Using the right tool helps to mitigate risk with EV chargers

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The demand for electric vehicles continues to increase rapidly. Manufacturers of these vehicles and EV supply equipment (EVSE) are working hard in an effort to meet the latest uptick in demand. However, because the EV market is relatively new and is still not well-regulated, there are some inherent issues. One is the need for charging points, which can be few and far between. This is a worry for drivers of EVs because there is no guarantee of when and where they will be able to charge next. This has caused a ground swell of installations of new EV charging stations for public use across the country.

EV chargers - level 1 and level 2

There are several types of EV chargers available, with the most common being a level 1 charger and a level 2 charger*. The level 1 charger, which is supplied by automobile manufacturers when you purchase your car, can be used at home. It delivers 1.4 kW of power to the vehicle and runs off of the standard 120V household supply. The level 2 charging system delivers an electrical current from an outlet or hardwired unit to the vehicle via a connector, similar to a standard-issue charger from the manufacturer. Level 2 car chargers need a 208-240 V, 40 A circuit similar to appliances like dryers and electric ovens. They can deliver power ranging from 6.2 to 7.6 kW. Level 2 chargers charge faster and offer more reliability. They are worth the additional investment for EV owners.

Routine inspection and safety

Chargers need to go through routine inspections. These inspections help to assess their safety and alert the inspector if maintenance needs to be performed. Assessments include checking for hazardous voltages, confirming there is a suitable ground connection, ensuring that any exposed metal work is properly grounded, certifying that the charger ground does not rise to a hazardous level when the charger output is on and timing the charger's safety device's tripping speed. Inspectors can also check to see if nuisance tripping or GFCI is likely to occur. But to perform any of these inspections, it is important to have the right equipment, like **Megger's EVCC300**. An all-in-one tool that makes checking EV charge points quick and easy.

Checking charge points could save individuals from serious injury or death

There are a variety of EV charger operation checks that should be performed to prevent serious hazards, including a proximity detection operation check. This test detects whether the latching detection of a sensor is working properly when testing a Type 1 connection. If this latch is not working properly when you unplug the connection, the AC contacts could still be powered and draw a current. This could lead to arcing that could lead to minor injuries, third degree burns or even death.

A control pilot operation check is also an important test. This reads the response state of the charger to communication from an EV. The main function of the control pilot connection is to make sure that power is delivered only when requested and there is a connection established between EV and EVSE. Again, if the control pilot operation is not working properly, it could lead to a loss of communication between the vehicle and the charge point. It could also lead to miscommunication where too much power is pushed to the vehicle and that could lead to damage and serious injuries.

It is therefore critical to have a control pilot signal check performed that measures the control pilot signal voltage, frequency, and duty cycle, as well as highlight instability in the signal. As stated, this needs to be performed to ensure that good clear communication is achieved between the EV and EVSE.

Perform an EV charger output check to measure output frequency when charging is in process or check for correct L – N supply polarity is also important because the supply output is necessary for providing charge to the connected vehicle. Electric Vehicles need their supply energy to come to them within a narrow frequency range and with correct polarity. Otherwise, a charging error will occur, and the EV owner will come back to a vehicle that has not been charged.

There are three foundational sections of an EVSE check and they are safety checks, control pilot signal (communication) checks, and the supply output check. All three must be done to ensure the correct operation of a charge point.

As always, safety must be the priority when working with electricity and EV charging points. Using the proper tools to mitigate risk is of utmost importance.

*_https://evocharge.com/resources/the-difference-between-level-1-2-ev-chargers/#:~:text=A%20Level%201%2C%20which%20is,from%206.2%20to%207.6%20kW_.

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