

# VOLTAGE FLUCTUATIONS AND THE IMPACT ON EV CHARGER PERFORMANCE



The growing popularity of electric vehicles (EVs) has highlighted the importance of reliable EV infrastructure. This increased demand for electric vehicles has revealed alarming issues around charging, specifically their capability to manage the high voltage levels frequently experienced in the UK.



While the majority of charging takes place at home, typically overnight when demand is lower and considered most convenient, overvoltage incidents on the grid can disrupt the EV charging process. EV chargers are sensitive electrical equipment that sometimes encounter difficulties due to high voltage levels, which can impact their ability to charge vehicles. EV chargers frequently cut out due to overvoltage, thereby increasing the risk of the battery not charging as expected.

In the UK, the optimal voltage for single-phase electricity supply is 230V and 400V for 3 phase supplies with a tolerance of -6% to +10%. Although this is deemed the optimal voltage, the average voltage across the UK is 242V with levels fluctuating significantly throughout the day. As a result, electrical equipment can often receive more voltage than is required, leading to wasted energy, potentially damaging equipment and causing EV chargers to stop functioning for unexpected periods of time.

Overvoltage incidents can be caused by overcompensation from the utility when demand is reduced. Close proximity to the generating source can also contribute to overvoltage which consequently create instances where EV chargers connected to buildings either stop charging or are reported as “broken” when supplied voltage has exceeded +10% (253V) tolerance.

This could be the result of a protective feature designed into some chargers that automatically cut power off if voltage levels are too high. Persistent and significant over voltage will interrupt charging which can be a major nuisance but also potentially cause irreparable damage to the EV chargers.



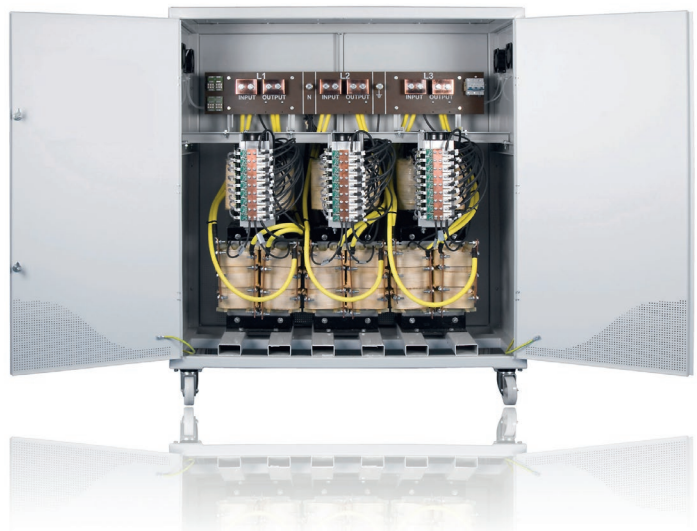
## Our Solution

Our solution to this challenge is the iVolt voltage optimiser, designed to lower the voltage to a consistent 220V (+/-1.5%), the optimum voltage for all sensitive electronic equipment. In Europe, electricity utility companies are obligated to supply a voltage range between 207V and 253V however, these levels could fluctuate. To combat this, the iVolt will maintain the incoming voltage of a building at the standard and most efficient 220V.

The iVolt is a dynamic solid-state device and responds in real-time to voltage variations. This differs from other voltage optimisers that 'follow' the voltage and are unable to provide the steady output like the iVolt. The 3 Phase iVolt uses 3 independently controlled autotransformers and thyristor switching technology to ensure stability and reliability.

The iVolt also protects against damaging voltage spikes and surges. It is fitted with the Sollatek 3 phase DSP (Distribution Surge Protection) units, which incorporate type I or Type II surge protection to clamp sudden spikes and divert it away from sensitive equipment.

The combined effect of accurate voltage stabilisation and spike/surge protection ensures significant reduction in the risk of damage to site equipment and increases the reliability and longevity of sensitive electronic equipment.



### For more information on iVolt:

T: 01753 214500

E: [info@ivoltsystems.co.uk](mailto:info@ivoltsystems.co.uk)

W: [www.ivoltsystems.co.uk](http://www.ivoltsystems.co.uk)

The iVolt® was designed in the UK and production takes place at its facility near Heathrow Airport. The company is part of the global Sollatek group and is accredited to ISO9001:2015

iVolt® offer a vast range of product sizes, ranging from 63A to 3,000A and above in both single and three phase, with a number of installations having been completed throughout the commercial, retail, manufacturing, leisure and public sectors.

**iVolt®**  
Intelligent Power Optimisation