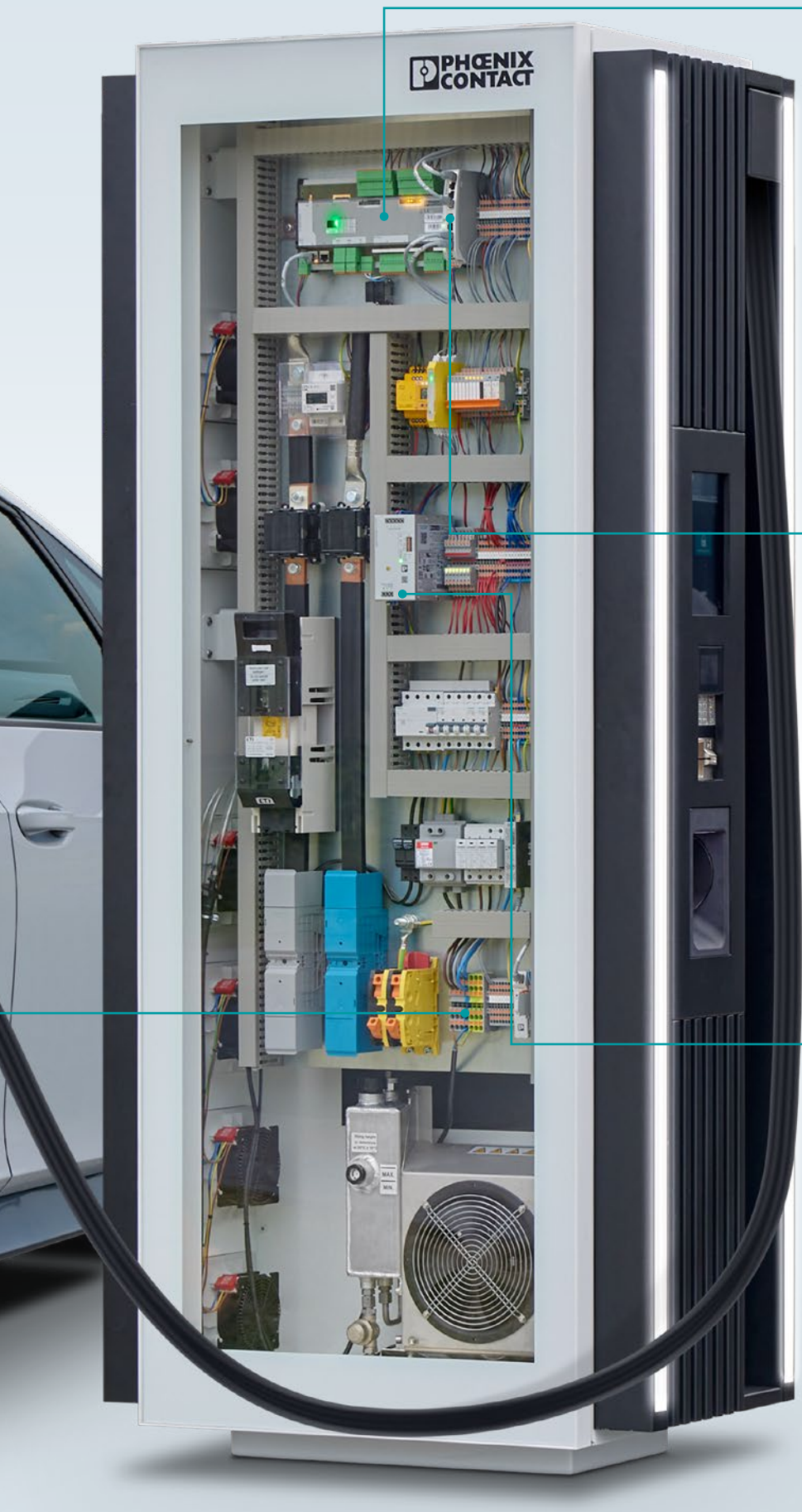
- Power electronics
- Power contactor
- Fuse
- Charging connection
- Cooling

More information starting on page 58

Connectivity

- Cable entry
- Power connection
- Marshalling
- Potential distribution
- Data connections
- Maintenance connections
- Charging connection

More information starting on page 66



Control and monitor

- Charging controller
- Energy measurement
- Residual current measurement
- Insulation monitoring
- Temperature measurement
- Signal coupling

More information starting on page 60

Network and communicate

- User authorization
- Visual status indicator
- Touch operation
- Ethernet connection
- Cellular connection

More information starting on page 62

Power reliability

- Power supply
- Surge protection
- Device protection
- Higher-level load measurement and energy monitoring

More information starting on page 64

The functional area “Charge”

How do I charge vehicles with total safety, and as quickly and gently as possible?

The required current is fed into the charging station via the functional area “Power reliability”, while the functional area “Control and monitor” regulates the charging process.

Depending on whether DC (direct current) or AC (alternating current) charging is to be used, different components are required.

Overall, our broad and scalable portfolio offers a wide range of possible combinations to flexibly implement all versions of AC and DC charging – with maximum safety.

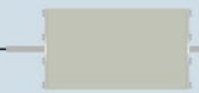
This means that the right solution can be created for any application, from private home chargers to HPC fast charging parks with liquid cooling.

Power reliability

Control and monitor

DC

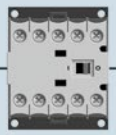
DC power electronics
More information
starting on page 116



Fuse [1)]

DC power contactor [1)]

AC

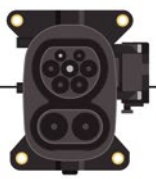


AC power contactor [1)]

[1)] Unfortunately, we do not currently carry this component in our portfolio. However, it is available from other providers.

Cooling unit
More information
starting on page 109

DC charging cable
More information
starting on page 94



Vehicle charging inlet
More information
starting on page 36

Vehicle

AC charging cable
More information
starting on page 68

AC infrastructure charging socket
More information
starting on page 78

Mobile AC charging cable
More information
starting on page 68

The functional area “Control and monitor”

How do I optimally control and monitor the charging process?

The functional area “Control and monitor” represents the intelligence behind the charging station.

The charging controller, as a central component, controls the charging process by communicating with the vehicle and sending control signals to contactors, locking actuators, or status LEDs. It also processes and monitors various measured values to ensure safety and facilitate billing.

Despite identical functional requirements, AC and DC applications differ with regard to the selection of components.

Overall, Phoenix Contact offers almost all of the components necessary for controlling and monitoring AC and DC charging processes.

AC

AC energy measurement
More information
starting on page 134

Residual current measurement
More information
starting on page 93

Temperature measurement (integrated in the AC charging socket)
More information
starting on page 78

AC charging controller
More information
starting on page 86

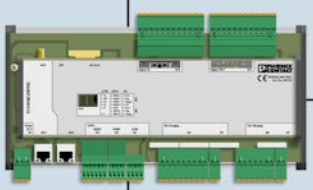
Signal coupling
More information
starting on page 132

Power reliability

[1] Unfortunately, we do not currently carry this component in our portfolio. However, it is available from other providers.

Network and communicate

DC

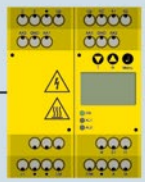


DC charging controller
More information
starting on page 110

Signal coupling
More information
starting on page 132

DC energy measurement
More information
starting on page 134

DC voltage monitoring
More information
starting on page 134



Insulation monitoring [1)]

Temperature measurement (integrated in the DC charging cable)
More information
starting on page 94

Charge

Connectivity

The functional area “Network and communicate”

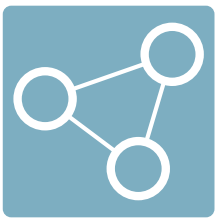
How do I network my charging station with the various stakeholders?

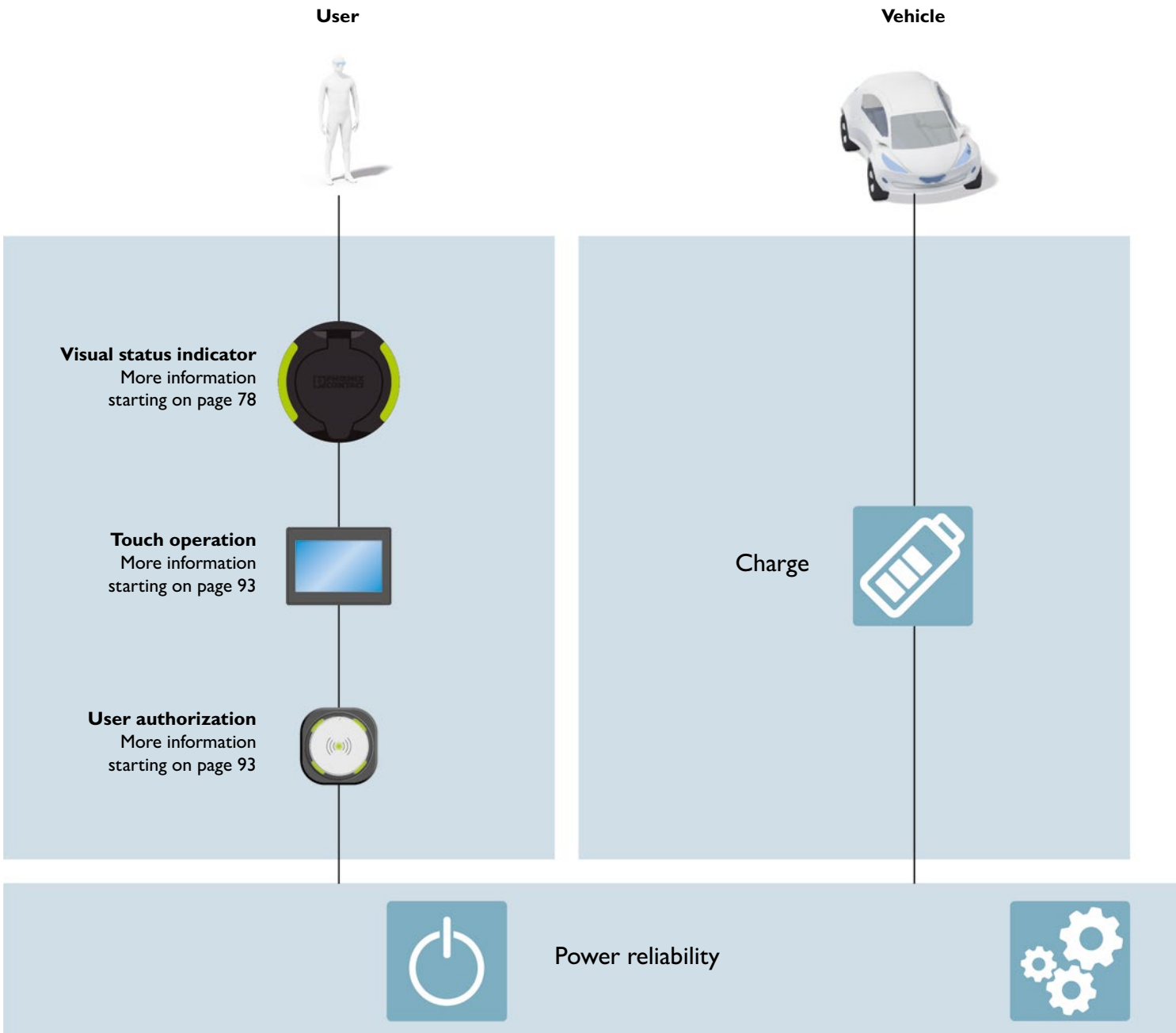
Depending on the application, communication in the charging process may be subject to a range of high requirements and may vary in terms of complexity.

There are therefore various options for communication between the charging station and the user, the charging park operator, and the backend provider. Communication with the vehicle takes place via the components in the functional area “Charge”.

Sector coupling, i.e., coupling between buildings, charging infrastructure operators, power generators and grids, and charging stations and electric vehicles, is becoming increasingly important. Communication is therefore the key to sustainable e-mobility based on renewable energies.

Whatever the networking and communication requirements are within the charging infrastructure, Phoenix Contact offers the appropriate solutions.



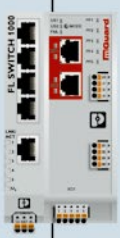


Charging park operator

Backend provider

Surge protection
More information
starting on page 122

Ethernet connection
More information
starting on page 138



Cellular connection
More information
starting on page 93

Control and monitor

Connectivity

The functional area “Power reliability”

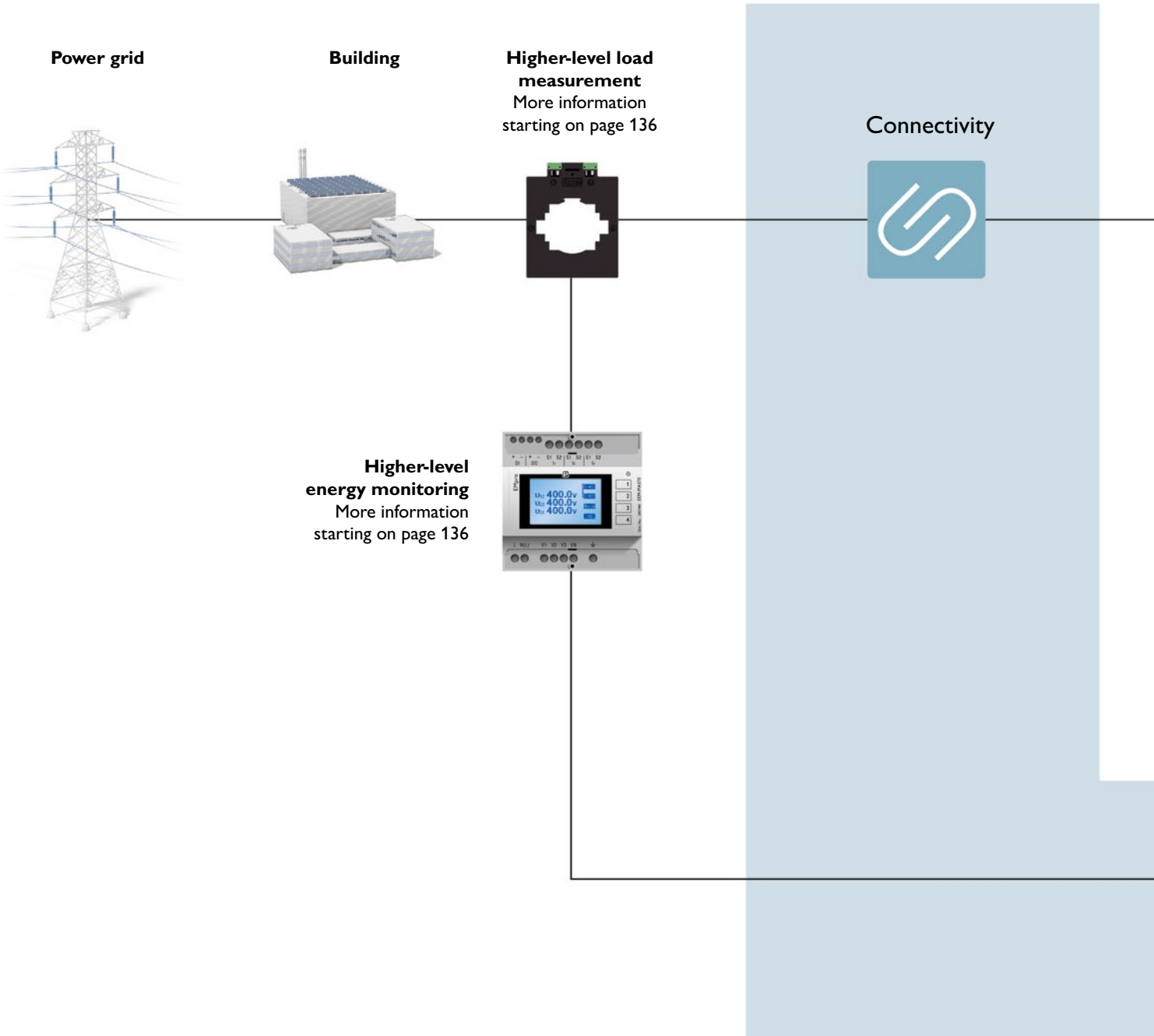
How do I reliably supply my charging station with power and protect it against failure?

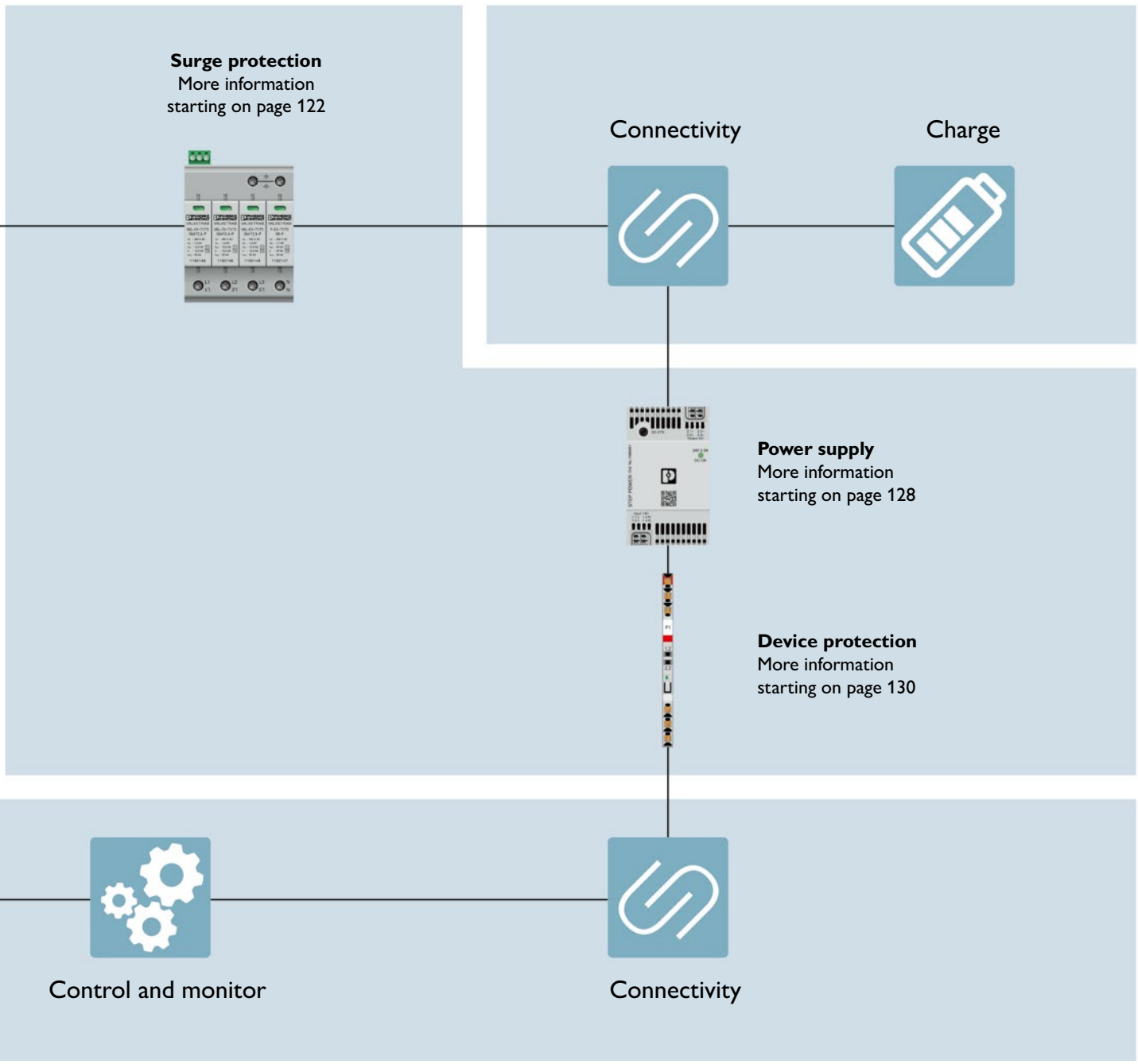
The components that are to be supplied and protected are located in the functional areas “Charge”, “Control and monitor”, and “Network and communicate”.

It is not just about providing power to charge the vehicles, it’s also about providing the electronic components with a stable 12 V or 24 V supply and protecting them from damage due to surge voltages, short circuits, and other sources of error.

In addition, the grid connection of the charging park or the building should be protected against overload – with the help of higher-level load management.

All these measures serve to ensure economical 24/7 operation of your charging stations and home chargers. Phoenix Contact provides you with comprehensive product solutions for this.




Surge protection
More information
starting on page 122
Connectivity
Charge
Power supply
More information
starting on page 128
Device protection
More information
starting on page 130
Control and monitor
Connectivity

The functional area “Connectivity”

How do I efficiently connect all the components of my charging station?

In order for the other functional areas to work, energy and data must flow. Connection technology is required for this, and it must meet a range of different requirements.

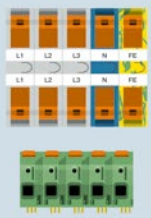
This technology is implemented based on various framework conditions. For example, the required charging power influences the cross-sections of the connecting cables. The communication link is sometimes wireless and sometimes wired.

Service and maintenance play an important role in commercial charging points. Maintenance connections make the service technician’s work easier by facilitating fast data connection and the supply of external devices such as notebooks.

Overall, Phoenix Contact offers a comprehensive range of connection technology to reliably and efficiently connect power and data to the charging station.

Power reliability

Feed-in



Power connection
More information
starting on page 140 and 148

Plug-in power connection
More information
starting on page 146

Cable entry
More information
starting on page 156

Connection of the power electronics

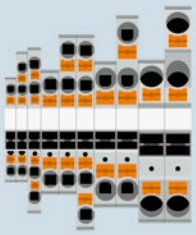
Power connection
More information
starting on page 150

Control and monitor

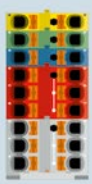
Connection of the battery modules

Power connection
More information
starting on page 158

Distribution



Marshalling
More information
starting on page 140



Potential distribution
More information
starting on page 142

Network and communicate

Data connection

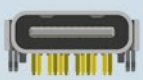
Data cable connection
More information
starting on page 154

Data cable
More information
starting on page 152

Cable entry
More information
starting on page 156

Connection of external devices for maintenance

Socket
More information
starting on page 144



USB port
More information
starting on page 144

Charge

Vehicle connection and charging

AC infrastructure charging socket
More information
starting on page 78

AC charging cable
More information
starting on page 68

Vehicle charging inlet
More information
starting on page 36

Charging infrastructure

Robust AC charging cables for charging stations, home chargers, and electric cars

The Mode 3 charging cables CHARX connect are suitable for AC charging of electric vehicles of all manufacturers. They achieve charging powers of up to 22 kW and are available with type 1 and type 2 connectors as well as GB/T standard.

In addition to cables for permanent installation on charging stations or home chargers, we also provide mobile charging cables that can be stored in the electric vehicle.

Comfortable handling

The ergonomic design of the gripping zone ensures easy and comfortable handling of the charging connector.

Clever sealing concept

The longitudinal water tightness protects the live parts inside the housing.

Silver-plated contacts

The silver-plated power and signal contacts ensure efficient power transmission, optimum corrosion protection, and a long service life.

CHARX connect

E-Mobility empowered by Phoenix Contact

Your custom logo

For consistent branding of your charging stations, we can also manufacture the charging connectors with your brand logo on request.

Triple award-winning design

The charging connectors CHARX connect comfort have won three design awards for their design and ergonomics.

For all regions and applications

Our complete portfolio covers the globally established charging standards type 1, type 2, and GB/T.

Robust cable in accordance with DIN EN 50620

Our charging cables are VDE-certified and specially designed for e-mobility applications in terms of insulation thickness, material flexibility, and other properties.

Which charging cable is right for my application?

Comparison of our product families		
		
Product family	**CHARX connect eco**	**CHARX connect comfort**
Design and comfort		
Triple award-winning design and ergonomics	✕	✓
Rubberized gripping zone for more comfortable handling	✕	✓
Protective cap on the infrastructure charging plug	✕	✓
Protective cap on the vehicle charging connector	✓	✓
Dimensions [1]	70 x 82 x 202 mm	70 x 137 x 216 mm
Variety and individuality		
Available charging standards	Type 2	Type 1, type 2, GB/T
Available charging cable colors	Black (others available on request)	Black, gray, yellow, red (others available on request)
Available charging connector colors	Black (others available on request)	Black, black-gray (others available on request)
Charging connector with custom logo	On request	On request
Minimum order quantity (depending on the item)	Approx. 500	1-100
Quality and safety		
Developed and produced in accordance with IATF 16949	✓	✓
VDE-certified cable in accordance with DIN EN 50620	✓	✓
Silver-plated power and signal contacts	✓	✓
Longitudinal water tightness	✓	✓

[1] Example comparison of the dimensions of the type 2 vehicle charging connector, excluding charging cable.

Stationary and mobile charging cables – customizable to your needs

Stationary charging cables – for permanent installation on home chargers

Our charging cables with a free cable end are ideal for mounting on AC home chargers for private use, e.g., in a carport or garage. These charging cables only have a charging connector on the vehicle side. This makes handling much easier for electric car drivers, as the charging cable only needs to be connected to the vehicle charging inlet – unlike home chargers with a charging socket, where the cable must additionally be connected to the home charger.

Mobile charging cables – to keep in the electric car

Most public charging stations are equipped with a charging socket instead of a permanently attached charging cable, as this is less susceptible to vandalism and requires less frequent maintenance.

To connect and charge a vehicle here, our mobile mode 3 charging cables are the ideal solution. They feature both a vehicle charging connector and an infrastructure charging plug.

AC charging cable and bag with customer logo

For consistent branding, we can also manufacture our AC charging connectors with your logo on request. You can choose to have your logo imprinted or use a UV- and weather-resistant plastic label.

Complete your unique branding by prominently displaying your logo on our black transport bags with handle for the mobile AC charging cable.

Charging connectors and cables to suit your requirements

For the charging cable, you can choose between various lengths and cross-sections, metric or AWG cables, and spiraled or straight cables.

If your preferred combination is not available as a standard item, then we can also manufacture a customer-specific item for you. We can also supply the cable end with a step cut, assembled, or compacted upon request.

AC charging cables CHARX connect eco

Reduced to the essentials – economical, price-conscious, and safe

Our AC charging cables CHARX connect eco feature extremely compact dimensions, a reduced use of materials, and a lighter weight. As a result, they not only conserve resources, but are also easy to handle and available at an attractive price.

With CHARX connect eco you still get Phoenix Contact's usual high standard of quality combined with a solid feel. The type 2 charging cable is provided as a mobile version to be kept in the electric car as well as with a free cable end for permanent installation on the charging station or home charger. It is available in the usual four performance classes from 3.7 kW to 22 kW.

The mode 3 charging cables CHARX connect eco meet the high quality and process requirements of automobile manufacturers in accordance with IATF 16949. Safe outdoor use is also ensured by a sealing concept that reliably protects the charging connector and cable against water ingress in accordance with IP67.

Upon request, the charging connector is available with your logo, matching the vehicle or charging station branding.

Experience it now in augmented reality (AR)!

Scan the QR code with your smartphone or tablet and virtually place the type 2 charging cable CHARX connect eco in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

AC charging cables CHARX connect comfort

Comfortable handling

The sophisticated design of CHARX connect comfort features a contemporary style and is also functionally well-developed.

The ergonomic shape of the gripping zone ensures easy handling and a comfortable feel.

Safe and robust in use

The clever sealing concept of CHARX connect comfort completely protects the live parts inside the housing from moisture.

High-quality materials ensure the necessary robustness. Therefore, there is nothing preventing constant outdoor use.

Three awards for design and form

The AC charging cables CHARX connect comfort have already won three prestigious design awards: the German Design Award, the iF Design Award, and the Good Design Award.

During product development, together with graduate designer Stephan Gahlow from Hamburg, the focus was on an ergonomic and attractive design, a modern and aesthetic use of form, and robust and high-quality materials. With these product characteristics, the charging cables made a lasting impression on the independent juries of international experts.

Experience it now in augmented reality (AR)!

Scan the QR code with your smartphone or tablet and virtually place the type 1 charging cable CHARX connect comfort in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

Our product portfolio for your charging stations, home chargers, and electric vehicles

Type 1

					
Product family		**CHARX connect comfort**			
Version		Stationary [1]			
Charging connector color		Gray-black		Black	
Cable type		Straight	Spiraled	Straight	Spiraled
Cable	**Charging power**				
Metric	5.0 kW 1-phase (20 A / 250 V)	1628013	1627345	1060405 [3]	On request
	8.0 kW 1-phase (32 A / 250 V)	1628096	1627344	1628126 [3]	On request
Metric (PSE)	7.5 kW 1-phase (30 A / 250 V)	On request	On request	1033865	On request
AWG	5.0 kW 1-phase (20 A / 250 V)	1049523 [3]	-	On request	-
	10.0 kW 1-phase (40 A / 250 V)	1488686	-	On request	-
	12.0 kW 1-phase (50 A / 250 V)	On request	-	1488548 [4] [5]	-
	20.0 kW 1-ph. (80 A / 250 V), without temperature sensor technology	On request	-	1277169 [5]	-
	20.0 kW 1-phase (80 A / 250 V), with temperature sensor technology	On request	-	1277166 [5]	-

Type 2

					
Product family		**CHARX connect comfort**			
Version		Stationary [1]			
Charging connector color		Gray-black		Black	
Cable type		Straight	Spiraled	Straight	Spiraled
Cable	**Charging power**				
Metric	5.0 kW 1-phase (20 A / 250 V)	1627354	1627126	1056696	1056548
	8.0 kW 1-phase (32 A / 250 V)	1518887	1627127	1097298	1056575
	16.6 kW 3-phase (20 A / 480 V)	1518883	1627128	1056697	1097295
	26.6 kW 3-phase (32 A / 480 V)	1518897	1627130	1056700	1056698

All AC charging cables shown with black straight 5 m cable or black spiraled 4 m cable and without locking option via U-lock, unless otherwise specified. Item versions are also available on our website or on request:

- With other cable colors and lengths
- With and without protective caps for vehicle charging connector and infrastructure charging plug
- With and without locking option via U-lock (for type 1 only)

Adapter cable

					
Product family		**CHARX connect comfort**			
Version		Mobile [2]			
Charging connector color		Gray-black			
Charging standard		From type 2 (infrastructure) to type 1 (vehicle)		From type 2 (infrastructure) to GB/T (vehicle)	
Cable type		Straight	Spiraled	Straight	Spiraled
Cable type	**Charging power**				
Metric	5 kW 1-phase (20 A / 250 V)	1628027	1628025	On request	On request
	8 kW 1-phase (32 A / 250 V)	1628028	1628026	On request	On request
	16.6 kW 3-phase (20 A / 480 V)	-	-	On request	On request
	26.6 kW 3-phase (32 A / 480 V)	-	-	On request	On request

					
CHARX connect comfort				**CHARX connect eco**	
Mobile [2]				Stationary [1]	Mobile [2]
Gray-black		Black		Black	
Straight	Spiraled	Straight	Spiraled	Straight	
1627982	1627131	1097301	On request	1285683	1285694
1627801	1627133	1097306	On request	1285691	1285688
1628348	1627135	1097299	On request	1285641	1285624
1627692	1627136	1628125	On request	1285633	1285622

[1] Stationary charging cable, consisting of vehicle charging connector with free cable end, for permanent installation on the charging station.
[2] Mobile charging cable, consisting of vehicle charging connector and infrastructure charging plug, to be kept in the electric vehicle.
[3] With locking option via U-lock.
[4] Without protective cap for vehicle charging connector.
[5] Cable length: 25 ft (7.62 m).

Our product portfolio for your charging stations, home chargers, and electric vehicles

GB/T			
			
Product family		**CHARX connect comfort**	**CHARX connect eco**
Version		Stationary [1]	
Charging connector color		Gray-black	
Cable type		Straight	
Cable	**Charging power**		
Metric	4.0 kW 1-phase (16 A / 250 V)	1627599	1206455 [2]
	8.0 kW 1-phase (32 A / 250 V)	1627601	1206446 [2]
	12.2 kW 3-phase (16 A / 440 V)	1627600	1206453 [2]
	24.4 kW 3-phase (32 A / 440 V)	1627602	1206444 [2]

All AC charging cables shown with black straight 5 m cable or black spiraled 4 m cable and without locking option via U-lock, unless otherwise specified. Item versions are also available on our website or on request:
- With other cable colors and lengths
- With and without protective caps for vehicle charging connector and infrastructure charging plug
- With and without locking option via U-lock (for type 1 only)

[1] Stationary charging cable, consisting of vehicle charging connector with free cable end, for permanent installation on the charging station.
[2] Currently only available in China.

Holder for vehicle charging connectors

		
Type 1	**Type 2**	**GB/T**
1624139	1624148	1624142

Transport bag

		
With CHARX logo	**Without logo**	**With customer logo**
1371733	1371732	On request

35 labels for identification in accordance with DIN EN 17186

		
Type 1	**Type 2**	
Vehicle charging connector “B”	Vehicle charging connector “C”	Infrastructure charging plug “C”
1309758	1309766	1315521

For the complete portfolio of **AC charging cables**, enter the web code on our website or scan the QR code.

Web code: #1021

Modular AC charging sockets for charging stations and home chargers

Our type 2 charging sockets CHARX connect modular are mounted in charging stations and home chargers and enable AC charging of electric vehicles via mobile AC charging cables with charging powers of up to 22 kW.

With the modular system, you can choose which components and functions you want to use for your home charger or charging station.

Plug-in connecting cables

You determine the maximum charging power based on the connecting cable you select. The plug-in cables also simplify installation and replacement of the charging socket in the event of maintenance.

Silver-plated contacts

The silver-plated power and signal contacts ensure efficient power transmission, optimum corrosion protection, and a long service life. They are fully molded and therefore waterproof and dirtproof.

Optional LED status indicator

Users of the charging station can see the availability and status at a glance with the colored LED display integrated in the protective cover.

CHARX connect

E-Mobility empowered by Phoenix Contact

Optional temperature sensor technology

The optional PTC sensor technology on the power contacts keeps the charging sockets safe from overheating.

Double award-winning design

Our AC charging sockets won the iF Design Award 2023 and the German Design Award Special 2023 for their modular concept and attractive design.

Optional shutter

It ensures safe touch protection in compliance with national standards. Operation is intuitive – inserting the charging plug opens the shutter.

Your custom logo

For consistent branding of your charging stations, we can also manufacture the protective cover with your brand logo on request.

AC charging sockets CHARX connect modular

Open and insert with just one hand

Whether they have a toddler in their arms or are carrying their shopping – in everyday charging situations, electric car drivers often only have one hand free to connect the charging cable to the charging station.

That is why we have designed our AC charging sockets for one-handed operation: The protective cover can be opened effortlessly with the charging plug, without needing to use your other hand.

A small feature that makes a big difference and is already appreciated by many of our customers.

Winner of two awards for design and modularity

Our AC charging sockets CHARX connect modular have won two design awards for their modular and attractive design.

The charging sockets were among the winners of the iF Design Award 2023, after the modular concept made a lasting impression on the independent jury of international experts.

The charging sockets also won the German Design Award 2023 in the “Special Mention” category. This prestigious award from the German Design Council recognizes remarkable achievements in design.

Our clever modular principle was a key factor in this win, as it also enables all components to be freely combined – tailored to the individual requirements of the customer’s application.

The modular system of the AC charging sockets – assembled in just 4 steps

With our AC charging sockets CHARX connect modular, we provide you with a clever modular system that allows you to freely combine all components in just four steps.

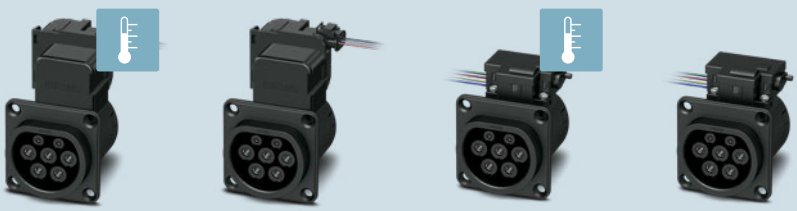
You can thus choose the design, scope of functions, and charging power of the charging socket to perfectly suit your charging station or home charger.

Charging sockets and protective covers are available as a set in the most common combinations, but are also available individually in other versions. An overview of the items can be found on page 84 onwards.

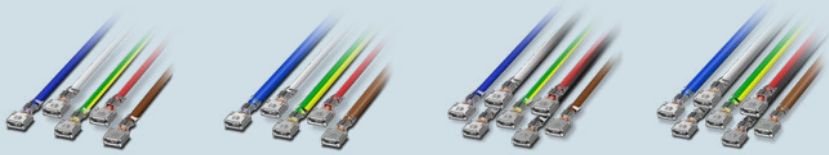
Step 1:
Select protective cover:
- Round or square design
- With or without LED indicator
- With Phoenix Contact logo, customer logo, or sticker field

Step 2:
Select optional shutter:
- Touch protection of all contacts in compliance with national standards
- Simple, intuitive operation without turning or pushing

Step 3:
Select charging socket:
- With 3- or 4-pos. locking actuator
- With or without PTC temperature sensor technology



Step 4:
Select connecting cable:
- 1- or 3-phase
- 20 A or 32 A charging current
- 0.3 m to 2 m cable length



5 kW
(1-phase, 20 A)

8 kW
(1-phase, 32 A)

16 kW
(3-phase, 20 A)

26 kW
(3-phase, 32 A)

AC charging sockets CHARX connect modular

LED status indicator for intuitive operation

Users of your charging station can see the availability and status at a glance with the optional colored LED display integrated in the protective cover.

The LEDs can be freely controlled by the charging controller via pulse width modulation (PWM). They can glow, flash, and pulsate in all RGB colors.

This allows you to configure an individual color value for each state of your charging point that matches your corporate design.

Example of LED color configuration:

Glowing green:
Charging point is free and ready for charging

Glowing orange:
Charging point is reserved for use

Pulsating blue: Charging process in progress
Glowing blue: Charging process completed

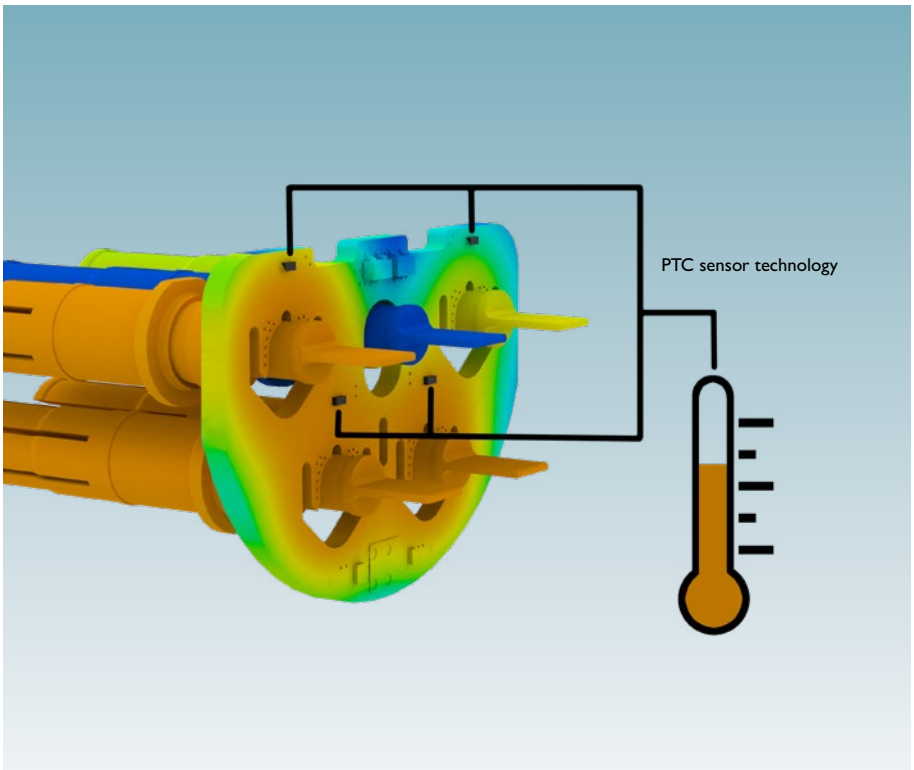
Flashing red:
Charging process interrupted due to a fault

Temperature sensor technology protects against overheating

With the optional PTC sensor technology, the temperature at the power contacts is constantly monitored so that the charging socket is safe from possible overheating, which can be caused by foreign objects or dirt, for example.

The sensor technology consists of a chain of PTC resistors, each of which is located at a power contact. By detecting the respective resistance values, the charging controller can initiate an immediate shutdown if the limit temperature is exceeded.

This protects users from danger and prevents expensive damage to the charging station.



Watch the product video on YouTube now!

Scan the QR code with your smartphone or tablet and find out more about the functions and features of the AC charging socket CHARX connect modular in the product video.

Experience it now in augmented reality (AR)!

Scan the QR code with your smartphone or tablet and virtually place the AC charging socket with shutter and LED protective cover in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

Our product portfolio for your charging stations and home chargers

Step 1: Select protective cover

						
Design	Square			Round		
LED status indicator	✕	✓ Common cathode	✓ Common anode	✕	✓ Common cathode	✓ Common anode
With imprinted Phoenix Contact logo	1164293	1164297	1549875	1347421	1347426	1388393
With imprinted customer logo	On request					
With sticker field for customer logo	1549751	-	-	1549871	-	-
With "C" identification in accordance with DIN EN 17186	1549869	-	-	1527521	-	-
Without logo, sticker field, or identification	1222326	1222335	1549889	1527539	1531953	1531959

Step 2: Select optional shutter

	
Shutter for touch protection in accordance with IEC 61851-1, IEC 62196-1, and IEC 62196-2	1200676

Step 3: Select charging socket

				
Locking actuator	12 V, 3-pos.		12 V, 4-pos.	
Temperature sensor technology	✕	✓	✕	✓
Item no.	1164309	1164307	1164300	1164299

Step 4: Select connecting cable

					
Charging power		5 kW 1-phase (20 A / 250 V)	8 kW 1-phase (32 A / 250 V)	16 kW 3-phase (20 A / 480 V)	26 kW 3-phase (32 A / 480 V)
Cable length	**0.3 m**	On request	1164343	1164355	1164362
	0.7 m		1164344	1164361	1164365
	1.0 m		On request	On request	1335117
	1.5 m		1322610		1300177
	2.0 m		On request		1359740

Sets consisting of charging socket and protective cover

						
Design of the protective cover	Square					
Locking actuator	12 V, 3-pos.			12 V, 4-pos.		
LED status indicator (common cathode)	×	✓		×	✓	
Temperature sensor technology	×	×	✓	×	×	✓
With imprinted Phoenix Contact logo	1164420	1268358	1164422	1164417	1268355	1164423

						
Design of the protective cover	Round					
Locking actuator	12 V, 3-pos.			12 V, 4-pos.		
LED status indicator (common cathode)	×	✓		×	✓	
Temperature sensor technology	×	×	✓	×	×	✓
With imprinted Phoenix Contact logo	1532118	1532112	1532123	1532126	1532128	1532125

Accessories and replacement parts

					
35 labels for "C" identification in accordance with DIN EN 17186	**Locking actuator (replacement part)**			**Protective cap for touch protection and strain relief (replacement part)**	**Tool for removing the protective cap**
	12 V, 3-pos.	**12 V, 4-pos.**	**24 V, 4-pos.**		
1315521	1300179	1296166	1622317	1202424	1286836

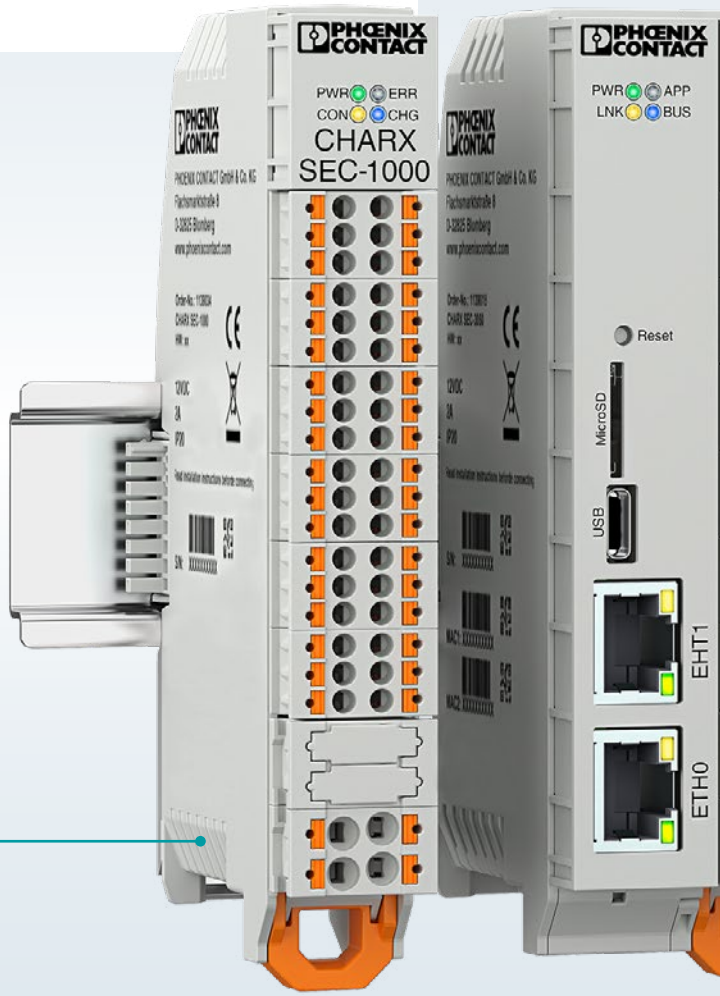
For the complete portfolio of **AC charging sockets**, enter the web code on our website or scan the QR code.

Web code: #2100

Modular AC charging controllers for charging stations and home chargers

The AC charging controllers CHARX control modular are the centerpiece of an intelligent and sustainable charging infrastructure for mode 3 charging of electric cars.

With the open Linux platform, they are ready for IoT applications, smart services, and sector coupling. The scalable portfolio covers all charging applications – from home chargers to parking garages.



All functions in extremely compact housing

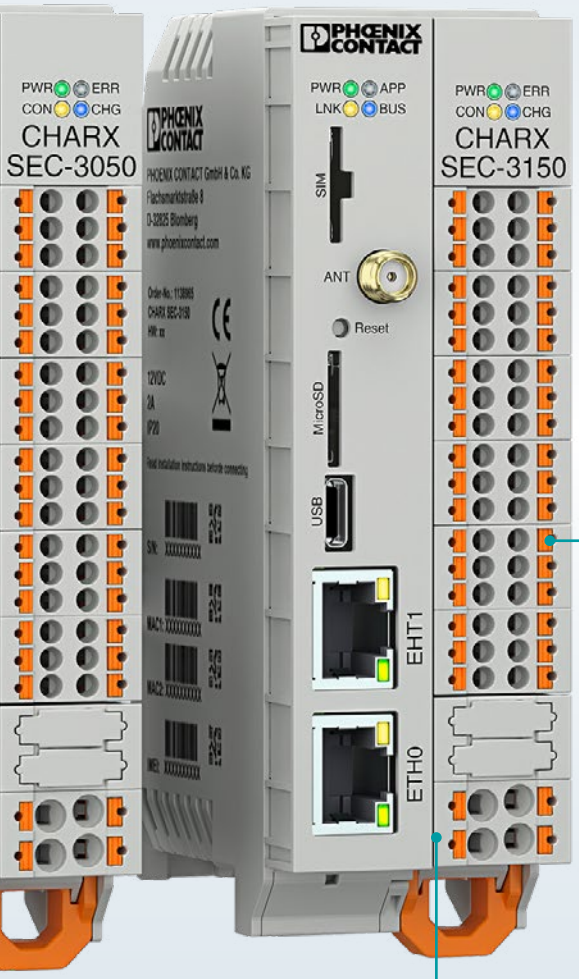
Full range of functions with a compact design taking up just 18.8 or 37.6 mm

CHARX control

E-Mobility empowered by Phoenix Contact

Intelligent and communicative

Secure communication through support for all common protocols and interfaces



Flexibly scalable and extendable

Alignable control modules for the precisely tailored realization of all applications, from private home chargers to public parking garages

Quick installation and startup

Tool-free installation with plug-in Push-in front connections, easy startup with plug-and-play, and convenient configuration via web-based management

Open Linux platform

Implementation of customer-specific software

AC charging controllers CHARX control modular

The controller for smart charging infrastructure – ready for IoT, smart services, and sector coupling

Coupling various sectors and stakeholders, such as power grids, buildings, local generators, charging stations, and electric vehicles, is becoming ever more important for the future of e-mobility.

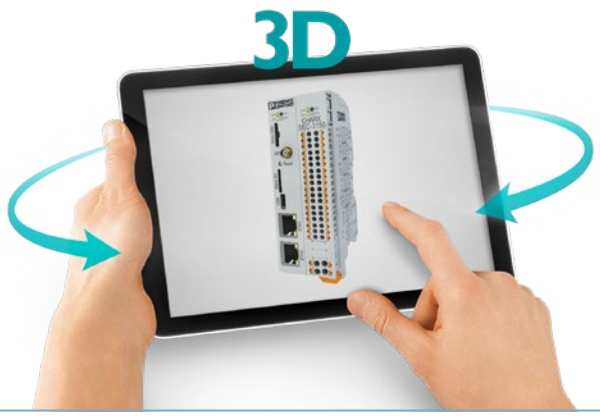
Communication is therefore the key to sustainable and integrated e-mobility based on renewable energies. This includes, for example, the integration of electric vehicles into the smart grid or smart home, efficient and user-friendly business processes, and device and patch management for charging park operators.

All these services require secure communication based on various protocols. With the new generation of controllers CHARX control modular, the open Linux platform, and Phoenix Contact's application expertise, you are ideally prepared for these challenges.

Experience it now in augmented reality (AR)!

Scan the QR code with your smartphone or tablet and virtually place the intelligent class 3000 AC charging controller in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

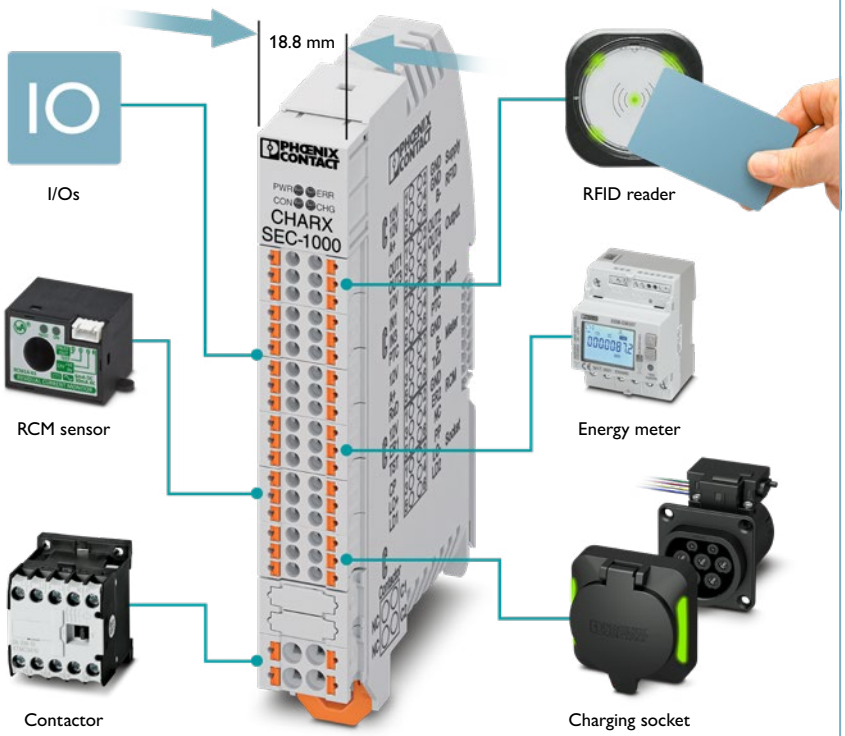


The compact 1000 class

With a housing width of just 18.8 mm, the class 1000 controller provides you with all the necessary interfaces and functions for a standard-compliant charging process:

- Charging socket or charging cable
- Contactor
- RFID identification
- Energy measurement
- Residual current monitoring
- Charging connector release in the event of mains failure
- Freely configurable I/Os, for example, for LED control

The class 1000 controller can therefore be used without difficulty as a stand-alone controller for single charging points. Or you can mount it next to a class 3000 controller to extend this with up to 12 charging points.

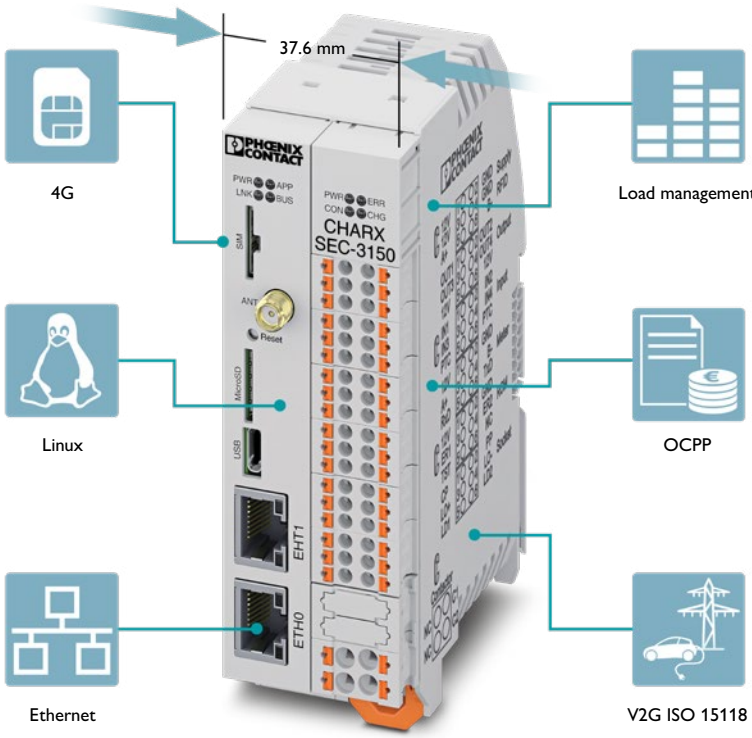


The intelligent 3000 class

With an overall width of just 37.6 mm, the 3000 class provides you with a smart controller with all functions and full connectivity:

- Ethernet and 4G cellular communication
- Dynamic charging and load management
- Backend integration via Open Charge Point Protocol (OCPP)
- Vehicle-to-grid communication in accordance with ISO 15118
- Open Linux platform for customer applications

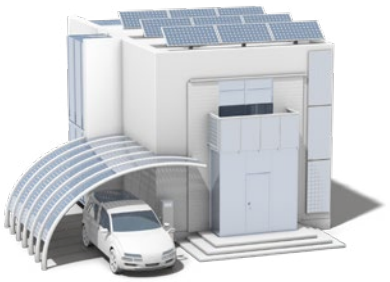
Manage up to 48 charging points with a class 3000 controller. Higher-level systems for billing and building management can be seamlessly connected via Modbus/TCP or MQTT.

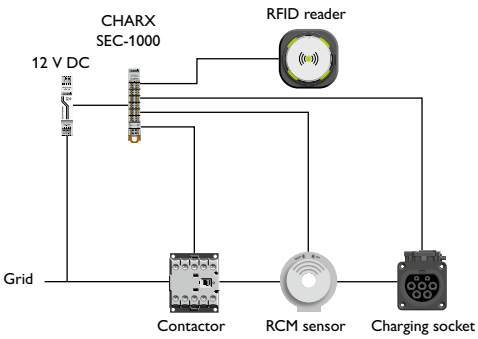


AC charging controllers CHARX control modular

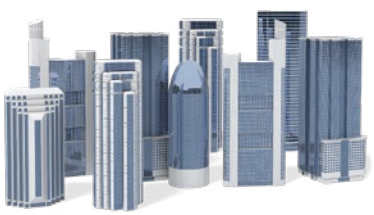
Scalable for every charging application – from home chargers to parking garages

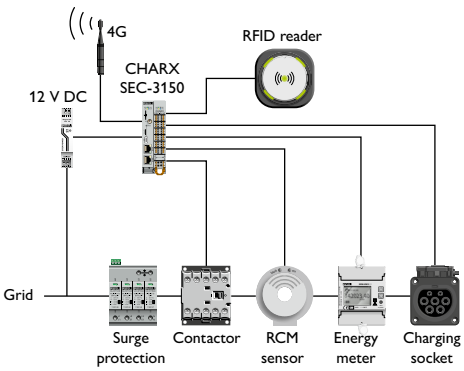
Take a look at how versatile using CHARX control modular for various applications can be and how the system can be tailored precisely to your requirements.



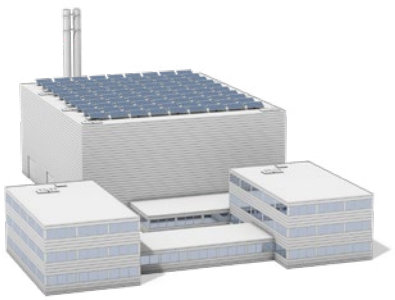


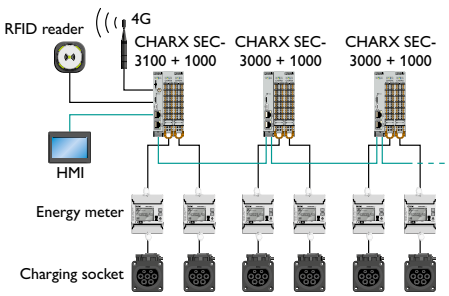
Carport: Single home charger without communication link
The class 1000 controller already has all the necessary functions for single charging points, such as residual current detection or charging connector release in the event of a power failure. Access rights can be granted by adding users to an RFID allowlist.



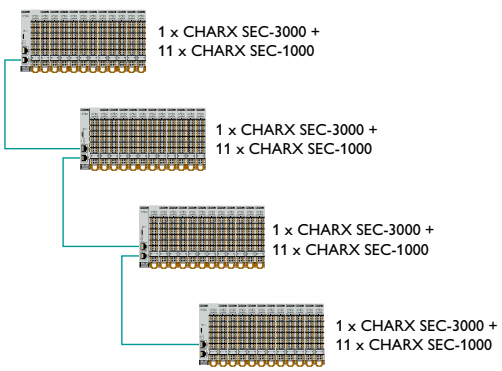


Smart city: Single charging point with wireless backend connection
The class 3100 controller enables the wireless connection of charging points to billing systems via the integrated 4G modem and the OCPP protocol. Due to the compact design, charging stations can be integrated into streetlamps, for example.





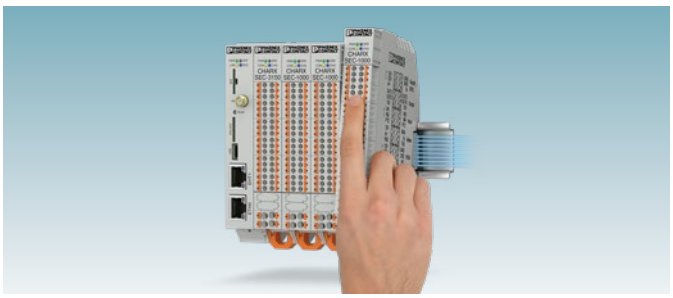
Company: Three double charging points with backend connection and terminal
A double charging station consisting of a class 3100 controller and a class 1000 controller manages two lower-level double charging points, each comprising a class 3000 controller and a class 1000 controller. The touch terminal and backend system are connected via the class 3100 controller.



Parking garage: 48 charging points with central control cabinet and backend connection
One class 3000 controller and 11 class 1000 controllers are connected via DIN rail connector to form a cluster of 12 charging points. The class 3000 controller is used to manage three additional clusters of the same structure, meaning a total of 48 charging points.

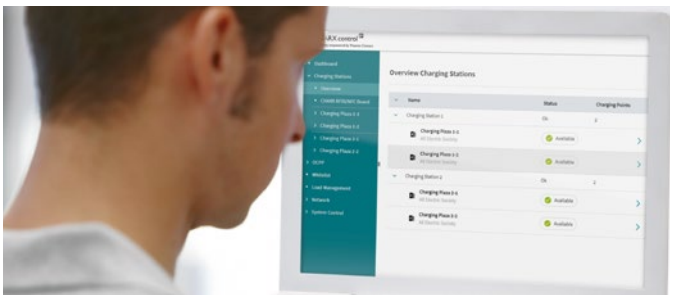
Easy handling – from installation through to maintenance

When developing CHARX control modular, we focused on maximum user friendliness and intuitive handling. The modular system architecture provides you with a high degree of flexibility in realizing your application. Our developers have also designed the modules so that any maintenance work can be performed easily and efficiently.

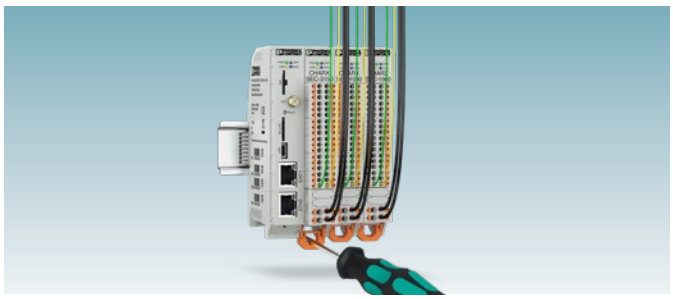


Snapped on modules are automatically detected in the network
Simply snap the required modules onto the DIN rail one after the other. The modules are supplied with power via the DIN rail connector and automatically detected in the local network. This reduces wiring effort considerably.

Fast and tool-free wiring of the modules with Push-in connection
The Push-in connection technology allows you to wire the control modules quickly, easily, and tool-free.



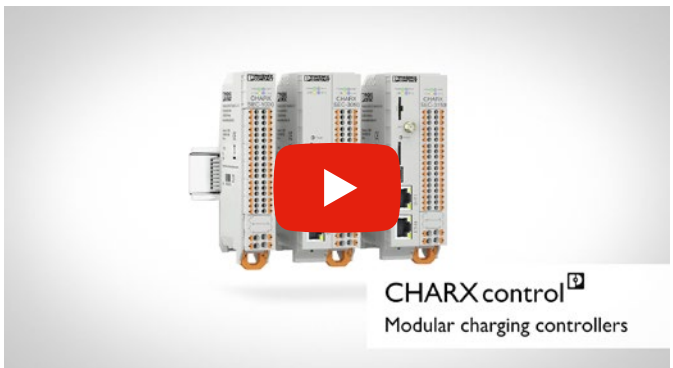
Easy and intuitive configuration in web-based management
You can configure all settings intuitively in web-based management. Here, you can copy over the configuration of a charging point to other charging points with just a few clicks.



Fast module replacement in the event of maintenance with lock-and-release technology
For maintenance purposes, the plug-in front connections with lock-and-release technology allow modules to be replaced quickly and without any rewiring work.

Watch the product video on YouTube now!

Scan the QR code with your smartphone or tablet and find out more about the functions and features of the AC charging controllers CHARX control modular in the product video.



AC charging controllers CHARX control modular

Bill charging processes in accordance with measurement and calibration law

With the AC charging controllers CHARX control modular, problem-free billing that is compliant with calibration laws is now possible. A coordinated, pre-certified package makes it easy for you to achieve compliance for your AC charging stations quickly and cost-effectively.

Our pre-certified package for your AC charging solution includes all the necessary hardware and software components, such as a built-in display, a signing energy meter, the controller software, and complete documentation with test reports.

With our AC charging controllers, we enable flexible topologies with up to 12 charging points and design freedom through the visualization of all calibration-related data on our built-in display in real time. Furthermore, our tamper-proof software reduces the sealing effort involved at the charging station.

Ready for vehicle-to-grid

With our charging controllers CHARX control modular, electric car batteries can be charged intelligently. Moreover, they are also able to return electricity to the grid whenever necessary. In this way, vehicle fleets become profitable energy storage facilities by using electric cars as electricity buffers.

The technology behind this is called vehicle-to-grid. The technical requirements and underlying conditions are described in ISO 15118. CHARX control modular already meets this standard, and is therefore ready for vehicle-to-grid.

Our product portfolio for your charging stations and home chargers

AC charging controllers						
						
Class		**Class 1000**	**Class 3000**			
Width		18.8 mm	37.6 mm	37.6 mm	37.6 mm	37.6 mm
Purpose	**Stand-alone or client**	✓	✓	✓	✓	✓
	Server	✕	✓	✓	✓	✓
Linux, Ethernet, backend connection, load management		✕	✓	✓	✓	✓
4G/2G cellular communication		✕	✕	✕	✓	✓
ISO 15118 communication		✕	✕	✓	✕	✓
Item no.		1139034	1139022	1139018	1139012	1138965

Accessories							
							
4.3" touch display for charging compliant with calibration laws	**AC energy meter for charging compliant with calibration laws [1)]**	**Cellular antenna with 5 m connecting cable and SMA circular connector**	**RFID reader in IP65 housing**	**RFID reader as PCB**	**RFID reader as PCB, with LED status indicator and buzzer**	**Residual current monitoring module**	**0.4 m connecting cable for residual current monitoring module**
1426836	1429603	2702273	1309687	1309772	1391227	1309697	1360462

[1)] Details of this energy meter and other versions can be found on page 134 onwards.

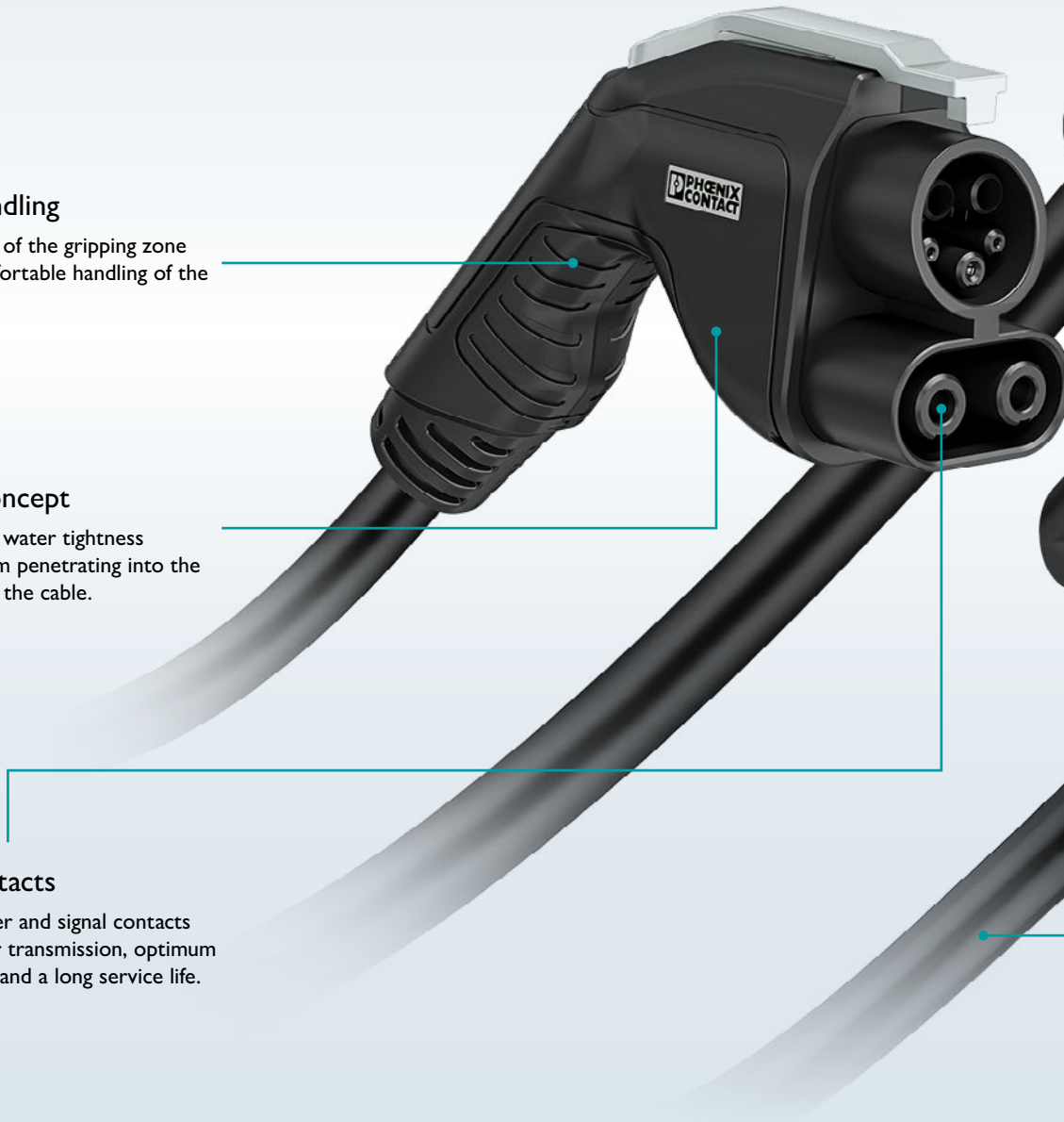
For the complete portfolio of **AC charging controllers**, enter the web code on our website or scan the QR code.

Web code: #0501

Powerful DC charging cables for fast charging stations and home chargers

The DC charging cables CHARX connect are used for fast DC charging of electric vehicles. In addition to type 1 and type 2 CCS charging cables, we also provide the GB/T standard for China.

Our portfolio is divided into different performance classes and thus offers the right charging cable for every application – from DC home chargers to public HPC charging parks.



Comfortable handling

The ergonomic design of the gripping zone ensures easy and comfortable handling of the charging connector.

Clever sealing concept

Complete longitudinal water tightness prevents moisture from penetrating into the charging connector or the cable.

Silver-plated contacts

The silver-plated power and signal contacts ensure efficient power transmission, optimum corrosion protection, and a long service life.

CHARX connect

E-Mobility empowered by Phoenix Contact

Your custom logo

For consistent branding of your charging stations, we can also manufacture the charging connectors with your brand logo on request.

For all regions and applications

Our portfolio covers the globally established charging standards CCS type 1, CCS type 2, and GB/T, as well as all performance classes – from DC home chargers to HPC charging parks.

Integrated temperature sensor technology

With fast and accurate temperature sensors at every power contact, the charging cables are safe from overheating.

Robust cable in accordance with DIN EN 50620

Our charging cables are VDE-certified and specially designed for e-mobility applications in terms of insulation thickness, material flexibility, and other properties.

Which charging cable is right for my application?

Comparison of our product families			
			
Product family	**CHARX connect compact**	**CHARX connect standard**	**CHARX connect professional**
Charging power (continuous)	40 … 80 kW	150 … 250 kW	375 … 500 kW
Charging power (Boost Mode) [1]	-	500 kW	600 … 700 kW
Area of application	Lower charging powers in the private and semi-public sector	Medium charging powers in the semi-public and public sectors	High Power Charging in the public sector
Typical application examples	Private carports, company, restaurant, and retail parking lots, public parking garages	Company, restaurant, and retail parking lots, public parking lots, and service stations	HPC fast charging parks, service stations, and rest areas on freeways and expressways
Charging standards	CCS type 1, CCS type 2	CCS type 1, CCS type 2, GB/T	CCS type 1, CCS type 2, GB/T
Replaceable mating face frame	✕	✓	✓
Replaceable power contacts	✕	✕	✓
Extended analysis data via CAN bus	✕	✕	✓[2]
Liquid cooling	✕	✕	✓[2]
Optional panel feed-through	✕	✕	✓[2]

[1] Boost Mode allows a higher charging power for a short period. The possible time span depends on numerous ambient conditions. Details can be found on the right and in the packing slip for the respective item, which you can download from our website.

[2] These features are only available with the 500 kW versions of CHARX connect professional.

Higher charging powers for a short period in Boost Mode

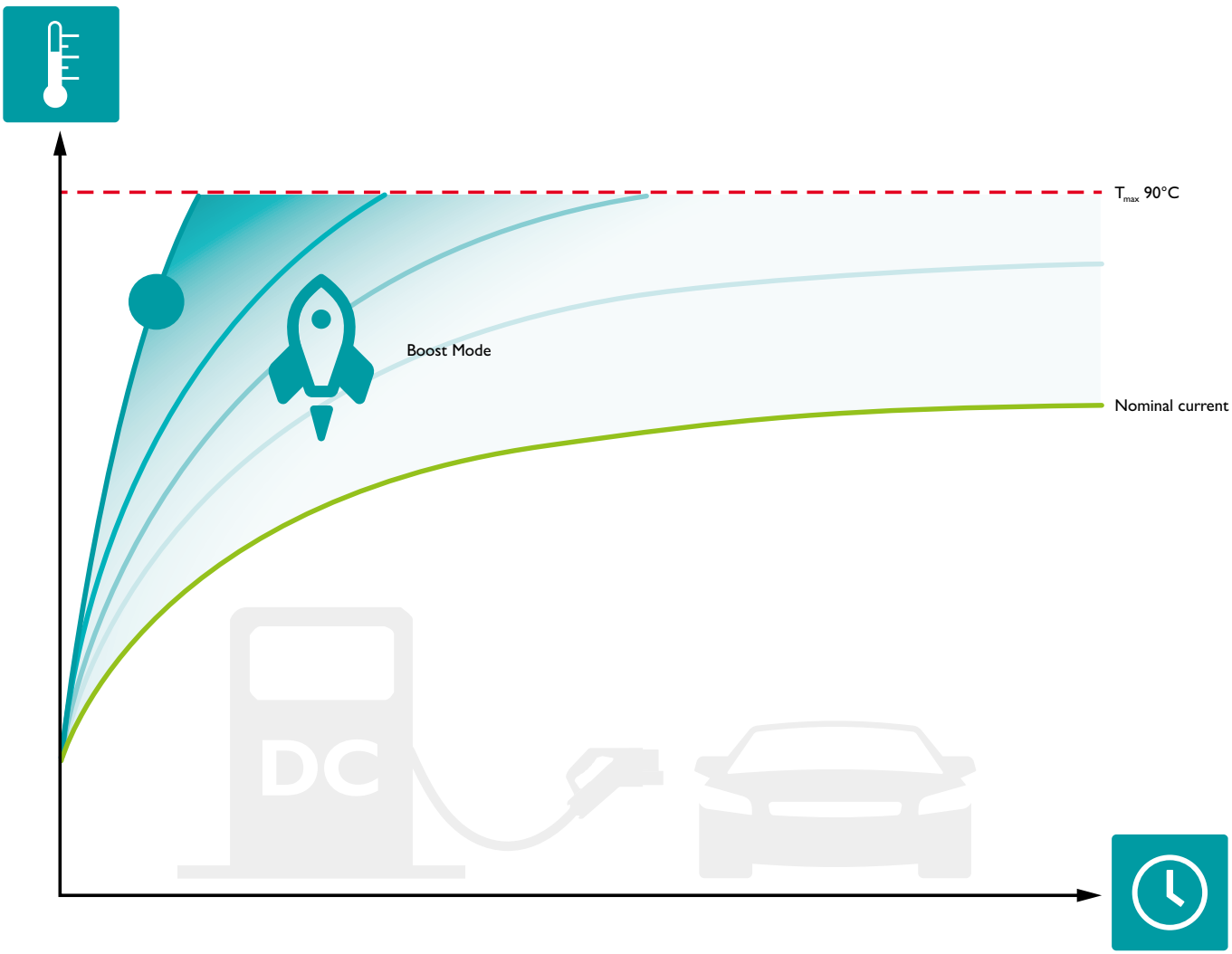
As a manufacturer, we design our DC charging cables for continuous operation at a nominal current as defined by us and at an ambient temperature of -30°C to +40°C.

In Boost Mode, some DC charging cables can carry significantly higher charging powers for a short period. For this purpose, we specify a maximum current I_{max} in the packing slip for the respective items.

The possible duration for operating a charging cable in Boost Mode depends on numerous ambient conditions, such as how frequently the charging point is used and the design of the vehicle charging inlet. Also, charging cables can operate at a higher ambient temperature for a shorter period of time.

For manufacturers and operators of charging stations that make use of Boost Mode, it is imperative that the temperatures at the DC power contacts are continuously monitored using the integrated temperature sensor technology.

The charging process must be shut down when a limit temperature of +90°C is reached. If the system approaches the limit temperature, it is recommended that the charging current is reduced early, e.g., to the nominal current. In this case, we are talking about derating.



DC charging cables CHARX connect

Waterproof and robust housing for safe outdoor use

The clever sealing concept of our DC charging cables ensures complete longitudinal water tightness, which reliably prevents moisture from penetrating into the charging connector or the cable. This maximizes electrical safety for the user while increasing the failsafe performance of your charging infrastructure. High-quality materials also ensure the necessary robustness and long service life of our charging connectors – even in constant outdoor use under harsh conditions.

The innovative two-chamber sealing system marks the next stage in the development of our sealing systems: By physically separating the DC+ and DC- power contacts, short circuits can be completely ruled out.

Billing compliant with calibration laws through four-conductor measurement technology

For the reliable billing of charging processes compliant with calibration laws, our DC charging cables and connectors are prepared for four-conductor measurement technology.

This makes it possible to record the power dissipation in the charging cable in order to determine the exact amount of power transmitted to the electric vehicle.

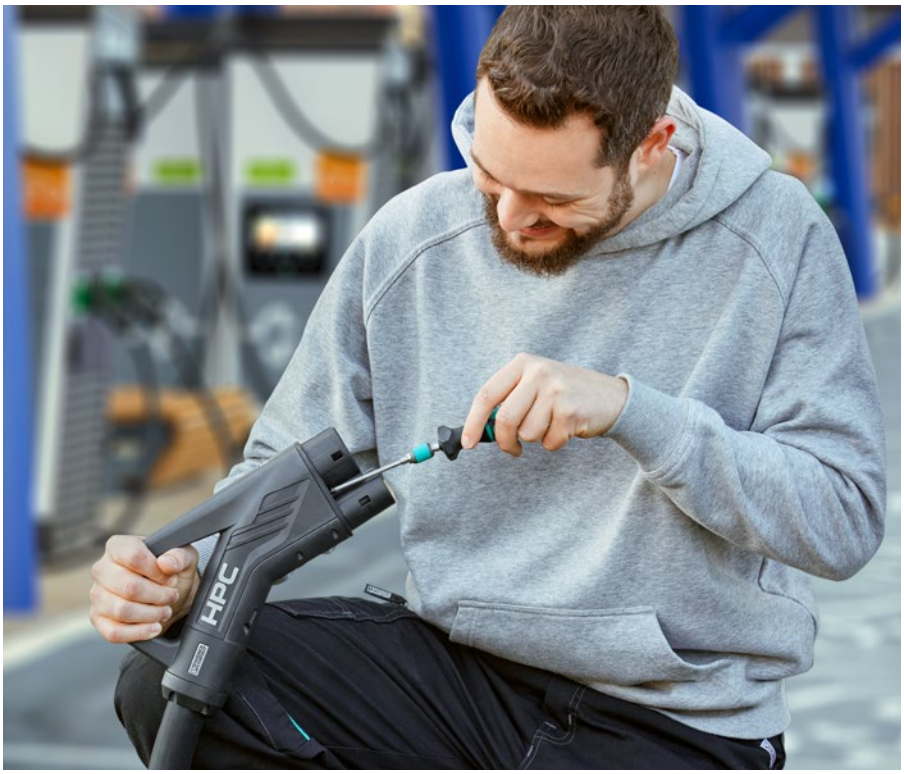
DC charging cables CHARX connect

Repair kits for easy and inexpensive maintenance

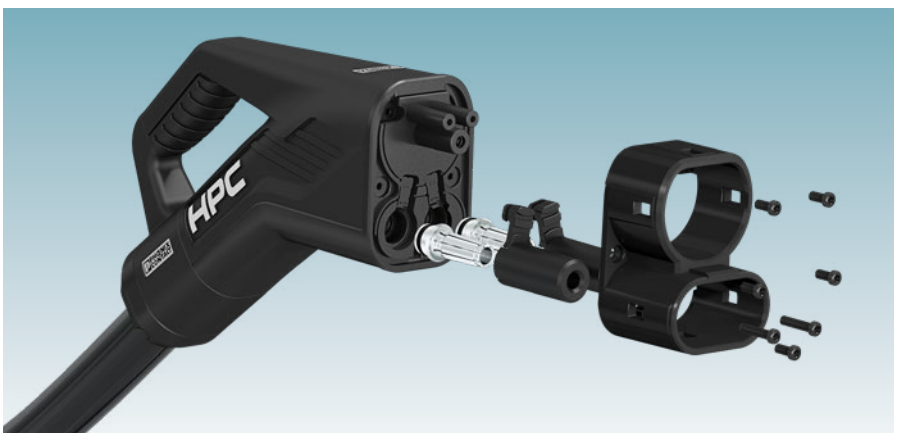
Despite being made of very robust materials, charging connectors at semi-public or public charging stations require regular maintenance, also as a result of improper handling. The damage usually occurs on the mating face.

Our repair kits, which are available separately, enable you to quickly and easily replace mating face frames and power contacts on the charging connector during maintenance work. This makes our DC charging cables particularly easy to maintain, saves time and costs, and increases the availability of your charging infrastructure.

This eliminates the need for time-consuming and costly replacement of the complete charging cable. This type of maintenance is not only more economical, but also more sustainable.



CHARX connect standard:
Replaceable mating face frame



CHARX connect professional:
Replaceable mating face frame and power contacts
(Similar to image)

DC charging cables CHARX connect professional

Cooled HPC charging cables for fast charging with 500 kW on a continuous basis

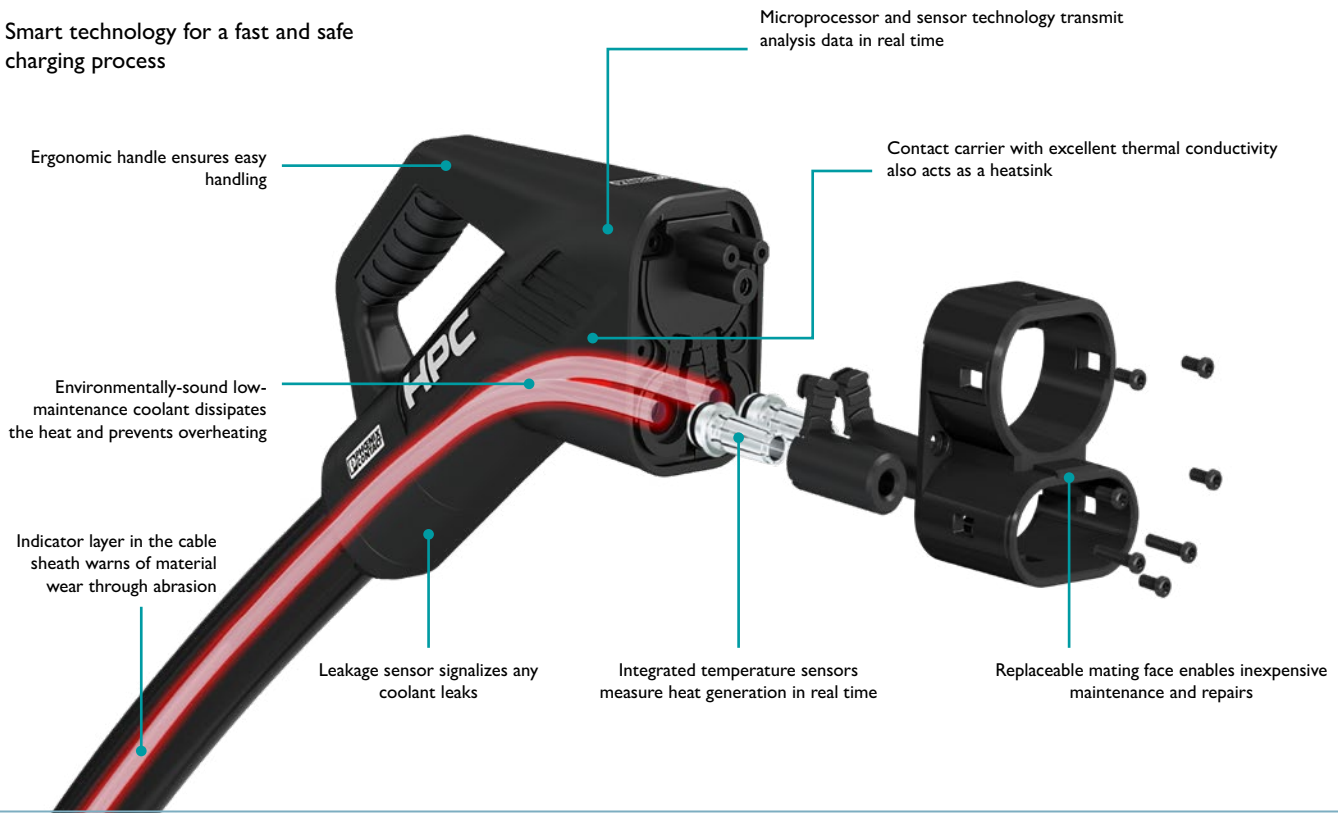
The CCS charging cables CHARX connect professional with our proprietary High Power Charging (HPC) Technology are used in public fast charging stations and fast charging parks. With HPC, long charging times are a thing of the past, because electric car batteries can be charged for a range of 100 kilometers in just three to five minutes.

Our intelligent HPC technology is based on active liquid cooling that enables constant charging powers of up to 500 kW – without compromising safety or manageability. In Boost Mode, charging powers of up to 700 kW are even possible for short periods.

We are thus revolutionizing fast charging technology and setting a milestone for the future of e-mobility, because HPC provides a practical solution for charging electric cars.

The cooled HPC charging connector in detail

Smart technology for a fast and safe charging process

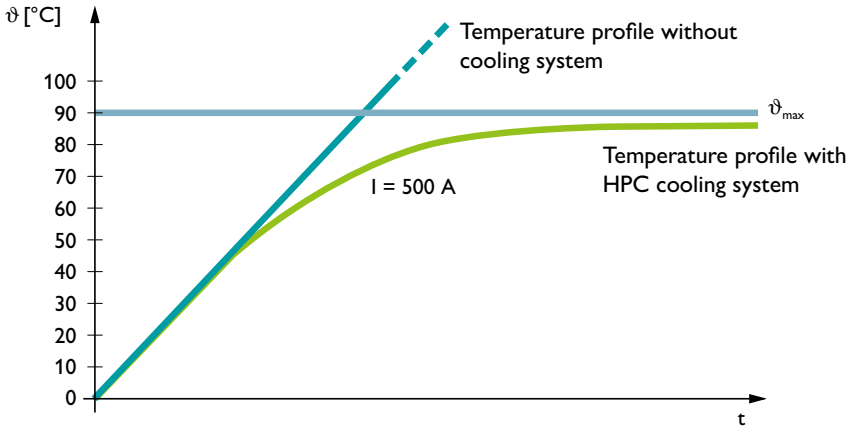


DC charging cables CHARX connect professional

How does liquid cooling work? And what do the standards require?

To determine the rated current, the charging connector and cable may be a maximum of 50 K warmer than the ambient air (ΔT_{max} = 50 K) in accordance with the VDE-AR-E 2623-5-3 directive and standard IEC TS 62196-3-1. Thus, a maximum temperature of +90°C is permitted at the power contacts during the charging process.

To ensure this, a total of five temperature sensors in the HPC charging connector measure heat generation in real time. A controller evaluates the data acquired and regulates the cooling output accordingly. The environmentally-sound coolant efficiently dissipates the heat via integrated cooling ducts. This prevents overheating safely and in compliance with standards.



Watch the product video on YouTube now!

Scan the QR code with your smartphone or tablet and find out more about the functions and features of the HPC charging cables CHARX connect professional in the product video.

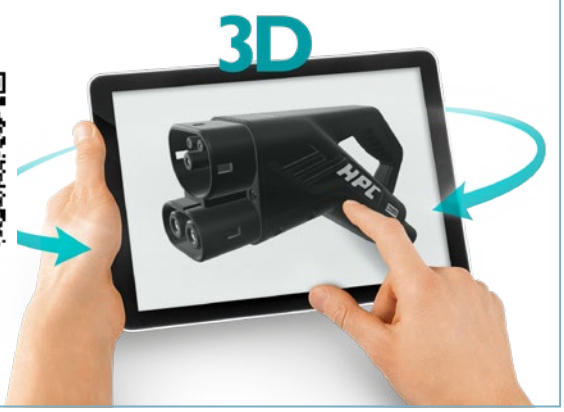
Experience it now in augmented reality (AR)!

Scan one of the QR codes with your smartphone or tablet and virtually place the HPC charging cables in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

Type 1 DC charging cables

Type 2 DC charging cables



DC charging cables CHARX connect professional

Quick and easy installation with the optional panel feed-through

During the development of the cooled HPC charging connector, the focus was not only on high charging power but also on making installation as easy as possible.

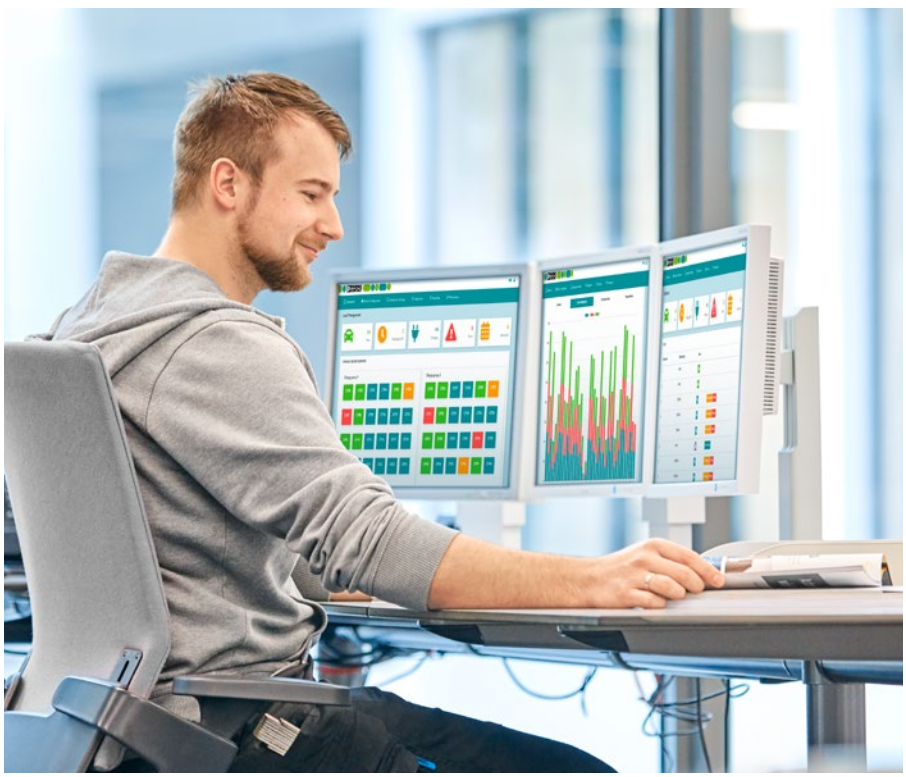
Therefore, our HPC charging cables are optionally available with a panel feed-through, which enables a quick, safe, and convenient installation of the charging cable at the charging station. It contains defined interfaces for power transmission, communication, and the cooling circuit.

The panel feed-through is available in the following versions:
- Straight
- Angled, for installation on the right
- Angled, for installation on the left

Real-time transmission of status and analysis data via CAN bus interface

There is even more intelligent technology installed inside the HPC charging connector: The integrated sensor technology provides information on the overall status of the High Power Charging connector, its usage and wear, and further analysis data.

All of this information is stored in the charging connector and transmitted to the operator in real time for greater transparency.



DC charging cables CHARX connect professional

Uncooled HPC charging cables for fast charging with 375 kW on a continuous basis

The HPC charging cables CHARX connect professional are also available without liquid cooling. Instead, they use an increased conductor cross-section of 4 x 55 mm². They can thus transmit 375 kW continuously and safely at temperatures up to 40°C – and even up to 500 kW for short periods in Boost Mode.

The uncooled charging cables also come with smart features and unlimited safety: For billing compliant with calibration laws, they are prepared for four-conductor measurement technology. The innovative two-chamber sealing system ensures that the DC+ and DC- power contacts are physically separated, and thus reliably prevents potential short circuits.

HPC-capable vehicle charging inlets

With DC conductor cross-sections of up to 120 mm², our vehicle charging inlets CHARX connect universal enable High Power Charging (HPC) on the vehicle side with up to 500 kW. The precise temperature sensor technology of the PT 1000 sensors at the DC power contacts and the PTC chain in the AC area protect the vehicle from overheating and ensure a safe charging process.

Our universal CCS charging inlets were originally developed for well-known manufacturers in the automotive industry. Today, they are used wherever HPC fast charging plays a crucial role – from cars and motorcycles to non-road vehicles in mining, construction, logistics, goods and passenger transport, agriculture and forestry, other special and purpose-built vehicles, and in marine sector.

More information starting on page 36

DC charging cables CHARX connect compact

The ideal solution for charging powers up to 80 kW

With their sophisticated design and compact dimensions, the CCS charging connectors are consistently designed for modern DC home chargers in garages and carports as well as for small DC charging stations in the public and commercial sector. The charging cables are available for the established charging standards CCS type 1 and CCS type 2, making them suitable for use almost anywhere in the world.

The charging connector design won the Good Design Award. It features a contemporary style and is also functionally well-developed. The ergonomic shape of the gripping zone ensures easy handling and a comfortable feel.

The compact CCS charging connector in detail

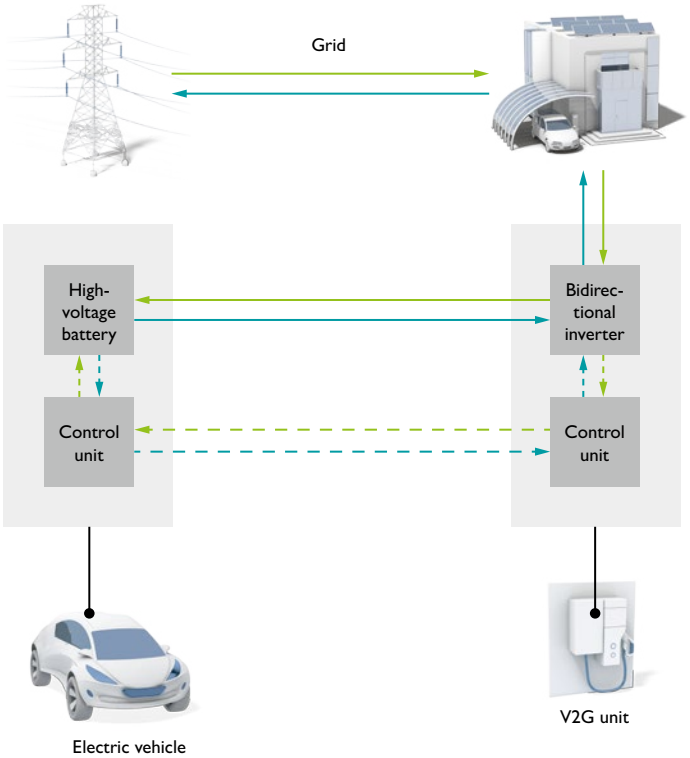
Perfectly tailored to DC home chargers and smaller DC charging stations

DC charging cables CHARX connect compact

Suitable for vehicle-to-grid and vehicle-to-home

Due to bidirectional converter technology, the DC home chargers of the near future will be able to perform vehicle-to-grid and vehicle-to-home power feed-in. Here, the electricity can flow under control from the vehicle battery via the charging station into the power grid or the user's own home.

For these V2G and V2H applications, our compact CCS charging cables are the ideal solution.



Watch the product video on YouTube now!

Scan the QR code with your smartphone or tablet and find out from our product manager in the video what makes our DC charging cables CHARX connect compact so special.

Experience it now in augmented reality (AR)!

Scan the QR code with your smartphone or tablet and virtually place the compact DC charging cable in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

Our product portfolio for your charging stations and home chargers

Type 1 CCS

			
Product family	**CHARX connect compact**		**CHARX connect standard**
Charging power (continuous)	40 kW (40 A / 1000 V)	80 kW (80 A / 1000 V)	200 kW (200 A / 1000 V)
Charging power (Boost Mode) [1)]	×	×	500 kW (500 A / 1000 V)
Replaceable mating face frame	×	×	✓
Replaceable power contacts	×	×	✓
Liquid cooling	×	×	×
Panel feed-through	×	×	×
Item no.	1105880	1105881	1051695

Type 2 CCS

					
Product family	**CHARX connect compact**		**CHARX connect standard**		
Charging power (continuous)	40 kW (40 A / 1000 V)	80 kW (80 A / 1000 V)	150 kW (150 A / 1000 V)	200 kW (200 A / 1000 V)	250 kW (250 A / 1000 V)
Charging power (Boost Mode) [1)]	×	×	×	500 kW (500 A / 1000 V)	500 kW (500 A / 1000 V)
Replaceable mating face frame	×	×	✓	✓	✓
Replaceable power contacts	×	×	×	×	×
Four-conductor measurement technology	×	×	×	×	×
Two-chamber sealing system	×	×	×	×	×
Liquid cooling	×	×	×	×	×
Panel feed-through	×	×	×	×	×
Item no.	1106637	1106633	1095767	1095775	1107339

			
CHARX connect professional			
500 kW (500 A / 1000 V)			
700 kW (700 A / 1000 V)			
✓			
✓			
✓			
×	✓ (straight)	✓ (angled to the right)	✓ (angled to the left)
1085658	1085641	1089931	1085642

				
CHARX connect professional				
375 kW (375 A / 1000 V)	500 kW (500 A / 1000 V)			
500 kW (500 A / 1000 V)	700 kW (700 A / 1000 V)			
✓	✓			
✓	✓			
✓	✓			
✓	×			
×	✓			
×	×	✓ (straight)	✓ (angled to the right)	✓ (angled to the left)
1396518	1085638	1085631	1089665	1085637

Our product portfolio for your charging stations and home chargers

GB/T DC			
			
Product family	**CHARX connect standard**		**CHARX connect professional**
Charging power (continuous)	125 kW (125 A / 1000 V)	250 kW (250 A / 1000 V)	500 kW (500 A / 1000 V)
Charging power (Boost Mode) [1]	×	500 kW (500 A / 1000 V)	600 kW (600 A / 1000 V)
Replaceable mating face frame	×	×	×
Replaceable power contacts	×	×	×
Liquid cooling	×	×	✓
Panel feed-through	×	×	✓
Item no.	1449525 [2]	1449523 [2)]	1459630 [2)]

All DC charging cables shown with 5 m cable. Item versions with other cable lengths are also available on our website or on request.

[1)] Boost Mode allows a higher charging power for a short period. The possible time span depends on numerous ambient conditions. Details can be found in the packing slip for the respective item, which you can download from our website.

[2)] This item is currently only available in China.

Accessories

						
Cooling unit for liquid-cooled HPC charging cables	**Quick coupling for connecting the coolant lines**	**Cable handle for HPC charging cables**	**35 labels for identification in accordance with DIN EN 17186**	**Holder for vehicle charging connectors**		
				Type 1 CCS	**Type 2 CCS**	**GB/T DC**
1237881	1346562	1091431	1309761 (“K”)	1624143	1624153	1623770 (without button)
			1309765 (“L”)			1623497 (with button)

Repair kits

					
Product family	**Type 1 CCS**		**Type 2 CCS**		
	CHARX connect standard	**CHARX connect professional**	**CHARX connect standard**	**CHARX connect professional 375 kW**	**CHARX connect professional 500 kW**
Mating face frame	-	1085800	1081734	-	1085797
Mating face frame, bit	-	1085801	1085796	-	1085798
Power contacts	1288247	1295744	-	-	1295577
Power contacts, bit	1288250	1295723	-	-	1295670
Mating face frame, power contacts	1288248	1281251	-	1582262	1281249
Mating face frame, power contacts, bit	1158266	1085802	-	1582285	1085799

For the complete portfolio of **DC charging cables**, enter the web code on our website or scan the QR code.

Web code: #2099

DC charging controllers for fast charging stations

The freely programmable DC charging controllers CHARX control professional and CHARX control integrated provide the intelligence for modern charging stations for mode 4 fast charging in accordance with IEC 61851-23.

They communicate with the electric vehicle, monitor the charging process, control parameters such as the charging current, and handle additional tasks as an option.

The all-rounder in 19-inch format

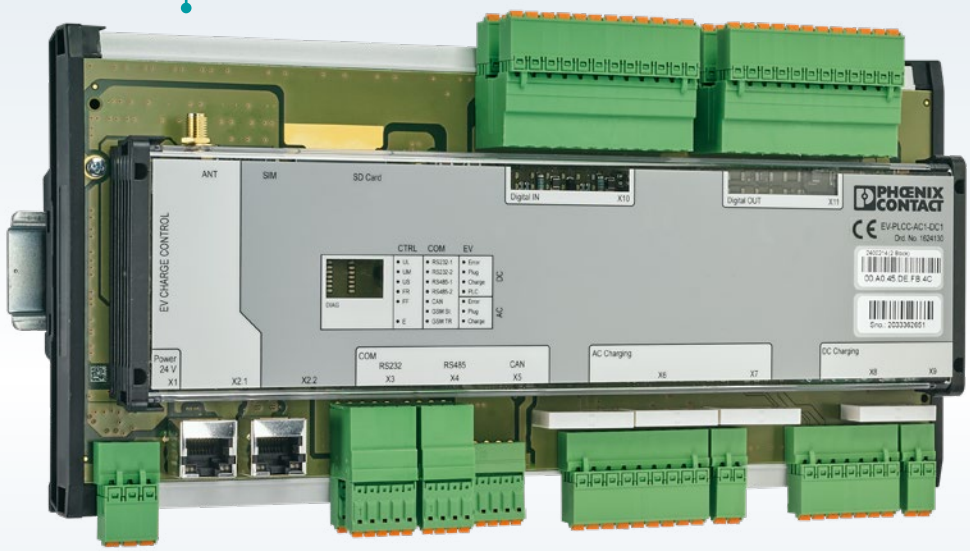
CHARX control integrated combines all control and monitoring functions for DC charging in one space-saving device. The 19" standard and fast-connection technologies simplify installation and maintenance.

CHARX control

E-Mobility empowered by Phoenix Contact

The classic solution for DIN rails

CHARX control professional is the DC charging controller for classic mounting in DIN-rail-based charging stations. This enables you to benefit from customized design-in and flexible wiring with other components.



Flexible to use and communicative

Both control solutions are freely programmable in accordance with IEC 61131, giving you the ability to fully customize the software and user interface of your charging station. Comprehensive interfaces allow you to easily connect all peripheral devices.

DC charging controller CHARX control integrated

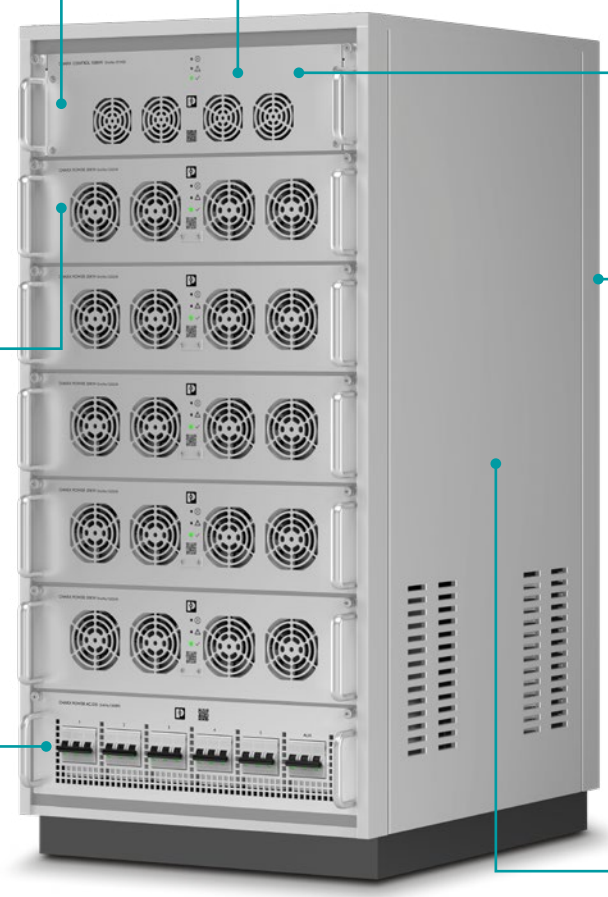
The modular 19" system in detail – for quick rack mounting of your DC charging station

The system in a standard 19" format consists of several coordinated modules for distributing, converting, and controlling the charging current: The new distribution module, CHARX power distribute, the new control module, CHARX control integrated, and the power modules CHARX power basic, can be combined to suit any charging situation.

Compared to classic assembly with DIN rail components, the modular design with the CHARX system in 19" standard dimensions significantly reduces the complexity of a DC charging station. It also enables the quick installation and replacement of modules.

Power control module controls and monitors
CHARX control integrated combines all functions for controlling and monitoring your 19" charging station and manages up to five 30 kW power modules for fast DC charging up to 150 kW.

Comprehensive interfaces
CCS, CAN bus, OCPP, TCP/IP, and RS-485 communication interfaces as well as I/Os for connecting charging cables, touch panels, RFID readers, status LEDs, and power electronics.



Freely programmable in accordance with IEC 61131
CHARX power integrated can be freely programmed, giving you the ability to fully customize the software and user interface of your charging station.

Fast-connection technology
Push-in fast connection and T-LOX knee-lever connection enable fast installation and maintenance.

Highly efficient power modules
Compact fast-charging modules CHARX power basic for direct installation in your DC charging station convert AC mains power into DC power and can be interconnected in accordance with power requirements.

Distribution module
CHARX power distribute supplies up to five power modules and also the control module with AC mains voltage. Protective functions ensure maximum safety.

Space-saving, efficient design
Ideal for urban locations: takes up less space for the same charging power and also involves less wiring effort than comparable systems.

DC charging controller CHARX control integrated

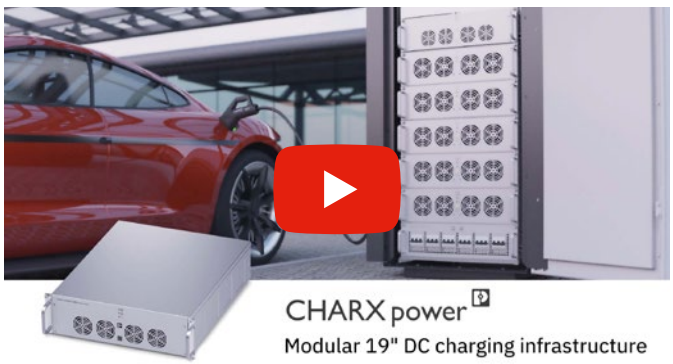
Design modular DC charging infrastructure – 19" racks for fast charging

Carbon-neutral charging is only made possible by coupling the different sectors. The coordinated power electronics enable efficient conversion, distribution, and storage.

This allows electric vehicles to be charged intelligently and quickly. Our solution enables you to implement a simple, economical, and full-coverage fast charging infrastructure.

Watch the product video on YouTube now!

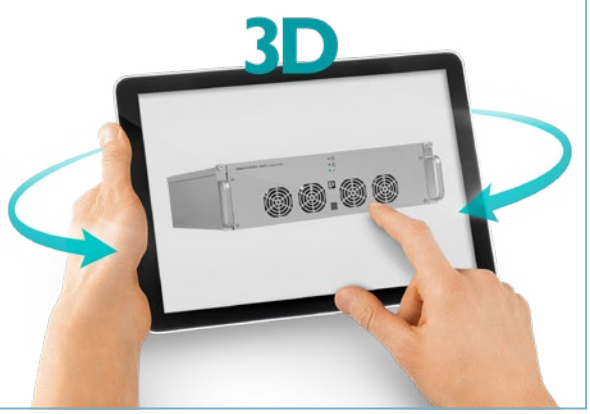
Scan the QR code with your smartphone or tablet and find out more about the design of a modular DC charging station in 19" format in the product video.



Experience it now in augmented reality (AR)!

Scan one of the QR codes with your smartphone or tablet and virtually place the DC charging controller in 19" format in the room, for example, on your desk.

View the product in the greatest detail and from every angle.



DC charging controller CHARX control professional

The DC charging controller for DIN rails in detail

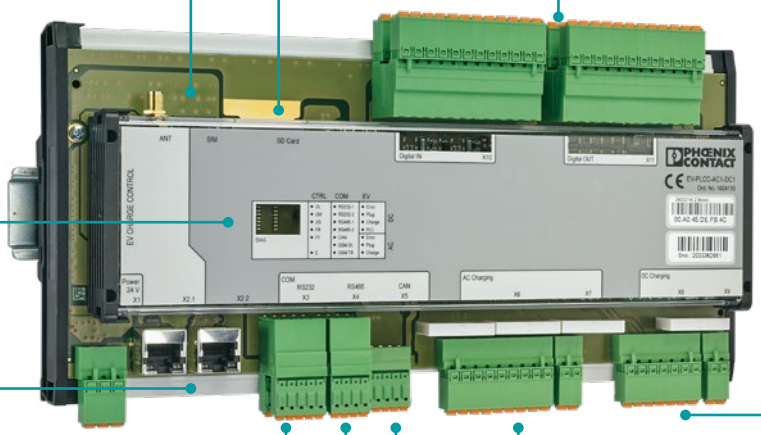
CHARX control professional is the all-rounder with versatile interfaces

Integrated cellular interface
To connect the charging controller via OCPP (Open Charge Point Protocol) to a backend system for user management, billing, and remote diagnostics

SD card slot
For SD card (available separately): includes user license for ready-made PC Worx programming blocks, stores logged charging processes, and is used to transfer controller configurations

Digital I/Os
The 16 digital inputs and 16 digital outputs allow additional customer-specific components to be connected, e.g., for control of the DC contactors, evaluation of the insulation monitor, monitoring of the door locking mechanism, activation of charging status LEDs, etc.

Status LEDs
For intuitive acquisition of the charging controller status, the data traffic of the communication interfaces, and for error diagnostics



Two Ethernet interfaces
For connection to a touch panel, programming via PC Worx, or integration into a charging and load management system

CCS charging interface
For standard-compliant fast charging: exchange of required charging parameters as per DIN SPEC 70121 with the vehicle via CCS charging interface in accordance with IEC 61851-23

AC charging interface
For standard-compliant AC charging: exchange of required charging parameters with the vehicle via AC charging interface in accordance with IEC 61851-1

Energy meter connection
Measure energy consumption and bill charging processes accurately: Connect AC and DC energy meters via RS-232 and RS-485 serial interfaces

RFID reader connection
Connection via RS-232 or RS-485 for user authorization with a backend system or using the local RFID allowlist

Control of the power electronics
Transmission of all necessary charging parameters via CAN bus interface and ready-made PC Worx function blocks for CHARX power

Wide range of possible applications – freely programmable in accordance with IEC 61131

CHARX control professional and CHARX control integrated can be freely programmed for your specific charging application in accordance with IEC 61131. This makes it a versatile charging controller for a wide range of possible applications, giving you the ability to fully customize the software and user interface of your charging station.

You can reduce the engineering work required with the ready-made PC Worx function blocks for vehicle communication in accordance with DIN SPEC 70121.

Our product portfolio for your charging stations

DC charging controllers

		
Product family	**CHARX control integrated**	**CHARX control professional**
Application and mounting type	For slide-in and fast connection in a 19" rack charging station – all necessary components for DC charging are already integrated	For classic mounting in a DIN-rail-based charging station – enables customized design-in and flexible wiring with other components
Integrated functions	Charging controller, cellular modem, insulation monitoring, power contactors, fuse, 24 V power supply	Charging controller, cellular modem
Integrated interfaces	IEC 61851-23 and DIN SPEC 70121 (CCS charging), OCPP, TCP/IP, RS-485, CAN bus, I/Os, SIM card, emergency switching off, 230 V for fan	IEC 61851-23 and DIN SPEC 70121 (CCS charging), IEC 61851-1 (AC charging), CHAdeMO, OCPP, TCP/IP, RS-232, RS-485, CAN bus, I/Os, SIM card, SD card
Supported charging points	1 x DC	1 x DC, 1 x AC
Supported DC charging power	150 kW	Unlimited
Freely programmable in accordance with IEC 61131	✓	✓
Dimensions (W x H x D)	483 mm x 134 mm x 550 mm (3 rack units in 19" standard)	285 mm x 158 mm x 70 mm
Item no.	1311433	1624130

Accessories

		
DC energy meter for charging compliant with calibration laws [1]	**Cellular antenna with 5 m connecting cable and SMA circular connector**	**SD card with user license for ready-made PC Worx programming blocks** [2]
1269236	2702273	1624092

[1] Details of this energy meter and other versions can be found on page 134 onwards.
[2] Replaceable SD card for CHARX control professional.

For the complete portfolio of **DC charging controllers**, enter the web code on our website or scan the QR code.

Web code: #1024

DC power electronics and distribution for fast charging stations

Our highly efficient power electronics CHARX power basic and the convenient distribution module CHARX power distribute facilitate the cost-effective operation of your DC charging infrastructure for the fast charging of electric cars.

Our modular and scalable solution supports DC charging with high voltages and currents all the way to High Power Charging (HPC).

Efficient power modules

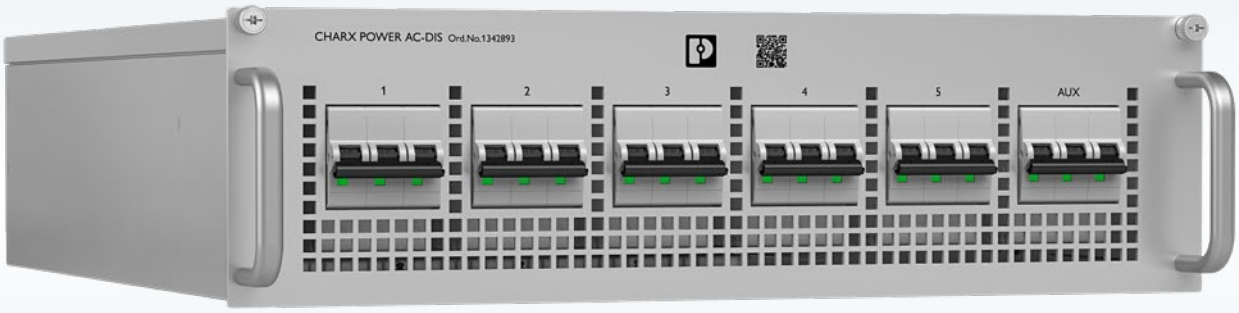
CHARX power basic provides a stable power supply over a wide voltage range with constant power. The 30 kW fast charging modules are available as AC/DC and DC/DC converters and enable the integration of solar panels in charging parks.

CHARX power

E-Mobility empowered by Phoenix Contact

Convenient distribution module

CHARX power distribute distributes AC mains voltage to up to five power modules. Downstream modules are protected by the integrated surge protection and miniature circuit breakers.



19" standard dimensions

The standardized 19" format enables the quick installation and replacement of modules. Compared to classic assembly with DIN rail components, the modular design significantly reduces the complexity of your DC charging station.

DC power electronics CHARX power

DC charging infrastructure with 19" racks

The modular CHARX system for 19" rack mounting offers a solution for the quick and economical setup of full-coverage fast charging infrastructure. The system in a standard 19" format consists of several coordinated modules for distributing, converting, and controlling the charging current, which can be combined to suit any charging situation:

- DC power modules CHARX power basic
- AC distribution module CHARX power distribute
- Control module CHARX control integrated

Compared to classic assembly with DIN rail components, the modular design with the CHARX system significantly reduces the complexity of a DC charging station. All processes are significantly accelerated and optimized for the charging station manufacturer.

More information starting on page 112

Fast installation and maintenance

The fast-connection technologies from Phoenix Contact and the established 19" standard dimensions enable the quick installation and replacement of modules:

Both the Push-in fast connection and the modern T-LOX knee-lever connection developed by Phoenix Contact allow for simple and direct conductor connection using stripped or ferruled conductor ends.

Both technologies enable connection without using additional tools. They are designed for the reliable transmission of data, signals, and power.

T-LOX Technology

Designed by Phoenix Contact

DC power electronics CHARX power

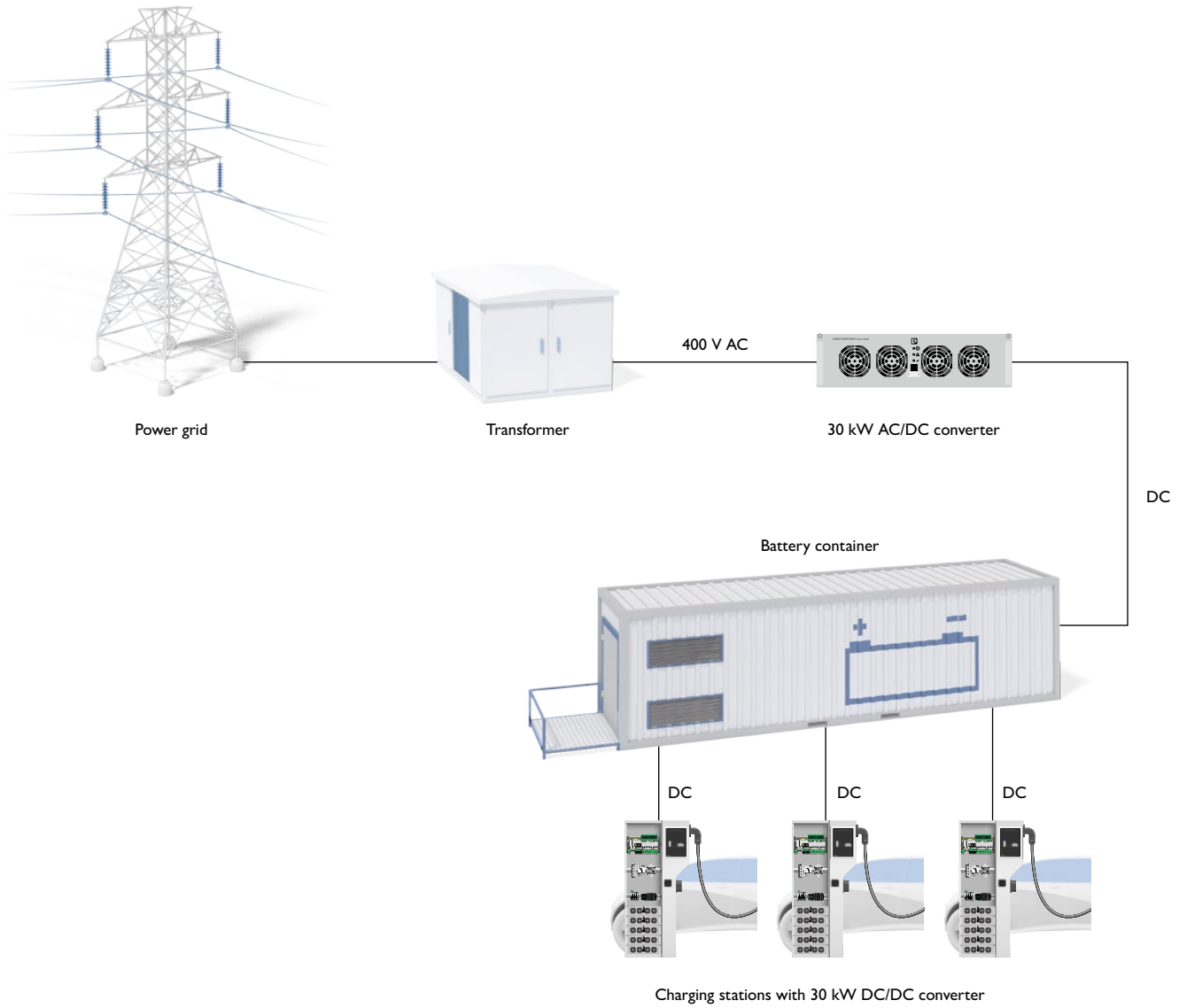
Areas of application

There are numerous fields of application for the CHARX power modules. First and foremost, you can integrate them into charging stations.

But they can also be used in other areas, such as charging buffer batteries for applications in the DC industry or charging mobile battery containers that are needed on construction sites.

All modules conform to emission class B, so use in urban environments is not an issue. In addition, the AC/DC modules can also be used on conventional 3-phase connections (32 A).

Supply of charging stations in the event of insufficient power from the grid:



Charging stations with 30 kW DC/DC converter

DC power electronics CHARX power

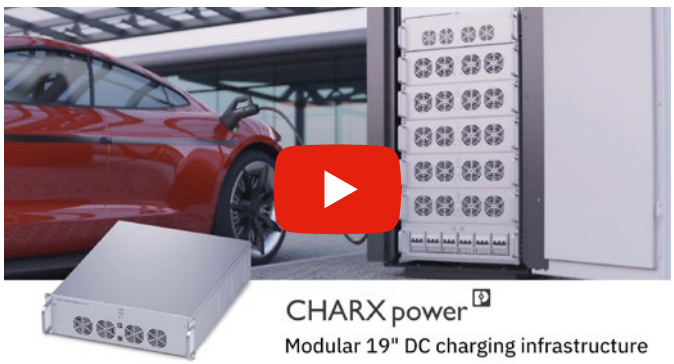
Flexibly scalable charging power – the right power for every situation

With the modular CHARX system for 19" rack mounting, the charging power can be scaled from 30 to 150 kW as required/ needed by interconnecting up to five 30 kW modules. Both in preconfiguration and retrofit situations.

The modules integrate the entire distribution, conversion, and control of the charging current.

Watch the product video on YouTube now!

Scan the QR code with your smartphone or tablet and find out more about the design of a modular DC charging station in 19" format in the product video.



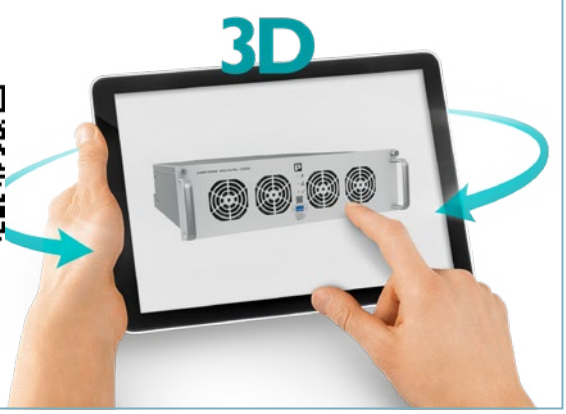
Experience it now in augmented reality (AR)!

Scan one of the QR codes with your smartphone or tablet and virtually place the DC power module or the AC distribution module in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

CHARX power basic

CHARX power distribute



Our product portfolio for your charging stations

DC power modules			
			
Product family	**CHARX power basic**		
Conversion type	DC/DC	AC/DC	AC/DC
Mounting type	19" rack mounting		Mounting in a separately available system cabinet
Output power	30 kW		87.5 kW
Output current	100 A		125 A
Efficiency	>95%		>97%
Standards	DIN EN 61851-21-2, Class B IEC 61851-1:2017 IEC 61851-23:2014 UL 2202		DIN EN 61851-21-2, Class A IEC 61851-23:2014
Electrical isolation	✓		✕
Dimensions (W x H x D)	483 mm x 134 mm x 550 mm (3 rack units in 19" standard)		536 mm x 222 mm x 600 mm
Item no.	1296467	1232243	1162690

AC distribution module	
	
Product family	**CHARX power distribute**
Mounting type	19" rack mounting
Integrated protective functions	Surge protection, miniature circuit breakers, protection against overheating
AC input	3 x 232 A, 400 … 480 V
AC outputs	5 outputs with 3 x 63 A each, 1 output with 3 x 6 A
Standards	IEC 61851-1:2017
Dimensions (W x H x D)	483 mm x 134 mm x 550 mm (3 rack units in 19" standard)
Item no.	1342893

For the complete portfolio of **DC power electronics and distribution**, enter the web code on our website or scan the QR code.

Web code: #2529

Surge protection for charging stations and home chargers

With our surge protective devices CHARX protect, you can protect charging stations and electric cars against damage due to surge voltages caused by lightning strikes or switching operations in the grid.

We can provide you with various arrester types for a comprehensive protection concept to ensure that your charging infrastructure remains available at all times – at any time of the day or night, and in any weather.

Remote indication contact

Integrated status indicator and remote indication contact provide information about the availability of the charging station – anytime, anywhere.

Low voltage protection level

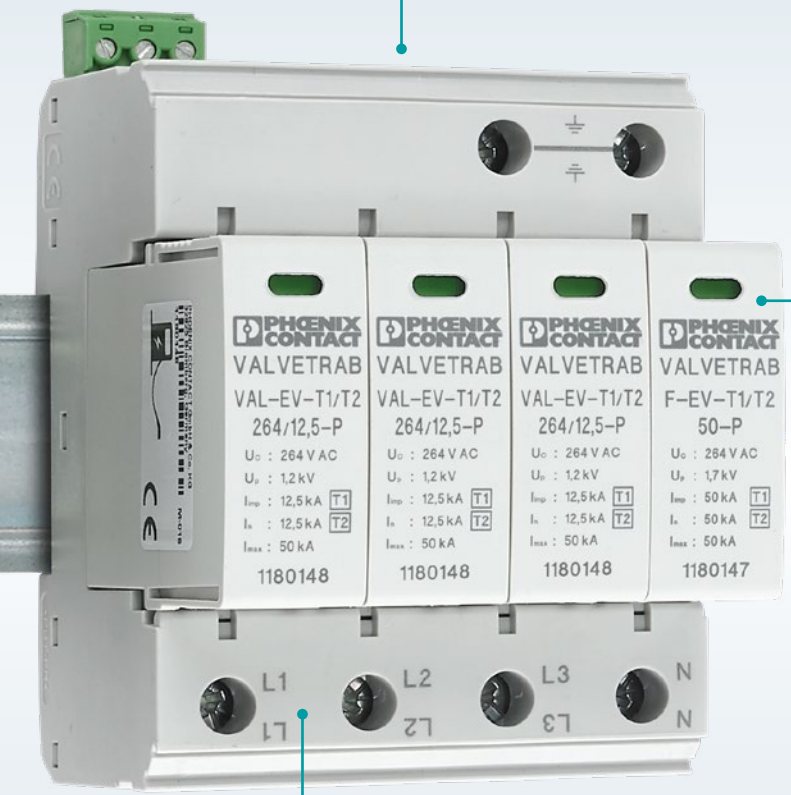
Optimum protection: low voltage protection level minimizes surge voltages for downstream components within the charging station and also for the electric vehicle.

CHARX protect

E-Mobility empowered by Phoenix Contact

Charging without risk

Comprehensive protection against damage and surge voltages: use charging stations and electric cars safely and without interruption.



Pluggable arresters

For easy maintenance and quick insulation measurement.

Protection even from lightning strikes

Limits surge voltages and high voltage peaks using varistor-based combined lightning current and surge arresters, preventing damage to sensitive equipment, the connected vehicle, and communication components.

Surge protection CHARX protect

Safe and uninterrupted charging of electric cars – with our comprehensive protection concept

The charging infrastructure for electric vehicles is just as complex as the vehicle itself. From the power supply and components for visualizing the charging process right through to the cables for Ethernet communication, the charging station is equipped with many important and sensitive components. These need to be protected to ensure that the charging infrastructure has a long service life and to enable a safe, uninterrupted charging process.

A comprehensive protection concept therefore consists of three areas:

- Type 2 protective devices and type 1+2 combined lightning current and surge arresters protect feed-in against dangerous surge voltages caused by lightning strikes and switching operations in the grid.
- Use type 3 surge arresters to ensure the long-term function of numerous sensitive components within your charging station.
- The communication components are usually connected via Ethernet and should also be protected.

Experience it now in augmented reality (AR)!

Scan the QR code with your smartphone or tablet and virtually place the type 2 surge arrester in the room, for example, on your desk.

View the product in the greatest detail and from every angle.

Surge protection CHARX protect

Surge protection for retrofitting – optimal protection for home chargers and electric vehicles

Even though the main distribution box already has surge protection, it often provides insufficient protection in the case of long cable routes to the home charger.

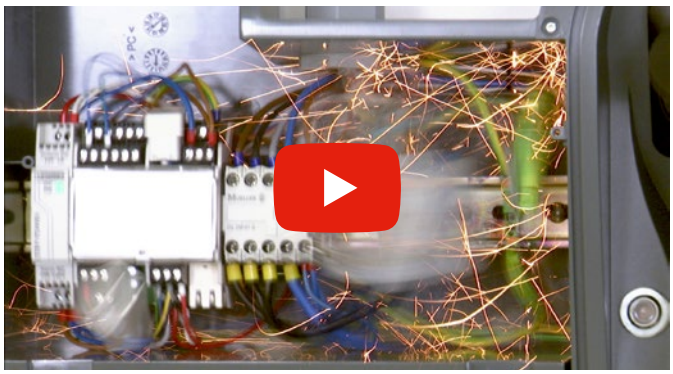
Due to its weatherproof and shockproof IP65 housing, CHARX protect retrofit can be easily installed in a carport under or even next to the home charger.

The integrated type 2 arrester reliably protects home chargers with charging powers of 11 to 22 kW and the connected electric vehicles against expensive damage due to voltage peaks that can be caused by lightning strikes or switching operations in the supply grid.

To match the existing cable routing, the feeding AC cable can be fed into the housing either at the top or at the bottom. Push-in connection means that internal wiring is particularly quick.

Watch the experiment video on YouTube now!

Scan the QR code with your smartphone or tablet and watch the video to see what happens when a home charger gets a surge voltage – when surge protection is and isn't installed.



Our product recommendations for your charging stations and home chargers

Feed-in protection

						
Product family	**CHARX protect basic**		**CHARX protect advanced**		**FLT-MB**	
Application	AC feed-in protection					
Mounting type	DIN rail mounting					
Arrester type	Type 2		Type 1/2		Type 1 + 2 + 3	
Incl. protection against surge voltages caused by lightning strikes	✕		✓		✓	
Incl. protection of 12 and 24 V components	✕		✕		✓	
Pluggable arrester	✓		✓		✕	
Remote indication contact	✕	✓	✕	✓	✕	✓
Connection technology	Screw		Screw		Screw	
Maximum continuous voltage	280 V AC		264 V AC		264 V AC	
Item no.	1180144	1180145	1180149	1180150	1380661	1380667

				
Product family	**CHARX protect retrofit**	**VAL-MS-BE-PCB**	**VAL-MB-DC**	
Application	AC feed-in protection – for external retrofitting	AC feed-in protection – base element for VAL-MS arrester	DC feed-in protection – installation upstream of DC power electronics	
Mounting type	Wall mounting in IP65 housing	PCB mounting	DIN rail mounting	
Arrester type	Type 2	Type 1/2	Type 2	
Incl. protection against surge voltages caused by lightning strikes	✕	✓	✕	
Pluggable arrester	✓	✓	✕	
Remote indication contact	✓	✓	✓	
Connection technology	Push-in	-	Screw	
Maximum continuous voltage	275 V AC	760 V AC / 800 V DC	800 V DC	1,100 V DC
Item no.	1380466	1035864	1376160	1376162

Protection of 12 and 24 V components

		
Product family	**PLT-SEC**	
Application	Protection of 12 and 24 V components	
Mounting type	DIN rail mounting	
Arrester type	Type 3	
Pluggable arrester	✓	
Remote indication contact	✓	
Connection technology	Push-in	Screw
Item no.	2907925	2907916

Protection of communication components

					
Product family		**PP-RJ**	**DATATRAB-LAN**	**DATATRAB-TELE**	**TERMITRAB complete**
Application		Patch panel with integrated Ethernet surge protection	Ethernet surge protection as intermediate plug	SHDSL surge protection as intermediate plug	Surge protection for telecommunications (e.g., CAN)
Mounting type		DIN rail mounting			
Connection technology	**Push-in**	-	-	-	1065316
	Push-in to RJ45	2703022			-
	IDC to RJ45	2703023			
	Screw to RJ45	2703021			
	RJ45 to RJ45	2703020	2881007	2801593	

Power supplies for reliable operation of all components

With our power supply units, you can reliably supply all electronic components within your charging station with 12 or 24 V. This ensures stable operation around the clock, even under extreme outdoor conditions.

Choose the right power supply for your application from our large portfolio in order to optimally meet your requirements.

Your advantages

- ☑ Broad portfolio with scalable range of functions to meet all charging infrastructure requirements
- ☑ Energy savings with the highest level of efficiency in no-load and partial-load operation
- ☑ Reliable operation even at extreme outdoor temperatures

Our product recommendations for your charging stations and home chargers

									
Product family		**STEP POWER**		**UNO POWER**		**TRIO POWER**		**QUINT POWER**	
Our recommendations for	**AC home chargers**	✓		✓					
	AC charging stations	✓		✓		✓		✓	
	DC charging stations					✓		✓	
Ambient temperature	**Operation**	-10°C … 70°C		-25°C … 70°C		-25°C … 70°C		-25°C … 70°C	
	Derating (power reduction)	>50°C		>55°C		>60°C		>60°C	
	Type-tested startup	-25°C		-40°C		-40°C		-40°C	
Particularly flat [1]		★★★★		★★★		★★		★★★	
Particularly narrow [1]		★★		★★★		★★★★		★★★★	
Durability		★★		★★		★★★		★★★★	
Interference immunity and emission (EMC)		★★★		★★		★★★		★★★★	
SFB Technology [2]		✕		✕		✕		✓	
Connection technology		Push-in		Screw		Push-in		Push-in [3] / screw	
Performance classes		**12 V**	**24 V**	**12 V**	**24 V**	**12 V**	**24 V**	**12 V**	**24 V**
1-phase	**15 W**	1170952	1088495	-	-	-	-	-	-
	30 W	1170953	1088494	2902998	2902991	-	-	2904605 [3]	2909575 [3] 2904597
	60 W	1170955	1088491	2902999 (55 W)	2902992	2903157	2903147 (72 W)	-	2909576 [3] 2904598
	90 W	-	1140066	2902997 (100 W)	2902994	-	-	2904607 [3]	2909577 [3] 2904599
	120 W	-	1088478	-	1110466	2903158	1159037	-	2904600
	240 W	-	-	-	1096432	-	1159038	2904608 (180 W)	2904601
	480 W	-	-	-	2910105	-	1159039	-	2904602
	960 W	-	-	-	1110043	-	-	-	2904603
3-phase	**120 W**	-	-	-	-	-	2903153	-	2904620
	240 W	-	-	-	-	-	1159042	-	2904621
	480 W	-	-	-	-	-	1159044	-	2904622
	960 W	-	-	-	-	-	1159045	-	2904623

[1] Compared within the same performance class.
[2] SFB (Selective Fuse Breaking) Technology supplies up to six times the nominal current for 15 ms, thus quickly and reliably tripping Phoenix Contact thermal and thermal-magnetic device circuit breakers (see page 130) as well as standard miniature circuit breakers in the event of a short circuit.
[3] These item numbers feature Push-in connection technology.

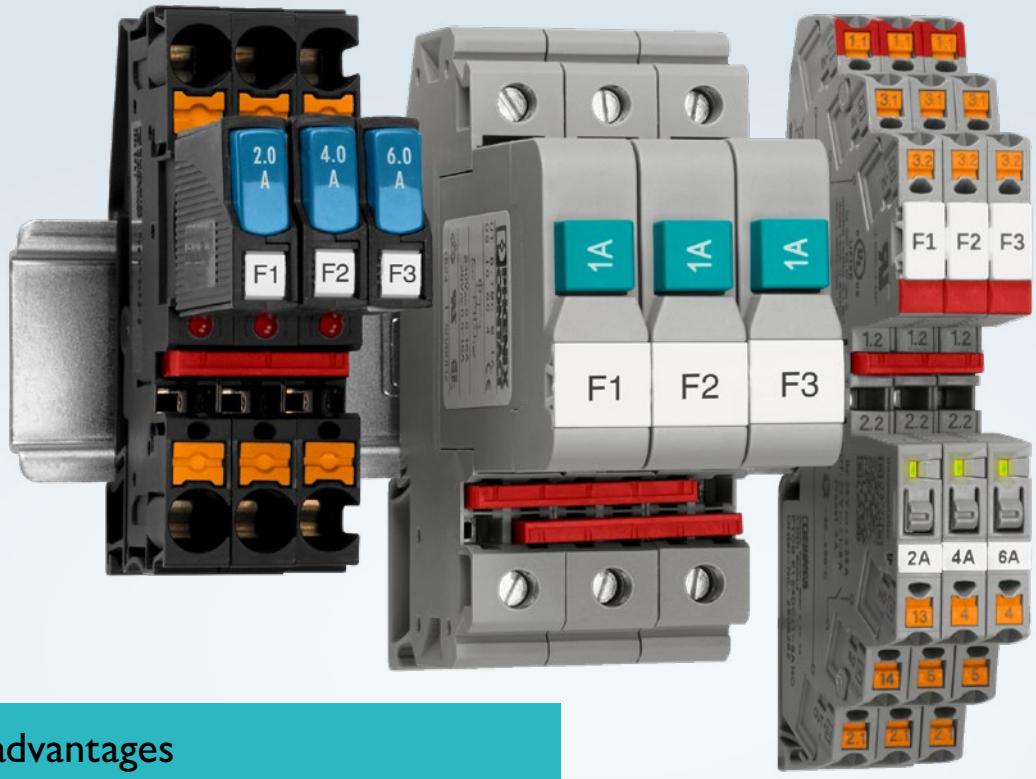
For the complete portfolio of **power supplies**, enter the web code on our website or scan the QR code.

Web code: #1985

Device circuit breakers for protection against overload and short circuits

In charging stations with numerous components and higher loads, there is an even greater need to install device protection. It protects all components on the secondary side, such as the cables and charging controller, against short-circuit currents and overload.

To provide the ideal protection, our circuit breakers use various technologies: thermal, thermal-magnetic, and electronic.



Your advantages

- ☑ High availability of your charging stations with selective protection
- ☑ Reliable component protection through targeted shutdown in the event of a fault
- ☑ Tripping mechanisms and low nominal current levels cover every application

Our product recommendations for your charging stations

					
Product family		**Thermal device circuit breakers** [1]	**Thermal-magnetic device circuit breakers** [1]	**Electronic circuit breakers**	
Protection for 12 V components		✓	✓	✕	
Protection for 24 V components		✓	✓	✓	
Connection technology		Depends on fuse terminal block used	Screw	Push-in	
Overload protection		✓	✓	✓	
Short-circuit protection		✕	✓	✓	
Remote signaling		✕	✕	✓	
Remote reset		✕	✕	✕	✓
Rated current	**1 … 8 A, adjustable**	-	-	2908262	1135752
	1 A	0712194	0916604	2909902	1135751
	2 A	0712217	0916605	2909903	1135749
	3 A	0712233	-	2909904	-
	4 A	0712259	0916606	2909906	1135745
	5 A	1538622	0916607	-	-
	6 A	0712275	0916608	2909908	1135740
Required fuse terminal block	**Push-in connection**	3212166	-	-	
	Screw connection	3118203			
	Spring-cage connection	3036372			

[1] Please make sure that you use a power supply that provides sufficient tripping current. In this case, we recommend using the power supplies in the QUINT POWER family (see page 129) with SFB (Selective Fuse Breaking) Technology. They supply up to six times the nominal current for 15 ms, thus quickly and reliably tripping Phoenix Contact thermal and thermal-magnetic device circuit breakers as well as standard miniature circuit breakers in the event of a short circuit.

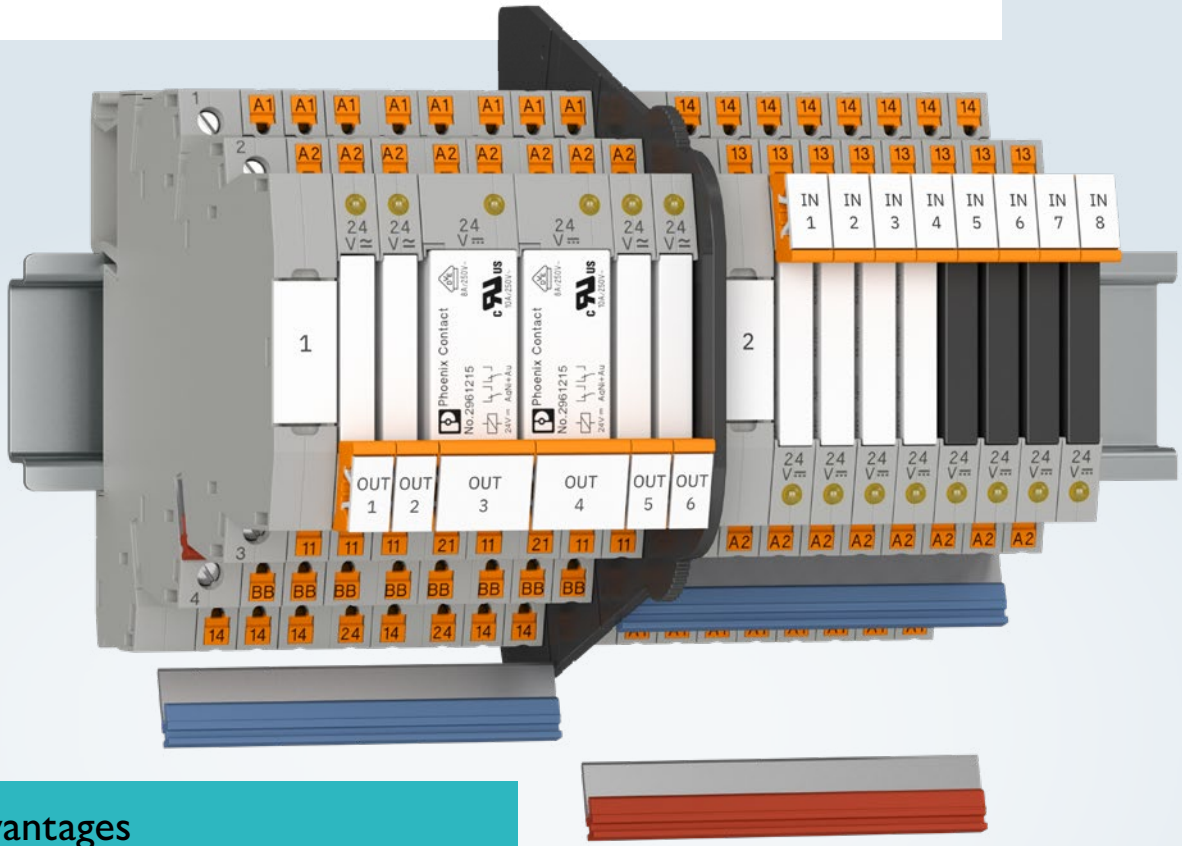
For the complete portfolio of **device circuit breakers**, enter the web code on our website or scan the QR code.

Web code:
#0156

Coupling relay modules for controlling and switching loads

With our coupling relay modules, you can reliably switch the actuators in your charging station, such as power contactors, locking actuators, or status LEDs.

In addition to power amplification and increasing the number of contacts, the coupling relays can be used for electrical isolation between the charging controller and I/O devices. The plug-in miniature relays enable particularly easy replacement in the event of maintenance.



Your advantages

- Broad portfolio for all common charging infrastructure applications
- Reinforced insulation in accordance with DIN EN IEC 60947-1 between coil and contact set
- Plug-in bridges for time-saving potential distribution
- Compact design saves space in the charging station

Our product recommendations for your charging stations and home chargers

Coupling relay modules

									
Area of application		Universal		Universal, contact multiplication		Universal, high continuous currents		High inrush currents	
Width		6.2 mm		14 mm					
Typical application examples		Switching a contactor with low to medium power consumption Switching a status LED (coupling from 12 / 24 V to 24 / 12 V) Controlling a CHAdeMO or GB/T charging connector (coupling from 24 V to 3 / 6 / 9 / 12 V)		Switching up to two contactors with low to medium power consumption Switching up to two status LEDs (coupling from 12 / 24 V to 24 / 12 V) Controlling a CHAdeMO or GB/T charging connector (coupling from 24 V to 3 / 6 / 9 / 12 V)		Switching a contactor with medium to high power consumption Switching a service socket (coupling from 24 V to 230 V) Controlling the locking actuator of a charging connector holder (coupling from 12 / 24 V to 24 / 12 V)		Switching lighting	
Contact switching type		1 changeover contact		2 changeover contacts		1 changeover contact		1 N/O contact	
Output limiting continuous current		6 A		2 x 6 A		10 A		6 A / 10 A [1]	
Connection technology		Push-in	Screw	Push-in	Screw	Push-in	Screw	Push-in	Screw
Nominal input voltage	**12 V**	2900316	2966906	2900329	2967235	2900290	2967617	1078801	1078800
	24 V	2900299	2966171	2900330	2967060	2900291	2967620	2900298	2967604

[1] 10 A only permitted if both connections 13, both connections 14, and both connections BB are bridged.

For the complete portfolio of **coupling relay modules**, enter the web code on our website or scan the QR code.

Web code: #2863

AC and DC energy meters for billing the charging process

The MID-certified EMpro energy meters are ideal for collecting energy data in your charging stations – for accurate billing of charging processes.

The meters are optimized for e-mobility applications so that the connection to the charging controller can be established in just a few minutes. To check the charging voltage, you can also use a DC voltage measuring module up to 1,500 V DC.

Your advantages

- Ideal for billing processes due to MID approval
- Narrow overall width saves space in the charging station
- Fast connection to the charging controller through preconfiguration and optimized register tables
- Reliable operation even at extreme outdoor temperatures

Our product recommendations for your charging stations and home chargers

AC energy meter for direct measurement

					
Input current	40 A	40 A	63 A	80 A	80 A
Input voltage range	1 x 184 ... 276 V	3 x 184 ... 264 V (320 ... 460 V)	3 x 184 ... 288 V (320 ... 500 V)	3 x 184 ... 288 V (320 ... 500 V)	3 x 184 ... 288 V (320 ... 500 V)
MID-certified	✓	✓	✓	✓	✓
Suitable for charging compliant with calibration laws	×	✓	×	×	×
Tariff input	×	×	✓	✓	×
Web-based management	×	×	×	×	✓
Communication protocols	Modbus/RTU				Modbus/TCP, HTTP
Communication interfaces	RS-485				Ethernet
Measurement connection	1.5 ... 6 mm²	1.5 … 25 mm²	1.5 ... 35 mm²		
Supply voltage	Supply from the measuring circuit				
Ambient temperature range	-25°C ... +70°C			-25°C ... +55°C	
Item no.	1219090	1429603	1219095	1252817	2908590

DC energy meter for direct measurement

	
Input current	650 A
Input voltage	1000 V
MID-certified	×
Suitable for charging compliant with calibration laws	✓
Tariff input	×
Web-based management	×
Measurement connection	M10 nut
Supply voltage	24 V DC (-20 ... +50%)
Communication protocol	SLIP
Communication interfaces	2 x RS-485
Ambient temperature range	-40°C ... +80°C
Item no.	1269236

DC voltage measuring module for reference measurement

		
Input voltage range	0 V DC ... 1500 V DC / 0 V DC ... 1000 V DC (UL)	
Temperature coefficient	<0.01%/K	
Output signal	2 ... 10 V DC	
Supply voltage	21.6 V DC ... 30 V DC	
Internal current consumption	8 mA (typical) / 65 mA (maximum)	
Degree of protection	IP20	
Maximum transmission error	±1%	
Ambient temperature range	-20°C ... +70°C	
Connection method	Screw connection	
Items per packing unit	1	10
Item no.	2903591	1084352

For the complete portfolio of **energy meters**, enter the web code on our website or scan the QR code.

Web code: #2842

For the complete portfolio of **DC voltage measuring modules**, enter the web code on our website or scan the QR code.

Web code: #1925

Charging infrastructure

Energy measuring devices and current transformers for higher-level load measurement

For load and charging management, as typically required in large charging parks, higher-level current measurement is performed at the feeding point – generators such as solar systems and multiple loads are taken into account.

Configure and integrate our energy measuring devices in just a few steps using the web-based, user-guided installation wizard.

Your advantages

- ☑ Optimal utilization of the available connected power through efficient load management
- ☑ Intuitively configurable energy measuring devices with direct connection for Rogowski coils
- ☑ Complete product family for converting high alternating currents into secondary currents

Our product recommendations for your charging infrastructure application

Multifunctional energy measuring devices

Measurement method		**Current transformer**		**Rogowski coil**	
Power measurement, active energy		Class 0.5 S (IEC 62053-22)		Class 1 (IEC 62053-21)	
Current measuring input		Up to 4,000 A			
Voltage measuring input		35 … 690 V AC			
Supply voltage		100 ... 230 V AC (±20%) / 150 ... 250 V DC (±20%)			
Temperature range		-25 … +70°C			
Connection technology		Screw			
Communication protocols	**Modbus/TCP**	✓	✓	✓	✓
	Modbus/RTU	✓	✗	✓	✗
Item no.		2907980	2907983	2907985	2908307

Current transformers for new installations

Primary rated current [1]	**0 ... 100 A to 0 ... 1500 A**		**0 ... 800 A to 0 ... 4000 A**
Secondary rated current [1]	1 A AC or 5 A AC		
Frequency measuring range	50 Hz ... 60 Hz		
Accuracy class [1]	0.5 or 1		
Circular conductor (diameter)	42 mm		85 mm
Copper rail (number x width x height)	1 x 50 x 12 mm / 2 x 40 x 10 mm		1 x 80 x 64 mm / 2 x 100 x 10 mm
Connection technology	Screw	Push-in	Screw
Item no.	2277297	2907416	2277378

Rogowski coils – direct connection to energy measuring devices

Primary rated current		**0 ... 4000 A**		
Frequency measuring range		40 ... 20,000 Hz		
Output signal		100 mV (no load, at 1000 A and 50 Hz)		
Coil diameter		95 mm	140 mm	190 mm
Length of signal line	**3 m**	2904890	2904891	2904892
	5 m	2910322	-	-
	10 m	2910323	1033482	2910324

Optional holding device

Thickness of the busbar	**5 … 10 mm**	**10 … 15 mm**
Item no.	2907888	2904895

Ensures the secure hold of the Rogowski coil on the busbar. The coil housing is pushed onto the flange of the holding device and snaps in automatically.

[1] The item must be configured for this feature before ordering. The specified values can be selected.

For the complete portfolio of **energy measuring devices**, enter the web code on our website or scan the QR code.

Web code: #2842

For the complete portfolio of **current transformers**, enter the web code on our website or scan the QR code.

Web code: #1263

Ethernet switches and security routers for reliable network connection

When setting up larger or commercial charging parks, it is essential that the charging stations are connected to the operator and the backend provider for the purposes of influencing load management and billing the charging processes.

This connection can be established in the local network via switches. Or you can implement secure remote access via the Internet using a security router.

Your advantages

- Stable and interference-free connection of your charging stations via copper or fiberglass
- Direct connection to building management systems
- Reliable operation even at extreme outdoor temperatures

Our product recommendations for your charging stations

Ethernet switches – for connection via the local network






Application		Copper uplink for distances under 100 m				Fiberglass uplink for distances over 100 m	
Managed switch		✕		✓		✕	✓
Number of SFP ports (fiberglass)		None				1	2
Number of RJ45 ports (copper)		5	8	5	8	4	6
Temperature range for operation		-40 … +75°C	-40 … +75°C	-40 … +70°C	-40 … +70°C	-40 … +75°C	-40 … +70°C
Ethernet speed	10/100 Mbps	1085170	1085165	2702326	2702327	1085169	2702969
	10/100/1000 Mbps	1085163	1085162	-	2702652	1343023	2702970

Security router – for secure remote access via the Internet

Number of RJ45 ports	2
Ethernet speed	10 / 100 / 1000 Mbps
Special features	Firewall, VPN, central management with MDM
Temperature range for operation	-20 … +60°C
Item no.	1357828

For the complete portfolio of **Ethernet switches**, enter the web code on our website or scan the QR code.

Web code: #0956

For the complete portfolio of **security routers**, enter the web code on our website or scan the QR code.

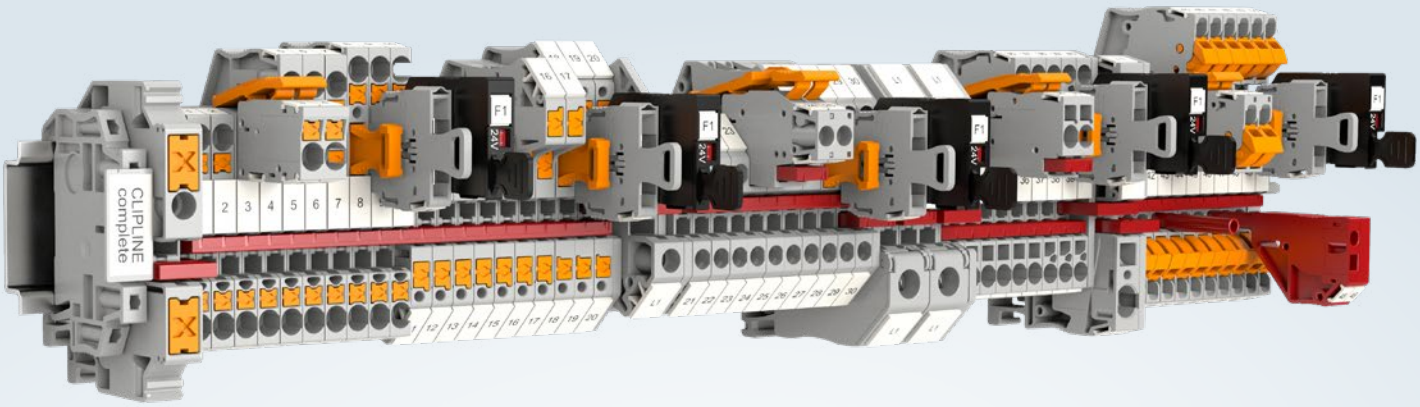
Web code: #1787

Charging infrastructure

Terminal blocks for power connection and marshalling

With our power connection and marshalling components, the power is distributed to the electronic components of the charging station after it has been fed in.

Installation of our terminal blocks in AC home chargers and DC charging stations is facilitated by various connection options and the different cross-sections and colors that are available.



Your advantages

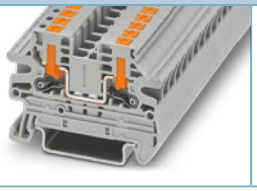
- Full flexibility with terminal blocks featuring different connection technologies
- Efficient wiring with uniform and diverse accessories
- Material quality exceeds normative requirements and guarantees long-term stability

For the complete portfolio of **terminal blocks**, enter the web code on our website or scan the QR code.

Web code: #1401

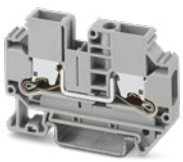
Our product recommendations for your charging stations and home chargers

Terminal blocks for marshalling


Mounting type			NS 35 DIN rail					
Connection technology			Push-in		Push-in vertical		Push-X	
Max. conductor cross-section			2.5 mm²	4 mm²	2.5 mm²	4 mm²	2.5 mm²	4 mm²
Number of connections and color	**2**	**Gray**	3209510	3211757	1078960	1088728	1343106	On request
		Blue	3209523	3211760	1078963	1088729	1343114	
		Green-yellow	3209536	3211766	1078962	1088730	1343116	
	3	**Gray**	3209549	3211771	1078966	1088731	1343117	
		Blue	3209552	3211775	1078971	1088732	1343121	
		Green-yellow	3209565	3211780	1078991	1088733	1343123	
	4	**Gray**	3209578	3211797	1078999	1088734	1343129	
		Blue	3209581	3211802	1079006	1088735	1343130	
		Green-yellow	3209594	3211809	1079012	1088736	1343137	

Terminal blocks for power connection of AC home chargers and charging stations

Mounting type			NS 35 DIN rail					
Connection technology			Push-in			Push-X		
Max. conductor cross-section			6 mm²	10 mm²	16 mm²	6 mm²	10 mm²	16 mm²
Number of connections and color	**2**	**Gray**	3211813	3212120	3212138	1329493	1329547	1329672
		Blue	3211819	3212123	3212141	1329494	1329549	1329673
		Green-yellow	3211822	3212131	3212147	1329495	1329550	1329674
	3	**Gray**	3211929	3208746	3208760	1329499	1329603	-
		Blue	3211485	3208747	3208773	1329506	1329605	
		Green-yellow	3211498	3208745	3208786	1329507	1329606	
	4	**Gray**	3212934	-	-	1329511	-	-
		Blue	3212947			1329512		
		Green-yellow	3212950			1329513		

Terminal blocks for power connection of DC charging stations


Mounting type			M6 bolt	M8 bolt	M10 bolt	M12 bolt	NS 35 DIN rail			
Connection technology			Bolt				PowerTurn			
Max. conductor cross-section			35 mm²	50 mm²	120 mm²	120 mm²	35 mm²	50 mm²	95 mm²	185 mm²
Number of connections and color	**2**	**Gray**	3049204	3049301	3049408	3049505	3212064	3260050	3260163	1054722
		Blue	-	-	-	-	3212065	3260051	3260166	1054723
		Green-yellow					3212066	3260052	3260106	-

Distribution blocks for potential distribution

After it has been fed in, the power needs to be distributed to the electronic components of your charging station. Our distribution blocks for potential distribution offer a compact and clear solution.

They can be bridged via the conductor shaft using Push-in and screw connection technology and come ready to connect in a wide range of versions.

Your advantages

- ☑ Fast installation and commissioning of your charging infrastructure
- ☑ Significant space savings inside the charging station or home charger due to the minimal size
- ☑ Flexible mounting options for potential distribution inside your home charger or charging station

Our product recommendations for your charging stations and home chargers

Distribution blocks

					
Number of connections	**6**				
Width	18.5 mm				
Nominal voltage	450 V				
Nominal current	32 A				
Connection technology	Push-in				
Color	Gray	Brown	Blue	Black	Green-yellow
Item no.	3273790	3273800	3273792	3273804	1154139

				
Number of connections	**2**			
Width	6.2 mm			
Nominal voltage	800 V			
Nominal current	32 A			
Connection technology	Push-in			
Color	Gray	Brown	Blue	Black
Item no.	1028360	1028365	1028361	1028367

Accessories

				
Description	**NS 35 DIN rail adapter with end bracket function**	**NS 35 DIN rail adapter without end bracket function**	**Flange with screw-on fixing**	**Adhesive marker strips**
Item no.	3274057	3274056	3274060	0801837

For the complete portfolio of **distribution blocks**, enter the web code on our website or scan the QR code.

Web code: #1404

Charging infrastructure

Sockets and data interfaces for service and maintenance

Service and maintenance play an important role in commercial charging points. Our sockets provide a power supply for accompanying devices, such as notebooks, even in remote locations.

Common data interfaces such as USB and Ethernet can be used to perform firmware updates directly, for example.

Your advantages

- ☑ Convenient maintenance of charging stations – even at remote locations
- ☑ Available with 11 different plug geometries for international use
- ☑ Extended range of possible applications with additional functions such as LED indicator, fuse, etc.

Our product recommendations for your charging stations and home chargers

Sockets – for supplying external devices such as notebooks

								
Pin connector pattern		**CF**			**E**	**J**	**K**	**L**
Region		Germany			France/ Belgium	Switzerland	Denmark	Italy
Nominal voltage		250 V						
Nominal current		6.3 A	16 A					
LED indicator		✓	✓	✕	✕	✕	✕	✕
Shutter		✕	✕	✕	✓	✕	✕	✓
Fuse		✓	✕	✕	✕	✕	✕	✕
Connection technology	**Push-in spring**	0804042	0804040	0804038	0804020	0804105	0804119	0804132
	Screw	0804029	0804026	0804024	0804016	0804099	0804113	0804126

									
Pin connector pattern		**GB**		**D**	**I**	**N**		**AB**	
Region		Great Britain		India/ Africa	China	Brazil/ South Africa		USA	
Nominal voltage		250 V						125 V	
Nominal current		13 A		6 A	10 A	10 A	20 A	15 A	
LED indicator		✕		✕	✕	✕		✓	
Shutter		✓		✕	✕	✕		✕	
Switch		✓	✕	✕	✕	✕		✕	
GFI		✕		✕	✕	✕		✕	✓
Connection technology	**Push-in spring**	0804069	0804063	0804009	-	0804146	-	0804168	1263626
	Screw	0804058	0804051	0804000	0804087	-	0804139	0804155	1263628

Data interfaces – for performing firmware updates, etc.

		
Pin connector pattern	**USB A 3.0**	**RJ45**
Item no.	1425185	1425186

For the complete portfolio of **sockets** and **service interfaces**, enter the web code on our website or scan the QR code.

Web code: #2915

Charging infrastructure

Heavy-duty connectors for creating modular charging systems

Provide your mobile charging stations with plug-and-play capability. Our heavy-duty connectors protect your interfaces and ensure the reliable transmission of signals, data, and power.

The robust connectors are ideally suited for outdoor use and withstand dirt, water, vibrations, and high levels of mechanical stress.

Your advantages

- ☑ Modular contact inserts for reliable transmission of signals, data, and power
- ☑ Housings are mounting and plug-in compatible with well-known manufacturers
- ☑ Variable connection technologies for contact inserts and terminal adapters

For the complete portfolio of **heavy-duty connectors**, enter the web code on our website or scan the QR code.

Web code: #2410

Our product recommendations for your modular charging systems

Contact modules

Application	Connection technology	Rated current	Rated voltage	Number of positions	Type			
					Male		Female	
Data	For patch cables	1 A	48 V	RJ45		1419885		1419886
Signal	Push-in connection [1]	10 A	250 V	12		1424246		1424228
Power	Push-in connection [1]	16 A	400 V	8		1424227		1424226
				5		1417372		1417373
			500 V	6		1424225		1424224
		40 A	690 V	3		1424218		1424219
			830 V	4		1424220		1424221
	Axial screw connection	40 A	830 V	2		1417389		1417387
		70 A	690 V			1417297		1417296
		100 A	1000 V			1417392		1417390
		200 A		1		1417381		1417379

Module carrier frame

Module slots	Size	Dimensions		Version			
		a (mm)	b (mm)	For panel-mount side		For sleeve side	
2	B06	44.0	51.0		1182085		1182087
3	B10	57.0	64.0		1182088		1182089
4	B16	77.5	84.5		1182090		1182093
6	B24	104.0	111.0		1182094		1182095

Housing

Housing type		Material	Size	Thread size	Type of locking	
					Single locking latch	Double locking latch
Panel-mount base [2]		Metal	B06	-	1411318	-
			B10		1411320	1411322
			B16		1411324	1411327
			B24		1411329	1411331
EVO panel-mount base [2]		Plastic	B06		1407621	-
			B10		1407632	1407634
			B16		1407646	1407648
			B24		1407659	1407661
Sleeve housing [3]		Metal	B06	M32 [4]	1412563	-
			B10		1412601	1412593
			B16		1412679	1412649
			B24		1412757	1412750
EVO sleeve housing [5]		Plastic	B06	-	1407620	-
			B10		1407627	1407629
			B16		1407642	1407643
			B24		1407656	1407657

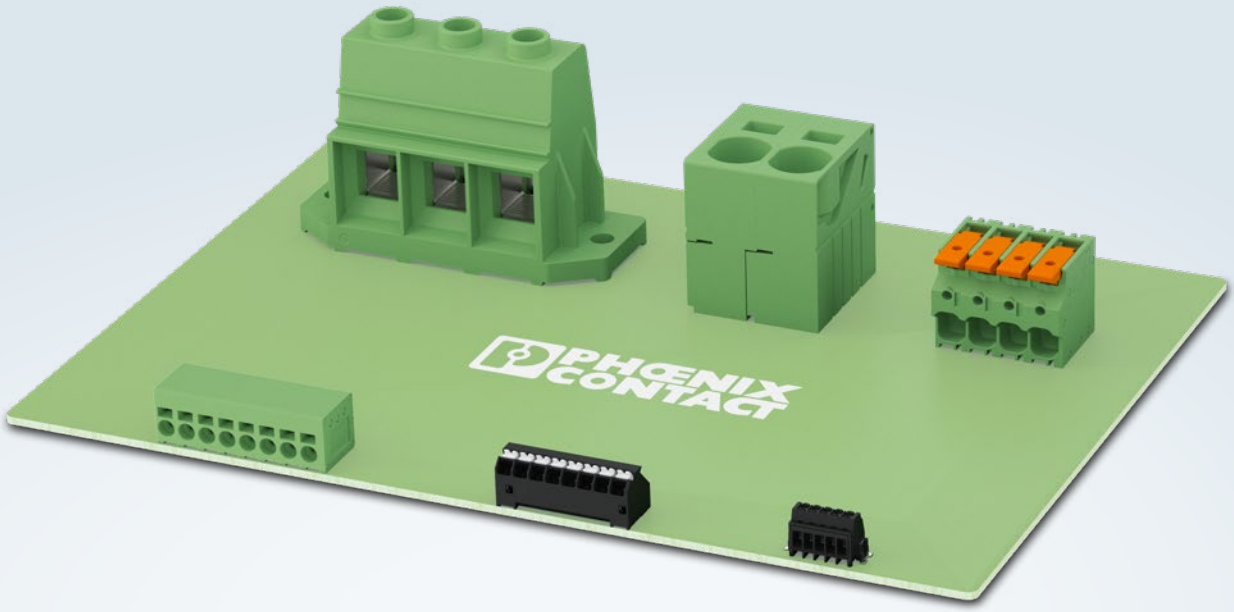
[1] Also available with crimp connection.
[2] Also available with protective cover.
[3] Standard cable gland for metal housing, see page 156.
[4] Also available in thread sizes M25, M40, and M50.
[5] Bayonet fittings available for EVO plastic housing.

Charging infrastructure

PCB terminal blocks and PCB connectors for power, signal, and data connection

Our PCB terminal blocks and PCB connectors up to 16 mm² are available for the power connections of home chargers with PCB assembly.

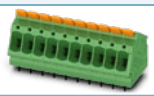
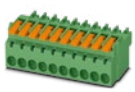
Our compact connection technology up to 1.5 mm² enables the connection of signal and control lines – which is a particularly easy and intuitive process with our lever-actuated PCB terminal blocks and PCB connectors.



Your advantages

- ☑ Reliable connection of the installation and AC charging cable, with colored actuation lever as an option
- ☑ Convenient conductor entry by selecting the appropriate connection direction as 0°, 30°, or 90°
- ☑ Compact internal wiring of your home charger
- ☑ Safe for voltages up to 1,000 V (IEC)/600 V (UL)

Our product recommendations for your home chargers

	Product family	Remarks	Number of positions	Pitch (mm)	Current (A)	Voltage [1] (V)	Connection direction
	LPTA 2,5	-	1 ... 12	5.0	24 IEC 20 UL (B, F) 10 UL (D, G)	400 IEC 300 UL (B, D, G) 320 V (F)	30°
	TDPT 4/...-SP	PCB terminal block of the same shape also available with screw connection	2 ... 6	6.35	41 IEC 30 UL (B, C) 10 UL (D)	1000 IEC 600 UL (B, C) 300 UL (D)	0°
	SPT 5/...-H	-	1 ... 12	7.5	41 IEC 36 UL (B, C)	1000 IEC 600 UL (B, C)	0°
	LPTA 6	-	1 ... 8	7.5	41 IEC 38 UL (B, C, F)	1000 IEC 600 UL (B, C) 1000 UL (F)	30°
	PTSPL 6	Without insulating housing	1	-	41 IEC 30 UL	-	0°
	SPT 16/...-V	-	1 ... 9	10	76 IEC 66 UL (B, C)	1000 IEC 600 UL (B, C)	90°
	LPT 16/...-15	-	2 ... 5	15	76 IEC 72 UL (B, C, E, F)	1000 IEC 600 UL (B, C) 1000 UL (E, F)	0°
	FMC 0,5/...-ST	Gold-plated contact system	2 ... 16	2.54	6 IEC 6 UL (B)	160 IEC 150 UL (B)	0°
	MC 0,5/...-G-THR	Lateral THR armature, gold-plated contact system	2 ... 16	2.54	6 IEC 6 UL (B)	160 IEC 150 UL (B)	0°
	MCV 0,5/...-G-THR	Lateral THR armature, gold-plated contact system	2 ... 16	2.54	6 IEC 6 UL (B)	160 IEC 150 UL (B)	90°
	LPC 1,5/..-ST LPC 1,5/..-STF LPC 1,5/..-ST-LR	Without flange With screw flange With LR lever	2 ... 16	3.81	8 IEC 8 UL (B, C)	160 V IEC 150 V UL (B, C)	0°
	MC 1,5/...-G-THR MC 1,5/...-GF-THR	Without flange With threaded flange	2 ... 20	3.5/3.81	8 IEC 8 UL (B, D)	160 IEC 300 UL (B, D)	0°
	LPC 6/...-ST LPC 6/...-STL	Without flange With center flange	2 ... 6 (7 ... 9 on request)	7.62	41 IEC 35 UL (B, C, F)	1000 IEC 600 UL (B, C, F)	0°
	PC 6 /...-G-THR PC 6/...-GL-THR	Without flange With center flange	2 ... 6	7.62	41 IEC 35 UL (B, C) 35 UL (F)	630 IEC 300 UL (B, C) 600 UL (F)	0°

[1] IEC rated insulation voltage with overvoltage category III/pollution degree 2.

For the complete portfolio of **PCB terminal blocks**, enter the web code on our website or scan the QR code.

Web code: #0391

For the complete portfolio of **PCB connectors**, enter the web code on our website or scan the QR code.

Web code: #2968

For the complete portfolio of **board-to-board connectors**, enter the web code on our website or scan the QR code.

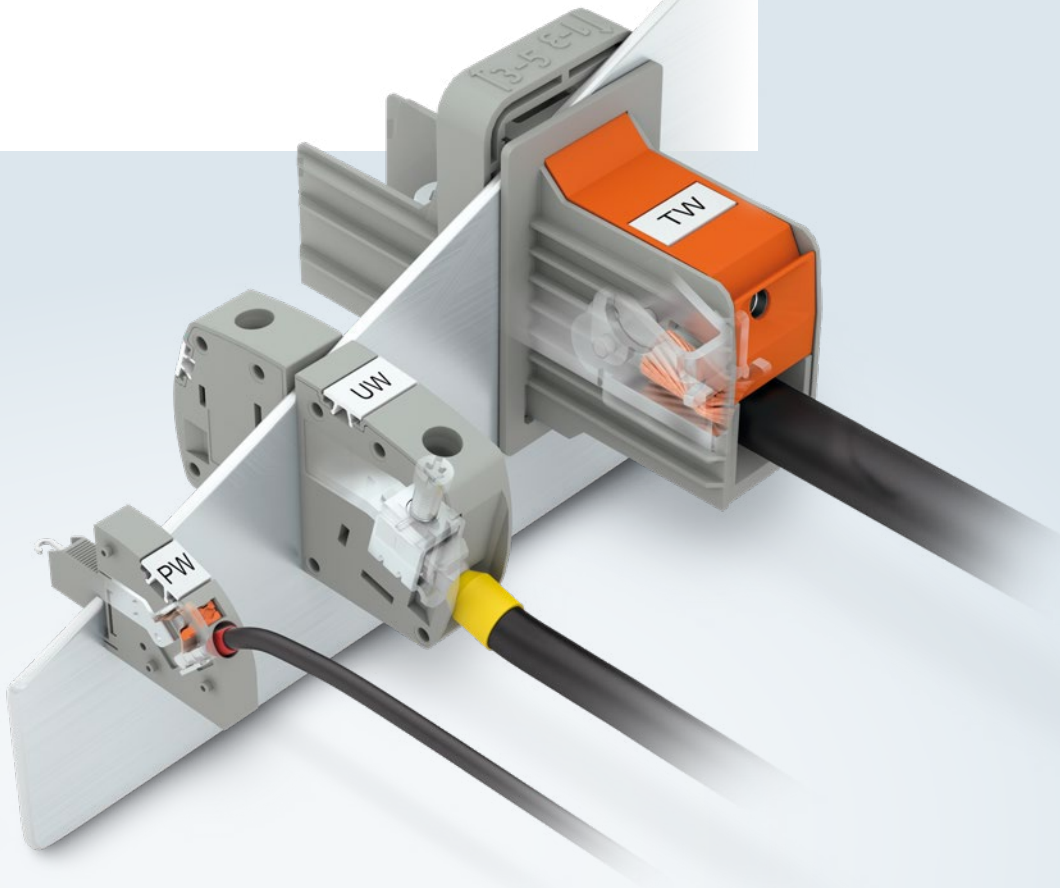
Web code: #2490

Charging infrastructure

High-current feed-through terminal blocks for connection of the power electronics

Our high-current feed-through terminal blocks for cross-sections up to 50 mm² are ideal for connecting the power electronics to your DC charging stations.

They are suitable for charging stations with a panel thickness of 1 to 6 mm and offer maximum flexibility for conductor connection, as they are available with different connection methods.



Your advantages

- ☑ Quick and easy mounting with tool-free conductor connection in any mounting position
- ☑ Quick installation and maintenance of your charging station by using fast-connection technology
- ☑ Safe for voltages up to 1,000 V (IEC)/600 V (UL B, C) and currents up to 232 A (IEC)/230 A (UL B, C)

Our product recommendations for your charging stations

	Product family	Remarks	Number of positions	Pitch (mm)	Current (A)	Voltage [1] (V)	Connection direction	Web code
	UW 4 UW 4-POT-SCM UW 4-POT-SL	Screw, solder, and spade connection	POT versions suitable for molding	1-pos. alignable	32 IEC 30 UL (B, C)	630 IEC 300 UL (B, C)	0°	#0829
	UWV 4	Screw connection	-	1-pos. alignable	32 IEC 30 UL (B, C)	630 IEC 300 UL (B, C)	-90°	#0829
	PW(O) 4-POT-SCM PW(O) 4-POT-SL	Spade and solder connection	POT versions suitable for molding, available with and without actuating push button	1-pos. alignable	32 IEC 30 UL (B, C)	1000 IEC 300 UL (B, C)	45°	#0830
	UW 10 UW 10-POT	Screw and solder connection	POT versions suitable for molding	1-pos. alignable	57 IEC 65 UL (B, C)	630 IEC 300 UL (B, C)	0°	#1230
	UWV 10 UWV 10-POT	Screw and solder connection	POT versions suitable for molding	1-pos. alignable	57 IEC 65 UL (B, C)	630 IEC 300 UL (B, C)	-90°	#1230
	UW 16 UW 16-POT	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	76 IEC 85 UL (B, C)	1000 IEC 600 UL (B, C)	0°	#0833
	UWV 16 UWV 16-POT	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	76 IEC 85 UL (B, C)	1000 IEC 600 UL (B, C)	-90°	#0833
	PWO 16-UW PWO 16-POT	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	76 IEC 76 UL (B, C)	1000 IEC 600 UL (B, C)	45°	#0834
	UW 25 UW 25-POT	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	101 IEC 112.5 UL (B, C)	1000 IEC 600 UL (B, C)	0°	#0837
	UWV 25 UWV 25-POT	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	101 IEC 112.5 UL (B, C)	1000 IEC 600 UL (B, C)	-90°	#0537
	UW 50/S UW 50-POT/S	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	150 IEC 150 UL (B, C)	1000 IEC 600 UL (B, C)	0°	#0840
	UWV 50/S UWV 50-POT-S	Screw and bolt connection	POT versions suitable for molding	1-pos. alignable	150 IEC 150 UL (B, C)	1000 IEC 600 UL (B, C)	-90°	#0840
	TW 50	T-LOX knee-lever connection, bolt connection	-	1 ... 6	150 IEC 150 UL (B, C)	1000 IEC 600 UL (B, C)	0°	#0841

[1] IEC rated insulation voltage with overvoltage category III/pollution degree 2.

For the complete portfolio of **high-current feed-through terminal blocks**, enter the web code on our website or scan the QR code.

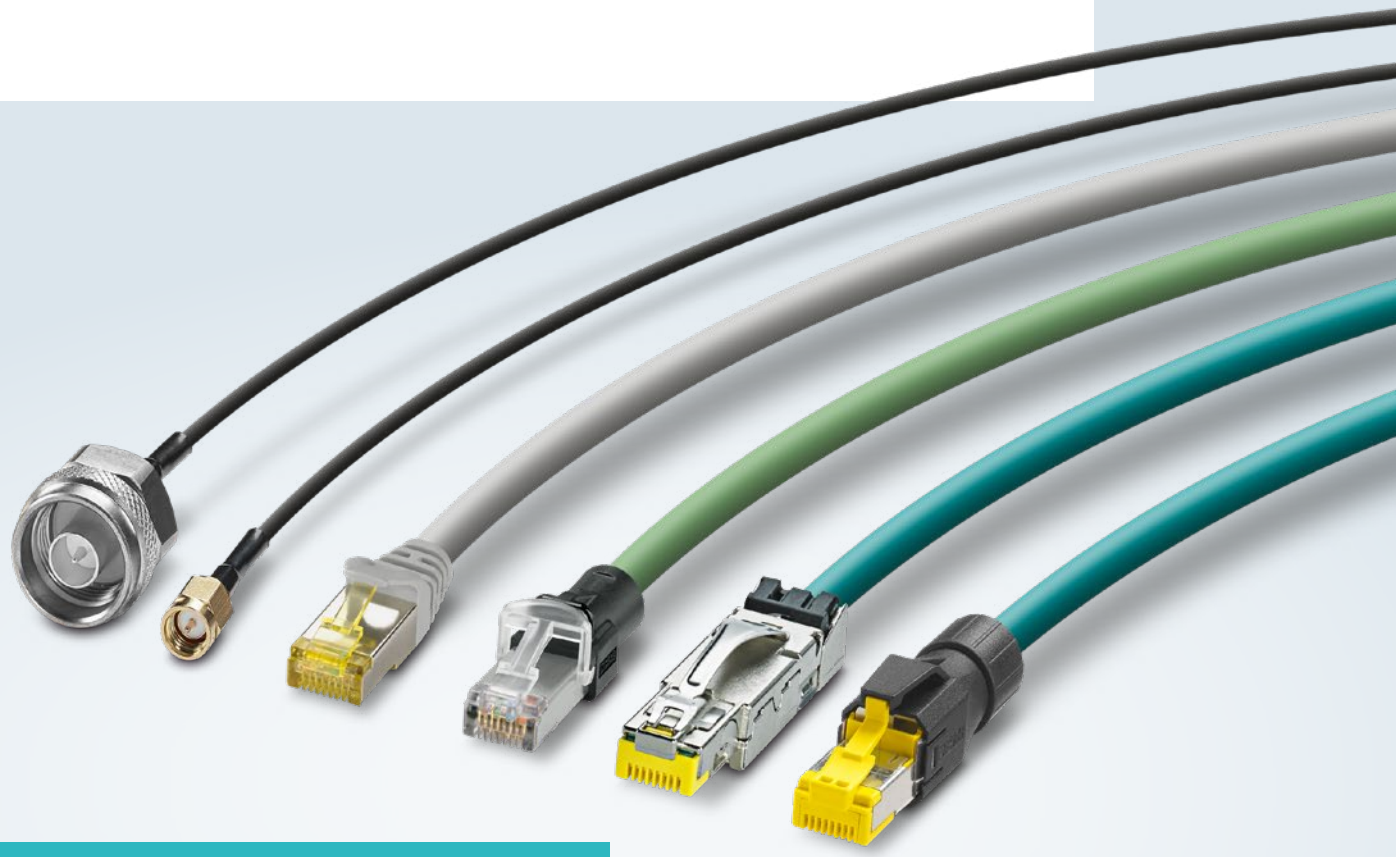
Web code:
#0456

Charging infrastructure

RJ45 patch cables and coaxial cables for data connection

Data cables are needed for the external connection of your charging station as well as for data transmission within the charging station.

Covering all data connections and pin connector patterns, our RJ45 patch cables for wired Ethernet connections and coaxial cables for connecting WLAN and cellular antennas are commonly used for this purpose.



Your advantages

- ☑ Reliable data transmission, especially for commercial charging stations, due to integrated shielding
- ☑ Maximum flexibility: designed for assembly and also available preassembled
- ☑ Particularly robust due to the high-quality industrial standard

Our product recommendations for your charging stations and home chargers

Assembled RJ45 patch cables

					
Transmission	CAT5 (up to 1 Gbps)	$CAT6_A$ (up to 10 Gbps)	$CAT6_A$ (up to 10 Gbps)	CAT5 (up to 1 Gbps)	$CAT6_A$ (up to 10 Gbps)
Cable design	2 x 4 x AWG 26/7	2 x 4 x AWG 26/7	AWG 26/7	AWG 26/7	AWG 26/7
Shielding	S/UTP	S/FTP	S/FTP	SF/UTP	S/FTP
0.3 m	1227558	1227572	-	-	-
0.5 m	1227559	1227573	1113823	-	-
1.0 m	1227560	1227575	1112909	-	-
1.5 m	1227561	1227578	-	-	-
2.0 m	1227562	1227580	1112908	-	-
0.5 to 400 m	-	-	-	1417333	1417359

Assembled coaxial cables

			
Head 1	N (f) BH	N (m)	SMA (m)
Head 2	SMA (m)	SMA (m)	SMA (f)
0.5 m	1340138	1340139	-
1.0 m	-	1340143	-
5.0 m	-	-	1340149

RJ45 connectors

					
Protocol	Ethernet				
Connection technology	IDC terminal blocks				
Connection range	AWG 26 … AWG 24	AWG 26 … AWG 23		AWG 26 … AWG 24	
CAT5	-	1656725	1658008	-	-
$CAT6_A$	1419001	-	-	1421607	1149846

For the complete portfolio of **preassembled data cables**, enter the web code on our website or scan the QR code.

Web code: #3269

For the complete portfolio of **cables available by the meter**, enter the web code on our website or scan the QR code.

Web code: #3267

For the complete portfolio of **data connectors**, enter the web code on our website or scan the QR code.

Web code: #2931

Charging infrastructure

RJ45 patch panels and connection sockets for data connection

Our RJ45 patch panels are ideal for the Ethernet connection of your charging stations. They sit on the DIN rail and transmit the Ethernet signal to flexible patch cables, which allow for structured cabling within the charging station.

Phoenix Contact also offers RJ45 jacks, coaxial female connectors, and USB sockets for PCB assembly of home chargers.

Your advantages

- ☑ Particularly reliable due to the high-quality industry standard
- ☑ Available with preassembled data cables, individual data connectors, by the meter, and appropriate tools for self-assembly

Our product recommendations for your charging stations and home chargers

Patch panels

	Connection method	Description	Shielding	Cable shield connection	Surge protection	Designation	Item no.
	RJ45 / RJ45	Standard Ethernet patch panel, 8-pos., 10 / 100 / 1000 Mbps, ATEX	Directly on the DIN rail	Tool-free via shield contact spring	No	PP-RJ-RJ	2703015
	RJ45 / screw					PP-RJ-SC	2703016
	RJ45 / Push-in					PP-RJ-SCC	2703018
	RJ45 / IDC					PP-RJ-IDC	2703019
	RJ45 / RJ45	Function version Ethernet patch panel 8-pos, 10 / 100 / 1000 Mbps, ATEX With surge protection and shield current diagnostics			Integrated	PP-RJ-RJ-F	2703020
	RJ45 / screw					PP-RJ-SC-F	2703021
	RJ45 / Push-in					PP-RJ-SCC-F	2703022
	RJ45 / IDC					PP-RJ-IDC-F	2703023
	RJ45 / IDC	8-pos., 10 Gbps			No	NBC-PP-J1PGY-S	1100077

RJ45 industrial PCB jacks

RJ45 PCB jacks with individual connection

												
Soldering process	Wave/THR				SMD			Wave			Wave/THR	
Orientation	90° horizontal		180° vertical		180° vertical	90° horizontal		180° vertical	90° horizontal		180° vertical	90° horizontal
Locking clip	-		-		-	Top	Bottom	-	Top	Bottom	-	Top
Without LED	-		-		1149611	1149882	1149874	1149872	1149870	1149868	-	-
With LED	1099281	1091950	1099282	1091947	-	1149873	-	1149871	1149867	1149866	-	-
With LED, short solder contacts	1321246	1321101	1321247	1321102	-	-	-	-	-	-	1337239	1337243

USB connection socket

							
Version	USB 2.0		USB 3.2 Gen. 1		USB 2.0	USB 3.2 Gen. 2	
Type	USB type A				USB type C		
Orientation	90° horizontal	90° horizontal	90° horizontal	180° vertical	90° horizontal	180° vertical	90° horizontal
Soldering process	Wave	SMD	Wave	THR	SMD		SMD/THR
Item no.	1332631	1332634	1332637	1430989	1332645	1332646	1332643

For the complete portfolio of **network installation accessories**, enter the web code on our website or scan the QR code.

Web code: #2355

For the complete portfolio of **data connectors**, enter the web code on our website or scan the QR code.

Web code: #2931

Glands and connectors for cable entry

Cables for feed-in and also for data connection must be routed into the charging station and home charger with water and dust protection.

Cable glands are a proven solution. Our wide range of products includes the most diverse materials and designs. While our QPD and PRC installation connectors offer a plug-in power connection.

Your advantages

- ☑ Reliable power transmission outdoors and in wet environments due to high degrees of protection up to IP69K
- ☑ Vibration-resistant plastic screw connection with protection against over-tightening the cap nut
- ☑ High strain relief force with laminated clamping cage principle

Our product recommendations for your charging stations and home chargers

Installation connectors






Product family		**PRC**					**QPD**			
Product type		**Panel feed-through**		**Coupler connector**	**Installation cable**		**Panel feed-through**		**Connector**	
Rated voltage		690 V								
Rated current		35 A			32 A		40 A			
Connection technology		Crimp connection		Screw connection			IDC connection			
Cable length		0.15 m		-	1.0 m	2.5 m	0.5 m		-	
Max. conductor cross-section		6 mm²	4 mm²	6 mm²	4 mm²		6 mm²			
External cable diameter		-		8 … 21 mm	-		9 … 14 mm	12 … 20 mm	Without nut	9 … 14 mm	12 … 20 mm
Number of positions	**3**	1409221	1409220	1017635	-		-			
	5	1409213	1409212	1017632	1150676	1150675	1410392	1410394	1410396	1410386	1410387

Plastic cable glands [1)]





Thread	Cable gland	With slotted seal	Pressure compensation element	Counter nut	Sealing plug
M12	1411131	-	1415223	1411213	1400254
M16	1411132	-	-	1411214	1400284
M20	1411133	-	-	1411215	1400260
M25	1424482	1076600	-	1411216	1421861
M32	1424483	-	-	1411217	1421862
M40	1424484	-	-	1411218	1421863
M50	1411138	-	-	1411219	1421864
M63	1411139	-	-	1411220	1421865

[1)] In addition to plastic, also available in brass and stainless steel.

For the complete portfolio of **installation connectors**, enter the web code on our website or scan the QR code.

Web code: #1525

For the complete portfolio of **cable glands**, enter the web code on our website or scan the QR code.

Web code: #1425

Charging infrastructure

Battery-pole and busbar connectors for connecting battery modules

Energy storage systems are fundamentally changing the power supply of the charging infrastructure. With their integration, it is possible to achieve high charging power and short charging times even with weak grid connections.

Use our battery-pole and busbar connectors to connect battery modules to your charging stations.

For the complete portfolio of **connectors for energy storage**, enter the web code on our website or scan the QR code.

Web code:
#2640

Your advantages

- For applications up to 350 A and 1,500 V DC
- Flexible use for front and rear wiring
- Safe for the user due to protection against contact with live parts
- Reliable operation due to high material quality

Our product portfolio for your energy storage

									
	Device connectors, front panel (BPC)						**Dust protection caps (BPC)**		
Item designation	ES-FT-BPC-S 16-25 OG	ES-FT-BPC-S 16-25 BK	ES-FT-BPC-B 35-70 OG	ES-FT-BPC-B 35-70 BK	ES-FT-BPC-C 95-120 OG	ES-FT-BPC-C 95-120 BK	ES-FT-BPC PROTECTION CAP	ES-FT-BPC 35 PROTECTION CAP	ES-FT-BPC 95-120 PROTECTION CAP
Item no.	1106303	1106304	1155483	1155592	1298078	1298077	1130817	1211119	1330312
Connection method	Screw connection	Screw connection	Busbar with elongated hole	Busbar with elongated hole	Crimp	Crimp	-	-	-
Contact connection type	Male	Male	Male	Male	Male	Male	-	-	
Rated voltage	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC	-	-	-
Rated current	120 A	120 A	250 A	250 A	350 A	350 A	-	-	-
Connection type	Threaded bolt	Threaded bolt	Current bar with elongated hole	Current bar with elongated hole	Crimp	Crimp	-	-	-
Degree of protection	IP65	IP65	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65	IP65	IP65
Color	Orange	Black	Orange	Black	Orange	Black	Black	Gray	Gray
Remark	-	-	-	-	-	-	For 1106303 and 1106304	For 1155483 and 1155592	For 1298078 and 1298077

						
	Connectors (BPC)					
Item designation	ES-BPC-C 16-25 OG	ES-BPC-C 16-25 BK	ES-BPC-C 50-70 OG	ES-BPC-C 50-70 BK	ES-BPC-C 95-120 OG	ES-BPC-C 95-120 BK
Item no.	1106306	1106307	1155594	1155595	1298070	1298071
Connection method	Crimp	Crimp	Crimp	Crimp	Crimp	Crimp
Contact connection type	Female	Female	Female	Female	Female	Female
Rated voltage	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC
Rated current	120 A	120 A	250 A	250 A	350 A	350 A
Connection type	Crimp	Crimp	Crimp	Crimp	Crimp	Crimp
Degree of protection	IP65	IP65	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67
Color	Orange	Black	Orange	Black	Orange	Black

								
	Device connectors, front panel (BPP)		**Connectors (BPP)**				**Busbar connector (BBC)**	**Panel-mount frame (BBC)**
Item designation	ES-FT-C4F-CO2	ES-FT-C4M-CO1	ES-C1F-C-CO1	ES-C1M-C-CO2	ES-C4F-S-CO1	ES-C4M-S-CO2	ES-BBC-5-3 BK	ES-BBC-MF3
Item no.	1231072	1231071	1231074	1231073	1231076	1231075	1155599	1155605
Connection method	Crimp	Crimp	Crimp	Crimp	Spring-cage	Spring-cage	Spring-cage	-
Contact	Female	Male	Female	Male	Female	Male	Fork for busbar	-
Rated voltage	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC	1500 V DC	-
Rated current	38 A	38 A	38 A	38 A	35 A	35 A	120 A	-
Connection type	Crimp	Crimp	Crimp	Crimp	Spring-cage	Spring-cage	Spring-cage	-
Degree of protection	IP66 / IP68 (2 m / 24 h) (plugged in)	IP66 / IP68 (2 m / 24 h) (plugged in)	IP66 / IP68 (2 m / 24 h) (plugged in)	IP66 / IP68 (2 m / 24 h) (plugged in)	IP66 / IP68 (2 m / 24 h) (plugged in)	IP66 / IP68 (2 m / 24 h) (plugged in)	IP20	-
Color	Blue-black	Red-black	Red-black	Blue-black	Red-black	Blue-black	Black	Black
Remark	-	-	-	-	-	-	-	For 1155599

Charging infrastructure

Electronics housings for building custom DIN rail devices for charging stations

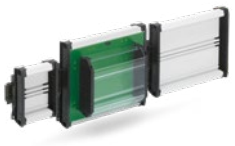
Do you develop your own DIN rail components for charging infrastructure, such as charging controllers or energy meters? Then our electronics housings provide comprehensive protection for the sensitive electronics of these devices.

With our extensive range of housing systems, which include modular and customizable options, you can realize optimum solutions.

Your advantages

- Customizable components for specific e-mobility applications
- Electronics housings, connection technology, services, and accessories from a single source
- Comprehensive support for your device development process

Our product recommendations for your charging infrastructure application

					
Product family		**ICS**	**ME-IO**	**BC modular**	**UM Pro**
Typical application		Charging controller	Charging controller	Energy meter	Charging controller
Product type	**Lower part**	2203881 2203895 (filler) 2203891 (filler)	1103436 (graduated) 1103440	2202951	Complete set 2200310
	Upper part	2203882 1215686 (with display)	2202626	1340863	Side element 2200174
	Cover	-	2201799 2202610	1335860 (with display and keypad)	2200310
	Header	1084018	2203783	-	-
	Connection technology	1102108	2201781 2202234	1135335	-
	DIN rail connector	1156781	1140958	-	-
	Accessories	1328715 (heatsink)	2201794 (lock-and-release)	-	-
Temperature range for operation		-40 … +105°C	-40 … +105°C	-40 … +105°C	-40 … +105°C
Degree of protection in accordance with DIN EN 60529		IP20	IP20	IP20	IP00
Material		PA - V0 (UL 94)	PA - V0 (UL 94)	PC - V0 (UL 94)	PA reinforced - V0 (UL 94)
Connection technology					
Connection direction		Top/bottom	Front	Front, top/bottom	Front, top/bottom
Conductor connection		Push-in, screw	Push-in	Push-in, screw	Push-in, screw
Connectors with header		✓	✓	✕	✓
PCB terminal blocks		✕	✕	✓	✓
THR		✕	✓	✓	✓
Locking function		✕	✓	✕	✕
PCB integration		Vertical	Vertical/orthogonal	Vertical/orthogonal	Orthogonal
Maximum usable PCB surface [mm²]		3500…22000	3370…6483	2200…13000	700 … 1200/cm
Conductor cross-section [mm²]		1.5 / 2.5	1.5 / 2.5	1.5 / 2.5	1.5 / 2.5 / >2.5
Others		RJ45, antenna, D-SUB, USB	RJ45	RJ45	RJ45, antenna, D-SUB, USB
Individual		✓	✓	✓	✓
Integrable standard components					
Keypad		✓	✕	✓	✕
Display		✓	✓	✓	✕
Heatsink		✓	✕	✕	✕
Light guide		✓	✓	✓	✓
DIN rail connector		8-pos.	5-pos., 8-pos.	8-pos., 16-pos.	Optional

For the complete portfolio of **electronics housings**, enter the web code on our website or scan the QR code.

Web code:
#2246

Everything for efficient installation of your charging stations and home chargers

Optimize the installation steps for your charging stations and reduce your workload: Efficient and professional wire preparation enables you to then wire all components quickly and reliably. It is therefore crucial that you choose the right tool.

With suitable mounting material and a wide range of marking solutions, you can also create order and clarity in the charging station, increase safety, and facilitate technical documentation.

Hand tools

Our hand tools for cutting, stripping, crimping, screwing, and measuring are characterized by their comfortable handling and superior quality. Professional tools are a prerequisite for excellent results. Our hand tools are all about precision, durability, and effectiveness.

Web code: #1929

Automatic tools

We offer innovative automatic tools for cutting, stripping, and crimping. Automate these three steps in your production processes, even for small and medium quantities. Achieve consistently high-quality results and save time and money with our automatic tools.

Web code: #2819

Worker assistance systems

Our clipx WIRE assist system enables efficient wire processing. The software-supported system guides users through the process of semi-automated wire processing, automatically controls the relevant output devices, and provides the necessary information based on CAE data.

Web code: #2715

Ferrules and crimp connectors

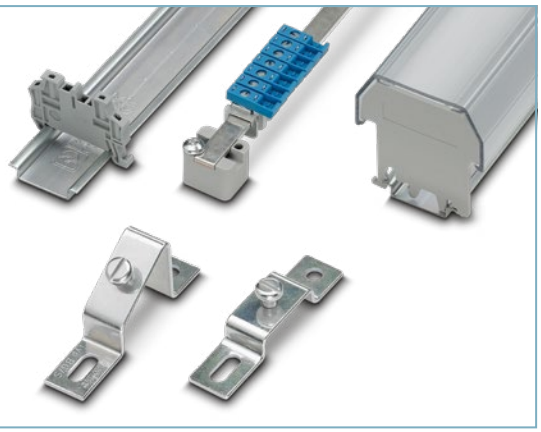
Process conductors professionally and safely – for durable, high-quality electrical connections. Our extensive portfolio of uninsulated and insulated ferrules and crimp connectors for conductor cross-sections from 0.14 to 240 mm² satisfies international standards and meets the requirements of industry and trade.

Web code: #3329

Mounting material

We offer a comprehensive range of mounting material for your charging stations and home chargers. Attach electrical connections and components quickly and safely using suitable mounting devices. Make the best use of the space available in the charging station by combining mounting materials.

Web code: #0573



Printing and marking systems

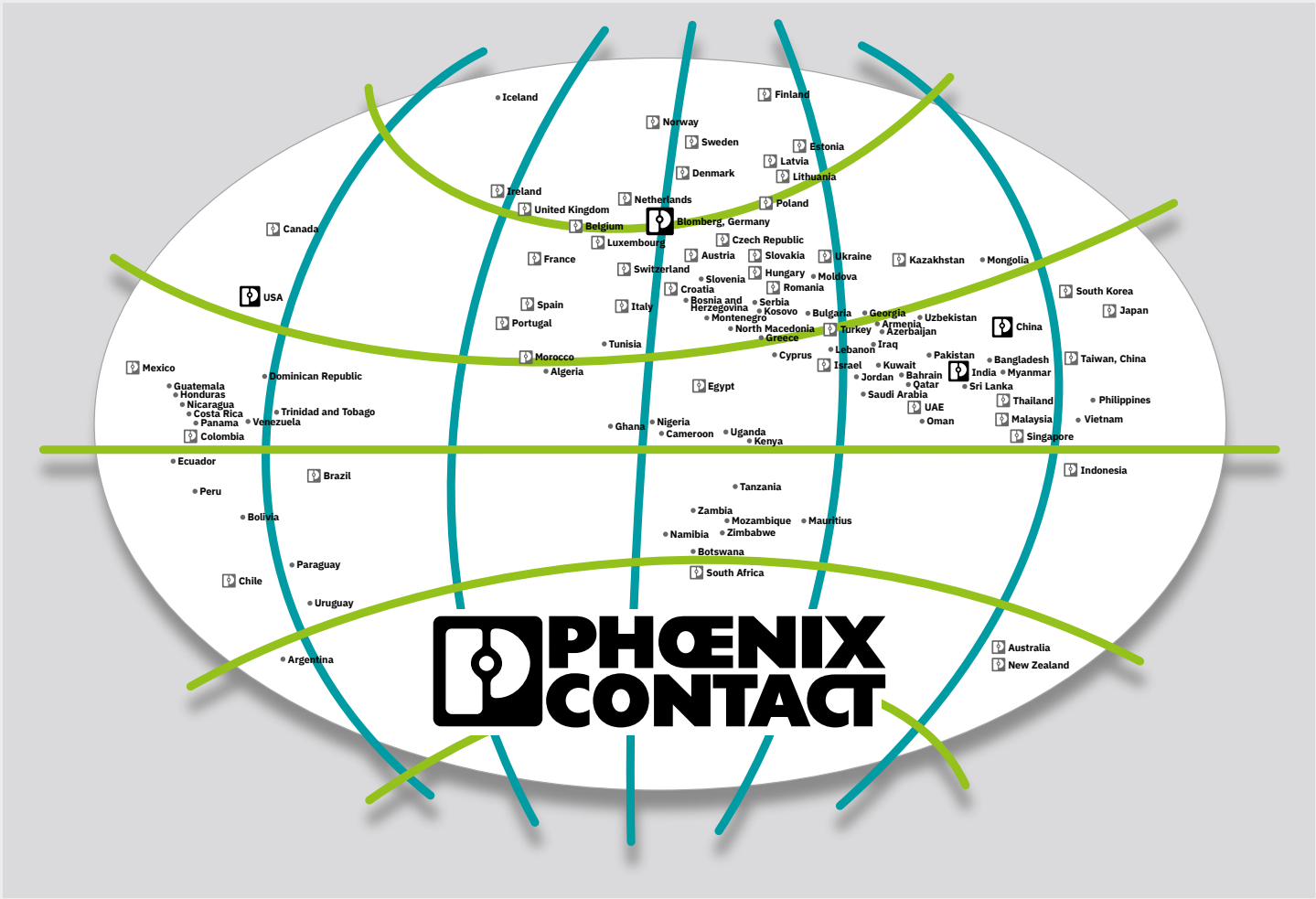
Characterized by their particularly intuitive handling, our printing systems make it easier than ever for you to create markings. Choose between direct laser marking, UV LED printing, and thermal transfer printing to mark terminal blocks, wires, and components in your charging stations.

Web code: #0849

Marking material

Our marking material is suitable for a wide range of applications in charging infrastructure: Numerous versions allow you to mark terminals, wires, and components, plus the charging station itself. The durability of the materials, even under extreme conditions, satisfies all international standards.

Web code: #0289



Open communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for producing future-oriented products and solutions for the electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network reaching across more than 100 countries with over 21,000 employees, we maintain close relationships with our customers, something we believe is essential for our common success.

Our wide range of innovative products makes it easy for our customers to implement the latest technology in a variety of applications and industries. This especially applies to the target markets of energy, infrastructure, industry, and mobility.

You can find your local partner at

phoenixcontact.com

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