

Electrician's guide

Guide to installing a charging station for electric cars

When installing a charging station for electric cars (the technical term being “electric vehicle supply equipment”, or “EVSE” for short), special regulations that extend beyond the well-known VDE standards (setting up high-voltage installations) are to be observed. The requirements are described in detail in DIN VDE 0100-722 (Low-voltage electrical installations – Part 7-722: Requirements for special installations or locations – Supplies for electric vehicles; adopted in German with HD 60364-7-722:201) and apply to every terminal.

A terminal can be both a charging station and a common domestic socket used to charge an electric car. We have summarized for you the most important points to consider when installing a charging facility for an electric car – from the basic requirements for installing a charging station for an electric car, to selecting a suitable location for the charging station.

The right charging station for your customer

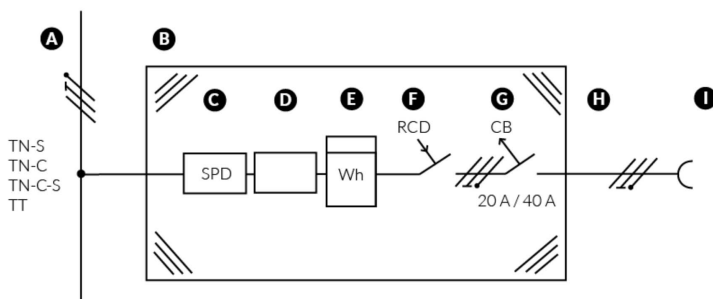
As an electrician, you know that the domestic socket is not the best choice for continuously charging an electric car. The advantages of a charging station are the shorter charging time, greater convenience, not to mention significantly higher performance – this also goes hand in hand with future-proofing, since electric car batteries are getting bigger and bigger.

The charging cable for the power socket (mode 2 charging cable) supplied as standard remains in the electric car for use when out and about. For everyday use, the electric car is easily charged at the charging station without dirty hands. You can find out what you need to consider when choosing the right charging station in our Knowledge Center post entitled [“Six things I have to consider when buying a charging station for my electric car”](#).

Schematic diagram:

From connecting to the power grid to the charging station

Installation scheme principle (recommendation)



- A Mains
- B Fuse Box
- C Lightning protection (optional)
- D Main / preliminary fuse
- E Meter
- F Residual current device:
 - type A RCD
 - type B RCD or, alternatively,
 - type A RCD with EV with DC detection
- G Circuit Breaker:
 - tripping characteristic C
- H Separate power circuit
- I Charging unit (according to VDE 722)

Checklist:

Five points that must be met when installing a charging station

1 | Have the charging station and length of the charging cable from the charging station to the electric car been chosen to suit the installation site (indoor or outdoor)?

- The installation site must correspond to the charging station's protection class (e.g. IP 54; see the installation instructions).
- Most charging stations are suitable for both indoor and outdoor use
- We advise using weather protection to preserve the charging station's appearance.
- When choosing the length of the charging cable, take into account the direction the customer prefers parking in and the position of the plug-in connection on the electric car.
- The charging cable should not pose a tripping hazard when plugged in.

2 | Is there a circuit breaker for a separate power circuit?

- Each charging point must be connected using a separately fused cable.
- The circuit breaker (fuse) is to be selected to suit the cable's load capacity and the charging station's charging power.
- The manufacturers of our charging stations recommend tripping characteristic C.

3 | Is an RCD available or integrated for each charging station?

- Each charging station must be protected by means of its own RCD. Note that some charging stations already have an integrated RCD.
- Depending on the charging power and which electric cars are to be charged at the charging station, an appropriate RCD is to be used.
- A type A RCD is adequate if the following three conditions are met:
 - Single-phase connection
 - The electric car being charged is guaranteed not to cause smooth DC residual currents (see the manufacturer specifications, or just ask the experts at The Mobility House)
 - The owner of the charging station ensures that no electric car is charging at the charging station where smooth DC residual currents may occur during charging
- A type B RCD or type A RCD with EV with DC residual current detection is required when the following are present:
 - Three-phase connection
 - Smooth DC residual currents can occur during charging at the electric car to be charged, or it cannot be ruled out that an electric car is charging at the charging station at which smooth DC residual currents can occur during charging
 - The Mobility House recommends charging stations with a built-in residual current device to solve the above problem in an affordable and straightforward way

4 | Are the cable length, cross-section and routing type designed for 22kW (32A)?

- We recommend already designing the cable for 22kW charging power for the future (five-core cable), regardless of the charging station or the electric car.
- Advantage: The charging capacity can be increased afterwards with little effort (electric cars will have higher charging powers and battery capacities in the future).
- The cables are to be sized according to the following four criteria:
 - Routing type
 - Voltage drop
 - Cable length
 - Required power or amperage
- We recommend using a cable with a cable cross-section of 2.5 mm² or greater for a charging current of 16 A and greater.
- Practical tip: We recommend flexible cables for connecting the charging station, especially with large cable cross-sections, for easier handling.

5 | Is the future viability for smart charging stations taken into account?

- We recommend a data connection at the charging station's installation site.
- A LAN cable should be installed unless a mobile data connection can be set up.
- Advantage: The charging station can be connected to billing systems and home management systems (e.g. for photovoltaic (PV) controlled charging)

If you ticked the box for every question, your customers can safely charge their electric car at their charging station.