

BEFORE YOUR EV CHARGER INSTALL

The five questions almost everyone asks us

The complete guide: the full answers on outlets, subpanels, panel upgrades, wiring routes and charging speed, so you know exactly what to expect before we quote.

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How getting a quote works

1. REQUEST

Fill out the two-minute form at chargeprotexas.com/contact.

2. THREE PHOTOS

Your panel, the wall where the charger goes, and the path between them.

3. SAME-DAY QUOTE

A real price, usually without a site visit. We pull the permit and guarantee the inspection.

Hardwired charger or a NEMA 14-50 outlet?

THE SHORT ANSWER

Hardwired, almost always. It's safer, it charges faster, it usually costs the same or less, and it comes with you if you move.

What's actually different

Both options put a Level 2 charger on a dedicated 240-volt circuit. The only difference is the last foot. With an **outlet**, we install a NEMA 14-50 receptacle (the same plug an RV or electric range uses) and the charger plugs into it. With a **hardwired** install, the circuit runs straight into the charger with no plug in between.

That last foot changes more than you'd think.

	Hardwired	NEMA 14-50 outlet
Fastest charging	48 amps (11.5 kW)	40 amps (9.6 kW)
Ground-fault protection	Built into the charger	Requires a GFCI breaker at the panel
Wire to the charger	Two hots and a ground	Adds a neutral conductor the charger never uses
Weak points	None beyond the charger itself	The plug and receptacle, which wear and can run hot
Moving house	We disconnect it and cap the circuit	Unplug it

Why the outlet usually isn't cheaper

An outlet looks like the budget option, but it brings its own costs:

- **The GFCI breaker.** Electrical code requires ground-fault protection on the outlet, which means a 2-pole GFCI breaker at your panel. They cost far more than a standard breaker, and because most chargers also have their own ground-fault monitoring, the two can disagree and trip the breaker for no real reason. You find out at 6 a.m. when the car didn't charge.
- **The extra conductor.** A 14-50 needs a neutral wire that a hardwired charger doesn't, so there's more copper in the run.

- **The receptacle.** A charger pulls full power for hours at a time, and an ordinary 14-50 isn't built for that. Cheaper receptacles are known to overheat and burn up under EV charging loads, so the outlet has to be an EV-rated, heavy-duty receptacle, which costs considerably more. Even then, the plug connection is a wear point that a hardwired charger simply doesn't have.

Add it up (the GFCI breaker, the extra conductor and the EV-rated receptacle) and the outlet typically costs about the same as hardwiring, or more, while charging slower.

"But what if I move?"

That's the most common reason people ask for an outlet, and it doesn't hold up. A hardwired charger mounts with a few screws and connects at a terminal block. When you move, an electrician disconnects it, caps the circuit safely, and the charger goes in the box with you. It can be installed at your next home the same way. The circuit and its permit stay with the house.

Renting?

Hardwired still works for you, because the charger leaves with you. Because the permit is pulled for your landlord's property, you'll need their OK before we start. Send them our way and we're happy to answer their questions by email. When you move out, we can remove the charger and leave the circuit capped for the next tenant.

When an outlet is the right call

It isn't our default, but there are times we'll recommend one:

- You want to charge with the portable cord that came with your car and don't plan to buy a wall charger.
- You also want to plug in an RV or other 50-amp equipment at the same spot.
- Your charger is a plug-in-only model.

If one of those is you, tell us, and we'll quote the outlet with the GFCI protection it needs.

What we'll need from you

- ☐ Your panel with the door open
- ☐ The wall where the charger will go
- ☐ The path between them
- ☐ What you drive, and the charger if you've already bought one

Can I use my subpanel?

THE SHORT ANSWER

Sometimes. It depends on the wire feeding the subpanel, not the number on its label. When we do use one, we always add load management.

What a subpanel is

A subpanel is a second breaker panel fed from your main panel through a single large circuit, called the **feeder**. You'll often find one in a garage, workshop, or addition. It's convenient because it's often right where you park, which is why so many people ask about it.



The subpanel's label is the most it could ever handle. What it can actually deliver is set by the feeder breaker back at the main panel.

Why the feeder is the whole story

A Level 2 charger is a **continuous load**: it pulls full power for hours. Electrical code sizes those circuits at 125%, so a 48-amp charger needs a 60-amp breaker. If your garage subpanel is fed by a 60-amp feeder, the charger alone would use all of it, with nothing left for the garage lights, the freezer, the door opener, or the shop tools already on that panel.

A bigger feeder helps, but the same logic applies: the charger plus everything else on the subpanel has to fit inside what the feeder can deliver.

What you have	What it usually means
Small garage or shop subpanel (feeder 60 A or less)	Usually not workable at full speed. We'll most likely run from the main panel instead.
Larger subpanel (feeder around 100 A) with light loads	Often workable, with load management added.
Outdoor meter-main feeding your indoor panel	Your indoor panel carries the whole house. We treat it like a main panel and it usually works fine.
Subpanel in a detached garage or shop	Can work if the feeder is large enough. We'll check the feeder size and grounding.

Why we always add load management on a subpanel

When a charger is fed from a subpanel, we always install load management. Our go-to setup is Tesla's Universal Wall Connector paired with a Neurio energy meter: the meter watches how much power is being used and tells the charger to turn down for a moment if the total gets close to the feeder's limit, then lets it back up. You keep the convenience of the nearby panel without any risk of overloading the feeder. Most charging happens overnight, when little else is running, so you rarely notice it working.

Why we'd usually rather use the main panel

- **Full capacity.** The main panel has your whole service available, not just what the feeder allows.
- **Full speed.** From the main panel we can usually install at 48 amps without throttling.
- **Fewer parts.** No extra load-management hardware to buy or maintain.

A longer run from the main panel sometimes costs a bit more up front. We'll quote it honestly and tell you if the subpanel is the better option for your house.

What we'll need from you

- ☐ The subpanel with its door open, including the label inside the door
- ☐ The breaker in your main panel that feeds the subpanel, so we can read its amp rating
- ☐ The wall where the charger will go
- ☐ What else runs on that subpanel (shop tools, a fridge or freezer, a window unit)

Do I need a panel upgrade?

THE SHORT ANSWER

Probably not. Most homes can add a Level 2 charger to the panel they already have, and when they can't, load management usually solves it for a few hundred dollars instead of a few thousand.

Why most homes don't need one

Add up every breaker in a typical panel and the total is far more than the service could ever supply. That's normal and by design, because the oven, dryer, AC, water heater and everything else never all run at full power at once. What matters is your home's realistic peak demand, and in most houses there's room for a charger on top of it.

A panel with every slot filled isn't necessarily out of capacity either. It may just be out of *space*, and there are usually ways around that, such as compact (tandem) breakers where the panel is listed for them or reorganizing circuits.

How we find out: your real usage data

Rather than guessing from a list of appliances, we base the load calculation on what your home has actually used. We ask you for your electricity usage from your utility in **15-minute intervals for the last 12 months**. That shows us your true peak, usually a hot summer afternoon with the AC flat out, and exactly how much room is left on top of it for a charger.

Most Texas utilities let you download this from your online account, and in many areas it's also available through Smart Meter Texas. We'll tell you where to find it for your utility. The calculation itself is **free**.

If the numbers come up short

A service upgrade is the last resort, not the first. Here's the order we work through:

- 1 Load management.** Our recommendation is Tesla's Universal Wall Connector with a Neurio energy meter. The meter watches the whole house and turns the charger down briefly whenever the house is using a lot of power, then lets it back up. You keep a full-speed charger almost all the time, especially overnight, for a few hundred dollars instead of a few thousand. Emporia also offers load management, but we've found the Tesla and Neurio setup works better.
- 2 A smaller charging circuit.** If the service genuinely can't carry 48 amps, a 40- or 32-amp circuit still fills most cars overnight. We still run heavy-duty wire, so you can step up later.

- 3 A service upgrade.** When nothing else works, or when the panel itself is the problem (see below). It costs thousands, involves your utility disconnecting and reconnecting power, and takes longer to schedule.

When an upgrade really is the answer

There are three reasons we'll recommend replacing the panel or upgrading the service:

- **The panel is too old.** Federal Pacific Stab-Lok and Zinsco panels have a documented history of breakers that don't trip when they should. We won't attach a continuous load to equipment that can't be relied on to protect it.
- **The panel is in bad condition.** Heat damage, corrosion, scorched or loose breakers, or water getting in. Adding a charger to a panel like that isn't safe, whatever the numbers say.
- **The service is too small.** If your usage data shows the house is already near its limit, as can happen with an older 100-amp service and electric heat, range and dryer, there's no realistic room left even with load management. The same applies if a second EV, a heat pump, a pool or a hot tub is on the way.

If one of these applies, we'll show you why in your own photos and data and price the upgrade honestly.

What we'll need from you

- ☐ Your panel with the door open, close enough to read the breakers
- ☐ The label inside the panel door (brand and model)
- ☐ The main breaker, so we can read its amp rating
- ☐ Your last 12 months of usage in 15-minute intervals, from your utility account (we'll show you where)

How do you get from my panel to my garage?

THE SHORT ANSWER

It depends on your house, and it's the biggest single factor in your price. That's why we ask for a photo of the path, not just the two ends.

How the wire usually gets there

Most of our installs use one of two routes, or a combination:

- **Up and over through the attic.** Conduit runs from the panel up into the attic, across the house, and back down on the other side to the charger. The bigger the house, the longer that run. A two-story attic run is more work than a single-story one, because there's further to climb and less room to work.
- **Along the wall.** Conduit runs along the exterior of the house, or along the inside or outside of the garage, straight to the charger.

Where your panel is	Typical route	Price impact
Inside the garage	A short run along the garage wall	Lowest
Outside, on a wall next to the garage	Through the wall behind the panel, or a short run along the exterior	Low
On the far side of a one-story house	Up into the attic, across, and back down. Or along the exterior wall	Moderate
On the far side of a two-story house	A longer, harder attic run, or a longer exterior run	Higher
Detached garage, shop, or no wall to mount on	Underground in conduit (trenching), to a wall or a pedestal	Highest

House size, number of stories and the distance from the panel to where you park are the biggest adders to complexity and price. A photo of the path tells us which one you are, so we can give you a real number without a site visit.

What our installs look like



Up and over. Conduit run above the garage door to reach the far wall.



Exterior brick. Mounted beside the garage door, weatherproof throughout.



Detached building. Subpanel and charger at a shop, away from the house.



No wall to mount on. Pedestal on a poured pad, right where the car sits.

Our standard on every run

- **Weatherproof conduit** inside or out, so an exterior run isn't a compromise.
- **Heavy-duty wire** (6 AWG) on every charging circuit, so a future car or charger won't need a rewire.
- **Straight, square and paintable** runs, with every wall penetration sealed.
- **Our own electricians** on every wire run, never a subcontractor.

Can it be hidden in the wall?

Yes, when the wall is accessible. If there's an open path, like an unfinished garage wall or a straight drop from the attic into an open cavity, we can run it inside the wall and all you'll see is the charger.

If hiding it would mean cutting into sheetrock, we usually don't recommend it. Cutting, patching and finishing drywall takes extra labor and adds significantly to the price. A neat, paintable conduit run is the cleaner option for most homes, and we'll tell you up front which applies to yours.

What we'll need from you

- ☐ Your panel with the door open
- ☐ The wall where the charger will go
- ☐ The path between them, including the outside of the house or the attic access
- ☐ For detached garages or pedestals: the ground between the house and the spot
- ☐ No measuring needed. We look up your home from the address to estimate distances

How long does it take to charge?

THE SHORT ANSWER

On a 48-amp home charger, most EVs add roughly 35 to 45 miles of range per hour, and nearly every car is full by morning. Most days you're only replacing that day's miles, which takes about an hour.

A wall outlet vs. a Level 2 charger

You can charge from a regular wall outlet with the cord that came with your car (called Level 1), but it only adds about **3 to 5 miles of range per hour**. That works for light driving, but after a long day the car may not be full by morning.

A **Level 2 charger** on its own 240-volt circuit is what we install and what most EV owners use at home. It's roughly ten times faster.

How fast each option charges

A Level 2 charger's speed depends on the size of the circuit we install for it: the bigger the circuit, the faster it charges. Here's how each option compares with a wall outlet:

Charging from	Circuit breaker	Range per hour*	Overnight (10 hrs)*
Wall outlet (Level 1)	Standard 120 V	3–5 miles	30–50 miles
Level 2 at 32 amps	40 A	25–30 miles	230–300 miles
Level 2 at 40 amps	50 A	30–38 miles	290–380 miles
Level 2 at 48 amps (our standard)	60 A	35–45 miles	Full charge, nearly any EV

*Typical sedans and crossovers. Trucks and large SUVs use more energy per mile, so they add less range per hour. Figures are approximate.



Why a 48-amp charger needs a 60-amp breaker

A charger is a continuous load: it pulls full power for hours. Electrical code sizes those circuits at 125% of the load, so 48 amps of charging needs a 60-amp breaker. The charger is set to match the circuit it's on, so

it can never draw more than the circuit is built for.

Your car has a limit too

Every EV has an onboard charger with a maximum it can accept, usually listed in kW (for example 7.7 kW or 11.5 kW). The car charges at whichever is lower: what the wall charger can give or what the car can take. If your car tops out at 7.7 kW, a 48-amp charger won't make it faster today.

We still recommend 48 amps wherever the panel allows. We run the same heavy-duty wire on every circuit regardless, so it doesn't cost you more, and your next car will very likely accept more power than this one.

What load management does to charging

If your install includes load management (we typically use Tesla's Universal Wall Connector with a Neurio energy meter), the meter watches your home's total power use. When the house gets busy, like the AC, oven and dryer all running at once, it turns the charger down for a moment, then brings it back up on its own. Because most charging happens overnight when little else is running, most owners never notice it.

What it looks like day to day

Most people don't charge from empty. They plug in when they get home and replace that day's driving. At 48 amps, a typical 30-to-40-mile commute is back in the battery in about an hour. Most cars and chargers also let you schedule charging from an app, so you can set it to run overnight.

What we'll need from you

- ☐ What you drive (year, make and model) so we can check its charging limit
- ☐ Your panel with the door open, so we can confirm 48 amps fits
- ☐ Whether a second EV is likely in the next few years

Ready for a real number?

Every answer in this guide depends on your house, and three photos are usually all it takes to know which one applies to you.

Start at chargeprotexas.com/contact, or email info@chargeprotexas.com. Our own licensed electricians do every install, and we guarantee your inspection passes.