

## CHARGE UP IN CONTROL – MENNEKES LOAD MANAGEMENT

Intelligent charge and load management for operational safety and cost control



# CHARGING SAFETY - THE NEXT GENERATION

With the growth in Electric Vehicles on our roads, many electric vehicles now have to be charged simultaneously. This in turn poses challenges for the charging infrastructure, for which MENNEKES offers appropriate solutions.

In future, when employees, customers and guests want to charge their vehicles on your premises, there will be peak periods of demand. Accordingly, a great deal of charging power should be available at these times. Intelligent load management is required to ensure that the power supply is trouble-free and reliable. This guarantees operational safety and increases the availability of the charging points.

As long as sufficient power is available for all connected vehicles, they can charge with full power. If total used by all of the charging points exceeds the maximum specified value, the MENNEKES load management system is activated. The charging currents for the charging points are reduced. It is guaranteed that the value of the adjustable current at each charging point does not fall below the minimum level. In this way, MENNEKES products ensure high availability and operational reliability. In addition, extremely costly peak demands on the power supply are avoided.



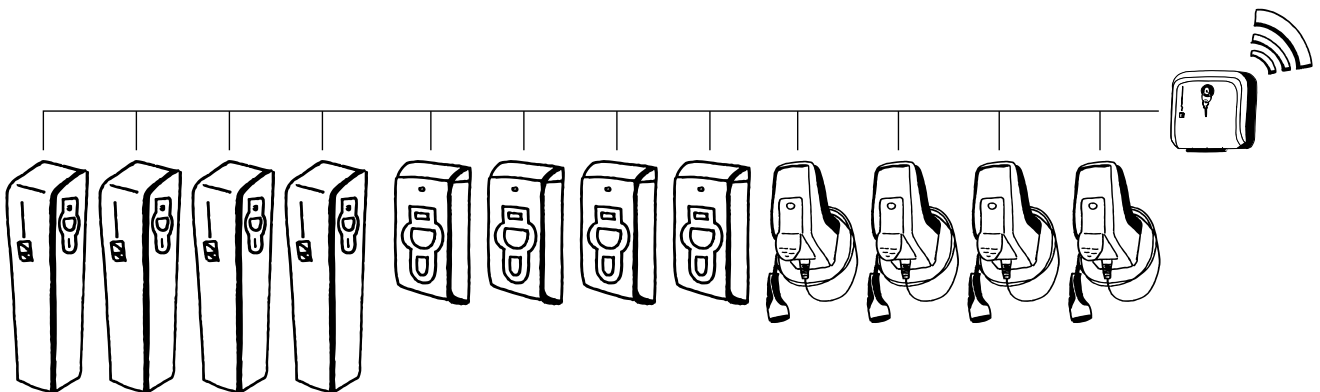
# DYNAMICALLY CONTROL CHARGING CURRENTS - WITH INTELLIGENT LOAD MANAGEMENT

The design and operation of a networked charging infrastructure requires good planning. In addition to simply setting up the appropriate hardware, seamless integration into the corresponding energy management provision of a company, property or fleet operation are critical.

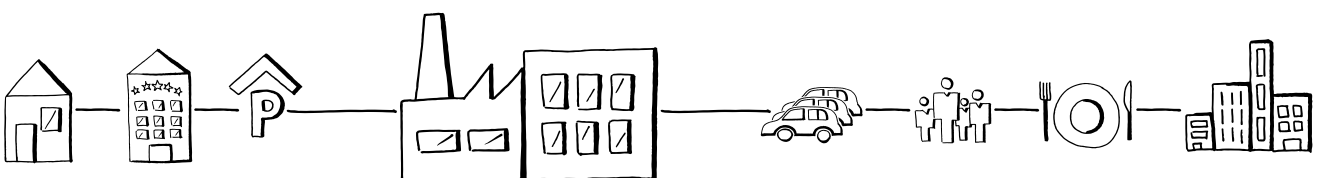
The solution is intelligent, automated load and charge management. Specifically, this means that each vehicle to be charged can be supplied with the required power. With intelligent and automated load and charge management, up to 16 charging points of different types can be integrated on one supply.

This ensures that your operating and cost security is always preserved when many vehicles are charging at the same time.

MENNEKES offers this important component as an essential element of networked charging solutions for controlling the operation of several charging points intelligently and economically. Just as the requirements for electric mobility solutions are constantly developing, MENNEKES works extremely hard to constantly expand the functions of its charging solutions. Charging solutions by MENNEKES stand for safe charging, optimum power distribution and cost-optimisation at all times.



MENNEKES E-Mobility.  
Intelligent, networked charging solutions.  
Made in Germany.



# OUR CLAIM: EASY HANDLING, OPTIMAL USE

For your charging systems to be integrated into the load management system, they must be networked with the same "Accounting Control Unit (ACU)". An ACU serves as an interface between charging points and the load management system. It is located, for example, in the MENNEKES E-Mobility Gateway or in the "Smart" charging systems.

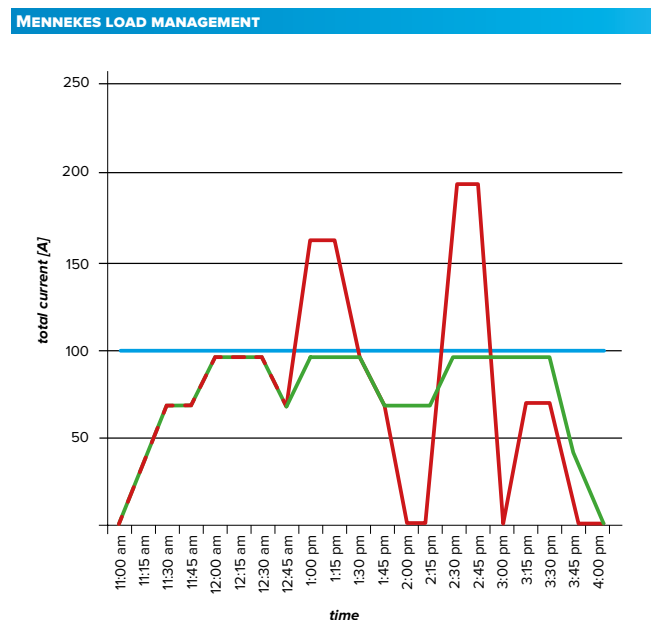
If sufficient power is available for the connected electric vehicles, no action is necessary. The MENNEKES load management system only intervenes in the charging currents of the individual charging points when the sum of the currents exceeds the maximum set current. This avoids the power peaks that can occur when many users want to charge their vehicles at the same time.

In addition, the system simultaneously ensures that a configured minimum current is not undershot. This minimum current is permanently available to all connected vehicles.

The equipment design is remarkably simple. The installer or technician enters two parameters via the password-protected web interface of our ACU:

1. The value of the maximum power supply current, and
2. The value of the minimum charging current

The maximum current can be freely selected by the user - for example, the rated current of the fuse in the energy distribution for the common supply line of the charging points. If, in addition to the charging stations, there are other consumers on the same supply line, their consumption can be reserved through the static reduction of the maximum current. Load management ensures the operational reliability of all connected devices. The value of the minimum current is equally effective for all charging points. With this parameter, the operator is able to adapt its charging infrastructure to the minimum current requirements of electric vehicles.



- total current (adjustable)
- without load management
- with load management

# LOAD MANAGEMENT - UPDATE WITH NEW FUNCTIONS

Our features allow you to automatically distribute the load in your networked charging infrastructure. This function is important if, for example, you have more charging points in operation than the power that is available to you.

The new function automatically ensures that the charging points in use are treated equally with regard to the electricity they consume. With the update, the system now also automatically detects the end of charging of a connected electric vehicle. When an end of charging is detected, the management system releases the previously required charging power for other users without the driver of the electric vehicle having to intervene by pulling the plug. The released current is automatically distributed to the charging vehicles in the order of the connection times.

Once the connected vehicles are charged, therefore, they can also be supplied with electricity for further charging cycles at a later point in time.

Thus, the system always guarantees optimum utilization of the total available energy. For local networking without an external backend, MENNEKES provides another new function: You can define "VIP users" within your locally integrated user administration. After your authorisation, these form a separate group with regard to load management.

This group thus forms its own "control loop" and gets preferential treatment over the rest of the users. For this reason, a reasonable ratio of users to VIP users is crucial. According to experience, only 20-30% of all permanent users should get VIP status. For example, this gives you the possibility to set up exclusive parking spaces or to adapt the charging infrastructure to the individual needs of the users.





# EVERYTHING AT A GLANCE

## Intelligent, optimal control of your charging infrastructure

**Perfect cost management.** You avoid power peaks in the energy network, for example when ten vehicles charge simultaneously. So you have your energy costs under control. Load management is an important independent component in the energy management concept of your company, property or fleet car park.

**Optimal control.** Control of the charging points, taking account of the maximum and minimum current - whether for companies, hotels or fleet operators, which operate several charging points and at the same time have a limited connected load.

**When using without an external backend: VIP users.** From now on, it is possible to define VIP groups for local networking, e.g. for exclusive guests, couriers or the CEO. The MENNEKES load management system can be retrofitted at any time if you already have an appropriate networked charging infrastructure.



### MENNEKES Charging Columns

2 charging points (maximum of 22 kW) per column, with and without an integrated E-Mobility Gateway, individual foiling possible



### MENNEKES Wall Charging Station

With and without fastened charging cable, 1 charging point (maximum 22 kW), individual foiling possible



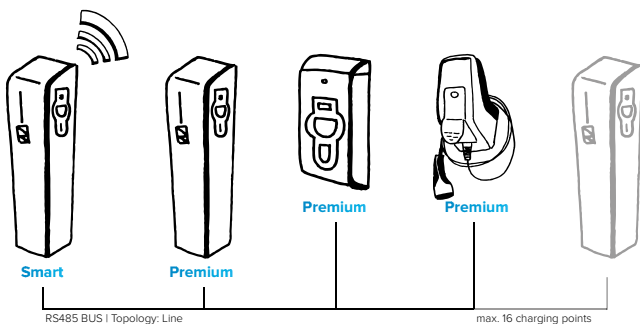
### AMTRON Wallbox

With and without fastened charging cable, suitable for wall or floor mounting (accessories required), 1 charging point (maximum 22 kW)

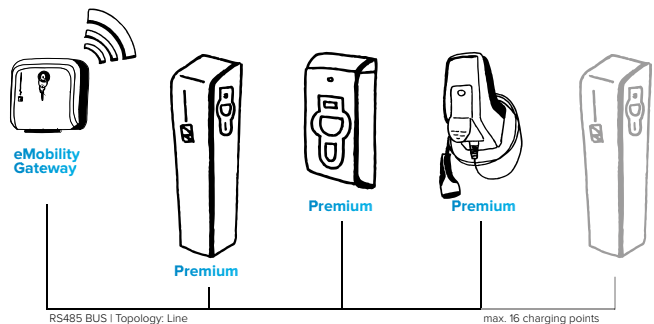


### E-Mobility Gateway

For the networking of up to 16 charging points, with integrated, local load management, OCPP for backend connection or local user administration



### Master Satellite



### External E-Mobility Gateway

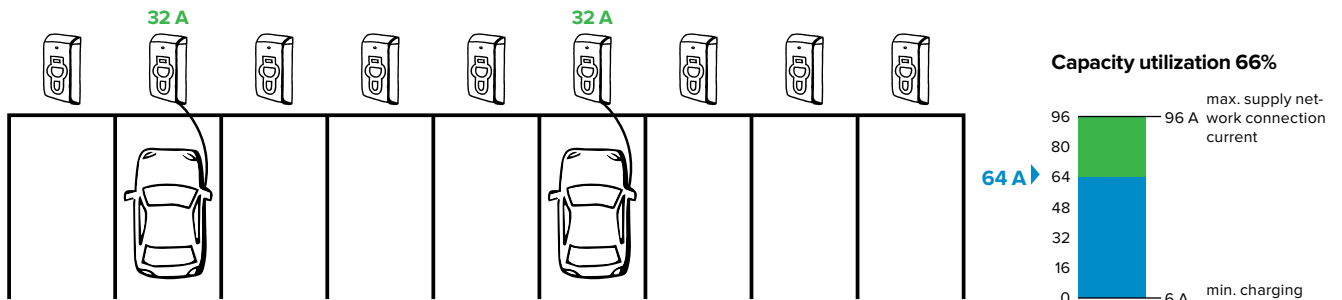
# AS IN HOTELS, COMPANIES AND FLEETS, MODERN LOAD AND CHARGING MANAGEMENT IS USED

Load management is of interest to many user groups. Mainly, this professional application is aimed at companies who want or need to embed their charging infrastructure into their operation in an optimal manner. Approaches and solutions are also available for building owners or operators as well as for hotels and parking garages.

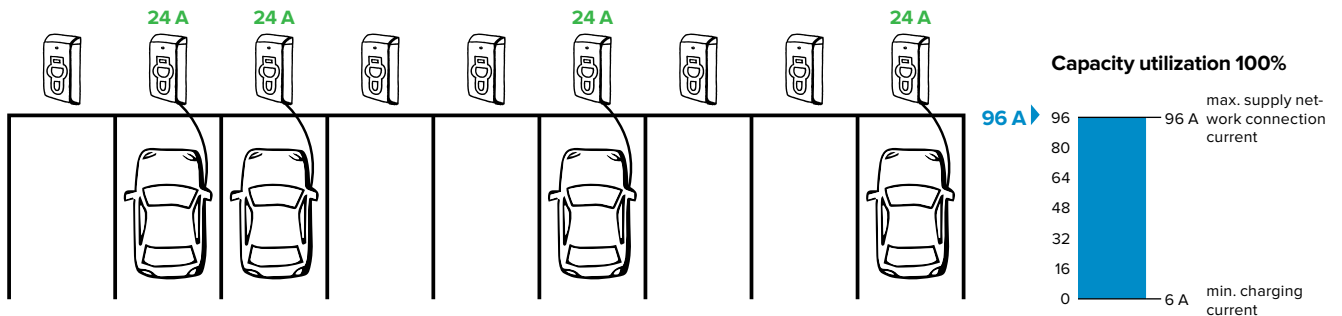
The design of the charging infrastructure in companies has various objectives, in order to meet a wide range of needs: employees, service vehicles, a fleet to be electrified, infrastructure safety, easy to control, simple billing and/or control of energy, and cost control.

## Application examples

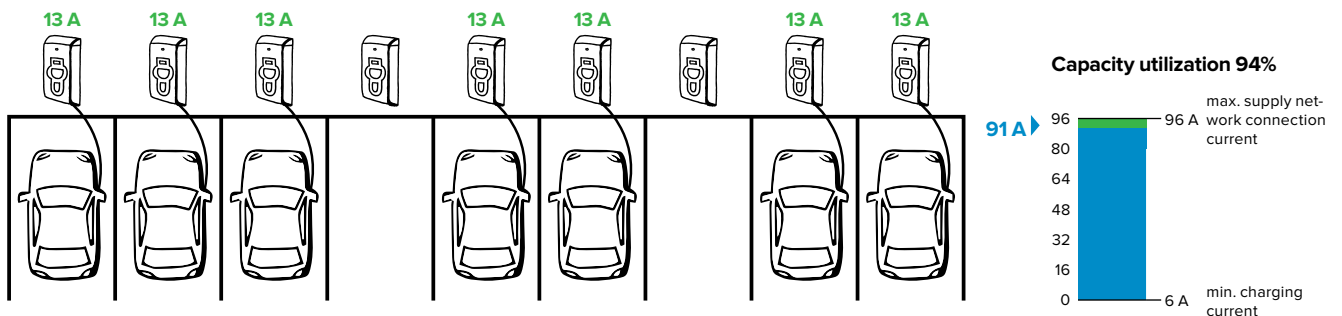
Two cars charge with a charging current of 32 A each. Regulation is not required as there is sufficient power available.



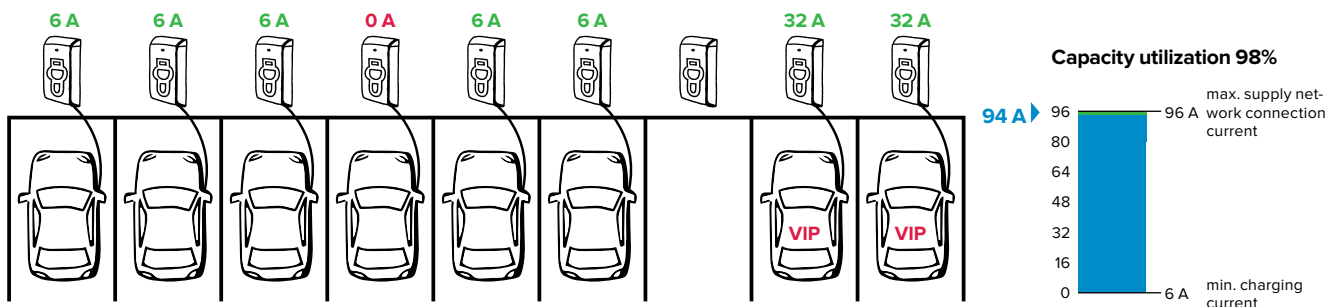
With four connected vehicles, the charging currents are evenly reduced to 24 A.



With seven connected vehicles, the charging currents are further reduced to 13 A. The capacity utilization is optimised.



Application with two VIP users: These VIPs receive the maximum charging currents, all other charging currents are reduced. One vehicle has to wait until an end of charging is detected and sufficient power is again available.

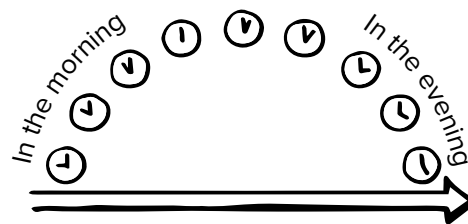


## EXAMPLE 1 - COMPANIES CHARGING EMPLOYEES' VEHICLES

More and more employees are using electric cars or plug-in hybrid vehicles to get to work. Here, the vehicles are often parked in staff car parks for 8 to 10 hours and also need to be charged during this time. For the design of an electro-mobile infrastructure, initially a number of charging stations with lower charging capacities per charging point - e.g. 3.7 kW - are sufficient. The infrastructure can then grow slowly with the number of vehicles. In order not to exceed the limited power available, the use of a load management system is recommended.

The vehicles are charged in the order in which they were connected. The available power is evenly distributed. If the total capacity is insufficient to charge all the vehicles at the same time, the last vehicles to be connected have to "wait".

When an end of charging is detected for a vehicle, the charging of a "waiting" vehicle begins. Thus, all vehicles can be serviced during the working day. The charging processes are automatically shifted in time. Optimum power distribution is guaranteed.



Uniformly distributed charging power

## EXAMPLE 2 - COMPANIES AND FLEET OPERATORS CHARGING OF POOL, SERVICE OR FLEET VEHICLES

Companies are increasingly using electro-mobility in their fleets. The vehicles must be available with high capacity, which means that they have to be charged quickly with maximum power where they stand. It is therefore recommended to design charging stations with a capacity of up to 22 kW.

Charging begins as soon as the vehicles are plugged in. If many vehicles are connected at the same time, a high power requirement is created.

Using load management ensures that no high and thus very expensive power peaks are generated in the supply. Operational safety is also guaranteed, as it is ensured that the fuse protection in the supply is not overloaded. In local networks, it is also possible to assign priorities and define "VIP users", so as to always facilitate the maximum charging power for specific vehicles.



High power requirement & optimal utilization

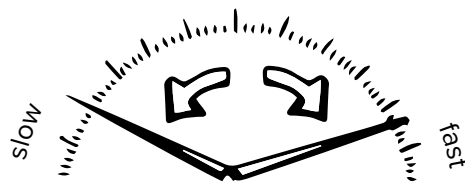


## EXAMPLE 3 - HOTELS

### INDIVIDUAL SERVICE FOR THE HOTEL GUEST

For hotels, the requirements on the charging infrastructure are very similar to those of a normal company. However, the use differs according to the charging needs of the hotel guests. If, similar to an employee, a guest's vehicle is idle for a lengthy period, limited charging power suffices. In addition to safe charging with guaranteed minimum power, the hotel operator's focus also lies on the subject of billing, which can be processed, for example, via a rate charge on the guest's hotel bill (cf. business package or similar).

If a guest spends a short time in the hotel and needs a quick charge, it is advisable to set up parking spaces with the VIP function, in order to ensure high charging power for this vehicle. The hotel bill could then include a comparatively higher amount for the "charging" service.



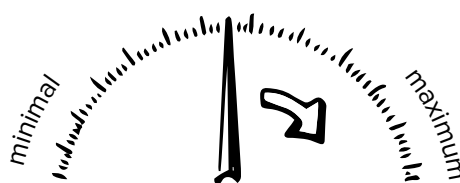
Individual power distribution

## EXAMPLE 4 - PARKING GARAGES

### OPTIMAL BILLING AND ORGANIZATION OF CHARGING POINTS FOR PARKING GARAGE OPERATORS

The charging infrastructure in parking garages continues to expand. It is therefore all the more important to be able to distribute the limited supply output to as many charging stations as possible. By using load management, the operator can provide the user with the advantage of guaranteeing a minimum charging current, without compromising operational safety. A specific example: A maximum current of 250 A is available in the parking garage. 20 charging points are to be operated.

Load management can ensure that the set minimum current of 12 A is never undershot. If there is free capacity, then the connected vehicles are loaded even faster with greater power. For its minimum guarantee, the parking garage operator can individually determine its tariff and bill accordingly for each charging point.



Guaranteed minimum current

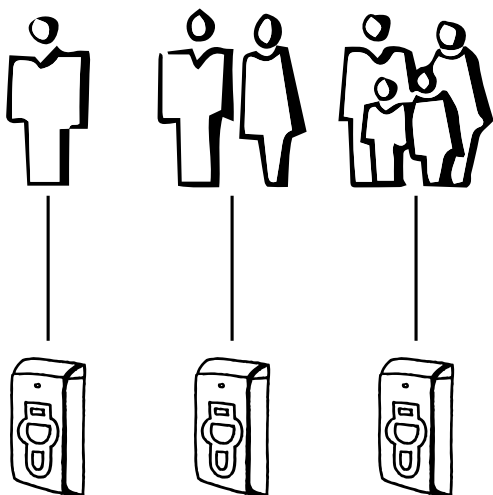
# EXAMPLE 5 - LANDLORDS AND TENANTS

## LOAD MANAGEMENT, USER MANAGEMENT AND COST ALLOCATION

### A. Building with private apartments

In such buildings, the vehicles often stand at the charging station for 8 to 10 hours. Charging stations with charging capacities between 3.7 kW and 11 kW are usually installed. As a landlord (for example of an apartment building), in addition to load management the organisation of charging point access is also important to you. You can arrange this conveniently with the E-Mobility Gateway.

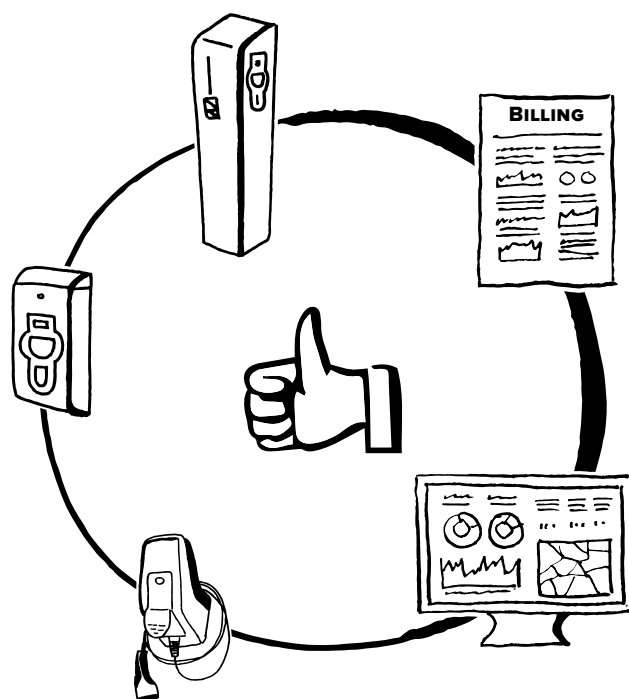
Specially installed counters, which are integrated into the charging station or in the energy distribution, are used to identify the data relevant to billing. For you as operator, the E-Mobility Gateway can also provide you with intermediate values (transaction list).



### B. Commercial building

In a commercial building, the facility manager controls the charging infrastructure. Whether long standing times with low charging capacity per charging point (e.g. for a private tenant) or short standing times and high charging capacities (e.g. for a commercial tenant), the right solution has to be provided.

From load distribution to user management and billing - MENNEKES offers the right solution for the specific local situation.



You too can find your own customised charging solution - with modern load management! Contact us.

More information at [www.chargeupyourday.de](http://www.chargeupyourday.de)

MENNEKES E-Mobility. Intelligent, networked charging solutions.  
Made in Germany.

# MENNEKES, A STRONG PARTNER

Whether you are building a stand-alone solution or a networked charging infrastructure: through our experience gained in the business with industrial plugs and connectors, we know the operational conditions for indoor and outdoor use. Reliability and operational safety are two essential requirements for a professional charging infrastructure. If your charging stations don't work, you can't charge vehicles. MENNEKES is a pioneer of modern electro-mobility and to date has supplied several thousand charging points, many of which are networkable systems.

In addition to the hardware for different fields of application in public and semi-public spaces, MENNEKES and its partner network provide assistance with planning, installation, commissioning and maintenance. Since 2016, MENNEKES, together with powercloud GmbH and Rhein-Energie, has been operating the modular, cloud-based "chargecloud" software solution for the operation of charging points, customer management and the billing of charging processes. When it comes to intelligent charging solutions, many companies rely on the professionalism and competence of MENNEKES.



**MENNEKES**

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