

# Highfield Level 3 End-Point Assessment for ST0150 Electrical, Electronic Product Service and Installation

End-Point Assessment Kit



# Highfield Level 3 End-Point Assessment for ST0150 Electrical, Electronic Product Service and Installation Engineer

EPA-Kit

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# How to Use this EPA Kit

Welcome to the Highfield End-Point Assessment Kit for the Electronic Product Service and Installation Engineer Apprenticeship Standard.

Highfield is an independent end-point assessment organisation that has been approved to offer and carry out the independent end-point assessments for the Level 3 Electrical, Electronic Product Service and Installation Engineer Apprenticeship Standard. Highfield internally quality assures all end-point assessments in accordance with its IQA process, and additionally, all end-point assessments are externally quality assured by the relevant EQA organisation.

The EPA kit is designed to outline all you need to know about the end-point assessments for this standard and will also provide an overview of the on-programme delivery requirements. In addition, advice and guidance for trainers on how to prepare apprentices for the end-point assessment are included. The approaches suggested are not the only way in which an apprentice may be prepared for their assessments, but trainers may find them helpful as a starting point.

## Key facts

|                                      |   |
|--------------------------------------|---|
| <b>Apprenticeship standard:</b>      | Highfield Level 3 End-Point Assessment for Electrical, Electronic Product Service and Installation Engineer |
| <b>Level:</b>                        | 3   |
| <b>On Programme Duration:</b>        | Typically, 36 months  |
| <b>End-Point Assessment Window:</b>  | Typically, 3 months   |
| <b>Grading:</b>                      | Pass/merit/distinction  |
| <b>End-Point Assessment methods:</b> | Multiple-choice test<br>Practical skills tests<br>Professional discussion                                   |

**In this kit, you will find:**

- an overview of the standard and any on-programme requirements
- a section focused on delivery, where the standard and assessment criteria are presented in a suggested format that is suitable for delivery
- guidance on how to prepare the apprentice for gateway
- detailed information on which part of the standard is assessed by which assessment method
- suggestions on how to prepare the apprentice for each part of the end-point assessment
- a section focused on the end-point assessment method where the assessment criteria are presented in a format suitable for carrying out 'mock' assessments

# Introduction

## Standard overview

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The engineer will install and service a range of domestic and/or commercial equipment from washing machines and microwave ovens in the kitchen, laundrette or restaurant to television and audio equipment in the living room. The influence of computers in controlling washing machines and providing television have brought the installation and service requirements of these products together. In the near future, the 'smart home' will give wireless control of these products and link their requirements still closer.

To meet the needs of these 'smart' products, it is essential that the engineer is I.T. literate and has an understanding of all aspects of connectivity, with the ability to make and troubleshoot I.P. connections to routers, Bluetooth and Wi-Fi connections, in both domestic and commercial situations. The engineer must also be capable in the usage of "Apps". Technology is developing at a rapid rate and the range of products requiring the engineer's skills will expand and require the engineer to maintain and update their knowledge and skills to meet these future needs. Many products will be integrated into the 'smart home' in the future and talk to each other through the "Internet of Things" giving the engineer a secure and profitable future.

As most of the work is carried out in the customer's home or business, the engineer has to be polite, well dressed and have the appropriate customer-facing skills. The work will be interesting and varied giving the opportunity to work with a wide range of people in differing environments. The engineer should have an enquiring mind and be able to follow a logical sequence of mechanical events or electrical tests. Following the Apprenticeship, the engineer will have additional training if they are working on gas appliances or working in specific commercial premises, they may also have the opportunity to take additional qualifications to further develop their skills and extend their prospects into management, training or development.

Apprentices may specialise in white goods or brown goods, and will be assessed on a white goods, brown goods or a generic pathway.

## On-programme requirements

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The period of learning, development and continuous assessment is managed by the employer, in most cases with the support of a training provider. The on-programme pace will be driven by individuals as well as by the breadth of experience an employer can offer. The whole programme will typically be completed in 36 months.

To drive quality and consistency through on-programme learning employers may wish to consider the following:

- use of their normal performance management processes to monitor the progress of the apprentice, provide feedback and guide development.
- provide support, ensuring the requirements of the apprenticeship standard are reflected in the above processes, and by filling any gaps through their work with apprentices.
- carry out joint reviews of progress at regular intervals, involving apprentices, line managers and others with a direct relationship, e.g. mentors, workplace coaches, etc. They should agree on how any issues are to be resolved together.

### Portfolio

During the time on programme, the apprentice must develop a portfolio that demonstrates progress and competency throughout the standard. The portfolio will not be assessed however it may be used to support the apprentice during the professional discussion.

The portfolio should include:

- a briefing document of approximately 1500 words (minimum 1350 and maximum of 1650) that summarises research completed by the apprentice into the latest development in health & safety and environmental legislation.
- photo and video evidence alongside job completion reports that highlight the apprentice undertaking and completing fault diagnosis and fitting parts for any jobs they have taken part in.
- documents that contribute to building a picture around the apprentice's behaviours throughout the duration of the apprenticeship. This should consist of attendance records from the employer and training provider (one from each is acceptable).

The portfolio must be accompanied by a portfolio matrix. This can be downloaded from our website. The portfolio matrix must be fully completed, including a declaration by the employer and the apprentice to confirm that the portfolio is valid and attributable to the apprentice.

The portfolio of evidence must be submitted to Highfield at gateway. It is not directly assessed but underpins the professional discussion.

## Use of Artificial Intelligence (AI) in the EPA

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Where AI has been used as part of the apprentice's day-to-day work and forms part of a project report, presentation, or artefact, it should be referenced as such within the work. AI must not be used to produce the report or portfolio.

Where AI has been used as part of a portfolio that underpins an interview or professional discussion or any other assessment method, it should be fully referenced within the portfolio.

## Additional, relevant on-programme qualification

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There are no mandatory qualifications for this standard, however, employers may wish to include relevant qualifications to help structure the on-programme delivery.

## Readiness for end-point assessment

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For an apprentice to be ready for the end-point assessments:

- the apprentice must have achieved level 2 English and maths.
- they must have compiled a portfolio containing evidence of work carried out under supervision with their employer that demonstrates their knowledge, skills and behaviours.
- they must have completed a 1500-word briefing document relating to health and safety, and environmental legislation.
- their line manager (employer) must be confident that the apprentice has developed all the knowledge, skills and behaviours defined in the apprenticeship standard and that the apprentice is competent in performing their role. To ensure this, the apprentice must attend a formal meeting with their employer to complete the gateway readiness report.
- the employer/training provider needs to submit a completed Practical Skills Test Plan to indicate the piece(s) of equipment to be used during the practical skills tests.
- The apprentice and the employer should then engage with Highfield to agree on a plan and schedule for each assessment activity to ensure all components can be completed within the end-assessment window. The assessment plan does not specify an assessment window for this standard. Highfield suggests a 3-month assessment window that starts from the attempt of the first assessment component.

If you have any queries regarding the gateway requirements, please contact your EPA Customer Engagement Manager at Highfield Assessment.

## **Order of end-point assessments**

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The assessment plan states that the practical skills tests must be completed before the professional discussion. The multiple-choice test can take place at any time.

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# The Highfield Approach

This section describes the approach Highfield has adopted in the development of this end-point assessment in terms of its interpretation of the requirements of the end-point assessment plan and other relevant documents.

## Documents used in developing this end-point assessment

Standard (2017)

<https://www.instituteforapprenticeships.org/apprenticeship-standards/electrical-electronic-product-service-and-installation-engineer/>

End-point assessment plan (2017 ST0150/AP01)

<https://www.instituteforapprenticeships.org/media/1456/electrical-electronic-product-service-and-installation-engineer-assessment-plan.pdf>

## Specific considerations

The assessment criteria for the multiple-choice test have been written by Highfield and are based on the content of the standard. The areas of the standard to be assessed by multiple-choice test has been based on the content of the assessment plan.

The assessment plan states that for an apprentice to pass the test they must achieve 65% and to achieve a merit, 75%. The test is made up of 50 multiple-choice questions and so it is impossible for these percentages to be achieved exactly. Therefore, Highfield has assigned a pass mark of 66% (33 out of 50) and 76% (38 out of 50) to achieve a merit. The apprentice must achieve 90% (45 out of 50) to achieve distinction.

The assessment criteria for the practical skills test are directly lifted from the assessment plan, alongside the mark allocation.

The assessment criteria for the professional discussion have been written by Highfield and are based on the content of the standard. The areas of the standard to be assessed by professional discussion has been based on the content of the assessment plan. The mark allocation for each assessment criteria is based on the total of the criteria being worth 100%.

The assessment plan states that the grade to be awarded for both the professional discussion and the practical skills test should be based on a percentage achievement, alongside grading descriptors. However, to apply a standardised approach across all apprentices, Highfield has used the number of marks the learner has achieved across the assessment criteria to determine the grade for each of these components, in line with the stated percentage achievement scores. These numbers can therefore then be used in the calculation for the overall grade of the apprenticeship.

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# Gateway

## How to prepare for gateway

After apprentices have completed their on-programme learning, they should be ready to pass through 'gateway' to their end-point assessment.

Gateway is a meeting that should be arranged between the apprentice, their employer and training provider to determine that the apprentice is ready to undertake their end-point assessment.

As part of their time on programme, the apprentice must have completed a portfolio of evidence that demonstrates the knowledge, skills and behaviours set out in this standard.

The portfolio will be reviewed in the professional discussion.

In advance of gateway, apprentices will need to have:

- achieved level 2 English and maths

Apprentices should be advised by employers and providers to gather the required evidence and undertake these qualifications during their on-programme training.

Apprentices will also need to have:

- collated a portfolio of evidence.
- completed a 1500-word briefing document relating to health and safety, and environmental legislation.

It is recommended that employers and providers complete regular checks and reviews of this evidence to ensure the apprentice is progressing and achieving the standards before the formal gateway meeting is arranged.

Employers or training providers will also need to submit to Highfield:

- a Practical Skills Test Plan indicating the pieces of equipment to be used during the practical skills tests. This will be available as a separate download from the Highfield Assessment website.

## The gateway meeting

The gateway meeting should last around an hour and must be completed on or after the apprenticeship on-programme end date. It should be attended by the apprentice and the relevant people who have worked with the apprentice on-programme, such as the line manager/employer or mentor, the on-programme trainer/training provider and/or a senior manager (as appropriate to the business).

During the meeting, the apprentice, employer and training provider will discuss the apprentice's progress to date and confirm if the apprentice has met the full criteria of the apprenticeship standard during their on-programme training. The **Gateway Readiness Report** should be used to log the outcomes of the meeting and agreed by all 3 parties. This report is available to download from the Highfield Assessment website.

The report should then be submitted to Highfield to initiate the end-point assessment process. If you require any support completing the Gateway Readiness Report, please contact your EPA Customer Engagement Manager at Highfield Assessment.

**Please note:** a copy of the standard should be available to all attendees during the gateway meeting.

### Reasonable adjustments and special considerations

Highfield Assessment has measures in place for apprentices who require additional support. Please refer to the Highfield Assessment Reasonable Adjustments Policy for further information/guidance.

### ID requirements

Highfield Assessment will need to ensure that the person undertaking an assessment is indeed the person they are claiming to be. All employers are therefore required to ensure that each apprentice has their identification with them on the day of the assessment so the end-point assessor can check.

Highfield Assessment will accept the following as proof of an apprentice's identity:

- a valid passport (any nationality)
- a signed UK photocard driving licence
- a valid warrant card issued by HM forces or the police
- another photographic ID card, e.g. employee ID card, travel card, etc.

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# The electrical, electronic product service and installation engineer apprenticeship standard

The following pages contain the electrical, electronic product service and installation engineer apprenticeship standard and the assessment criteria in a format that is suitable for delivery.

## Multiple-choice test

### Health and safety

#### Knowledge

Health & Safety regulations and practices relevant to the role  
 Testing to EU/BS Product Standards  
 PAT (Portable Appliance Testing)

#### Multiple-choice test

#### Assessment criteria

- HS1 Outline an **employer's main duties** under the Health and Safety at Work etc. Act 1974
- HS2 Outline the **main duties of an employee** under the Health and Safety at Work etc. Act 1974
- HS3 State how injuries, ill health and other damage may result following exposure to common **workplace hazards**
- HS4 Explain how risks from different hazards may be affected by occupational, environmental, human and organisational factors
- HS5 Outline the steps involved in a **risk assessment**
- HS6 State **risk controls** while at work
- HS7 Explain the **benefits** of assessing and controlling risks at work
- HS8 State how to minimise risk to personal safety and security
- HS9 Outline **methods** of safe transportation for goods
- HS10 State the purpose of **PAT testing**
- HS11 Describe **EU/BS product standards** that are relevant to own role

- HS12 Define what **safe isolation** is
- HS13 Explain **insulation resistance testing**
- HS14 Identify the **environmental factors** that will impact on insulation test results
- HS15 State how to identify if electrical tools are fit for purpose
- HS16 Outline the importance of earthing
- HS17 Describe the key features of earth continuity testing

### Amplification and guidance

- **Employer's main duties:**
  - Providing, so far as is reasonably practicable a safe place to work
  - Provide safe equipment
  - Provide information, instruction, training and supervision
  - Provide adequate welfare facilities
  - Adequate welfare facilities, such as the required number of toilets and providing drinking water
  - First aid
  - Provide equipment and PPE which is suitable and fit for purpose
  - Ensure policies and procedures are:
    - in place,
    - reviewed and
    - updated
- **Main duties of an employee:**
  - Duty of care
  - Must follow the instructions, guidance and training given by their employer including on equipment
  - Must not interfere with equipment provided for H&S
  - Must report and record:
    - hazards that could cause a risk
    - accidents
    - near misses, and
    - diseases

- **Workplace hazards**
  - Electric shock/burns
  - Fire
  - Slips, trips and falls
  - Ergonomics
  - Manual handling
  - Stress
  - Hazardous materials and substances
  - Violence
- **Risk assessment:**
  - The steps to be taken to complete a simple risk assessment:
  - The 5-step process for risk assessment
  - Employee consultation
  - Risk evaluation method
- **Risk controls**
  - Good housekeeping
  - Barriers and enclosures
  - Safe lifting techniques and equipment
  - Visual checks
  - Safe storage of hazardous materials
  - Design and layout of workstations
  - Machine guards
  - Personal Protective Equipment
  - Regular breaks/reporting procedures
- **Benefits**
  - Benefits of good health and safety standards
  - Legal compliance
  - Reducing risks and controlling hazards
  - Promoting a positive health and safety culture

- **Methods**

- The loading of the vehicle and the use of manual handling equipment to transport to and from the vehicle.

- **PAT testing**

- Portable appliance testing (PAT) is the term used to describe the examination of electrical appliances and equipment to ensure they are safe to use. It is not compulsory; the law requires an employer to ensure that their electrical equipment is maintained to prevent danger, but it does not say how this should be done or how often. Employers should take a risk-based approach, considering the type of equipment and what it is being used for.

- **EU/BS product standards**

- For example, oven internal temperature & surface temperature tests

- **Safe isolation**

- This is to securely 'disconnect' (isolate) one or all parts of the installation from the live electrical supply.

## Environmental legislation

### Knowledge

Environmental legislation i.e. WEEE (Waste Electrical & Electronic Equipment) Directive

### Multiple-choice test

#### Assessment criteria

- EL1 State the key features of the **Waste Electrical and Electronic Equipment Regulations 2013**
- EL2 Outline the purpose of energy efficiency labels
- EL3 Describe **features** that manufacturers use to make products energy efficient
- EL4 Identify organisational procedures regarding the environment
- EL5 Identify best practice procedures for **repair** and safe **transportation** of products

### Amplification and guidance

- **Waste Electrical and Electronic Equipment Regulations 2013**
  - Regulations to help reduce the amount of waste electrical and electronic equipment being incinerated or sent to landfill sites. This reduction is achieved through various schemes to encourage recovery, reuse and recycling of products and components.
- **Disposal process**
  - Disposal through certified procedures such as correctly identified bins for electronic waste and using certified companies to dispose of WEEE. The disposal process is dependent on company policy and procedure.
- **Features**
  - Examples include heat pump tumble dryers, lower temperature washes, recirculation pumps and better agitation
- **Repair**
  - This includes warranty and the right to repair products within a certain time of being produced along with components for appliances.
- **Transportation**
  - This includes disposal process through certified procedures such as correctly identified bins for electronic waste and using certified companies to dispose of WEEE. The disposal process is dependent on company policy and procedure.



## Principles of servicing electrical & electronic products

### Knowledge

The principles by which the product operates to help diagnose the faulty area and component or software.

### Multiple-choice test

#### Assessment Criteria

- PS1 State product operational **cycles**
- PS2 State required factors and **resources** for an appliance to function
- PS3 Identify how different **variables** impact on the output of appliances
- PS4 Explain the impact of a singular component failure on the overall appliance operation
- PS5 State **appliance functions** used to isolate potential causes of breakdown
- PS6 Identify logical **steps to isolate potential causes of breakdown**

### Amplification and guidance

These assessment criteria will be generic or tailored to white goods, brown goods, depending on what the apprentice has studied.

- **Cycles**
  - This includes product flow charts
- **Resources**
  - For example, water, electrical and waste
- **Variables**
  - For example, laundry load size, programme selection, detergents used, water hardness
- **Appliance functions**
  - Examples of this include error codes, laundry fill drain and self-scan/troubleshooting
- **Steps to isolate potential causes of breakdown**
  - Using suitable questioning to identify issues, test cycles and electrical testing

## Practical skills test

### Fault diagnosis

#### Skills

|  |   |
|--|---|
| Identify and use the appropriate mode of communication and be able to deal with and listen to customers<br>Comply with health and safety procedures to protect colleagues, customers and their family<br>Select, use and apply diagnostic tools and aids to locate fault<br>Ensure that there is not a primary reason for fault occurring<br>Observe and adhere to the principles of Electrostatic Discharge (ESD) when handling spare parts and open products | Understand Apps and use them in product function & troubleshooting<br>Apply electrical safety tests<br>Avoid the hazard left by residual energy<br>Ensure all tools and equipment are safe and fit for purpose<br>Apply Portable Appliance Testing<br>Communicate technical findings and product claim investigations, both verbally and in writing<br>Ensure replacement components are correct and meet specification |
|--|---|

#### Practical skills test

#### Assessment criteria

- FD1 Asking relevant questions about the reported fault
- FD2 Carrying out the safe isolation procedure
- FD3 Carrying out the correct opening safety check
- FD4 Using manufacturers technical information to aid diagnosis
- FD5 Using the correct diagnostic tools available
- FD6 Identifying the correct area of the product that the fault relates to
- FD7 Correctly identifying the faulty component
- FD8 Accurately recording the diagnostic process and test results

| Installation of a product   |   |  |
|---|---|--|
| Skills  |   | Behaviour  |
| Deliver product<br>Apply electrical safety tests<br>Apply Portable Appliance Testing<br>Identify and use the appropriate mode of communication and be able to deal with and listen to customers<br>Comply with health and safety procedures to protect colleagues, customers and their family<br>Agree suitable site, with customer, for installation<br>Install product to manufacturer's regulations<br>Demonstrate product to customer's satisfaction ensuring customer can operate product<br>Ensure product is working properly, test is for electrical safety, EU/BS Standards and demonstrate it to the customer | Understand and complete Network & Router set-up<br>Relate performance to speed and/or set-up of the customer network<br>Understand Apps and use them in product function & troubleshooting<br>Advise customers on energy-saving practices and choosing environmentally friendly purchases in the future<br>Fit/remove safety bolts<br>Complete paperwork including re-call registration if agreed with customer<br>Make network connections including Wi-Fi, Internet and Bluetooth | Showing respect for customers property and possessions |
| Practical skills test   |   |  |
| Assessment criteria   |   |  |
| IP1   | Pre-installation survey   |  |
| IP2   | Referring to manufacturer' instructions   |  |
| IP3   | Completion of all necessary <b>safety checks</b>  |  |
| IP4   | Correct installation  |  |

- |     |  |
|-----|--|
| IP5 | <b>Functional test/s</b>   |
| IP6 | Explanation of correct function including energy saving features |
| IP7 | The connection to a wireless network                             |

| Replacement of a faulty component   |   |   |
|---|---|---|
| Skills  |   | Behaviour   |
| Apply electrical safety tests   | Comply with health and safety procedures to protect colleagues, customers and their family        | Having concern for the safety of colleagues, customers, their family and pets |
| Avoid the hazard left by residual energy  | Ensure all tools and equipment are safe and fit for purpose                                       |   |
| Ensure all tools and equipment are safe and fit for purpose   | Apply Portable Appliance Testing  |   |
| Apply Portable Appliance Testing  | Replace components or reinstate software using correct sequence, appropriate tools and techniques |   |
| Use the correct lifting techniques  | Ensure no damage to other components  |   |
| Apply safe stowing procedures   | Ensure product is working properly, test it for electrical safety, EU/BS                          |   |
| Carry out electrical safety tests   |   |   |
| Understand Apps and use them in product function & troubleshooting  |   |   |
| Standards and demonstrate it to the customer  |   |   |
| Observe and adhere to the principals of Electrostatic Discharge (ESD) when handling spare parts and open products |   |   |
| Practical skills test   |   |   |
| Assessment criteria   |   |   |
| RC1   | Safe isolation  |   |
| RC2   | Electrostatic discharge   |   |
| RC3   | Manual handling   |   |
| RC4   | <b>Health and safety awareness</b>  |   |
| RC5   | Replacing components using appropriate tools and technique  |   |
| RC6   | Electrical safety checks  |   |
| RC7   | Functional test/s   |   |

## Professional discussion

### Knowledge

#### Knowledge

Customer care techniques including any particular company policies

#### Assessment criteria

- PDK1 Explain effective **customer care techniques**  
PDK2 Outline **company policies** relating to customer care  
PDK3 State the customer care approach regarding **vulnerable customers**

#### Amplification and guidance

- **Customer care techniques**
  - providing a personalised customer experience, being helpful, being professional, building trust, using interpersonal skills, building rapport, answering queries honestly and accurately, using customer-friendly language, appropriate body language and tone of voice, keeping promises, being sensitive to customers' needs, keeping customers informed.
- **Company policies**
  - brand promise, core values, customer service charter, policies that support customer service, after-sales policies and GDPR followed, understand reputational damage to the employer, awareness of customer metrics.
- **Vulnerable customers**
  - Someone who, due to personal circumstances is susceptible to detriment. A vulnerable customer can be someone who is physically, emotionally, socially or economically vulnerable

## Skills

### Skills

Understand and apply EU/BS product standards

Resolve disputes and know who to report to in case of problems

Research and apply environmental legislation that is current and appropriate to installations and repairs

Apply the appropriate electrical, electronic & software principles to understanding the nature and reason for faults

### Assessment criteria

PDS1 Explain the principles of the **EU/BS product standards**

PDS2 Explain how to resolve disputes and know who to report to in case of problems

PDS3 Research and apply environmental legislation that is current and appropriate to installations and repairs

PDS4 Explain the principles of electrical safety and how to work safely

PDS5 Explain how electrical, electronic and software issues can be caused and how these lead to faults in equipment

PDS6 Describe different fault-finding techniques

### Amplification and guidance

- **EU/BS product standards**
  - Examples include BS7671, IPX4 and GS38

## Behaviours

### Behaviours

Giving a good impression of their employer and themselves by being polite and appropriately dressed  
Having a friendly greeting and manner to colleagues and customers  
Continuing 'personal professional development' in an industry that is changing rapidly  
Developing a trusting relationship with customer and colleagues

### Assessment criteria

PDB1 Give a good impression of their employer and themselves by being polite and appropriately dressed  
PDB2 Use a friendly manner to colleagues and customers  
PDB3 Undertake '**personal professional development**' in an industry that is changing rapidly  
PDB4 Develop a trusting relationship with customer and colleagues

### Amplification and guidance

- **Personal professional development**
  - Define own strengths and weaknesses, goals, reflection and planning regarding self-improvement within the organisation. Use appropriate sources of information to maintain knowledge of current technology

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# Assessment Summary

The end-point assessment for the Electrical, Electronic Product Service and Installation Engineer Apprenticeship Standard is made up of 3 components.

1. 90-minute multiple-choice test.
2. 4 practical skills tests, each of approximately 60-75 minutes duration.
3. 75-minute professional discussion.

As an employer/training provider, you should agree on a plan and schedule with the apprentice to ensure all assessment components can be completed effectively.

Each component of the end-point assessment will be assessed against the appropriate criteria laid out in this kit and a mark allocated. The grade will be determined using the combined mark.

The EPA is expected to last for a total duration of two days.

## Multiple-choice test

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The multiple-choice test is weighted at 40% of the total end-point assessment grade.

The total marks available for this assessment method is 100. There will be a total of 50 questions in the multiple-choice test and each question is worth 2 points.

- To achieve a **pass**, apprentices must score at least 66 out of 100
- To achieve a **merit**, apprentices must score at least 76 out of 100
- To achieve a **distinction**, apprentices must score at least 90 out of 100
- **Unsuccessful** apprentices will have scored 64 or below

The test may be delivered online or be paper-based and should be in a 'controlled' environment.

## Practical skills test

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The practical skills test is weighted at 40% of the total end-point assessment grade.

The apprentice will take 4 practical skills tests, each worth 100 marks. The marks for the four practical tests will be added together, divided by four and an average calculated.

- To achieve a **pass**, apprentices must score an average of at least 65
- To achieve a **merit**, apprentices must score an average of at least 75
- To achieve a **distinction**, apprentices must score an average of at least 90
- **Unsuccessful** apprentices will have scored an average of 64 or less

## Professional discussion

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The professional discussion is weighted at 20% of the total end-point assessment grade.

The professional discussion is marked out of 100.

- To achieve a **pass**, apprentices must score at least 65 out of 100
- To achieve a **merit**, apprentices must score at least 75 out of 100
- To achieve a **distinction**, apprentices must score at least 90 out of 100
- **Unsuccessful** apprentices will have scored 64 or below

The professional discussion may be conducted using technology such as video link, as long as fair assessment conditions can be maintained.

## Grading

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To pass, the apprentice must achieve at least a pass mark in all three assessment methods.

Each of the assessment components is weighted as follows:

| Assessment method       | Weighting |
|-------------------------|-----------|
| Multiple-choice test    | 40%       |
| Practical skills test   | 40%       |
| Professional discussion | 20%       |

The marks awarded for each assessment component will be weighted in line with the above table and the sum of this will be used to calculate a final weighted mark.

The final weighted mark will determine the overall grade, as per the table below:

| Total mark achieved | Grade       |
|---------------------|-------------|
| 64 or below         | Fail        |
| 65                  | Pass        |
| 75                  | Merit       |
| 90                  | Distinction |

## Retake and re-sit information

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If an apprentice fails an end-point assessment method, it is the employer, provider and apprentice's decision whether to attempt a resit or retake. If a **resit** is chosen, please call the Highfield scheduling team to arrange the resit. If a **retake** is chosen, the apprentice will require a period of further learning and will need to complete a retake checklist. Once this is completed, please call the Highfield scheduling team to arrange the retake.

When undertaking a resit or retake, the assessment method(s) will need to be re-attempted in full, regardless of any individual assessment criteria that were passed on any prior attempt. The EPA Report will contain feedback on areas for development and resit or retake guidance.

An apprentice who passes the EPA will not be allowed to retake it to try and increase their grade.

If an apprentice has to retake the EPA for extenuating circumstances, then the new grade will stand. Highfield will determine the criteria for extenuating circumstances.

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## Assessing the multiple-choice test

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The electrical, electronic product service and installation engineer apprenticeship standard multiple-choice test will have a duration of 90-minutes and is designed to assess the apprentice's knowledge of the importance of electrical and electronic principles in diagnosing faults.

The test consists of 50 multiple-choice questions each worth 2 marks. To pass, at least 33 questions must be answered correctly (66 marks).

| Multiple-choice test |                 |                 |
|----------------------|-----------------|-----------------|
| Pass                 | Merit           | Distinction     |
| 33-37 questions      | 38-44 questions | 45-50 questions |

Please refer to the Highfield Examination and Invigilation policy for information regarding the ID verification process and details regarding the set-up of End-Point Assessments.

### Before the assessment

- While on-programme, the employer/training provider should brief the apprentice on the areas to be assessed by the multiple-choice examination.
- In readiness for the end-point assessment, the apprentice should complete a mock examination.

## Multiple-choice test criteria

| Health and safety  |   |
|--|---|
| Health & Safety regulations and practices relevant to the role<br>Testing to EU/BS Product Standards<br>PAT (Portable Appliance Testing) | HS1 Outline an employer's main duties under the Health and Safety at Work etc. Act 1974                                       |
|  | HS2 Outline the main duties of an employee under the Health and Safety at Work etc. Act 1974                                  |
|  | HS3 State how injuries, ill health and other damage may result following exposure to common workplace hazards                 |
|  | HS4 Explain how risks from different hazards may be affected by occupational, environmental, human and organisational factors |
|  | HS5 Outline the steps involved in a risk assessment   |
|  | HS6 State risk controls while at work   |
|  | HS7 Explain the benefits of assessing and controlling risks at work   |
|  | HS8 State how to minimise risk to personal safety and security  |
|  | HS9 Outline methods of safe transportation for goods  |
|  | HS10 State the purpose of PAT testing   |
|  | HS11 Describe EU/BS product standards that are relevant to own role   |
|  | HS12 Define what safe isolation is  |
|  | HS13 Explain insulation resistance testing  |
|  | HS14 Identify the environmental factors that will impact on insulation test results   |
|  | HS15 State how to identify if electrical tools are fit for purpose  |
|  | HS16 Outline the importance of earthing   |
|  | HS17 Describe the key features of earth continuity testing  |

| Environmental legislation   |  |
|---|--|
| Environmental legislation i.e. WEEE (Waste Electrical & Electronic Equipment) Directive | EL1 State the key features of the Waste Electrical and Electronic Equipment Regulations 2013 |
|   | EL2 Outline the purpose of energy efficiency labels  |
|   | EL3 Describe features that manufacturers use to make products energy efficient               |
|   | EL4 Identify organisational procedures regarding the environment                             |
|   | EL5 Identify best practice procedures for repair and safe disposal of products               |

### Installing, testing & handing over electrical & electronic products

|  |     |   |
|--|-----|---|
| Electrical services, utility services, signal requirements and network connections<br>Manufacturer's installation requirements e.g. Ventilation, building strength, viewing distance and other site requirements | PS1 | State product operational cycles  |
|  | PS2 | State required factors and resources for an appliance to function                     |
|  | PS3 | Identify how different variables impact on the output of appliances                   |
|  | PS4 | Explain the impact of a singular component failure on the overall appliance operation |
|  | PS5 | State appliance functions used to isolate potential causes of breakdown               |
|  | PS6 | Identify logical steps to isolate potential causes of breakdown                       |

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## Assessing the practical skills test

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During the on-programme time, the apprentice will have been practising fault diagnosis, installation of electrical products and replacement of components along with other important skills needed to undertake the role of an electronic product service and installation engineer. The assessment plan states that to demonstrate their competency appropriately they should undertake a total of 4 practical skills tests as part of the end-point assessment.

The practical tests will be conducted on a role-playing basis with the end-point assessor playing the role of the customer.

Each practical test will typically last up to 75-minutes. The skills tests therefore should take up to 5 hours in total.

The skills tests will consist of:

- fault diagnosis on **two** separate pieces of equipment
- the installation of a product
- the replacement of a faulty component

Each skills test is worth 100 marks. Therefore, the practical skills test end-point assessment component is worth a total of 400 marks.

The marks achieved within the 4 practical skills tests will be added together, divided by 4 and then given a 40% weighting. This number will be carried forward and combined with the mark achieved in the other assessment components to determine the overall grade of the apprenticeship.

### Equipment requirements

For the apprentice to be able to conduct the practical skills tests, suitable equipment must be made available and set up in advance of the assessment.

Set up will include ensuring the following are available on the day of assessment:

- two separate pieces of equipment, each containing a fault to diagnose
- another piece of equipment that requires a component to be replaced
- another piece of equipment to be installed, which should have wi-fi capability

A list of products that may form the basis of the practical skills test are below:

**White goods**

- Washing machine
- Tumble drier
- Fridge
- Freezer
- Fridge/freezer
- Dishwasher
- Oven
- Hob

**Brown goods**

- Laptop
- PC
- Mobile phone
- Tablet

A **Practical Skills Test Plan** document will need to be completed by the centre and submitted at Gateway. This will list the four pieces of equipment the centre has available for the practical skills test. This is available to download from the Highfield website. Once received, Highfield will review this and will assign faults to be set up on the pieces of equipment. This will then be returned to the centre so that the appropriate equipment can be set up in advance of the assessment.

If an assessor arrives to conduct an assessment and finds the equipment has not been set up, the assessment cannot take place and will need to be rearranged.

The assessor will use an "opening customer statement" to start each skills test and will then answer any questions asked by the learner as a "customer".

**Before the assessment:**

Employers/training providers should:

- ensure suitable equipment is available (containing appropriate faults) that the apprentice should use when completing their practical skills tests.
- ensure the apprentice knows the date, time and location of the assessment
- ensure the apprentice knows which criteria will be assessed (outlined on the following pages)
- encourage the apprentice to reflect on their experience and learning on-programme to understand what is required to meet the standard and identify real-life examples



- be prepared to provide clarification to the apprentice, and signpost them to relevant parts of their on-programme experience as preparation for this assessment

## Practical skills test mock assessment

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It is the employer/training provider's responsibility to prepare apprentices for their end-point assessment, and Highfield recommends that the apprentice experiences a mock practical skills test in preparation for the real thing. The most appropriate form of mock practical skills test will depend on the apprentice's setting and the resources available at the time.

In designing a mock assessment, the employer/training provider should include the following elements in its planning:

- the mock practical skills test should take place in a suitable location.
- the employer should play the role of the customer
- a 75-minute time slot should be available to complete each practical skills test.
- consider a video or audio recording of the mock professional discussion and allow it to be available to other apprentices, especially if it is not practicable for the employer/training provider to carry out a separate mock assessment with each apprentice.
- ensure that the apprentice's performance is assessed by a competent trainer/assessor, and that feedback is shared with the apprentice to complete the learning experience. Mock assessment sheets are available to download from the Highfield Assessment website and may be used for this purpose.

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## Practical skills test criteria

| Fault diagnosis  |                     |   |
|--|---------------------|---|
| <p>Identify and use the appropriate mode of communication and be able to deal with and listen to customers</p> <p>Comply with health and safety procedures to protect colleagues, customers and their family</p> <p>Select, use and apply diagnostic tools and aids to locate fault</p> <p>Ensure that there is not a primary reason for fault occurring</p> <p>Observe and adhere to the principles of Electrostatic Discharge (ESD) when handling spare parts and open products</p> <p>Understand Apps and use them in product function &amp; troubleshooting</p> <p>Apply electrical safety tests</p> <p>Avoid the hazard left by residual energy</p> <p>Ensure all tools and equipment are safe and fit for purpose</p> <p>Apply Portable Appliance Testing</p> <p>Communicate technical findings and Product/claim investigations, both verbally and in writing</p> <p>Ensure replacement components are correct and meet specification</p> | Assessment criteria |   |
|  | FD1                 | Asking relevant questions about the reported fault                    |
|  | FD2                 | Carrying out the safe isolation procedure                             |
|  | FD3                 | Carrying out the correct opening safety check                         |
|  | FD4                 | Using manufacturers technical information to aid diagnosis            |
|  | FD5                 | Using the correct diagnostic tools available                          |
|  | FD6                 | Identifying the correct area of the product that the fault relates to |
|  | FD7                 | Correctly identifying the faulty component                            |
|  | FD8                 | Accurately recording the diagnostic process and test results          |

## Installation of a product

| Deliver product   | Assessment criteria  |
|---|--|
| Apply electrical safety tests   | IP1 Pre-installation survey  |
| Apply Portable Appliance testing  | IP2 Referring to manufacturers instructions                          |
| Identify and use the appropriate mode of communication and be able to deal with and listen to customers               | IP3 Completion of all necessary safety checks                        |
| Comply with health and safety procedures to protect colleagues, customers and their family                            | IP4 Correct installation   |
| Agree suitable site, with customer, for installation  | IP5 Functional test/s  |
| Install product to manufacturer's regulations   | IP6 Explanation of correct function including energy-saving features |
| Demonstrate product to customer's satisfaction ensuring customer can operate product                                  | IP7 The connection to a wireless network                             |
| Ensure product is working properly, test is for electrical safety, EU/BS Standards and demonstrate it to the customer |  |
| Understand and complete Network & Router set-up   |  |
| Relate performance to speed and/or set-up of the customer network   |  |
| Understand Apps and use them in product function & troubleshooting  |  |
| Advise customers on energy-saving practices and choosing environmentally friendly purchases in the future             |  |
| Fit/remove safety bolts   |  |
| Complete paperwork including re-call registration if agreed with customer   |  |
| Showing respect for customers property and possessions  |  |
| Make network connections including Wi-Fi, Internet and Bluetooth  |  |

## Replacement of a faulty component

|  | Assessment criteria   |
|--|---|
| <p>Apply electrical safety tests</p> <p>Avoid the hazard left by residual energy</p> <p>Ensure all tools and equipment are safe and fit for purpose</p> <p>Apply Portable Appliance Testing</p> <p>Use the correct lifting techniques</p> <p>Apply safe stowing procedures</p> <p>Carry out electrical safety tests</p> <p>Understand Apps and use them in product function &amp; troubleshooting</p> <p>Standards and demonstrate it to the customer</p> <p>Observe and adhere to the principals of Electrostatic Discharge (ESD) when handling spare parts and open products</p> <p>Comply with health and safety procedures to protect colleagues, customers and their family</p> <p>Ensure all tools and equipment are safe and fit for purpose</p> <p>Apply Portable Appliance Testing</p> <p>Replace components or reinstate software using correct sequence, appropriate tools and techniques</p> <p>Ensure no damage to other components</p> <p>Ensure product is working properly, test it for electrical safety, EU/BS Having concern for the safety of colleagues, customers, their family and pets</p> | <p>RC1 Safe isolation</p> <p>RC2 Electrostatic discharge</p> <p>RC3 Manual handling</p> <p>RC4 Health and safety awareness</p> <p>RC5 Replacing components using appropriate tools and technique</p> <p>RC6 Electrical safety checks</p> <p>RC7 Functional test/s</p> |

## Assessing the Professional Discussion

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The 75-minute professional discussion will be conducted after the practical skills tests and will focus on the apprentice's understanding of installation and replacing components, as well as other areas as specified by the assessment criteria on the following pages.

During the on-programme part of their apprenticeship, the apprentice will have completed a portfolio that details all of the training, learning and workshops they have attended over the course of the apprenticeship, as well as a briefing document of approximately 1500 words (minimum 1350 and maximum 1650) summarising research into the latest developments in both Health & Safety and Environmental Legislation.

During the professional discussion, there will be 2 end-point assessors. The assessors will question the apprentice on environmental legislation and health and safety. They will also ask the apprentice to talk through a repair scenario.

The apprentice may use the contents of the portfolio to illustrate their answers and explain how they went about researching the topics for their briefing report, what conclusions they came to, and provide evidence for the other skills, knowledge and behaviour criteria assessed by the professional discussion.

The professional discussion will be marked out of 100, based on the coverage of the criteria. The result will then be given a weighting of 20%. This number will be carried forward and combined with the mark achieved in the other assessment components to determine the overall grade of the apprenticeship.

### **Before the assessment:**

Employers/training providers should:

- ensure the apprentice knows the date, time and location of the assessment.
- ensure the apprentice knows which criteria will be assessed (outlined on the following pages).
- encourage the apprentice to reflect on their experience and learning on-programme to understand what is required to meet the standard.
- be prepared to provide clarification to the apprentice, and signpost them to relevant parts of their on-programme experience and portfolio as preparation for this assessment.

## Professional discussion mock assessment

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It is the employer/training provider's responsibility to prepare apprentices for their end-point assessment, and Highfield recommends that the apprentice experiences a mock professional discussion in preparation for the real thing. The most appropriate form of mock professional discussion will depend on the apprentice's setting and the resources available at the time.

In designing a mock assessment, the employer/training provider should include the following elements in its planning:

- the mock professional discussion should take place in a suitable location.
- a 75-minute time slot should be available to complete the professional discussion if it is intended to be a complete professional discussion covering all relevant standards. However, this time may be split up to allow for progressive learning.
- consider a video or audio recording of the mock professional discussion and allow it to be available to other apprentices, especially if it is not practicable for the employer/training provider to carry out a separate mock assessment with each apprentice.
- ensure that the apprentice's performance is assessed by a competent trainer/assessor, and that feedback is shared with the apprentice to complete the learning experience. Mock assessment sheets are available to download from the Highfield Assessment website and may be used for this purpose.
- use structured 'open' questions that do not lead the apprentice but allow them to express their knowledge and experience in a calm and comfortable manner.

For example:

- Tell me about your customer care company policy.
- How can you deal with electrostatic discharge safely?
- Tell me about a fault you have diagnosed correctly. What led you to make that diagnosis?
- Which environmental legislation is applicable to your role as an electrical product service and installation engineer, and in what ways?

## Professional discussion criteria

Throughout the 75-minute professional discussion, the assessor will review the apprentice's competence in the criteria outlined below.

| Knowledge   |  |
|---|--|
| Customer care techniques including any particular company policies (PDK1, PDK2, PDK3) | Assessment criteria  |
|   | PDK1 Explain effective customer care techniques                      |
|   | PDK2 Outline company policies relating to customer care              |
|   | PDK3 State the customer care approach regarding vulnerable customers |

| Skills  |   |
|---|---|
| Understand and apply EU/BS product standards (PDS1, PDS2, PDS3, PDS4, PDS5, PDS6)<br>Resolve disputes and know who to report to in case of problems (PDS1, PDS2, PDS3, PDS4, PDS5, PDS6)<br>Research and apply environmental legislation that is current and appropriate to installations and repairs (PDS1, PDS2, PDS3, PDS4, PDS5, PDS6)<br>Apply the appropriate electrical, electronic & software principles to understanding the nature and reason for faults (PDS1, PDS2, PDS3, PDS4, PDS5, PDS6) | Assessment criteria   |
|   | PDS1 Explain the principles of the EU/BS product standards  |
|   | PDS2 Explain how to resolve disputes and know who to report to in case of problems                                  |
|   | PDS3 Research and apply environmental legislation that is current and appropriate to installations and repairs      |
|   | PDS4 Explain the principles of electrical safety and how to work safely   |
|   | PDS5 Explain how electrical, electronic and software issues can be caused and how these lead to faults in equipment |
|   | PDS6 Describe different fault-finding techniques  |

| Behaviours  |  |
|---|--|
| Giving a good impression of their employer and themselves by being polite and appropriately dressed (PDB1, PDB2, PDB3, PDB4)<br>Having a friendly greeting and manner to colleagues and customers (PDB1, PDB2, PDB3, PDB4)<br>Continuing 'personal professional development' in an industry that is changing rapidly (PDB1, PDB2, PDB3, PDB4)<br>Developing a trusting relationship with customer and colleagues (PDB1, PDB2, PDB3, PDB4) | Assessment criteria  |
|   | PDB1 Give a good impression of their employer and themselves by being polite and appropriately dressed |
|   | PDB2 Use a friendly manner to colleagues and customers   |
|   | PDB3 Undertake 'personal professional development' in an industry that is changing rapidly             |
|   | PDB4 Develop a trusting relationship with customer and colleagues                                      |

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