About “e-cars” in general?

An electric car is a means of transport powered by one or more electric motors, whose energy storage can also be charged from an external source. Electric cars (abbreviated in English as EV - Electric Vehicle) can be divided into two large groups: cars driven purely by electric motors and cars not driven purely by electric motors. In the case of cars that are not driven purely by electric motors, electric drive is combined with other forms of drive:

Plug-in hybrid cars (PHEV - Plug-in Hybrid Electric Vehicle): compared to hybrid cars, they have a larger battery and external charging options.

Vehicles driven purely by electric motors are powered purely by electric motors.

Range-extended electric cars (REX): Range-extended electric cars are vehicles driven purely by electric motors, in which a small gasoline engine optimized for power generation is also installed. The gasoline engine charges the battery when necessary so that longer distances can be covered without external charging of the battery. Such cars are often referred to with the abbreviation REX, which is based on the English expression (range extender).

Purely electric cars (BEV - Battery Electric Vehicle): The energy is stored in a battery (currently of the lithium-ion type in most cases), they can only be charged from an external source, they do not contain an internal combustion engine and they are driven purely by electric motors. Essentially this is the type for which we use the term "e-car" or "electric car" in everyday speech.

What charging modes exist (MSZ EN 61851)

Mode1 - Slow charging from a household socket, without built-in protection. Not a typical application.

Mode2 - Slow charging (2.3-3.5 kW). Typical charging time is 8-12 hours from a household socket, via the electronic control device (ICCB) installed in the cable. The charging cable is a basic accessory of the electric car.

Mode3 - Normal charging (7.4-22 kW). Alternating current (AC) charging from a charging equipment with built-in control and protection functions. The estimated charging time, depending on the car's on-board charger, is 1.5-7 hours. The 22-kW versions are also called fast chargers.

Mode4 - High-power fast charging (over 40 kW). Direct current (DC) charging, also called lightning charging. The charging time, depending on the size of the battery, could be as short as 30 minutes until 80% charge.

In the case of charging points, it is stipulated that they may only be connected into a circuit that has standard protective grounding, protection against overcurrent and electric shock (current protection switch or RCD relay). The latter can be placed in the electrical distribution cabinet of the property or in the equipment itself.

A sudden disconnection of the mains voltage is not good for an electric car. Frequent switching on and off of the network during charging can confuse the vehicle's electronic system and also damage the batteries. When stopping the charging, it is advisable to gradually reduce the charging current to a certain value (which varies from vehicle to vehicle) and then switch off the charging. Therefore, if you want to interrupt charging before the car is fully charged, don’t do it by simply turning off the charger, but always do it at the vehicle, according to its user manual. This way the possible damage to the vehicle's electronics and/or battery cells can be avoided.

How should electric chargers be installed professionally?

Chargers may only be installed and put into operation by electricians with appropriate qualifications and authorization. Improper installation can be dangerous and cause damage to the vehicle as well.

If the charging point is to be placed outdoors, it must be checked whether it is properly protected against environmental effects. An important indicator of this is the so-called IP protection. Electrical equipment have a so-called IP number. This shows the degree of protection against mechanical and water penetration. The first digit of IP (Ingress Protection) refers to solid particle protection, the second to protection against water.

Protection against liquid and water Protection against solid objects

0 No protection 0 No protection

l Protected against vertically dripping liquid (water), e.g. precipitating water 1 Protected against objects greater than 50 mm

2 Protected against water splashing at most 15 degrees from the vertical 2 Protected against objects greater than 12 mm

3 Protected against water splashing at most 60 degrees from the vertical 3 Protected against objects greater than 2.5 mm

4 Protected against splashing water from all directions (non-damaging leaks are allowed) 4 Protected against objects greater than 1 mm

5 Protected against low-pressure water jets from all directions (non-damaging leaks are allowed) 5 Protected against dust, allowing for non-damaging ingress

6 Protected against strong water jets and immersion in water (short-term immersion, non-damaging leaks are allowed) 6 Completely protected against dust, dust-free

7 Protected against immersion in water for a limited time (depth of 0.15 to 1 m, for 30 minutes)

8 Can be used continuously under water for the duration specified by the manufacturer (depth greater than l m)