Ev charging level

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Electric vehicle (EV) adoption is accelerating faster than experts predicted. This accelerated adoption results from government incentives, an increased choice of vehicles, increased public and private funding for EV adoption, and a cultural shift to greener and cleaner vehicles helping to push down harmful emissions. With the rise in EV adoption, it is essential to understand the different levels of EV charging and how these levels of charging can affect the type of electric vehicle supply equipment (EVSE) you consider.

There are three EV charging levels; Level 1, Level 2, and Level 3. There are differences between each charging level. However, as a general rule, the higher the Level, the higher the power output from the charger and the faster it can charge.

Level 1 EV charging utilizes the slowest EV charger available, which provides between 1 kW and 1.8 kW of power through a standard 120-volt AC outlet. Level 1 EV charging is available in North America and uses a standard 3-prong household plug on one end and a J1772 (Type 1) EV connector on the other, which plugs into the vehicle. Level 1 chargers are unavailable in Europe due to standard residential electricity being 230-volt.

Level 1 is the slowest of the electric car charging levels and can take between 22-40 hours to fully charge a standard battery electric vehicle (BEV) from empty. An hour of charging with a Level 1 charger will give your EV between 3-7 miles (4-11 kilometers) of range. All Battery Electric Vehicles (BEVs) and Plug-in Hybrids (PHEV) can use a Level 1 EV charger, and they are usually provided free when purchasing the vehicle.

Level 2 EV charging is much faster than Level 1 and utilizes a 208-volt to 240-volt AC outlet in North America and a 230-volt (single-phase) or 400-volt (three-phase) outlet in Europe. In North America, Level 2 chargers top out at 19.2 kW (80A), and in Europe, it"s 22 kW. A Level 2 charger can come with various additional functions and features, such as RFID cards, load balancing, and OCCP (Open Charge Point Protocol) networking.

The EV connector type for North America and Japan is J1772 (Type 1); for Europe, it"s a Mennekes (Type 2) connector. Level 2 charging stations can be provided with tethered charging cables (hard-wired to the charging station) or untethered with just a socket (you plug in your charging cable). Currently, Level 2 EV charging is the most common level of EV charger installed globally. However, the installation of Level 3 chargers is growing.

A Level 2 charger can be as much as 19 times faster than a Level 1 charger, depending on the power output and the charge acceptance rate of the vehicle you are charging. An hour of charging with a Level 2 charger can provide a range between 10-75 miles (16-120 kilometers).

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Level 2 charging is the most common type used in public charging stations. Level 2 charging equipment can be installed at the home, workplace, and in many public locations such as hotels, retail parks, and supermarkets. It is the ideal charging level for overnight charging or while at work.

Level 1 EV charging and Level 2 EV charging are both defined as AC-type EV chargers. Before we move on to Level 3 EV charging it is important to understand the difference between AC-type EV chargers and DC-type EV chargers.

The power that comes from the electricity grid is AC. However, the energy used for an electric vehicle is stored in its battery, and a battery holds its power in DC. The difference between AC-type EV charging and DC-type EV charging is where the AC power is converted to DC power.

In AC-type charging, the AC is converted in the vehicle by its on-board charger, which is time-consuming; however, with DC-type charging, the conversion takes place in the charging station before the power is delivered to the vehicle, and as a result, it can bypass the limitations of the electric vehicle"s on-board charger and deliver more power. This is what makes DC EV charging faster than AC EV charging.

Level 3 EV charging is also called DC fast charging and is significantly faster than Level 2 EV charging. Level 3 charging stations are the market’s quickest and most powerful EV charging options. A Level 3 charging station utilizes a three-phase supply, 480-volt in North America and 400-volt in Europe, with chargers capable of outputting over 360 kW of power.

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