

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.

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Revision Record

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Reason for update: updates as per below

- 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.

What has changed:

- EVCP Connection Process section added (Section 4).
- Supply Overview section updated (Section 5).
- Mandatory Notification Process section updated (Section 7.1).
- Diversity Guidance section revised (Section 7.5 & Section 7.5.1).
- ENA EVCP notification form updated (Appendix A).
- Diagram showing typical domestic supply set-up and ownership boundaries added (Appendix B).

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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.

What has changed:

- Supply overview section added (Section 5).
- Connection requirements revised included (Section 6).
- Disturbing load section updated (Section 7.3).
- Disturbing load assessment form added (EDS 08-5050B).
- Minor revisions to all other sections, document title revised

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New standard to cover electrical vehicle charge equipment installation to the distribution network

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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:

- For domestic single-phase supplies; refer to EDS 08-2101.
- For domestic three-phase supplies; refer to EDS 08-2100.
- For large LV, above 100A, single customer; also refer to EDS 08-2100.
- For 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.

A copy of 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; refer to EDS 08-0113.

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.

3 Glossary and Abbreviations

Term	Definition
CCCM	Common Connection Charging Methodology
DNO	Distribution Network Operator
Elexon	Service company for the Balancing and Settlement Code
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
pf	Power Factor
PME	Protective Multiple Earthing
PQM	Power Quality Monitor
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: <ul style="list-style-type: none"> • Eastern Power Networks plc (EPN). • London Power Network plc (LPN). • South Eastern Power Networks plc (SPN).
UMC	Unmetered Connection
UMSO	Unmetered Supplies Operator

4 EVCP Connection Process

4.1 Process for Installing EVCPs on Existing Supplies

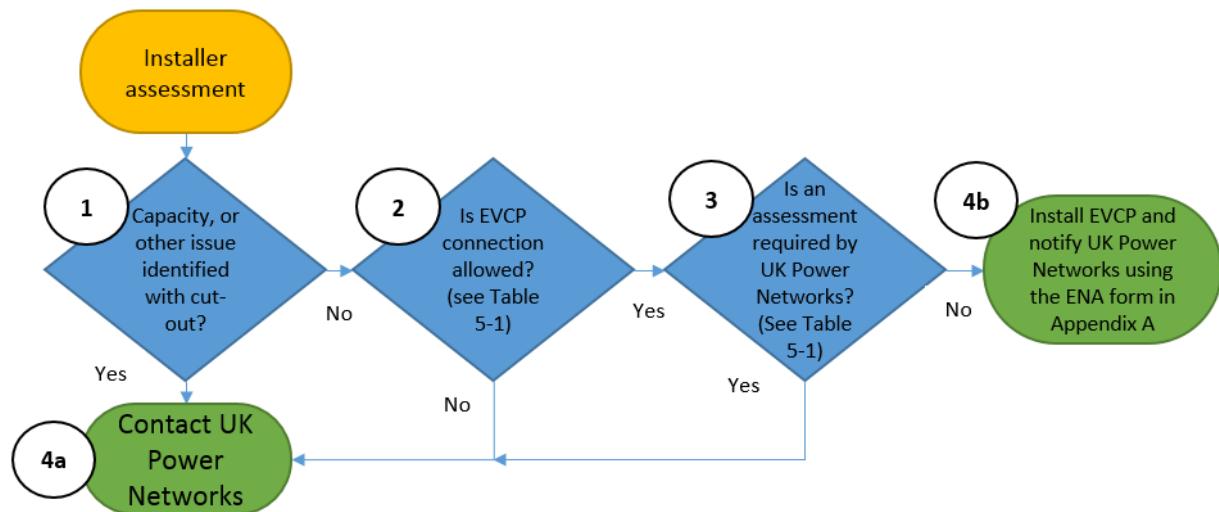


Figure 4-1: Process for installing EVCPs on existing supplies

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 7.5 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.

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 UK Power Networks [connections website](#). The diversity factors in Section 7.5 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.

5 Supply Overview

Table 5-1 – EVCP Supply Overview 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 details and specification of each supply type.

Table 5-1 – EVCP Supply Overview

Type	Total MPR Available (kVA)	Max Single EVCP (Typical CPs)						Section
		≤3kW	>3kW, 7kW,	>7kW, ≤15kW	>15kW, ≤22kW	>22kW, ≤50kW	>50kW	
UMC	5.75	✓	✗	✗	✗	✗	✗	6.1
100A SPN Highway	23	✓	✓	✓†	✓†	✗	✗	6.2
100A TPN Highway	69	✓	✓	✓†	✓†	✓†	✓†	6.3
100A SPN Domestic	23	✓	✓	✓†	✗	✗	✗	6.4
100A TPN Domestic	69	✓	✓	✓†	✓†	✓†	✗	6.4
Large LV	≤1500*	✓*	✓*	✓*	✓*	✓*	✓*	6.5
HV Supplies	Limited by MPR	✓*	✓*	✓*	✓*	✓*	✓*	6.5
EHV Supplies	Limited by MPR	✓*	✓*	✓*	✓*	✓*	✓*	6.5
Multi-Occupied Building	Limited by MPR	✓*	✓*	✓*	✓*	✓*	✓*	6.5
Legend: ✗ Not possible from this connection type ✓ Possible to connect without additional assessment ✓† Possible to connect subject to thermal capacity and power quality assessment. ✓* Possible to connect multiple EVCPs available subject to thermal capacity and power quality assessment of an existing or proposed connection type.								

6 Connection Requirements

EVCPs may be supplied from a number of new or existing supplies. In each case, the hosting supply shall adhere to the requirements of the primary design standard for that size or type of supply.

6.1 Unmetered Connections

A single EVCP shall be provided from an UMC based on the requirements of EDS 08-2102; The UMC hosting the EVCP shall fully comply with the requirements of EDS 08-2102 for all issues regarding supply, for example hardware provision, fuse rating, ownership of the UMC etc. with the exception of the provision of earthing (refer to Section 7.2).

Where an UMC earthing differs from the requirements of Section 7.2, the UMC shall be converted accordingly. This may have wider implications for EVCPs derived from looped or other complex UMC scenarios and should be considered prior to installation.

It is noted that EVCPs derived from UMCs will use mCMS to collect consumption data and as such will have to adhere to the Elexon certification process for use on unmetered connections.

Therefore EVCPs are not limited by the 500W or 2kW MPR requirements for UMC where prior agreement has been given by UK Power Networks' UMSO.

For EVCPs derived from existing UMCs, the MPR of the unmetered and mCMS component shall be considered in the total MPR of each UMC. For example an EVCP to be derived from a UMC in excess of 500W shall consider the MPR of both the UMC and the EVCP at their peak load. Note that diversity of load shall not be considered for a single point of supply.

The maximum power available for UMC shall be constrained by the fuse rating of the UMC connection, as listed in Table 6-1.

Table 6-1 - Maximum Power Available per Fuse Rating

Fuse Rating (A)	6	10	16	20	25
Total MPR (kW)	1.38	2.3	3.68	4.6	5.75

As discussed, fuse provision shall be determined in accordance with EDS 08-2102. Where fuse rating is insufficient for a proposed EVCP/UMC combination, a service alteration shall be required.

Note: UK Power Networks cannot guarantee the minimum or maximum fuse rating available for a UMC due to the operational requirements of the LV distribution network in accordance with the ESQCRs.

For EVCPs to be provided from looped UMCs, diversity shall be applied across the volume of UMCs to be equipped, refer to Section 7.5 for guidance.

EVCPs shall not be derived from UMCs on unmetered three-phase supplies, fifth core and other switched supplies or those supplies referred to as "Historic Cables and Cut-outs", as detailed in EDS 08-2102. UMCs supplied by overhead lines are not prohibited from hosting an EVCP but, should be considered for replacement by underground services if practical.

6.2 100A Single-phase Connections in the Public Highway

A single EVCP up to 22kW may be provided from a single 100A single-phase neutral (SPN) metered supply mounted in the public highway.

100A SPN EVCPs shall be provided from an underground LV distribution network only (refer to EDS 08-2000) and shall be:

- An approved 35mm² single-phase aluminium cable (refer to EAS 02-0000).
- Installed in a 32mm internal diameter UK Power Networks approved duct (refer to EAS 02-0000).
- A service length no greater than 43 metres,
- Terminated in an approved 100A cut-out (refer to EAS 13-0000).
- Supplied with standard 25mm² copper double-insulated conductors (meter tails) from the meter to the cut-out, provided and installed by the appointed meter operator.

The cut-out and whole current meter shall be accommodated within a customer owned, provided and maintained position that shall be:

- Electrically safe to allow for the termination of the approved cut-out and meter.
- Provided with a BS 7671 electrical test certificate.
- Watertight and secured with the appropriate tool.

The meter shall not be positioned lower than 500mm or higher than 1800mm.

100A SPN EVCPs shall be earthed in accordance with Section 7.2.

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

For EVCPs exceeding 7kW, also refer to Section 6.5.

6.3 100A Three-phase Connections in the Public Highway

A single EVCP of up to 50kW may be provided using a 100A three-phase and neutral (TPN) metered supply mounted in the public highway.

100A TPN EVCPs shall be provided from an underground LV distribution network only (refer to EDS 08-2000) and shall be:

- An approved 35mm² three-phase aluminium cable (refer to EAS 02-0000),
- Installed in a 50mm internal diameter UK Power Networks approved duct (refer to EAS 02-0000),
- For a service length no greater than 43 metres,
- Terminated in an approved 100A cut-out (refer to EAS 13-0000),
- Supplied with standard 25mm² copper double-insulated conductors (meter tails) from the meter to the cut-out, provided and installed by the appointed meter operator.

The cut-out and whole current meter shall be accommodated within a customer owned, provided and maintained position that shall be:

- Electrically safe to allow for the termination of the approved cut-out and meter.
- Provided with a BS 7671 electrical test certificate.
- Watertight and secured with the appropriate tool.

The meter shall not be positioned lower than 500mm or higher than 1800mm.

100A TPN EVCPs shall be earthed in accordance with Section 7.2.

For EVCPs exceeding 7kW, also refer to Section 6.5.

6.4 Single-phase and Three-phase Domestic Connections

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

If a direct fused connection for an EVCP is required; as described in EOP 03-0072, the UK Power Networks approved cut-out provides a facility for a parallel 30A fuse or “pup fuse” from a maximum 60A primary fuse to supply dedicated domestic services that cannot be provided by a BS 7671 domestic consumer unit.

This may be applied to both single-phase and three-phase whole current metered supplies for the provision of an EVCP up to 7kW. In three-phase supplies, only the primary fuse to which the pup fuse is attached is required to be a maximum 60A.

The primary 60A supply shall remain in accordance with EDS 08-2101 or EDS 08-2100 as appropriate. The 30A pup fuse supply shall be metered remotely from the cut out at a position discussed, approved and provided by the customer with their electricity supplier.

The 30A pup fuse supply shall be fitted with standard 25mm² copper double-insulated conductors (meter tails) from the meter to the cut-out, provided and installed by the appointed meter operator.

Earthing for the 30A pup fuse supply shall be in accordance with the existing earthing system of the original supply; refer to EDS 06-0017 for specific information.

Refer to EOP 03-0072 for technical guidance on the provision of pup fuse supplies.

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, refer to section 6.5.

For 100A TPN domestic supplies if the 30A pup fuse is not appropriate or the MPR of EVCP combined with the existing load exceeds 69kVA, additional supplies or an increase in supply will be required in accordance with EDS 08-2100, refer to Section 6.5.

For EVCPs exceeding 7kW, also refer to Section 6.5

6.5 EVCPs exceeding 7kW and Multi-Occupied Buildings

EVCPs exceeding 7kW shall be assessed and supplied in accordance with the appropriate design standard for the size of supply being used:

- EDS 08-1103 for supplies to multi-occupied buildings.
- EDS 08-2102 for unmetered supplies.
- EDS 08-2101 for supplies up to 100A single phase.
- EDS 08-2100 for supplies above and including 100A three-phase.
- EDS 08-3100 for HV supplies.
- EDS 08-4100 for EHV supplies.

Supplies within buildings such as car parks shall be assessed as per 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 7.5 for guidance on EVCP diversity.

7 General Requirements

7.1 Mandatory Notification Process

Following the installation of EVCP equipment, installers are required to 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 small services via the online portal, or directly to the small services email address 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 to 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 30 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 Earthing Arrangements

Earthing system 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.

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.

A PME earth terminal shall not be provided for a supply direct to EVCPs installed in the highway, refer to EDS 06-0017. The supply and installation of earthing system and protection is the responsibility of the EVCP installer.

Section 6.4 and 6.5 EVCPs shall be earthed in accordance with the existing building earthing arrangement. The customer's EVCP installer is responsible for ensuring that the earth system is used appropriately and conforms to the requirements of BS 7671.

It is the responsibility of the EVCP installer to:

- Confirm the earthing and bonding arrangements of the location meet the requirements for EVCP equipment.
- Ensure that any earth terminal provided for the premise is used appropriately.

Refer to EDS 06-0016 and EDS 06-0017 for additional earthing information.

7.3 Power Quality and Disturbing Loads

Connection of potentially disturbing equipment to the distribution network shall be assessed in accordance with ENA EREC G5/4-1. 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 08-5050B shall be completed and submitted to UK Power Networks with an EVCP application. UK Power Networks shall subsequently carry out a power quality assessment in accordance with EDS 08-5055.

7.4 Network Reinforcement Guidance for EVCPs

Upstream reinforcement costs associated with eligible EVCP equipment installed in existing small service whole current metered properties shall be fully funded by UK Power Networks in accordance with the CCCM. This only applies where there is no modification to a customer's existing service from the installation of eligible equipment. For all other applications costs for reinforcement shall be in accordance with the CCCM.

Eligible equipment is deemed to be any and all:

- Generation equipment with a rated output not greater than 16A per phase (or not greater than 16A per phase at any single premises if a single application for multiple installations) or,
- Equipment installed that conforms with the technical requirements of BS EN 61000-3-2 and BS EN 61000-3-3, notwithstanding that the equipment may have an input current that is more than 16A per phase.

7.5 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 stated in the IET Code of Practice for Electric Vehicle Charging Equipment Installation – 3rd Edition, a diversity factor of 1 shall be applied in this instance.

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 and description in Section 7.5.1.
	Case 1b	Multi Occupancy Buildings (No. of EVCPs ≥ no. of dwellings)	See Table 7-2Table 7-2 and description in Section 7.5.1.
	Case 1c	Multi Occupancy Buildings (No. of EVCPs < no. of dwellings)	0.8
	Case 1d	Public Car Parks or On-Street Charging Points	0.8
	Case 1e	Multiple charging points, in commercial customer applications	Case specific
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

Case 1a - Where the assessment is for fast or slow EVCPs that are in single dwellings, use the methodology in section 7.5.1 to select diversity factors to apply to the EVCPs.

Case 1b - For multi-occupancy buildings with single electrical intakes, supplying slow or fast EVCPs in their associated private car parks, where the number of dwellings are less than or equal to the number of charge points. For this case, use the methodology in section 7.5.1 to select diversity factors to apply to the EVCPs.

Case 1c - For multi-occupancy buildings with single electrical intakes supplying slow or fast EVCPs in their associated private car parks, where the number of dwellings are in excess of the number of charge points, a diversity factor of 0.8 shall be applied to the total kW rating of the EVCPs.

Case 1d - For car parks or on-street slow or fast EVCPs with common electrical power supplies (i.e. LV feeder), a diversity factor of 0.8 shall be applied to the total kW rating of the EVCP.

Case 1e - For multiple slow or fast EVCPs, in commercial customer applications, with a common electrical power supply (e.g. bus fleets, logistics fleets) – assessment of diversity shall be made on a case-by-case basis using the customers operating profile and associated network studies.

Case 2a – For rapid EVCPs, where the customer connecting the EVCPs is the sole user of the network asset that the EVCP is being connected to, a case specific diversity factor shall be applied to the total kW rating of the EVCPs.

Case 2b – For rapid EVCPs, where the customer connecting the EVCPs is not the sole user of the network asset that the EVCP is being connected to, a diversity factor of 0.8 shall be applied to the total kW rating of the EVCPs.

7.5.1 Case 1a and Case 1b Diversity Factors

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 asset¹. 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

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:

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)

B = (Accumulative capacity of all EVCPs * slow diversity factor which corresponds to the total number of chargers)

¹ 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.

7.6 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 as detailed in EDS 08-3101.

7.7 Guidance on BS7671 (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 e.g. Electrical Contractors Association (ECA), National Inspection Council for Electrical Installation Contracting (NICEIC) etc.

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.

7.8 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 EDS 07-0009.147 (refer to EAS 07-0021) or shall be suitably marked on the cut-out for UMCs.

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

7.9 Commissioning, Energisation and Disconnection

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

8 References

8.1 UK Power Networks Standards

EAS 13-0000	Approved Equipment List – LV Plant and Equipment
EAS 02-0000	Approved Equipment List – Cables and Joints
EDS 06-0016	LV Network Earthing Design
EDS 06-0017	Customer LV Installation Earthing Design
EDS 07-3101	Pre-design Requirements for Secondary Substations
EDS 08-0113	Guidance for Inset Networks
EDS 08-0132	Planning Guidance for Disturbing Loads
EDS 08-1901	Guidance for the Connection of Customers Disturbing Loads
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	HV Customer Demand and Generation Supplies
EDS 08-4100	EHV Customer Demand and Generation Supplies
EDS 08-5050B	Electric Vehicle Charging Point (EVCP) Data Collection Form
EOP 03-0072	Pup Busbar for WT Henley Cut-Outs

8.2 National Standards

BS 7671	BS 7671:2008+A3:2015 Requirements for Electrical Installations (IET Wiring Regulations Seventeenth 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
ESQCR	Electricity Safety, Quality and Continuity Regulations 2002

Appendix A – Notification Form Specimen

The notification form can be submitted online through the UK Power Networks online portal available at:

<http://www.energynetworks.org/assets/files/electricity/futures/Electric%20Vehicles%20and%20Heat%20Pumps/EV%20HP%20Application%20Form%20v9.5.docx>

EV & HP Application



Application Form for the Installation of Low Carbon Technologies

This application form must be completed and sent by the installer to the DNO directly when installing an Electric Vehicle Charge Point or Heat Pump. This form should be used for premises with an existing DNO connection. For new DNO connections, this form should be used in addition to a new electricity connection application. To ensure the safety and security of the Electricity Networks, depending on the size, type and location of the installation, you may need to apply for a connection with the DNO prior to installation of the device. To determine if you need to apply to the DNO for a connection prior to installation or not, please ensure you read and understand the connection processes for Electric Vehicles and Heat Pumps on the ENA website here: <http://www.energynetworks.org/electricity/futures/electric-vehicles-and-heat-pumps.html>

For help identifying the correct DNO and their contact details please visit:

http://www.energynetworks.org/assets/files/electricity/futures/Electric%20Vehicles%20and%20Heat%20Pumps/dno_info_for_ev&hp_310818.pdf

Please note that:

- One form must be submitted per device per premises. For multiple devices (including multiple devices under one controller) or multiple properties, please use the multiple installations spreadsheet, also available on the ENA website here: <http://www.energynetworks.org/electricity/futures/electric-vehicles-and-heat-pumps.html>
- An 'adequacy of the supply' assessment is required prior to any Electric Vehicle Charge Point or Heat Pump installation. This requires a load survey to calculate the new Maximum Demand (MD), including the device to be installed.
- The DNO must be contacted in advance of installation where there is an identified issue with adequacy or safety concern with the premises existing service equipment, where the new MD is greater than the cut-out rating, where the new MD is >60A (13.8kVA single phase) for residential properties or the devices do not meet the required standards.* Depending on the size and/or number of devices being connected, the DNO may ask for additional information to be supplied.
- In certain circumstances, for example if the total MD of the premises is ≤80A and adequacy of the connection is known*, the DNO shall be notified within 28 days of the installation.
- Any reinforcement costs associated with this installation may be recharged to the customer.

Providing that this form is fully and correctly completed, the following timeframes are applicable:

- Properties with new MD ≤80A and meeting all other relevant requirements* - installers can connect their device(s) and shall notify the DNO by filling in this form within 28 days of the installation
- Properties with new MD >80A and ≤100A (and not CT metered) - the installer must apply for a connection prior to installation by filling in this form and the DNO will assess the supply capacity within 10 working days
- Properties with new MD >100A (and not CT metered) - the installer must apply for a connection prior to installation by filling in this form. Timescales as per the Electricity Distribution Licence, Electricity (Guaranteed Standards of Performance) Regulations 2010: <https://www.ofgem.gov.uk/ofgem-publications/47616/connections-gsop-guidance-sept0809.pdf>. See local DNO connections Guarantee Standards of Service for specific response timescales in your area.

* All devices must comply with the process described on the ENA website here: <http://www.energynetworks.org/electricity/futures/electric-vehicles-and-heat-pumps.html>

Installer Contact Details

Name	
Company	
Address line 1	
Address line 2	
Town	
Postcode	
Contact Number	
Email	

Customer Contact Details

Name	
Address line 1	
Address line 2	

Figure 8-1 – ENA Notification Form (Page 1)



EV & HP Application

Town	
Postcode	
Contact Number	

Installation Location Address (if different from Customer Address)

Name	
Address line 1	
Address line 2	
Town	
Postcode	
Contact Number	

Electrical Installation Details

Type of Installation Please note that one technology per form should be used MPAN (11 digit MPRN if Northern Ireland) See http://www.energynetworks.org/electricity/futures/electric-vehicles-and-heat-pumps.html for details. If the supply is unmetered, the 'Apply to Connect' process is applicable and the local DNO must be contacted.	<input type="checkbox"/> Electric Vehicle Charge Point <input type="checkbox"/> Heat Pump -----
Number of Phases	<input type="checkbox"/> Single Phase <input type="checkbox"/> Split/two Phase <input type="checkbox"/> Three Phase
Declared Voltage at Connection Point Volts
Maximum Demand (MD) of premises Including proposed installation, concluded from a Load Survey, as well as any import or load limiting devices. Amps (per phase – Whole Current Metered Only) kVA (CT Metered Only)
Does this premises include an import or load limiting device?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Maximum Current Demand the proposed EV/HP can draw Include any associated additional components. The maximum simultaneous demand must be stated [†] . Additional equipment/reconfiguration not included in this application is not permitted after installation Amps <input type="checkbox"/> Single Phase <input type="checkbox"/> Three Phase
Has the DNO been contacted about this installation and confirmed the Premises Supply Capacity? Essential if new MD >80A. Tick one as appropriate	<input type="checkbox"/> Yes – Reference Number / Date, if applicable: Agreed Supply Capacity: A (Whole Current Metered Only) Agreed Maximum Import Capacity: kVA (CT Metered Only) <input type="checkbox"/> No
Premises Cut-out Rating* If known. Whole Current Metered only. See ENA website for guidance. Amps
Premises Existing Agreed Maximum Import capacity CT metered only kVA
Final or Proposed Earthing Arrangements as per BS 7671 and the IET Code of Practice: https://www.theiet.org/resources/standards/cop-electric.cfm	<input type="checkbox"/> TN-C-S (PME) <input type="checkbox"/> TN-S (SNE) <input type="checkbox"/> TT (Direct) <input type="checkbox"/> Customer Substation (HV CT metered)
Is the service looped? Tick one as appropriate	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
Type of installation Tick one as appropriate	<input type="checkbox"/> Domestic <input type="checkbox"/> Non-domestic

Figure 8-2 – ENA Notification Form (Page 2)



EV & HP Application

<input type="checkbox"/> Other - Please detail: <small>.....</small>	
Have you identified any issues with adequacy of the existing supply equipment? <small>Tick one as appropriate</small>	<input type="checkbox"/> Yes - Please detail: <small>.....</small> <input type="checkbox"/> No
Date of Installation (if 'connect and notify' applicable)	DD/MM/YYYY

[†] The installer must ensure no other parallel devices can run simultaneously. If the installation is one controller but multiple devices, please use the multiple installations spreadsheet

* If the cut-out rating is unknown or uncertain, it can be established by raising an enquiry with the DNO. If the supply capacity still cannot be established, the 'Apply to Connect' process must be followed and the aforementioned timeframes are applicable. Please note that one should not open the cut out. Guidance on cut-out ratings is available on the ENA website. If the cut-out rating is unknown, a picture can be provided to the DNO.

Power Quality Declaration - Heat Pumps Only[†]

Heat Pump Manufacturer		
Heat Pump Model		
How will the Heat Pump be used? Please tick one of the following options	<input type="checkbox"/> The Heat Pump model stated will provide HEATING ONLY <input type="checkbox"/> The Heat Pump model stated will provide HEATING & COOLING	
Does the Heat Pump have additional components installed?	<input type="checkbox"/> Back-up heater – on-board <input type="checkbox"/> Back-up heater – external <input type="checkbox"/> Boost heater – on-board <input type="checkbox"/> Boost heater – external <input type="checkbox"/> Immersion heater – on-board <input type="checkbox"/> Immersion heater – external	
Is this model in the ENA Heat Pump Type Register Database and is the information in the Database correct? See register in database found in the second paragraph under "Processes & Forms" on the ENA website here . If yes, please proceed to 'Declaration' section.	<input type="checkbox"/> Yes - Register No: <input type="checkbox"/> No	
If no, please fill in the following additional Power Quality details required for non-registered Heat Pump Models		
Datasheet and other Power Quality documentation for the Heat Pump attached to this application? <u>Must be provided</u> . It is the installer's responsibility to ensure all information required to populate the Heat Pump Type Register Database is provided.	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Does the installation meet the Microgeneration Certificate Scheme* Product Requirements?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Harmonics Does the proposed installation comply with the technical requirements of BS EN/IEC 61000-3-2?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Harmonics Does the proposed installation comply with BS EN/IEC 61000-3-12?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Flicker Does the proposed installation comply with the technical requirements of BS EN/IEC 61000-3-3?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Flicker Does the proposed installation comply with BS EN/IEC 61000-3-11?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

[†] Please refer to the Manufacturers Declaration of Conformity, device type test certificate and datasheet. If using the multiple installations spreadsheet, the confirmation of standards compliance should refer to the whole installation, i.e. at the point of common coupling.

* <https://www.microgenerationcertification.org/mcs-standards/product-standards/heat-pumps/>

Declaration

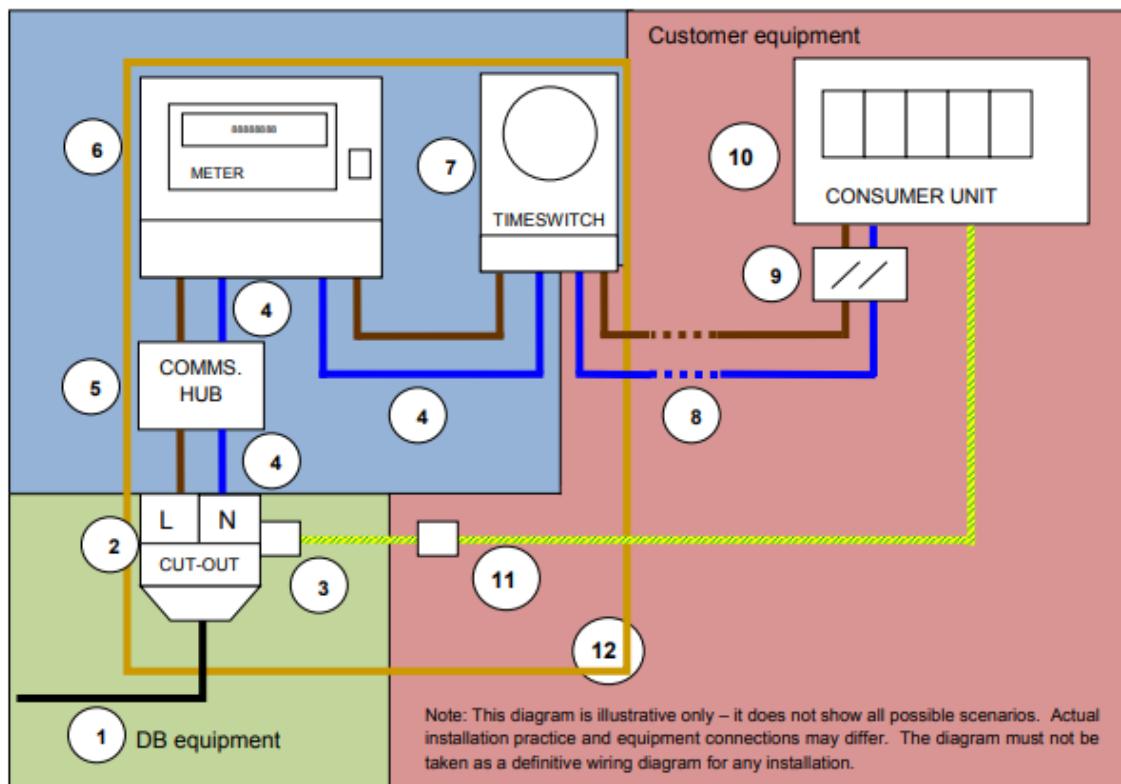
I confirm that the information I have given in this form is true to the best of my knowledge for the electrical installation noted above. The customer at the above address has been advised that commissioning of the installation may only take place when the Network Operator has completed any reinforcement works the supply network requires.

Name	Signed	Date
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Figure A-3 – ENA Notification Form (Page 3)

Appendix B – Typical domestic set-up 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 7 - Timeswitch (if fitted)	10 - Customer consumer unit 11 - Customer earthing conductor (and earth block if fitted) 12 - Meter board (and external meter box if fitted)