

ELECTRIC VEHICLE READY HOMES BUILDERS

Electric Vehicles in North Carolina

Electric vehicle (EV) adoption in North Carolina is growing rapidly as North Carolinians are recognizing the benefits of driving electric. With more than 4,000 electric vehicles already in operation in the state, we continue to see growth in registrations each year.



More than 90 percent of North Carolina counties have registered electric vehicles. Given this high rate of EV adoption in North Carolina, consumers will expect to have readily available, cost effective charging solutions in their homes.

What is an EV Ready Home?

An EV ready home is one that offers safe access to a dedicated power supply for the purpose of charging an electric vehicle. There are a variety of charging options that range from simple to complex. For residential applications, the most common are:

120 Volt electrical outlet

- 120V/20A outlet dedicated circuit
- Cord and connector provided with vehicle
- Charge time: 5 miles of driving range per hour of charging

240 Volt electrical outlet

- 240V/40A outlet with dedicated circuit
- Plug-mounted charging station purchased by home owner
- Charge time: 10-20 miles of driving range per hour of charging

The estimated cost of pre-wiring a 240V outlet is \$50-\$300. For retroactive installations, the price may increase significantly.



GE Watt Charging Station Installed

Value to the homeowner:

Installing a charging station post-construction can be a large expense for the homeowner.

- May require trenching and new conduit to run the wiring.
- Upgrades to the electrical service panel may be needed.

An EV ready home ensures that the conduit and service panel capacity are ready and available.



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Home Builder Benefits:

- Doesn't cost much to install
- Can differentiate you from other builders
- Demonstrates a commitment to the environment
- Shows support of consumer choices

Locating an EV outlet:

- Consider the available space on floor, walls and ceiling.
- Ensure overhead doors and objects do not conflict with the vehicle's ability to plug into the outlet.
- Avoid locations requiring the charging cord to be wrapped around or draped over the vehicle.
- Consider an outdoor outlet when there is no garage.

Electric Vehicle Ready 240v outlet specifications	
Voltage and Current Rating	208-240 VAC at 30 Amps Continuous
AC Power Input	208-240 VAC requiring only Line1, Line2, and earth ground
Power Supply Connection	NEMA (6-50 P Plug) (250 VAC, 50 Amps)
Recommended Service for Panel Breaker	2-Pole 40-Amp breaker on dedicated circuit

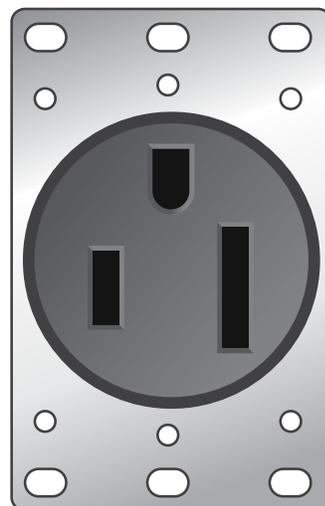
A standard 240V outlet can provide a low cost, flexible charging solution for future electric vehicle drivers.

Industry Highlights:

KB Home has been offering electric vehicle charging options for their custom homes since 2010.



In 2013, KB Home teamed with Ford Motor Company to promote Ford's MyEnergi Lifestyle™ to showcase smart appliances, solar power and electric-powered vehicles, and demonstrate how families can save money and reduce environmental impact by leveraging smart home technologies.



NEMA 6-50
Receptacle

More North Carolina Information:

Charging Station Installation Handbook
for Electrical Contractors and Inspectors
www.PluginNC.org

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What is an electric vehicle ready home?

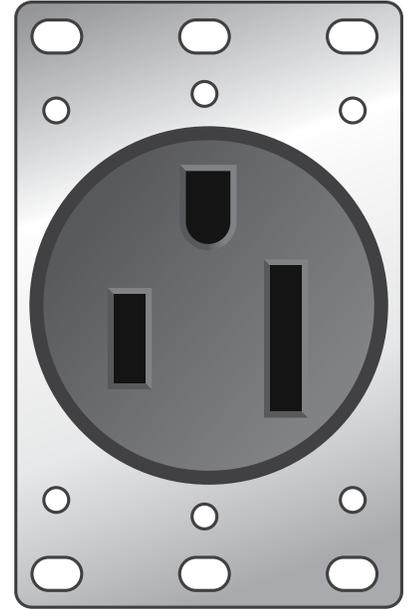
An electric vehicle ready home is one that offers safe access to a dedicated electric power supply for purposes of electric vehicle fueling.

Level 2 Charging Station

Many electric vehicle owners will install a Level 2 charging station at their home to charge their vehicle. A Level 2 charging station:

- Typically needs a 240V/40A dedicated circuit
- May require up to 80A maximum current (100A circuit)
- Uses only a SAE J1772 connection to the vehicle
- Uses amount of power similar to large appliances, such as air conditioners or clothes dryers
- Provides a faster charge time of 10 – 20 miles of range per hour

NEMA 6-50
Receptacle



Installation Steps (INTERIOR)

Step 1: Consider available space on floor, walls and ceiling.

- Ensure overhead doors do not conflict, along with other objects.
- Ensure installation does not conflict with vehicle ability to park in garage.

Step 2: Note the location of the charging port on the expected vehicle.

- If no vehicle has been selected, most vehicles are expected to have a charging port toward the front end of the vehicle.

Step 3: Ensure remaining locations best meet guidelines for a residential garage as follows:

- Lighting
 - Requirement: Garages are required by the NEC to provide a switch-controlled lighting outlet (NEC 210.70).
 - Recommendation: Ensure functionality of lighting in garage.
- Connector Height
 - Requirement: Mount the connector at a height between 18" and 48" from the ground (NEC 625.29).
 - Recommendation: Mount the station such that the connector is at a height between 36" and 48" from the ground, unless otherwise indicated by the manufacturer.

• Tripping Hazard Mitigation

- Recommendation: Charging stations should be placed to minimize the intersection of cords with typical walking paths. Stations mounted at greater heights and equipped with cord management technologies may further reduce this risk. Charging stations should also be mounted in close proximity to the vehicle charge port.

• Physical Damage Prevention

- Requirement: Equipment operating above 50 volts will be protected against accidental physical damage (NEC 110.27).
- Recommendation: When possible, placement of the enclosure above 36" may be sufficient in a residential garage. When possible, placement of the charging station out of the line of vehicle travel is advised. If desired, a wheel stop or protective bollards may be installed as well.

Step 4: If spaces are comparable, selection based on cost and/or ease of installation is advised.



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Installation Steps (EXTERIOR)

Step 1: Consider available parking areas.

- If a particular charging station has been selected, eliminate surfaces to which it cannot mount.

Step 2: Note the location of the charging port on the expected vehicle.

- If no vehicle has been selected, most vehicles are expected to have a charging port toward the front end of the vehicle.

Step 3: Ensure remaining locations best meet guidelines as follows:

- **Lighting**
 - Recommendation: Lighting should minimize the risk of tripping, vehicle impact and vandalism. Charging stations should be installed in a well-lit location. If no lighting exists, the installation of a separate lighting circuit should be discussed with the homeowner. A light level of a minimum of 2 foot candles is recommended.
- **Connector Height**
 - Requirement: Mount the station such that the connector is at a height between 24" and 48" from the ground (NEC 625.30(B)).
 - Recommendation: Mount the connector at a height between 36" and 48" from the ground unless otherwise indicated by the manufacturer.
- **Tripping Hazard Mitigation**
 - Recommendation: Charging stations should be placed to minimize the intersection of cords with typical walking paths. Stations mounted at greater heights and equipped with cord management technologies may further reduce this risk. Charging stations should also be mounted in close proximity to the vehicle charge port.

• Physical Damage Prevention

- Requirement: Equipment operating above 50 volts should be protected against accidental physical damage (NEC 110.27).
- Recommendation: When possible, placement of the charging station out of the line of vehicle travel is advised. Protective bollards can offer significant protection. Wheel stops may also be beneficial, however, they may present a tripping hazard in poorly lit areas.

Step 4: If spaces are comparable, selection based on cost and/or ease of installation is advised.

Level 2 Watt Charging Station Installed



More Installation Information:

Visit the North Carolina Plug-in Electric Vehicle Taskforce's website to download the full Charging Station Installation Handbook for Electrical Contractors and Inspectors

www.pluginnc.com



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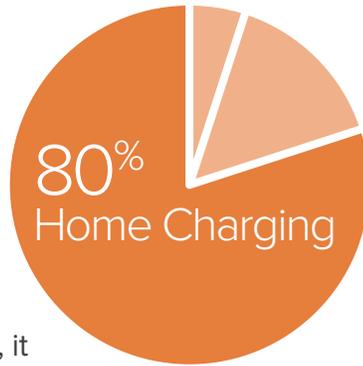
REAL ESTATE AGENTS

What is an electric vehicle ready home?

An electric vehicle ready home is one that offers safe access to a dedicated electric power supply for the purpose of charging an electric car.

There are close to 400,000 electric vehicles registered in the United States. Electric vehicle owners save money by switching from gas to electricity. Studies show that around 80 percent of an electric vehicle driver's charging will occur at home. To increase home value and move-in readiness, it is important that homes are pre-wired and include the proper outlet to charge a vehicle.

There are a variety of charging options for residential homes that can be made available:



Level 1 Electrical Outlet:

- 120V/20A outlet dedicated circuit
- Cord and connector provided with vehicle
- Slowest charge time (*5 miles per hour of charging*)

Level 2 Electrical Outlet:

- 240V/40A outlet dedicated circuit
- Plug-mounted charging station purchased by home buyer
- Faster charge time (*10-20 miles per hour of charging*)

Level 2 Charging Station:

- 240V/40A service with dedicated circuit
- Hard wired charging station installed by builder
- Faster charge time (*10-20 miles per hour of charging*)
- Best promotional value for home buyer

Value to the Home Owner

An electric vehicle ready home saves the homeowner time and money. Making a home electric vehicle ready is a simple task during construction, but upgrades after construction can be expensive. A home that includes the proper outlet will help to increase home value and attractiveness to buyers.



KB Home has been offering electric vehicle charging options for their custom homes since 2010.

They offer an option to pre-wire their new homes to accommodate charging stations for homeowners' electric vehicles. This earth-friendly option is designed to ease the future installation of a station to charge an electric or plug-in hybrid vehicle conveniently at home. The pre-wire option is available to KB Home home buyers nationwide.

Along with single-family homes, many multifamily home owners and renters desire charging stations. Multifamily housing communities across the country are installing Level 2 charging stations as an extra amenity for their residents.



Level 2 Charging Station



For more information visit www.pluginn.com

