

ENGINEERING DESIGN STANDARD**EDS 08-5050****ELECTRIC VEHICLE CONNECTIONS****Network(s):** EPN, LPN, SPN**Summary:** This standard outlines the design requirements for the connection of electric vehicle charging point equipment to new and existing supplies.**Author:** Stephen Tucker**Date:** 20/11/2023**Approver:** Paul Williams**Date:** 23/11/2023

This document forms part of the Company's Integrated Business System and its requirements are mandatory throughout UK Power Networks. Departure from these requirements may only be taken with the written approval of the Director of Asset Management. If you have any queries about this document please contact the author or owner of the current version.

Circulation**UK Power Networks**

- Asset Management
- Capital Programme
- Connections
- Health & Safety
- Legal
- Network Operations
- Procurement
- Strategy & Regulation
- Technical Training

External

- G81 Website
- Contractors
- ICPs/IDNOs
- Meter Operators

Revision Record

Version	4.1	Review Date	23/06/2028
Date	20/11/2023	Author	Stephen Tucker
<p>Reason for update: New open PEN detection device.</p> <p>What has changed:</p> <ul style="list-style-type: none"> • Section 3 OPDD definition added. • Section 5 section references updated in Table 5-1. • Section 5, 6.2, 6.3 & 6.4 dedicated EV supplies included. • Section 6.1 UMS requirements clarified and minor wording changes. • Section 6.5 reinstated from v3.0. • Section 7.5.2 OPDD term used. • Section 7.5.2 CityEV device added to Table 7-3. • Section 7.5.4 separation increased from 2 to 2.5 metres to align with BS 7671. • Section 8.1 references updated. 			
Version	4.0	Review Date	23/06/2028
Date	22/06/2023	Author	Christina Tsechlidou
<p>Reason for update: Periodic review.</p> <p>What has changed:</p> <ul style="list-style-type: none"> • Section 4.1 & 7.1 Smart Connect Portal added. • Section 4.2 UK Power Networks website for EV connections added. • Section 5 Table 5-1 reformatted and updated to include maximum UMS and 80A fuses. • Section 6.1 UMS fuse and cable sizes clarified. • Section 7.2 network reinforcement guidance for EVCPs section revised. • Section 7.5 earthing requirements included from EDS 06-0017. • Appendix A link for ENA notification form updated. • EDS 08-5050B withdrawn. • Document reviewed. 			
Version	3.0	Review Date	23/03/2023
Date	13/05/2019	Author	Jack Lewis Wilkinson
<p>Reason for update: Updates as per below.</p> <ul style="list-style-type: none"> • Guidance on UK Power Networks EVCP connections process has been provided. • New evidence has allowed UK Power Networks to enhance fast and slow EVCP diversity factors, to enable quicker and lower cost EVCP connections for customers. • Rapid EVCPs up to 50kW can be connected to 100A TPN domestic supplies under certain situations, and rapid EVCP diversity factors have been updated. <p>What has changed:</p> <ul style="list-style-type: none"> • Section 4 EVCP Connection Process section added. • Section 5 supply overview section updated. • Section 7.1 mandatory Notification Process section updated. • Section 7.4 diversity Guidance section revised. • Appendix A ENA EVCP notification form updated. • Appendix B diagram showing typical domestic supply set-up and ownership boundaries added. 			

Version	2.0	Review Date	23/03/2023
Date	19/03/2018	Author	Stephen Cuddihey
<p>Reason for update: Standard revised to encompass all the electric vehicle relevant requirements and the LV network connections design standards suite in one document for ease of use in electric vehicle connections.</p> <p>What has changed:</p> <ul style="list-style-type: none"> • Section 5 supply overview section added. • Section 6 connection requirements revised included. • Section 7.3 disturbing load section updated. • EDS 08-5050B disturbing load assessment form added. • Minor revisions to all other sections, document title revised. 			
Version	1.0	Review Date	20/06/2018
Date	20/06/2017	Author	Tobi Babalola
<p>New standard to cover electrical vehicle charge equipment installation to the distribution network.</p>			

Contents

1	Introduction	6
2	Scope	6
3	Glossary and Abbreviations	7
4	EVCP Connection Process	9
4.1	Process for Installing EVCPs on Existing Supplies	9
4.2	Process for Installing EVCPs on New Supplies	10
5	Supply Overview	11
6	Connection Requirements	12
6.1	Unmetered Supplies	12
6.2	100A Single-phase Connections in the Public Highway	13
6.3	100A Three-phase Connections in the Public Highway	13
6.4	Single-phase and Three-phase Domestic Connections	13
6.5	Large Supplies	13
6.6	Multi-Occupied Buildings	14
7	General Requirements	15
7.1	Mandatory Notification Process	15
7.2	Network Reinforcement Guidance for EVCPs.....	15
7.3	Power Quality and Disturbing Loads.....	15
7.4	Diversity Guidance	16
7.5	Earthing Arrangements.....	18
7.6	Ownership Boundaries	20
7.7	Commissioning, Energisation and Disconnection	20
7.8	Guidance on BS 7671 (IET Requirements for Electrical Installation)	20
7.9	Legal Requirements	20
8	References	21
8.1	UK Power Networks Standards	21
8.2	National Standards.....	21
Appendix A – Notification Form		22
Appendix B – Typical Domestic Setup and Ownership Boundaries		23

Tables

Table 5-1 – EVCP Supply Overview.....	11
Table 6-1 – Unmetered EV Requirements.....	12
Table 7-1 – EVCP Diversity Factors.....	16
Table 7-2 – Case 1 Diversity Factors	17
Table 7-3 – Assessed Open PEN Detection Devices	18
Table 7-4 – PME and TT Earthing System Separation.....	19

1 Introduction

This standard outlines the design requirements for the connection of electric vehicle charging point (EVCP) equipment to new and existing supplies. This standard also provides guidance on the processing of installation notification forms.

This standard is intended to be used by UK Power Networks staff, contractors, ICPs, Public Lighting Authorities, License Exempt Network Operators and customers.

This standard is intended to augment the existing LV supply and multi-occupied building design standards and should be read in conjunction with the appropriate standards:

- Unmetered supplies – refer to EDS 08-2102.
- Domestic single-phase supplies – refer to EDS 08-2101.
- Domestic three-phase supplies – refer to EDS 08-2100.
- Large LV, above 100A, single customer – refer to EDS 08-2100.
- Multi-occupied buildings, including LV and above supplied buildings – refer to EDS 08-1103.

This standard establishes the requirements for EVCP installers, including:

- Assessment of the adequacy of the supply capacity for the new electric vehicle load plus any existing load, before installation of the charging equipment.
- Assessment of the adequacy of the earthing, before installation of the charging equipment.
- Notification to the DNO of the installation once completed.

Information for the notification form can be found in Appendix A. Notification to UK Power Networks is required within a month after the installation of an EVCP to an existing property.

2 Scope

This standard applies to EVCP supplies only; for inclusion into new supply proposals and for addition to existing supplies.

This standard is designed to work in conjunction with the LV network design standard EDS 08-2000.

This standard does not apply to IDNO EVCPs; for IDNO networks refer to EDS 08-1101.

It shall be noted that within this standard:

- 3kW refers to a single phase EVCP not exceeding 13A at unity power factor based on a 230V nominal voltage.
- 7kW refers to a single phase EVCP not exceeding 30A at unity power factor based on a 230V nominal voltage.

Vehicle to grid technology (V2G) is not in the scope of this standard. V2G enables energy stored in electric vehicles to be fed back into the electricity network (grid) to help supply energy at times of peak demand. V2G chargers have the ability to export as well as import power. Relevant information and the application process can be found on the Smart Connect portal.

3 Glossary and Abbreviations

Term	Definition
CCCM	Common Connection Charging Methodology
BSC	The Balancing and Settlement Code. A legal document which defines the rules and governance for the balancing mechanism and imbalance settlement processes of electricity in Great Britain
CMS	Central Management System. A system used for remote dynamic street lighting control. Central Management Systems are coordinated by Elexon
DB	Distribution Board
DNO	Distribution Network Operator
Elexon	Administrator for the Balancing and Settlement Code (BSC)
ENA	Energy Network Association
EVCP	Electric Vehicle Charge Point
HV	High Voltage, AC Voltages above 1000V; generally used to describe 6.6kV or 11kV distribution systems but may include higher voltages.
ICP	Independent Connection Provider
LV	Low Voltage, AC Voltages up to 1000V; generally used to describe 230/400V or 230/460V distribution systems.
mCMS	Measured Central Management System
MD	Maximum Demand
MOCOPA	Meter Operation Code of Practice Agreement
MPAN	Meter Point Administration Number
MPR	Maximum Power Requirement
Ofgem	Office of Gas and Electricity Markets (GB Energy Regulator)
OPDD	Open PEN Detection Device. A device that detects a broken neutral and disconnects the supply
PEN	Protective Earthed Neutral
PoC	Point of Connection
pf	Power Factor
PME	Protective Multiple Earthing
PQM	Power Quality Monitor
SCR	Significant Code Review
SPN	Single-phase and Neutral
TPN	Three-phase and Neutral
TT	Terre- Terre Earthing
UK Power Networks	UK Power Networks (Operations) Ltd consists of three electricity distribution networks: Eastern Power Networks plc (EPN). London Power Network plc (LPN). South Eastern Power Networks plc (SPN).

Term	Definition
UMS	Unmetered Supply
UMSO	Unmetered Supplies Operator http://www.umso.co.uk/
V2G	Vehicle to Grid

4 EVCP Connection Process

4.1 Process for Installing EVCPs on Existing Supplies

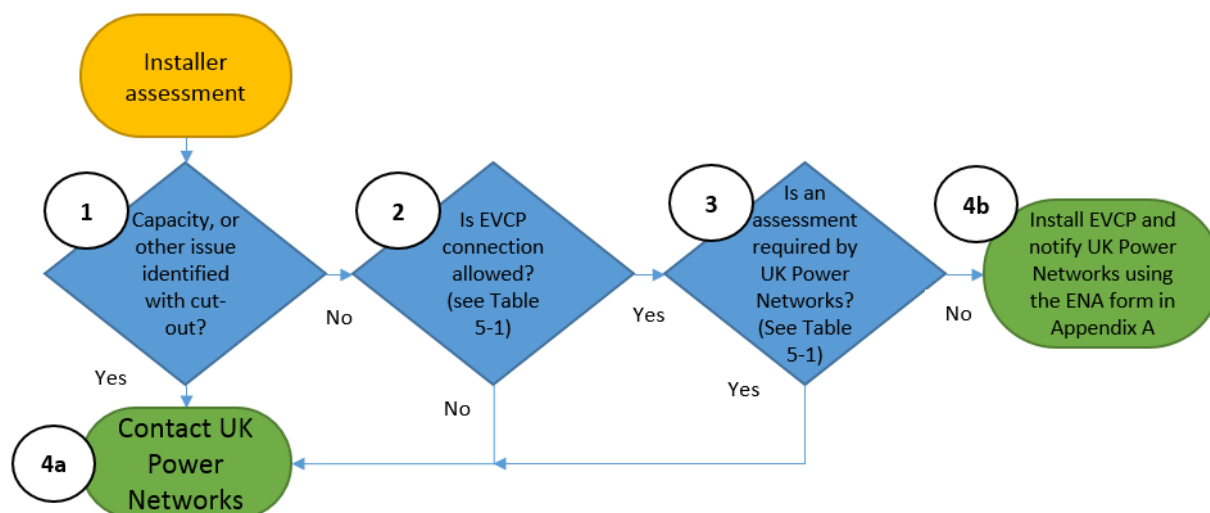


Figure 4-1: Process for Installing EVCPs on Existing Supplies

When installing EVCPs on existing supplies, the four-step process shown in Figure 4-1, and detailed below, shall be followed.

1. The installer shall conduct an assessment of the customer's cut-out. UK Power Networks shall be contacted for more information, to arrange a cut-out replacement or to upgrade the cut-out in cases where:
 - There are safety concerns over the cut-out, cut-out fuse, or any other existing equipment.
 - The installer is uncertain of the supply capacity or the adequacy of the supply.
 - The MD calculations performed by the installer indicate that a property's MD is greater than the known supply capacity (refer to Section 7.4 for additional information).
 - The installer is certain that the connection requires an upgrade.
2. The installer shall consult Table 5-1 to determine if the EVCP's installation requires a cut-out or supply upgrade. If a cut-out or supply upgrade is required, the installer shall contact UK Power Networks to arrange this.
3. The installer shall consult Table 5-1 to determine if the EVCP's installation requires a power quality or thermal assessment. If a power quality or thermal assessment are required, the installer shall contact UK Power Networks to arrange this.
4. If a cut-out or supply upgrade is not required (2), and if a power quality or thermal assessment are not required (3) for the EVCP to be installed, the EVCP installer may proceed with the installation. The EVCP installer shall then notify UK Power Networks of the EVCP installation as per the notification process detailed in Section 7.1.

If the customer/installer is installing a new device to a single dwelling/premise connected to electricity distribution network, the connection request can be raised via the online Smart Connect portal [here](#)¹.

Smart Connect can be used when:

- Connecting one or multiple new Low Carbon Technologies (LCT).
- Connecting at an existing single dwelling/premise (domestic or non-domestic).
- The premise has an existing electricity connection of up to a three-phase supply with 100A per phase.

4.2 Process for Installing EVCPs on New Supplies

Installers seeking to install EVCPs via a new supply can find guidance on how to connect on the UK Power Networks web site [here](#)². The diversity factors in Section 7.4 can be used by customers to assess the size of the capacity of the connection that is needed. Installers shall notify UK Power Networks as per the notification process detailed in Section 7.1.

¹ [Smart Connect | UK Power Networks](#)

² [Electric Vehicles | UK Power Networks](#)

5 Supply Overview

Table 5-1 specifies the supplies that are required for various EVCPs. The table also specifies the instances where thermal capacity and power quality assessments shall be completed by UK Power Networks.

Section 6 provides further details and the specification of each supply type.

Table 5-1 – EVCP Supply Overview

Type	Total MPR Available (kVA)	Max Single EVCP (Typical CPs)		Standard	Typical Earthing (Section 7.5)
		Max without assessment*	Max with assessment**		
25A UMS (Section 6.1)	5.75	5kW***	n/a	EDS 08-2102	TT
100A SPN Highway (Section 6.2)	23	7kW	22kW	EDS 08-2101	TT
100A TPN Highway (Section 6.3)	69	7kW	50kW	EDS 08-2100	TT
80A SPN Domestic (Section 6.4)	18	3kW	7kW	EDS 08-2101	PME
80A TPN Domestic (Section 6.4)	55	7kW	15kW	EDS 08-2100	PME
100A SPN Domestic (Section 6.4)	23	7kW	15kW	EDS 08-2101	PME
100A TPN Domestic (Section 6.4)	69	7kW	50kW	EDS 08-2100	PME
Large LV (Section 6.5)	≤1500	n/a	up to 1500kVA	EDS 08-2100	Case specific
HV Supplies (Section 6.5)	Limited by MPR	n/a	All load	EDS 08-3100	Case specific
EHV Supplies (Section 6.5)	Limited by MPR	n/a	All load	EDS 08-3100	Case specific
Multi-Occupied Building (Section 6.6)	Limited by MPR	n/a	All load	EDS 08-1103	Case specific

* Possible to connect without additional assessment.
** Possible to connect subject to thermal capacity and power quality assessment (Section 7.3). Max values assume other load is connected, the total MPR may be considered for dedicated EV supplies.
*** Refer to Table 6-1 for cable ratings and fuse size requirements.

6 Connection Requirements

EVCPs may be supplied from new or existing supplies. In each case, the supply shall adhere to the requirements of the applicable design standard for the size and type of supply.

6.1 Unmetered Supplies

A single EVCP may be connected to an UMS provided it satisfies the following criteria:

- The EVCP shall be used in conjunction with a measured central management system (mCMS)³.
- The EVCP shall not be used for fast or rapid charging⁴.
- The EVCP shall comply with the requirements of EDS 08-2102 (the 500W and 2kW maximum load limits only apply to the unmetered asset and not the EVCP).
- The total MPR shall include the unmetered asset and the EVCP.
- The EVCP MPR shall be constrained by **both** the fuse rating and the cable size of the UMS in accordance with Table 6-1. Where the fuse rating or cable is insufficient for a proposed EVCP/UMS combination, a service alteration shall be requested from UK Power Networks.
- The EVCP earthing shall comply with Section 7.5. Where the UMS earthing differs from the requirements of Section 7.5, the UMS shall be converted accordingly. This may have wider implications for EVCPs derived from looped or other complex UMS scenarios and should be considered prior to installation.

UMS EVCPs **shall not** be derived from:

- Looped supplies without a prior agreement with UK Power Networks (diversity shall be applied in accordance with Section 7.4).
- Unmetered three-phase supplies.
- Fifth core and other switched supplies.
- Supplies referred to as 'historic cables and cut-outs', as detailed in EDS 08-2102.

UMS EVCPs may be derived from overhead lines but should be considered for replacement by underground services if practical.

Table 6-1 – Unmetered EV Requirements

Fuse Size (A)*	Minimum Cable Size	Maximum EVCP (kW)
6	4mm ² / 0.007inch ² Copper	1
10	16mm ² / 0.0225inch ² Aluminium	3
25	25mm ² / 0.04inch ² Aluminium	5
* The earth loop impedance may dictate a smaller fuse to comply with EDS 08-2102.		

³ The mCMS measures consumption events and sends a log to the owners' meter administrator (MA), which is matched to the inventory reports processed by the DNO on behalf the customer and reported to the MA. The MA produces a consumption report of the actual consumption as opposed to predictable consumption. EVCPs are only permitted via UMS on this basis. There are currently 9 active UMS EVCP portfolios.

⁴ Fast and rapid chargers typically have an output greater than 7kW, the Table 6-1 limits are below this value.

6.2 100A Single-phase Connections in the Public Highway

A single EVCP up to 22kW (for an existing supply with other load) or 23kW (for a dedicated EV load) may be provided from a single 100A single-phase neutral (SPN) metered supply mounted in the public highway in accordance with EDS 08-2101.

100A SPN EVCPs shall not be provided by looped connections nor shall 100A SPN EVCPs be looped from a single point of connection.

6.3 100A Three-phase Connections in the Public Highway

A single EVCP of up to 50kW (for an existing supply with other load) or 69kW (for a dedicated EV load) may be provided using a 100A three-phase and neutral (TPN) metered supply mounted in the public highway in accordance with EDS 08-2100.

6.4 Single-phase and Three-phase Domestic Connections

A single EVCP of up to 7kW may be provided from an 80A SPN domestic supply and up to 15kW from an 80A TPN domestic supply.

A single EVCP of up to 15kW may be provided from a 100A SPN domestic supply and up to 50kW from a 100A TPN domestic supply.

Note: The maximum EV load limits stated above assume the supply is also used for typical domestic load.

Domestic connections shall be installed in accordance with EDS 08-2101 and EDS 08-2100.

If a direct fused connection for an EVCP is required, the UK Power Networks approved cut-out provides a facility for a parallel 30A fuse or "pup fuse" with a maximum 60A primary fuse to supply dedicated domestic services that cannot be provided by a BS 7671 domestic consumer unit. This is only applicable to single-phase supplies for the provision of an EVCP up to 7kW. For further guidance on pup fuse refer to EDS 08-2101 and EOS 03-0072.

Earthing shall be in accordance with the existing earthing system of the original supply, refer to Section 7.5.

For 80A SPN domestic supplies if the 30A pup fuse is not appropriate or the MPR of EVCP combined with the existing load exceeds 18kVA a supply upgrade to 100A SPN/TPN in accordance with EDS 08-2101/EDS 08-2100 is required to accommodate the additional load requirement.

For 100A SPN domestic supplies if the 30A pup fuse is not appropriate or the MPR of EVCP combined with the existing load exceeds 23kVA a supply upgrade to 100A TPN in accordance with EDS 08-2100 will be required to accommodate the additional load requirement.

6.5 Large Supplies

EVCPs exceeding 100A TPN shall be assessed and supplied in accordance with the appropriate design standard:

- EDS 08-2100 for LV supplies above and including 100A three-phase.
- EDS 08-3100 for HV and EHV supplies.

Refer to Section 7.4 for guidance on EVCP diversity.

6.6 Multi-Occupied Buildings

Supplies within multiple occupancy buildings, or buildings such as car parks shall be assessed in accordance with EDS 08-1103 and the appropriate connections for the required voltage of supply, with each EVCP considered another metered exit point within the building.

Refer to Section 7.4 for guidance on EVCP diversity.

7 General Requirements

7.1 Mandatory Notification Process

Following the installation of EVCP equipment, installers shall notify UK Power Networks of the installation using the notification form in Appendix A. This applies to EVCP installations to both an existing supply and where an application has been made for a new point of connection. Installations for larger commercial schemes, multiple installations and unmetered connections should also notify the UK Power Networks post commissioning.

Notification forms shall be sent to UK Power Networks via the online Smart Connect portal [here](#)⁵, or directly to the mailbox MBX-EVnotifications@ukpowernetworks.co.uk.

For multiple installations (multiple locations and/or multiple charge points in one location), a spreadsheet version of the form is available for installers to notify UK Power Networks. This applies to installation of EVCP in all customer contexts, residential, commercial, public on-street etc.

The notification form shall be completed by the EVCP installer and sent to UK Power Networks within 28 days of the date of the installation. The accepted notifications are recorded in our master database.

All submitted forms shall be archived and recorded by UK Power Networks in the central data repository from which the data can be used for regulatory reporting and analysis.

EVCPs connected to unmetered supplies shall be included on an unmetered supplies inventory to UK Power Networks UMSO on a monthly basis.

7.2 Network Reinforcement Guidance for EVCPs

The same voltage level and upstream reinforcement costs should be in line with the new charging rules set by Ofgem in the significant code review (SCR) for all the applications after the 1 April 2023. The high-cost project threshold for demand customers is set at £1,720/kVA. Reinforcement costs below the threshold are paid in full by the DNO, including costs at one voltage level above the PoC. For all applications, costs for reinforcement shall be in accordance with CCCM (external) and CON 00 024 (internal).

7.3 Power Quality and Disturbing Loads

Connection of potentially disturbing equipment to the distribution network shall be assessed in accordance with ENA EREC G5. Disturbing equipment is any equipment that has the potential to cause voltage harmonic distortion. The majority of equipment used to charge electric vehicles falls into this category.

The data collection form EDS 08-5055B shall be completed and submitted to UK Power Networks with an EVCP application. For multiple variants of different/unique chargers, a data collection form shall be submitted for each different type of charger. UK Power Networks shall subsequently carry out a power quality assessment in accordance with EDS 08-5055. Where power quality is not a constraining factor for the connection of chargers, the number of chargers to be connected should be assessed via a thermal assessment.

⁵ [Smart Connect | UK Power Networks](#)

7.4 Diversity Guidance

For the avoidance of doubt, the diversity factors in Table 7-1 shall not be applied when calculating the MD of a property, for sizing its service or cut-out (sole use equipment). As indicated in the IET Code of Practice for Electric Vehicle Charging Equipment Installation – 4th Edition, no diversity should be applied.

The diversity factors in Table 7-1 can be used by customers and lighting authorities to assess the thermal capacity of network assets (transformers and conductors) needed to supply new EVCP connections.

The diversity factor is applied to the total kW rating of customer EVCPs connected to a network asset.

Table 7-1 – EVCP Diversity Factors

EVCP Capacity & Reference Case		Case Description	Case Diversity Factor
Fast or Slow ≤22kW	Case 1a	Charging points in single dwellings	See Table 7-2
	Case 1b	Multi Occupancy Buildings with single electrical intakes (No. of EVCPs ≥ no. of dwellings)	See Table 7-2
	Case 1c	Multi Occupancy Buildings with single electrical intakes (No. of EVCPs < no. of dwellings)	0.8
	Case 1d	Public Car Parks or On-Street Charging Points with common electrical power supplies	0.8
	Case 1e	Multiple charging points in commercial customer applications with a common electrical power supply	Case specific using the customers operating profile and associated network studies
Rapid >22kW	Case 2a	Where the customer connecting the rapid chargers is the sole user of the network asset that the EVCP is being connected to	Case specific
	Case 2b	Where the customer connecting the rapid chargers is not the sole user of the network asset that the EVCP is being connected to	0.8

For Case 1a & Case 1b, Table 7-2 below shall be used to select a diversity factor based on the **capacity** of the EVCPs connected to the network asset and the **number** of EVCPs connected to the network asset⁶. Where UK Power Networks has data on the number and type of existing EVCPs already connected to a network asset, they can be factored into the assessment; however, if this is unknown, or there are no existing EVCPs connected to the network asset, the number of new chargers being connected shall be used.

Table 7-2 – Case 1 Diversity Factors

Number of EVCPs connecting to the asset	Slow (<6.6kW)	Fast (>6.6kW, <22kW)
1 to 14	0.5	0.5
15-19	0.5	0.47
20-29	0.5	0.41
30-39	0.5	0.33
40-49	0.48	0.33
50-69	0.46	0.30
70-99	0.42	0.28
100-139	0.4	0.25
140-274	0.35	0.22
>274	0.31	0.22
<p>Where there are a mixture of slow and fast chargers connected or connecting to the network asset, use the lower of calculations A & B below to calculate capacity requirements:</p> <p>A = (Accumulative capacity of slow EVCPs * slow diversity factor which corresponds to the number of slow chargers) + (Accumulative capacity of fast EVCPs * fast diversity factor which corresponds to the number of fast chargers)</p> <p>B = (Accumulative capacity of all EVCPs * slow diversity factor which corresponds to the total number of chargers)</p>		

⁶ Different diversity factors shall be applied to different network assets based on the number of EVCPs connected to them, for instance: two LV feeder sections each with 20 fast EVCP connections will both have diversity factors of 0.41 applied; however, the secondary transformer that those sections are fed from will have a diversity factor of 0.33 applied.

7.5 Earthing Arrangements

7.5.1 Overview

The earthing requirements for the EVCP will depend on the earthing arrangements of the electrical supply to the charge point and the location of the charge point. The requirements for EVCPs in the public highway and buildings is detailed in Sections 7.5.2 and 7.5.3 below. Further guidance on TT earthing is included in Section 7.5.4.

7.5.2 Public Highway

A TT earthing system shall be used for all supplies from Section 6.1, 6.2 and 6.3 EVCPs, this includes all EVCPs in the public highway, public car parks and similar locations or those constructed to a no lesser standard than the public highway/carpark. Refer to Section 7.5.4 for specific TT earthing requirements.

Alternatively, a TN-C-S (PME) earth terminal may be used for electric vehicle charging points in the public highway where an OPDD device from Table 7-3 is utilised.

Note: Evidence has been provided by the manufacturer/supplier for the devices listed in Table 7-3 to demonstrate that the device satisfies the criteria detailed in ENA EREC G12 Issue 5 Section 6.2.16.2. Only the OPDD devices listed in Table 7-3 may be used on the UK Power Networks distribution network. For guidance on the application and assessment of Open-PEN devices refer to EBB 06-0106.

Table 7-3 – Assessed Open PEN Detection Devices

Manufacturer	Address	Device	Date Added
Matt:e Ltd	Unit 1 Langley Brook Business Park Middleton Tamworth B78 2BP	MTE/A 5P, MTE/A 3P, MTE/A 13-32G, O-PEN Monitor. Any device from the manufacturer that fundamentally uses the same core technology as the devices above	01/05/2023
CityEV Ltd	Technopole Kingston Crescent Portsmouth PO2 8FA	Cityline and EVline Safevolt® 100 models. Cityline and EVline Safevolt® 300 models. Any device from the manufacturer that fundamentally uses the same core technology as the devices above	20/09/2023

7.5.3 Buildings

Section 6.4, 6.5 and 6.6 EVCPs shall be earthed in accordance with the existing building earthing arrangement.

A PME earth terminal may be provided to a premise with an electric vehicle charging point that is not street electrical furniture (e.g. domestic installation) subject to the general requirements of BS 7671 Regulation 722.411.4.1 (limitation of earth potential rise to 70V). The customer’s electrical designer/installer is responsible for ensuring that any PME earth terminal is used appropriately and conforms to the requirements of BS 7671.

It is the responsibility of the EVCP installer to ensure that:













- The earthing and bonding arrangements comply with the requirements of BS 7671 for EVCP equipment.
- Any earth terminal provided for the premise is used appropriately.

7.5.4 TT Earthing

Any TT earth electrode shall be segregated by a minimum of 2.5 metres from any PME earthing system; this can usually be achieved by ensuring there is 2.5 metres separation above ground between earthed metalwork. Where reasonably practicable consideration should be given to the presence of underground earth electrodes. Some examples of acceptable and unacceptable arrangements are given Table 7-4.

It is not permissible to consider metallic lamp columns to be earth electrodes.

Table 7-4 – PME and TT Earthing System Separation

Existing Earthing System	Separation	New Earthing System	Acceptable
	$< 2.5m$		✓
	$\geq 2.5m$		✓
	$\geq 2.5m$		✓
	$\leq 2.5m$		✓
	$< 2.5m$		✗
	$< 2.5m$		✗

7.6 Ownership Boundaries

In all instances, the ownership boundary shall be at the outgoing terminals of the cut-out. Appendix B includes a diagram of a typical domestic supply set-up, and the ownership boundaries between the Customer, Supplier and DNO.

The ownership boundary shall be indicated on site by the use of the approved boundary label (material code 20042K, refer to EAS 07-0021) or shall be suitably marked on the cut-out for UMS.

For supplies in the public highway; inspection and reporting of service termination issues will be required by the customer or public lighting authority.

7.7 Commissioning, Energisation and Disconnection

Refer to the appropriate standards for the correct commissioning, energisation and disconnection procedures required for each supply, including the requirements for MPANs where required.

7.8 Guidance on BS 7671 (IET Requirements for Electrical Installation)

UK Power Networks is not an enforcing or advisory body for BS 7671. Where questions of the adequacy of the customer's installation need to be resolved the electrical contractor should seek advice from the trade body providing their accreditation.

Arrangement of the customer installation is entirely at the discretion of the customer. Legislation requires that the customer installation shall be provided, installed and maintained in accordance with BS 7671 by the customer's electrical contractor.

7.9 Legal Requirements

All necessary consents relating to the service cables and access arrangements shall be provided by the customer. If UK Power Networks equipment is to provide a strategic purpose additional to the function of a supply point for an unmetered supply customer, UK Power Networks shall ensure that its interests are adequately protected by the agreed tenancy arrangements. Necessary land rights shall be secured before starting construction.

8 References

8.1 UK Power Networks Standards

EOS 03-0072	Pup Busbar for WT Henley Cut-Outs
EDS 06-0017	Customer LV Installation Earthing Design
EBB 06-0106	Guidance on Open PEN Detection Devices for Electric Vehicle Charging Points
EAS 07-0021	Signs and Labels for Operational Sites and Equipment
EDS 08-1101	IDNO Networks
EDS 08-1103	Multiple Occupancy Building Supplies
EDS 08-2000	LV Network Design Standard
EDS 08-2100	LV Customer Supplies
EDS 08-2101	LV Customer Supplies up to 100A Single-phase
EDS 08-2102	Unmetered Connections
EDS 08-3100	EHV and HV Customer Demand and Generation Supplies
EDS 08-5055B	Electric Vehicle Charging Point (EVCP) Data Collection Form
EDS 08-5055	Power Quality Assessment Process for Mode 4 Electric Vehicle Charging Points and heat pumps
CON 00 024	Connection Charge Manual (internal use only)
CCCMS	Statement of Methodology and Charges for Connection to the Electricity Distribution Systems of Eastern Power Networks Plc, London Power Networks Plc & South Eastern Power Networks Plc

8.2 National Standards

BS 7671:2018+A2:2022	Requirements for Electrical Installations (IET Wiring Regulations 18th Edition)
BS EN 61000-3-2	Electromagnetic compatibility (EMC) Limits. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
BS EN 61000-3-3	Electromagnetic compatibility (EMC) Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
ENA EREC G5/5	Harmonic Voltage Distortion and the Connection of Harmonic Sources and/or Resonant Plant to Transmission Systems and Distribution Networks in the United Kingdom
ENA EREC G12/5	Requirements for the Application of Protective Multiple Earthing to Low-voltage Networks

Appendix A – Notification Form

The notification form is available from the ENA website and can be submitted online through the UK Power Networks online portal. Information for the form is available at ENA's website.

The latest version of the form can be found via the link below:

[Single-Electric-Vehicle-Charge-Point-and-Heat-Pump-Installation-Application-Form.docx \(live.com\)](#)

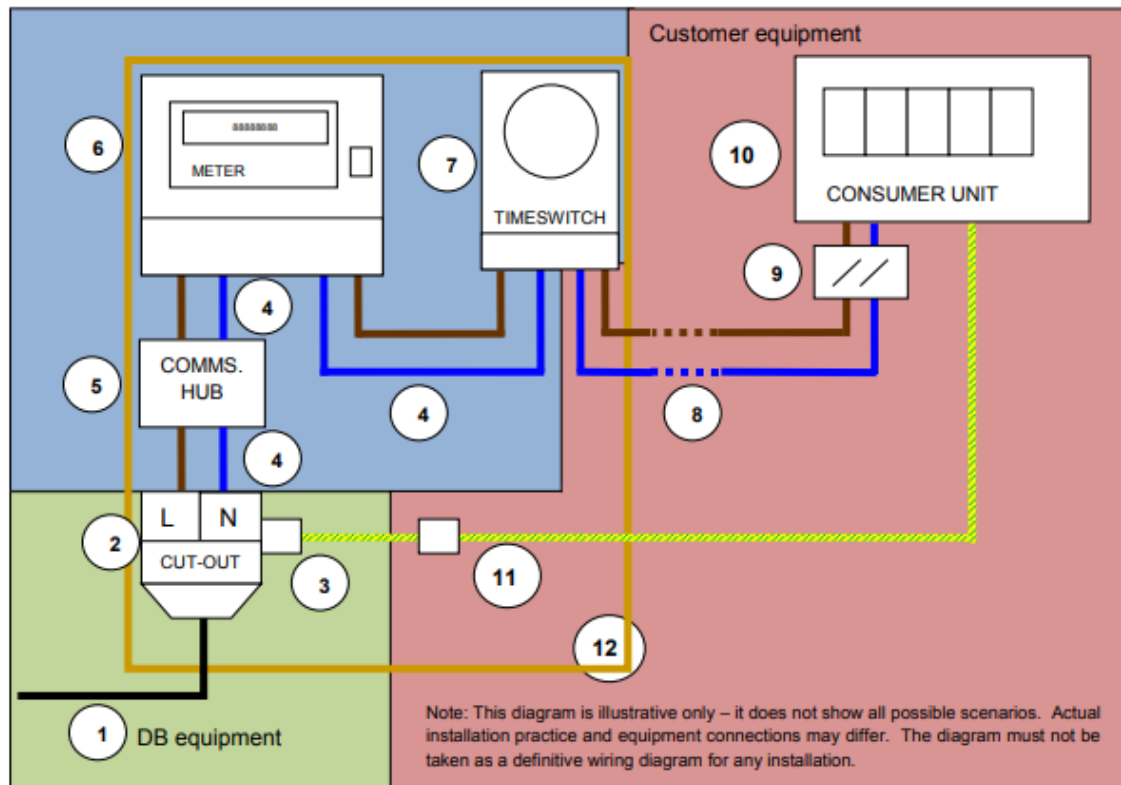
If you have any difficulty in accessing the form, visit ENA's website:

[Connecting electric vehicles and heat pumps to the networks – Energy Networks Association \(ENA\)](#)

Or contact ENA at info@energynetworks.org.

Appendix B – Typical Domestic Setup and Ownership Boundaries

The following diagram is from the MOCOPA 'Guidance for Service Termination Issue Reporting V3.5', it shows a typical domestic supply set-up. The aim of the diagram is to clarify boundaries of responsibility; it is for illustrative purposes only and does not show all possible scenarios.



DB equipment	Supplier equipment	Customer equipment
1 - Service cable	4 - Meter tails (cut-out to meter and meter to timeswitch)	8 - Meter tails (between the meter / timeswitch and the Customer equipment)
2 - Cut-out (or main fuse or DB fuse)	5 - Communications hub if fitted (may be within the meter)	9 - Customer isolating switch (if fitted / requested)
3 - DB earth terminal	6 - Meter	10 - Customer consumer unit
	7 - Timeswitch (if fitted)	11 - Customer earthing conductor (and earth block if fitted)
		12 - Meter board (and external meter box if fitted)