

witty.park charging station

The development of charging infrastructure for electric vehicles: a market with potential for the electrical industry



Electric vehicles are unquestionably on the rise. Against a backdrop of climate change and with the transition to renewable energy already under way, electrically powered vehicles can no longer be ignored. Alongside this technology, an extensive nationwide charging infrastructure must be built, covering private, semi-public and public locations.

This opens up excellent opportunities for the electrical industry, as the charging stations which form part of the infrastructure must be incorporated into domestic electrical installations. Tapping into these opportunities requires the right expertise and products.

Hager offers a comprehensive range of charging station solutions for the private and semi-public sectors, designed to be connected to conventional meter cabinets and modern electronic domestic meter advanced technology systems. Hager charging stations comply with EN 61851. Two designs are available: one with an IP54-rated housing made of robust sheet steel for use in freely accessible outdoor locations and one with foam-filled, UV-resistant plastic for installation in sheltered locations such as garages.

A high degree of flexibility: an invaluable feature
Different charging cables can be ordered with male or female connectors, thus making the charging stations compatible with all models of electric vehicle and suitable for the most common type of charging, **Mode 3**. In this case, the charging station communicates directly with the electric vehicle, regulating the charge current. Charging via **Mode 2** is also possible, using a conventional SCHUKO® socket. Various charging cables for connecting the charging station to the electric vehicle are available for single-phase and three-phase charging with currents from 16 A to 32 A. Either 230 V or 400 V

supply voltages can be used. The charging stations also use several interfaces, enabling managed charging methods such as the use of solar PV power. The charging stations are even designed so that they can be integrated into a LAN at a later date and are thus future-proofed to meet changing requirements.

RFID prevents unauthorised charging

Charging stations with built-in RFID (radio-frequency identification) technology are recommended for use in the semi-public and commercial sectors.

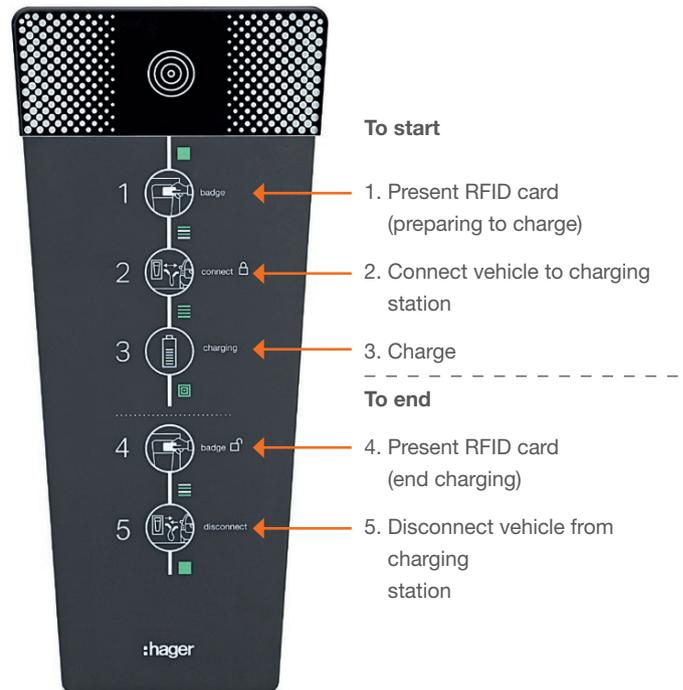
This enables charging stations to be activated only by authorised individuals. Users are identified by holding an RFID card in front of the RFID reader. Hager's new witty.park charging station is equipped with this RFID technology and is therefore suitable not only for use in homes but also for rented properties or semi-public facilities such as underground car parks.

A charging point on both sides, each with 22 kW output, provides another feature which makes the new witty.park suitable for a range of uses: two shuttered **Mode 3** sockets can supply all common models of electric vehicle with three-phase charge currents of up to 32 A. Two further **Mode 2 SCHUKO®** sockets supply vehicles with smaller batteries such as electric bikes with single-phase currents of up to 16 A. Two electric cars or two electric bikes can therefore be “refuelled” at the same time using this charging station. The corresponding charging cables are available as an option.

Easy to use

A decisive factor for the acceptance of new technology by users is whether it is easy to use. To ensure that the equipment is user-friendly and that it can be marketed successfully by the electrical trade, Hager has provided operating instructions which are easy to understand. Intuitive symbols lead the user through the charging process in five steps.

The current charging status is shown by a green LED on the right and left respectively.



Technical installation requirements

A range of technical safety regulations must be complied with when fitting and connecting charging stations to domestic electrical installations. Each charging point must thus generally be protected by a circuit breaker and an RCD (residual current device). This means that, in the case of the new witty.park with its charging point on either side, each station requires installation of two circuit breakers and two RCDs. The protective devices are generally installed in the meter cabinet or distribution board outside the column, as they are not built into the charging stations during manufacture.

This is not necessary when the witty.park is installed with the optional pedestal as a Hager Vector compact distribution board can be used in the pedestal to house the protective devices. In this case, the charging station can be supplied via a cable of sufficient size; where the charging station is wall-mounted without the pedestal, two protected cables are required.

When choosing the appropriate circuit breakers it is also necessary to ensure that they are matched to the cable gauge. The RCDs must be of type A minimum (sufficient for single-phase, 16 A); a type B RCD must be installed if DC residual currents could potentially exceed 6 mA.

Planning for future requirements

In order to future-proof customer facilities to meet changing electric vehicle requirements, it is always advisable to plan for an additional meter panel for charging stations in new buildings or when undertaking extensive renovations. This applies to both owner-occupied homes and rented properties, whose value can be viably increased by the installation of electric vehicle charging stations and additional meter panels.

Contact	Voltage	Function	Colour
L1	230 V AC	Phase 1	Brown
L2	230 V AC	Phase 2	Black
L3	230 V AC	Phase 3	Grey
N	-	Neutral	Blue
PE	-	PE	Green/Yellow

Common charging modes: Modes 1, 2 and 3

Different charging processes are used depending on the battery size and charging capacity of the electric vehicle and are specified in detail in IEC 61851. In general, the higher the charging capacity, the quicker and more comfortable the charging experience, though the stricter the safety requirements.

Mode 1 charging

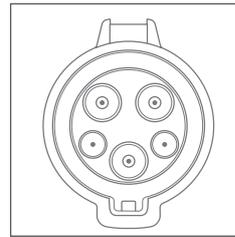
Mode 1 charging enables the electric vehicle to be connected via a standard single-phase socket with currents of up to 16 A. This method requires the use of an RCD and an overcurrent protection device. Mode 1 is mostly used for small electric vehicles such as electric bikes and scooters. Lengthy charging at 16 A and over using sockets should, however, be avoided due to the high load involved.

Mode 2 charging

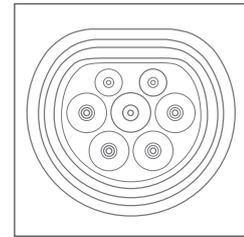
Mode 2 charging enables single-phase charging with a maximum of 16 A using standard sockets. It differs from Mode 1 in that the charging cable must incorporate a charging control system. This charging control system ensures the charging cable is suitable for the electric vehicle and provides the vehicle with the maximum allowable charge current using pulse width modulation in accordance with IEC 61851. Most vehicle manufacturers supply a Mode 2 charging cable (essentially as a fall-back charging cable) with their vehicles. Hager charging stations with SCHUKO® sockets ensure compatibility with all vehicles.

Mode 3 charging

Mode 3 is the most common charging method. Due to the high charging capacity, it requires a fixed charging station which must be installed by a qualified electrician.



Type 1,
single-phase, 16 A



Type 2 (male/female connector),
three-phase, 16/32/63 A

Single-phase or three-phase charge currents of up to 32 A are permitted. The charging station communicates directly with the electric vehicle and regulates the charge current. This mode requires a specific type of plug and socket.

Connector systems for electric vehicles

There are generally two connector systems available for connecting electric vehicles to charging facilities:

Type 1 connectors, still commonly used but which only allow single-phase charging; and Type 2 connectors, which have become the standard type in Europe. The appropriate charging cable is required to charge electric vehicles using Type 1 or Type 2 connectors. Hager charging stations are designed exclusively for use with a Type 2 socket for Mode 3 charging.

Connecting charging stations to the domestic electrical installation

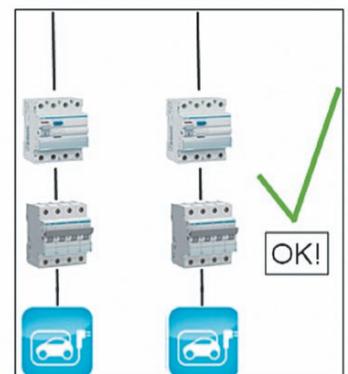
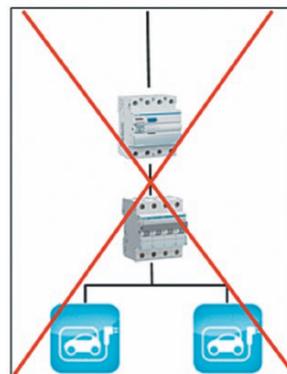
As indicated on page 2, charging electric vehicles places a particular load on the domestic electrical installation. Due to the lengthy periods of high current drawn during charging, particular care must be taken when connecting charging stations. The following requirements must therefore be complied with:

Connect to separate circuits

Connecting to the meter panel, which acts as an advanced technology system, requires a minimum 5 x 10 mm² cable; cables must be installed in accordance with local regulations. This means that each charging station generally requires a separate supply circuit.

Connecting several charging stations to the same circuit is strictly prohibited. Each charging station must be protected by its own RCD and its own circuit breaker. The cable sizes must be chosen accordingly.

With regards to residual current protection, the current draft of IEC 61851 stipulates explicitly that each charging point must be protected by its own RCD and that the rated residual operating current must not exceed 30 mA. The protective device must be able to switch off all phases including the neutral wire. For single-phase connection, type A protective devices are sufficient. However, if DC residual currents of more than 6 mA are expected, the standard requires use of a type B RCD. The use of this type of RCD is generally recommended.



It is important to note that the required protective devices are not incorporated in the witty.park charging stations and must therefore be installed in the meter cabinet or distribution board.

Charging station with two charging points for electric vehicles

Description	Pack Qty.	Price Group	Trade Price	Cat ref.
Park charging station COM 2x M3T2 32A 3ph& 2x M2 16	1	H06	€3,400.00/prt.	XEV653C



XEV653C

Accessories for charging station with two charging points for electric vehicles

Description	Pack Qty.	Price Group	Trade Price	Cat ref.
Pedestal for witty.park XEV6xx	1	H06	€480.00/prt.	XEV426
Wall bracket for witty.park XEV6xx	1	H06	€170.00/prt.	XEV427
Base for pedestal XEV426	1	H06	€130.00/prt.	XEV428



XEV426

Charging cable for witty charging station

Description	Pack Qty.	Price Group	Trade Price	Cat ref.
Charging cable Mode 3 T2+T1 20A 1ph sw	1	H06	€493.90/prt.	XEV42151611
Charging cable Mode 3 T2+T2 20A 1ph sw	1	H06	€520.10/prt.	XEV42251611
Charging cable Mode 3 T2+T2 20A 3ph sw	1	H06	€532.70/prt.	XEV42251631
Charging cable Mode 3 T2+T2 32A 3ph sw	1	H06	€604.10/prt.	XEV42253231



XEV42151611

RFID cards

Description	Pack Qty.	Price Group	Trade Price	Cat ref.
Set of 20 RFID cards for users	1	H06	€111.40/prt.	XEV308



XEV308