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Qualification

Specification

EAL Level 3 Technical Specialist in the Installation of Electric Vehicle Charging Equipment (Award)

Qualification Number: 610/3908/1

Version 1

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# About EAL

For over fifty years, EAL has been the specialist awarding organisation for engineering, manufacturing, building services and related sectors. Developed to the highest technical standards, our qualifications reflect ever-changing industry and regulatory needs. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared to take the next step in their journeys, whether study, an apprenticeship or work.

Through industry partnerships with EAL Centres and training providers, decades of experience supporting our core sectors, and our role as part of the Enginuity Group, we have built unrivalled knowledge and understanding of employer skills needs. As a result, EAL’s skills solutions, including apprenticeship End-Point Assessment, External Quality Assurance and qualifications are respected and chosen by employers to deliver real lifelong career benefits for all our learners. That’s why in the last ten years, 1.2 million people across the UK have taken EAL qualifications.

## 1.1 Equal Opportunities and Diversity

EAL expects its Centres to enable learners to have equal access to training and assessment for qualifications in line with equalities legislation. Further details can be located in the EAL Equal Opportunities and Diversity Policy.

## 1.2 Customer Experience and Feedback

Customer Experience is a fundamental part of EAL’s commitment to you. EAL aims to ensure that all customers receive a high-quality efficient service. We are always interested in feedback and if you have any comments or feedback on our qualifications, products or services, please contact the Customer Experience team:

EAL Customer Experience

Tel: +44 (0)1923 652 400

Email: Customer.Experience@eal.org.uk

# Introduction to the Qualification

What is this qualification?

This qualification covers the underpinning technical requirements for the installation of electric vehicle charging points. It follows the IET Code of Practice for Electric Vehicle Charging Equipment Installation and BS 7671. It enables an industry recognised competent electrician to meet the mandated technical competency requirements for the installation of electric vehicle charging equipment.

Who is this qualification for?

This qualification is aimed at those who wish to develop their knowledge and skills in

installation of EV charging equipment. It builds on the outcomes within the Installation and Maintenance Electrician standard and enables an individual to specialise in the occupation. It is for Competent electricians who wish to gain an understanding of the requirements for electric vehicle charging equipment installations, and who are already conversant in inspection and testing and the wiring regulations. Please refer to Section 5.3 for entry requirements.

What does this qualification cover?

The qualification covers the IET Code of Practice for Electric Vehicle Charging Equipment Installation.

The award comprises of one unit which has 10 Guided Learning Hours (GLH). It has a Total Qualification Time (TQT) of 12 hours (notional time required by the learner to complete the qualification).

## 2.1 Support for this Qualification

This qualification:

* Is regulated at Level 3
* Is supported by the ECA.

## 2.2 Progression Opportunities

This qualification relates to a variety of CPD awards for electricians, such as:

* EAL Level 3 Award in the Design, Installation and Commissioning of Electrical Energy Storage Systems
* EAL Level 3 Award in the Installation of Small Scale Solar Photovoltaic Systems
* EAL Level 4 Award in the Design and Verification of Electrical Installations.

Further information can be obtained from the EAL Website or alternatively contact:

EAL Customer Experience

Tel: +44 (0)1923 652 400

Email: Customer.Experience@eal.org.uk

## 2.3 Qualification Support Materials

The following material is available for this qualification:

* Delivery pack: contains the qualification unit and the relevant tutor guidance

All materials can be accessed by EAL registered Centres from the EAL Website: [www.eal.org.uk](http://www.eal.org.uk)

## 2.4 Achievement of the Qualification

The qualification is achieved when the unit assessment (on-screen exam) has been successfully completed. The Centre will then be able to apply for the learner’s certificate. The overall grading type for this qualification is Pass (or Fail).

# Qualification Structure

## 3.1 Rule of Combination

This qualification will be obtained by the learner once they have completed the single mandatory unit below. It has a Total Qualification Time (TQT) of 12 hours (notional time required by the learner to complete the qualification).

### Mandatory Unit:

|  |  |  |  |
| --- | --- | --- | --- |
| **EAL Code** | **Unit Title** | **GLH** | **Ofqual Code** |
| EV3/02 | Understand the Requirements for the Installation of Electric Vehicle Charging Equipment | 10 | L/651/0939 |

# Centre and Qualification Approval

Centres wishing to run the qualifications will need to comply with the Qualification Manual and EAL’s Centre recognition criteria for these qualifications upon accreditation and launch. Centres must also put in place the appropriate physical and human resources and administration systems to effectively run the qualifications. Please refer to Section 5 for the requirements of Centre staff involved in the delivery of the qualifications.

**For existing EAL Centres to put the qualification on your Centre remit:**

* Add these qualifications to your Centre qualification remit, create and complete a qualification approval application form in Smarter Touch and submit to EAL

**For non EAL Centres to gain Centre approval to run the qualification:**

* Please contact the EAL Customer Experience Department, who will be delighted to hear from you:

EAL Customer Experience

Tel: +44 (0)1923 652 400

Email: Customer.Experience@eal.org.uk

# Profiles and Requirements

## 5.1 Staff Responsible for Registering and Certification of Learners

Centres are required to appoint a suitable member of staff who can take responsibility for registering learners onto qualifications, submitting entries for assessments to EAL, and taking receipt of external assessment procedures (if appropriate). They may also be responsible for applying to EAL for learner certificates. The role may be undertaken by the same person who undertakes quality assurance.

## 5.2 Teaching Staff

These personnel must have the necessary knowledge and understanding of the assessment criteria and learning outcomes they are delivering. They must also understand the structure and content of the qualification.

It is a recommendation that the teaching staff will:

* Have two years’ experience in teaching / training

 **or**

* Are working towards an appropriate teaching / training qualification (e.g., Cert Ed or Learning & Development trainer units)

 **or**

* Hold an appropriate teaching / training qualification (e.g., Cert Ed or Learning & Development trainer units)

## 5.3 Learners

Learners must be conversant with the relevant wiring regulations and initial verification and commissioning. This can be demonstrated by the learner holding relevant qualifications in BS 7671 and inspection and testing.

**IMPORTANT ENTRY REQUIREMENT**

To take this qualification, learners must be competent electricians and hold one of the qualifications listed below, with the relevant AM test; (e.g. AM2/S/E/D):

* Level 3 NVQ Diploma in Installing Electrotechnical Systems and Equipment (Buildings, Structures and the Environment)
* Level 3 NVQ Diploma in Electrotechnical Services (Electrical Maintenance)
* Level 3 Electrotechnical Qualification
* Level 3 in Electrotechnical Services Experienced Worker
* Level 3 NVQ in Electrotechnical Services - Electrical Installation (Building and Structures)
* Level 3 Electrotechnical Experienced Worker Qualification
* Level 3 Electrotechnical in Dwellings
* EAL Building Services Engineering (Level 3) - Electrotechnical Installation
* Equivalent historical qualifications. See EAS Table 4B/4C, and the [EAS Qualifications Guide](https://electrical.theiet.org/bs-7671/building-regulations/electrotechnical-assessment-specification/)

**Or** they hold an ECS Gold Card, as a JIB Electrician or Approved Electrician.

Learners must have the minimum levels of literacy and numeracy to complete the learning outcomes and assessments.

Centres should make learners with particular requirements aware of the content of the qualification and they should be given every opportunity to successfully complete the qualification. EAL will consider any reasonable suggestions, for and from, those with disabilities that would help them to achieve the learning outcomes without compromising the standards required.

Age Restrictions

Learners must be at least 19 years old.

## 5.4 Staff Invigilating On-Screen Exams

Members of staff with responsibility for invigilating on-screen exams must know, understand, and comply with the Procedures for Conducting the Exam Component within EAL Qualifications’ (EAF 1), which are published by EAL. These members of staff must also:

* Have experience in conducting and controlling exam sessions

 **or**

* Be supervised by an individual experienced in conducting and controlling exam sessions

Note: A teacher / tutor who has prepared the learners for the subject of the exam must not be the sole supervisor at any time during an exam for that subject(s).

# Assessment

This qualification is assessed using one on-screen Multiple-choice question (MCQ) exam. The exam must be passed for the qualification to be awarded.

Key aspects

* The pass mark for the exam is notionally set at 60%
* Grading for the exam is pass / fail
* This is an open-book assessment, and learners are permitted the use of the IET Code of Practice for Electric Vehicle Charging Equipment Installation
* The test duration is 60 minutes and consists of 30 questions
* There are no additional resitting constraints
* Candidates may also use a non-programmable calculator
* A centre exam specification is given in Appendix 1

The exam must be undertaken by the learner under controlled conditions as specified by EAL. (Refer to EAL’s procedures for External Assessment contained within the Centre Operations Manual).

Assessment objectives are used to set the level of thinking skills being assessed within the level 3 context, including knowledge, understanding and application of knowledge and understanding. Our approach to assessment objectives is designed to complement the purpose of the qualification and align with the occupational levels’ guidance provided by the regulator.

The unit within the setting specification (Appendix 1) has a set number of questions. Across the questions, there is a question writing requirement to meet a defined coverage of each assessment objective so that the following assessment objective profile is met across the full range of assessment questions, as shown in the table below:

|  |  |
| --- | --- |
| **Assessment Objective**  | **MCQ Coverage**  |
| AO1 Knowledge of the principles, processes and procedures | 25% |
| AO 2 Understanding of the principles, processes and procedures | 50% |
| AO3 Application of understanding of the principles, processes and procedures | 25% |

Resitting external assessments (on-screen exams)

Learners who fail to achieve a pass will be permitted to resit this exam after feedback and appropriate tuition has taken place.

The learner will be allowed a maximum of two resit opportunities (three attempts in total). Learners who fail to achieve after three attempts will be required to re-register on the qualification.

The resits for externally set and marked exams will be subject to the current published charges.

Practice exam

EAL will make available an onscreen practice exam. This can be accessed via EAL’s Surpass Exam System. The practice exam is not part of the formal assessment arrangements and will therefore NOT count towards the qualification.

# Quality Control of Assessments

There are two major activities in which EAL interacts with the Centre in relation to the External Quality Control of Assessment for this qualification. These are:

* **Recognition**: When a Centre decides to offer the qualification, the EAL External Quality Assurer (EQA) ensures that the Centre is suitably equipped and prepared for delivery and assessment
* **Engagement**: Throughout the ongoing delivery of the qualification EAL, through monitoring and other mechanisms will review the quality and consistency of assessment and internal quality assurance and recommend actions to address issues of concern

Recognition

In granting approval, EAL, normally through its EQAs, will ensure that the prospective Centre:

* Meets any procedural requirements specified by EAL
* Has sufficient and appropriate physical and staff resources
* Meets relevant health and safety and / or equality and access requirements
* Has a robust plan for the delivery, assessment, and QA for the qualifications (including, where appropriate, scope for involving employers)

EAL may decide to visit the Centre to view the evidence provided.

Engagement

EAL, through EQA Engagement and other mechanisms will ensure that:

* A strategy is developed and deployed for the ongoing monitoring of the Centre – this will be based on an active risk assessment of the Centre, and will include details of the learner, assessor and internal quality assurer’s sampling strategy and the rationale behind this
* The Centre’s internal quality assurance processes are effective in learner assessment
* Outcomes of internal assessment are verified, through sampling, to ensure standards are being maintained
* Sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the EQA
* Reviews of EAL’s external auditing arrangements are undertaken

# 8.0 Unit Content

## Unit: EV3/02: Understand the Requirements for the Installation of Electric Vehicle Charging Equipment

### GLH: 10

### Unit description

This unit covers the requirements for the installation of electric vehicle (EV) charging points and follows the IET Code of Practice for Electric Vehicle Charging Equipment Installation.

It is aimed at electricians who are already conversant in inspection and testing and the wiring regulations - for example they already hold a qualification for initial verification (4337), and for the wiring. regulations.

Although this unit covers the theory aspects only, practical training on manufacturers equipment can be incorporated into the delivery to enhance a course. This could also involve circuit design, cable termination, and relevant initial verification and commissioning.

Ensure comprehensive coverage of the application of BS 7671, earthing, PEN faults, and the type and use or RCDs. Use real world installations as case studies for learners.

### Summary of learning outcomes

1. Understand the overview of EV charging equipment.
2. Understand the design considerations for EV charging point installations.
3. Understand the physical installation requirements for EV charging points.
4. Understand the general electrical requirements for EV charging points.
5. Understand the electrical requirements for EV charging points: dwellings.
6. Understand the electrical requirements for EV charging points: on-street installations.
7. Understand the electrical requirements for EV charging points: commercial and industrial installations.
8. Understand the Inspection, testing and maintenance requirements for EV charging points.
9. Understand the additional requirements for EV charging points.

### Assessment

This unit is assessed by an externally set and marked on-screen Multiple-choice exam, which assesses the knowledge requirements of learning outcomes 1 – 9.

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|  |  |  |
| --- | --- | --- |
| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **1. Understand the overview of EV charging equipment.**  | 1.1 | Outline EV supply equipment. | Include / recap that the installation work will have to be in accordance with the health and safety requirements for the relevant nation, such as the: Health and Safety at Work etc Act. The Health and Safety at Work (Northern Ireland) Order. The Electricity at Work Regulations. Compliance with non-statutory requirements such as BS 7671, IET CoP, and industry guidance, and manufacturer’s instructions and requirements. Cover scope of Section 722 of BS 7671. Cover section 2, and Annex H Glossary of Terms. Cover how Annex I can support in finding information. Familiarise learners with the types of equipment used. Refer also to the Bea[ma Guide to EV Infrastructure.](https://www.beama.org.uk/resourceLibrary/guide-to-electric-vehicle-infrastructure.html)  |
| 1.2 | Describe charging modes and equipment used for modes 1, 2, 3, and 4. |
| 1.3 | Explain the requirements for socket-outlets,connectors, and cables. |
| 1.4 | Describe the considerations to variations in EV charging equipment design and specification. |
| **2. Understand the design considerations for EV charging point installations.** | 2.1 | Interpret the considerations for theinstallation of EV charging equipment. | In accordance with BS 7671. Cover Section 3. Use the information contained within the CoP Annex to support delivery. Cover:* Adequacy of the supply
* Existing earthing arrangements *(ensure comprehensive coverage of earthing and PEN faults)*
* Simultaneous contact assessment
* Mobile or wireless coverage
* Manufacturer’s instructions and requirements
* Planning permission
* Traffic management order
* Agreeing the installation details with the client
* Ensure good coverage of load curtailment (e.g., in a car park).
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| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **3. Understand the physical installation requirements for****EV charging points.** | 3.1 | Interpret the physical location andinstallation requirements. | Cover Section 4. Annex B: Physical installation requirements – (Dwelling installations). Refer to Physical installation requirement checklist forms for the different locations given in the Annex of the CoP. Cover: * Potentially explosive atmospheres (EV Charging equipment not to be installed in hazardous zones)
* Fuel filling stations
* Location of charging equipment relative to the parking space
* Protection against vehicle impact
* Location of controls and socket-outlets
* Free space around the charging equipment
* Ventilation and cooling
* Avoidance of trip hazards
* Avoidance of unnecessary obstruction
* Labelling of BS 1363 socket-outlets
* Lighting

Also, ensure good coverage of installation practices of electrical equipment, and real-world situations and problems that contractors may find.  |

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **4. Understand the general electrical requirements for EV****charging points.** | 4.1 | Interpret the general requirements for the electrical installation supplying the EV charging equipment. | Cover:* General
* Protection against electric shock (CoP 5.2 and 5.5)
* PME supply
* Requirements for circuit design in accordance with BS 7671, IET CoP, and the equipment
* Requirements for the provision of RCDs

*(Ensure good coverage of type and application of RCDs for compliance with* *BS 7671, with the design of the circuit)** Requirements for isolation and switching
* IP ratings
* Socket-outlets and connectors
* Lightning protection systems
* Installations having alternative sources of supply.
 |

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **5. Understand the electrical requirements for EV charging points: dwellings.** | 5.1 | Interpret the electrical requirements for charging equipment (dwellings). | Cover:* The scope of section 6 of the CoP (what is meant by a dwelling in the CoP)
* Demand
* Earthing and protective equipotential bonding requirements *(ensure comprehensive coverage of earthing and bonding)*
* TT systems
* TN-S system
* TN-C-S system (PME supply)
* Using the PME earth (also refer to Annex G)
* TT charging circuits from PME supplies
* Protective equipotential bonding
* Requirements for circuit design
* Protection against electric shock
* Requirements for the provision of RCDs
* Requirements for isolation and switching
* IP ratings
* Lighting and surge protection systems
* Also, highlight any relevant notification/self-certification requirements for new circuits (e.g., in England and Wales the requirement for Part P).
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| --- | --- | --- |
| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **6. Understand the electrical requirements for EV charging points: on-street installations.** | 6.1 | Interpret the electrical requirements for charging equipment (on-street). | Cover:* Scope
* Planning and client specifications for an on-street installation
* Technical requirements for on-street installations
* Typical supply and earthing arrangements for dedicated supplies
* Supply and earthing arrangements for re-purposed supplies.

*(ensure comprehensive coverage of earthing).*  |
| **7. Understand the electrical requirements for EV charging points: commercial and****Industrial installations.** | 7.1 | Interpret the electrical requirements for charging equipment (commercial and industrial installations). | Cover:* General requirements
* Earthing and protective equipotential bonding requirements *(ensure comprehensive coverage)*
* Requirements for circuit design
* Protection against electric shock
* Requirements for the provision of RCDs
* Requirements for isolation and switching
* IP ratings
* Lightning and surge protection systems.
 |

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **8. Understand the inspection, testing and maintenance****requirements for EV charging points.** | 8.1 | Identify the requirements for inspection and testing | For 8.1 Cover:* Requirements of BS 7671 - recap on commissioning tests and certification as required
* EV charging equipment functional checks
* Customer care (handover)
* Maintenance
* Frequency of inspection and test
* RCD testing.

For Section 9 cover the relevant checklists and risk assessment forms given in CoP Annexes which can be provided as part of commissioning documentation. Cover the handover requirements, including the biannual test of the RCD. Cover that equipment requires routine checks, inspections and tests in accordance with the charging equipment manufacturer’s recommendations, and the installation in accordance with IET Guidance Note 3, and BS 7671. Recap on circuit inspection, testing and certification (learners are expected to beconversant at this already). |

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes****The learner will:** | **Assessment Criteria****The learner can:** | **Coverage and depth**  |
| **9. Understand the additional****requirements for EV charging points.** | 9.1 | Identify the additional requirements for EV charging points with regards to:* vehicles for energy storage
* Distribution Network Operator (DNO)
* notification
* integration and smart infrastructure.
 | Section 10: Just provide an overview of this section. Further guidance is given in the IET Code of Practice for Electrical Energy Storage Systems.Section 11: Cover the DNO notification requirements. This is a key area contractors will require to understand. Cover Section 12 ‘smart charging’. |

# Appendix 1: Centre Exam Specification

|  |
| --- |
| **Unit:** EV3/02 Understand the Requirements for the Installation of Electric Vehicle Charging Equipment |
| Assessment Type: MCQ ExamNumber of Questions: 30Time Allowed: 60 MinutesAdditional resitting constraints: None.The pass mark is notionally set at 60%. This is an open book exam requiring reference to IET Code of Practice for Electric Vehicle Charging Equipment Installation. Candidates may also use a non-programmable calculator.The exam will cover the knowledge learning outcomes of the unit, as follows: |
| **Learning Outcome** | **Title** | **Number of Questions** |
| 1 | Understand the overview of EV charging equipment | 3 |
| 2 | Understand the design considerations for EV charging point installations | 5 |
| 3 | Understand the physical installation requirements for EV charging points | 4 |
| 4 | Understand the general electrical requirements for EV charging points | 5 |
| 5 | Understand the electrical requirements for EV charging points: dwellings | 3 |
| 6 | Understand the electrical requirements for EV charging points: on-street installations | 2 |
| 7 | Understand the electrical requirements for EV charging points: commercial and industrial installations | 2 |
| 8 | Understand the inspection, testing, and maintenance requirements for EV charging points | 5 |
| 9 | Understand the additional requirements for EV charging points | 1 |
|  | **Total:** | **30** |

# Appendix 2: Learner Registration and Certification

Learners must be registered with EAL on a code which relates to the qualification - this must be completed prior to assessment. Both learner registration and certification can be completed online at the EAL Website www.eal.org.uk. For paper-based registration and certification use the appropriate forms. These are located on the EAL Website, for guidance on registration and certification please refer to the Registration and Certification User Guide.

To register the learner on the chosen qualification / pathway code:

|  |  |
| --- | --- |
| **Qualification Title:** | **Code:** |
| EAL Level 3 Technical Specialist in the Installation of Electric Vehicle Charging Equipment (Award) | 610/3908/1 |

For further information, please contact EAL Customer Experience:

Tel: +44 (0)1923 652 400

Email: Customer.Experience@eal.org.uk

Published by:

EAL

Unit 2, The Orient Centre

Greycaine Road

Watford

Herts

WD24 7GP

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