# Types of electric charging stations

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Charging is a big part of electric vehicle ownership, and knowing the difference between the types of charging solutions is key to getting the most out of your EV. Chargers are different not only in terms of the charging power they deliver and how quickly they can replenish range but also by their charging connector--some EVs require a specific kind of plug and you won"t be able to physically connect them to a charger if the plug type isn"t compatible.

Rating EV chargers by their charging power, they fall into three categories: Level 1, Level 2, and Level 3. Each corresponds to a range of charging power ratings that are limited both by the charger"s design and by the power of its connection to the electrical grid.

The slowest possible way to charge your EV is through a Level 1 connection. This type of AC (Alternating Current) charging ranges in power from 1 kW to around 2 kW, and it doesn"t require any special equipment to be installed in your home or any modifications to be made to your home"s electrical system.

Level 1 refers to you plugging your car"s supplied AC adapter into a wall socket in your home or garage. Ideally, you shouldn"t have any other high-demand appliances plugged into the same outlet so that you don"t overburden the system and cause overheating or the circuit breaker to trip.

The big advantage of Level 1 charging is its simplicity--you just plug your vehicle in without having to install any additional equipment. Another plus point is that this type of charging is better for the longevity of your EV"s battery pack since it doesn"t put a lot of thermal strain on the cells (it heats up the battery the least out of all the levels of EV charging).

Downsides include long charging times (it can take over 40 hours to fully charge some big-battery EVs and more than 8 hours to charge some new plug-in hybrids), reduced efficiency (especially if you live in an area where the local electrical grid has a 120-volt standard), and the usually low quality of the supplied AC adapter. BMW, for instance, refers to the Level 1 adapter that it supplies every EV with as an "occasional use charger," hinting that it would prefer you didn"t use it regularly.

Don"t expect your EV to gain more than 5 miles of range per hour when hooked up to a Level 1 connection. In Europe, where a regular wall outlet delivers 230 volts, the charging rate will be slightly quicker.

Investing in a Level 2 charger for your home is wise since it"s considerably quicker to charge than Level 1 (between 5 and 10 times quicker, depending on which chargers you"re comparing). It"s also safer with its separate dedicated electrical connection that goes straight into the breaker box, thus minimizing the possibility of an overload occurring and leaving your home in the dark. This way, you can also gain access to a more powerful 208- to 240-volt connection and a higher amperage.

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In Europe, Level 2 chargers run on the standard 230 volts, but for more powerful stations (like the ones that can deliver 19.6 kW or more), you will need to upgrade to a separate three-phase 400-volt connection.

Level 2 chargers can be wall-mounted (they are also known as wall boxes), and you can also find them attached to a pedestal as part of public charging stations, as well as in some office park parking lots or even on the edge of the sidewalk facing the road in some urban areas. You usually need to have your own charging cable to be able to plug in, although you will find the

Charging power varies between 3.6 kW and 19.2 kW (or 22 kW in Europe), although the latter is quite rare, and you usually see them going up to 11 kW. The time you spend waiting for your EV"s battery to top up on a Level 2 charger is considerably shorter than Level 1, and you should get a full charge in about 5 to 10 hours, depending on the power of a given charger and the size of the battery pack it needs to replenish.

Even though Level 2 chargers can provide up to 80 amps of current, most home chargers don"t go any higher than 40 amps, which is enough for a very respectable 9.6 kW. If you want a 48-amp charger that delivers over 11 kW to your EV, you will need special heavy-duty wires, and the installation will cost extra, which is why you rarely see these more powerful Level 2 chargers--they cost a lot more to install for only a marginal charging power gain.