

# Understanding EV Charging Stations: Watts, Amps, and Volts

## DESCRIPTIVE AUDIO SCRIPT

This is an animated video.

A woman backs her red electric vehicle into the garage. She takes the charging cord from a charging station that has a white lightning bolt on it and plugs it into her car.

In the living room, with a cup of coffee and a pen on the coffee table in front of her, the woman picks up and reads a spiral bound book that has the title, "EV User Manual".

On a page of the manual is a wide yellow/orange arrow labelled "Pressure" – it is pointing down a plumbing pipe.

The title says "Voltage is like water pressure." The next image shows water flowing through the pipe and arrows point in towards the sides of the pipe. Inside the pipe it says, "size of hose", and at the bottom of the page it says, "Current Flow Rate Equals Amps".

Over this image a title appears that says, "Amp rating – the maximum amount of electrical current that can be delivered to your vehicle's battery".

At the end of the plumbing pipe is a faucet and a glass below it. Next to the glass is a label that reads, "Your EV battery"

Water flows into the glass from the pipe and a title appears that says "V times A equals KW".

A circular label appears that says, "kw value equals charging rate."

As the narrator talks equations appear on the screen.

A green circle pops on the screen, it says, "Hours for a full charge".

A white car drives on a white road. There is a geometric city scape in the background. The Narrator's words are shown in titles. The white electric car is parked near a charging station with trees in the background.

A title appears on the screen that says "Maximum Charge Rate". An equation appears which shows, "Hours for a Full Charge" on the left and a proportion on the right which says, "Battery Capacity", on top and, "Vehicle charging rate or EV charging station output" on the bottom.

A full screen title on a light green background reads, "Level 2 – residential chargers"

typically range from 16 to 80 amps”.

There is an overhead perspective of the white car driving on a highway. A faster red car passes it. As the narrator discusses the equations they appear in titles on the screen.

In the EV manual we see a page with the Title, “Future Changes” with three squares that enlarge in turn as the narrator discusses each one. The first says, “All Electric Vehicles”, the second says, “Multiple Electric Vehicles”, and the third says, “Driving Habits”.

The last page of the manual says, “Enjoy your new EV”.

The woman waves good-bye to a PGE vehicle leaving her driveway as she plugs in her red EV inside the garage.

On the final slide bullet points with URL's in them appear as the narrator says them.

## **ORIGINAL VIDEO TRANSCRIPT**

- [Narrator] Charging stations are rated by kilowatts, volts, and amps. But what do those terms mean? And how do you choose the charging station that best fits your needs? To understand how EV charging works, think of the electricity flowing into your car like a plumbing system. The voltage, measured in volts, is like water pressure, and pushes electrical current to the charging station. The electrical current flow, measured in amps, is similar to the water's volume. The maximum amount of electrical current that can be delivered to your vehicle's battery is the amp rating. Volts and amps deliver kilowatts, kW, of power to your EV's battery, which means the kilowatt value listed in the charging station specifications is the rate at which your vehicle will charge. To determine how much power will flow to your car's battery multiply the volts by the amps and divide by 1,000. For example, a 240 volt level two charging station with a 30 amp rating will supply 7.2 kilowatts per hour. After one hour of charging your EV will have added 7.2 kilowatt hours of energy to your vehicle. To calculate how long it will take to charge your entire battery based on your EV charging station, take the vehicle's battery capacity, found in the owner's manual, which is in kilowatt hours, and divide that by the charging station's kilowatt output. For instance, here's a fully electric EV model that has a 42 kilowatt hour battery capacity. And we know that the EV charging station output is 7.2 kilowatts, which means it'll take approximately six hours for a full charge. Each EV also has a charging rate which indicates the amount of power the battery can safely accept regardless of the amount of power being delivered by the EV charging station. To find your vehicles charging rate, enter the make, model, year, and type maximum charge rate into an internet search engine. When

deciding how many amps your charging station should have, consider your average miles driven per day, how often you would be able to charge at home, and your vehicles charging rate. For example, using a 16 amp charging station for eight hours would provide you 95 miles of range each time you charge. If you normally drive 30 miles per day, then you would only need to charge your EV overnight three times a week. If you drive longer distances more often, you might consider a higher amp charging station for fewer charges per week. Be sure to think about any future changes you might have, such as transitioning from a plug-in hybrid to an all electric EV, owning multiple Evs, or any potential changes to your driving habits. We hope this video has been a helpful resource. Here are some additional resources when considering which EV and charging station is right for you. Review the EV buyer's checklist before purchasing an EV at [pge.com/ev](https://www.pge.com/ev). Learn more about EV charging stations and review the charging checklist at [pge.com/evcharging](https://www.pge.com/evcharging). Both checklists are offered in Spanish and Chinese. Research available EV model, costs, savings, and incentives at [ev.pge.com](https://www.ev.pge.com).