

zappi Protection and Safety Features

This information relates to the following products

ZAPPI-207UW	ZAPPI-222UW
ZAPPI-207UB	ZAPPI-222UB
ZAPPI-207TW	ZAPPI-222TW
ZAPPI-207TB	ZAPPI-222TB

Zappi includes a number of built in protection and safety features which mean that it can be installed without an earth rod on a TN-C-S (PME system – in accordance with BS7671:2018 722.4.11.4.1¹) and using the built in RCD protection rather than an external RCD.

RCD Protection

Zappi has a built in RCD which means that in most circumstances there is no need to fit an external RCD on the circuit that feeds the EV charger². The RCD has the following characteristics:

- 30mA Type A RCD (EN 60947-2, Annex M)
- 6mA DC RCD protection (EN 62955)

TN-C-S (PME) Systems

Zappi has built-in protection (the “PEN Fault Protection”³) which means that there is no need to install an earth rod if the zappi is installed on a TN-C-S (PME) electrical system and located outdoors. This protection meets the requirements of BS7671:2018 722.411.4.1¹

- indent (iii) and (v) for a three-phase zappi, and
- indent (v) for a single-phase zappi

and includes the following protective features to ensure that the protection is at least as safe as the other forms of protection described in the Standard.

1. Protection against over- and under-voltage, based on 230V nominal line voltage $\pm 12\%$ (to avoid nuisance tripping if the supply temporarily goes outside the EU Harmonised Voltage Limits of 230V $\pm 10\%$). Using these settings will ensure that zappi will trip if the line to neutral voltage collapses as the line to neutral to Earth voltage rises.
2. Measurement of the current flowing to true Earth via the fault path (which for an EV charger includes the chassis and bodywork of the vehicle being charged). A 30mA type A RCD characteristic has been used to trigger the protection, ensuring that the person in contact with the EV or charge point is protected in any circumstances where a very small current flows to Earth, even if the neutral to Earth voltage is below 70V.
3. Isolation of the live, neutral and earth conductors in the case of a fault being detected.

¹ BS7671:2018 Amendment 1:2020

² If the cable supplying the EV charge point is buried in a wall (i.e. under plaster) then the whole circuit must be protected by an upstream RCD to protect against accidental damage, for instance from a nail or drill. Where the cable is buried under ground then a steel wire armoured cable should be used, but an upstream RCD is not required.

³ Patent pending

4. Galvanic isolation between input and output, including all conductors going to the EV (including signalling wires CP & PP). This is achieved through the galvanic isolation provided by the electronic components in the charge point which remain live in order to provide information on the fault and the ability to reset the charger once the fault is cleared.

By taking this approach, which builds on the accepted principles of Residual Current protection but then applies these in combination with other key components in a novel application, the “PEN Protection Function” provides more comprehensive protection than a poorly installed earth electrode or simple measurement of the line to neutral voltage