Weatherproof box for ev charger

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When electric cars started to become more prominent, one of the most urgent and burning questions in many people"s minds was what to do about charging when it was raining outside. Some owners had their home charging infrastructure installed inside of their garage, and therefore had much less to worry about. The car was always going to be charged inside while at home, so there"s no fear there.

For others, however, whose garage either didn"t permit charging or for where there is no garage space, need to use outdoor charging solutions. The problem of rain and charging emerges and is genuinely concerning. We are so well trained to keep all things electrical far away and separate from water, that the idea of plugging something in while it"s raining out is enough to give us anxiety.

In today"s blog, we"re exploring questions surrounding waterproofing of electric vehicle charging ports and the chargers themselves. We"ll also be looking at some of the solutions that are out there to allay these fears and further weatherproof EVSE chargers and EV charging ports.

One article on marketwatch confidently claimed that "some of the only things more waterproof than an electric car include submersibles, buoys, or similar oceanic equipment." That"s quite a bold statement and in this section of the blog we will see how that stacks up with reality.

Let"s start with the EVSE chargers themselves. At home or in public charging stations, they are hard-wired into the ground. The units themselves undergo a very strict regimen of testing to ensure that they can last in any weather. The testing itself typically goes on in OSHA-certified laboratories, meaning they conform to federally mandated safety standards. They also have to meet standards set by the Society of Automotive Engineers (SAE).

Every part that could come into contact with water is rigorously tested for waterproofing. The most rigorous test actually involves using a fire hose where the charging connector is subjected to high-pressure spray to ensure proper waterproofing. It"s quite hard to top that. No rain fall anywhere in the country would be as pressurized or intense as a fire hose, suggesting that for the charging connector there is nothing to fear.

When you buy a home charger that you plan to use outdoors, you may notice that certain brands like to push their Ingress Protection "IP" ratings for weatherproofing, protection from particulates, and waterproofing. The rating is the letters IP followed by two numbers. These numerical suffixes are the crucial part that indicate the level of waterproofing and weatherproofing that something boasts. Here"s how to decode the IP rating:

If you therefore purchase an outdoor charging station that is rated at IP67, for example, you are getting a very high degree of protection. This means that for particulate and dust protection, the charger has "full protection against dust and other particulates, including a vacuum seal, tested against continuous airflow.

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Most chargers would get IP66 or IP56 ratings, since level 6 is the highest that would be required for a charging station: "Protection against powerful jets (12.5mm nozzle) of directed water from any direction." That"s essentially the fire hose test. Still, it"s interesting to know that an IP67 charger could even get partially submerged in flooding and still come out working fine.

For your EVSE charger housing, you should also look at the NEMA enclosure ratings. These range from NEMA 1 to NEMA 12 (but not every number in between), and the best outdoor EV charger enclosures will be rated at NEMA 4. This offers, according to the official nemaenclosures website:

The port itself into which you insert the charging connector is typically set back within the opening and is therefore not exposed to the rain even when opened:

The interior has a huge amount of protective technology designed to detect any sign of water ingress. In the unlikely event that water was able to get into the system, the cars will typically shut down the charging process, and it will be safe to remove the connector and close up the port again if needed.

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