



REFERENCE DESIGN

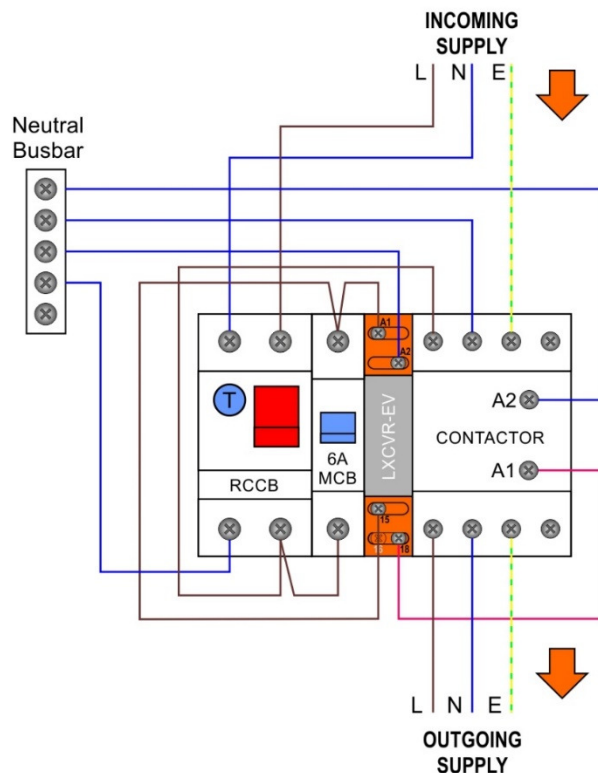
Subject	EV Charging Point (O-PEN) protection without the need for earthing electrodes
Product(s)	LXCVR-EV (EV – Voltage Monitoring Relay)
Document Date	9 th November 2021
Version	1.2

Purpose

Provides a complete solution for domestic electric vehicle charging points and is a safe alternative to using earth electrodes. Full compliance with BS 7671 18th edition wiring regulations (*excerpt on next page*) is also maintained.

Typically used in conjunction with a contactor and circuit breaker, the LXCVR-EV continually monitors the electrical supply to the charging point and in the event of a fault, will automatically disconnect all conductors including earth connection via the contactor.

Typical Wiring Example



Example for a single-phase installation

Part Recommendations

Installation example: **Single-phase, 32A rating**

Part	Purpose	Qty	Supplier recommendation	Stock Code
LXCVR-EV	Monitoring of incoming supply voltage and to detect under or overvoltage conditions	1	RS Components	222-6842
Contactors 3 or 4-pole, 32A, 230VAC coil	Controlled by the LXCVR-EV and used to switch power to the load	1	RS Components	845-1627
Consumer unit enclosure c/w DIN rail and neutral busbar	Housing of all above parts	1	RS Components	811-1899
RCCB, 32A, 2-pole¹	Protection of connected load	1	RS Components	223-7549
MCB, 6A¹	Protection of LXCVR-EV and switching contactor	1	RS Components	850-8625

Note: The above parts are only to be used as a guide.

¹ *Optional and may be substituted by other means of protection (standard fuses, etc). Reference to latest installation regulations for guidance.*

BS 7671:2018 Requirements for Electrical Installations

Amendment 1, 2020 to BS7671 added the change to Section 722 Electric Vehicle Charging Installations

Excerpts from the standard:

Regulation 722.411.4.1 adds indent (iv) which adds an alternative solution requirement for charging installations.

722.411.4 TN system

722.411.4.1 A PME earthing facility shall not be used as the means of earthing for the protective conductor contact of a charging point located outdoors or that might reasonably be expected to be used to charge a vehicle located outdoors unless one of the following methods is used:

- (iv) Protection against electric shock in a single-phase installation is provided by a device which electrically disconnects the vehicle from the live conductors of the supply and from protective earth in accordance with Regulation 543.3.3.101(ii) within 5 s in the event of the utilisation voltage at the charging point, between the line and neutral conductors, being greater than 253 V rms or less than 207 V rms. The device shall provide isolation and be selected in accordance with Table 537.4. Equivalent means of functionality could be included within the charging equipment. Closing or resetting of the device shall be possible only if the voltage between line and neutral conductors is in the range 207 to 253 V rms.