



ENERGY &  
UTILITY SKILLS

Skills for a greener world

EUIAS Level 3 End-point Assessment for Low Carbon  
Heating Technician

## Supporting Documents

QAN 610/4956/6  
ST1020 V1.1



# Supporting Documents for

## EUIAS Level 3 End-point Assessment for Low Carbon Heating Technician

**QAN 610/4956/6**

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## Updates to the supporting documents

Since the first publication of the EUIAS Low Carbon Heating Technician (LCHT) Supporting Documents, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v1.0	December 2024	First published	All

## Appendix A: Glossary

**Amplification** – provides more detail on how individual knowledge, skills or behaviours statements should be interpreted. Where the KSB statements, themselves are deemed self-explanatory, no amplification is provided. Assessment may include questions on anything identified in the amplification

**Behaviours (as part of KSBs)** – specific mindsets, attitudes or approaches identified as part of the apprenticeship standard that must be evidenced during end-point assessment

**Elements** – are the knowledge, skills and behaviours and what is needed to competently undertake the duties required for an occupational standard

**Gateway** - the stage of the apprenticeship where the apprentice, employer and training provider determine whether the apprentice is ready to undertake end-point assessment

**Guidance** – is only provided where it is required to support interpretation of the KSB statements

**Knowledge (as part of KSBs)** – specific information, technical detail, and 'know-how' identified as part of the apprenticeship standard that must be evidenced during end-point assessment

**Skills (as part of KSBs)** – the practical application of knowledge identified as part of the apprenticeship standard that must be evidenced during end-point assessment

**Standard** – An occupational standard is a description of an occupation. It contains occupational profile, and describes KSBs needed for someone to be competent in the occupation's duties. Occupational standards are developed by employers for occupations that meet the Institute for Apprenticeships and Technical Education current occupation criteria

**Topic** - is a collection of elements grouped into a theme e.g. Health and Safety



## Appendix B: Gateway Eligibility Form

(Standard Version: ST1020 version 1.1)

Apprentice's name:	Apprentice's job title:
Name of Employer:	Name of Training provider:
Employer representatives present:	Training provider representatives present:
Apprenticeship start date:	Apprenticeship on-programme end date:
Gateway meeting date:	
Has the apprentice taken any part of the end-point assessment for this apprenticeship standard with any other End Point Assessment Organisation?	Y / N
If "Yes" please give details:	

## Apprentice's details

Eligibility requirements:

The apprentice must confirm their achievement of the following:

Eligibility requirement	Achieved by the apprentice? Y/N	Evidence (Scans of certificates MUST be included)
Confirm the apprentice is working at or above the occupational standard as a low carbon heating technician		
Confirm the apprentice has the evidence required to pass the gateways and is ready to take the EPA		
Achieved English in line with apprenticeship funding rules		
Achieved Maths in line with apprenticeship funding rules		
Compiled and submitted a competent EPA portfolio of evidence that meets the specification requirements, on which the professional interview will be based		

## Gateway Eligibility Declaration

1. The apprentice, the employer and the training provider must sign this form to confirm that they understand and agree to the following:
2. The apprentice has completed the required on-programme elements of the apprenticeship and is ready for end-point assessment with EUIAS.
3. EUIAS has been informed about any reasonable adjustment and/or special considerations requests.
4. The apprentice will only submit their own work as part of end-point assessment.
5. All parties agree that end-point assessment evidence may be recorded and stored by EUIAS for quality assurance purposes.
6. The apprentice has been on-programme for a minimum duration of 365 days.
7. The apprentice is working at or above the occupational standard as a low carbon heating technician.
8. The apprentice has the evidence required to pass the gateway and is ready to take the EPA.
9. The apprentice has achieved English and maths in line with apprenticeship funding rules.
10. The apprentice has compiled and submitted a competent EPA portfolio of evidence, on which the professional interview will be based.
11. The apprentice, if successful, gives permission for EUIAS to request the apprenticeship certificate from the ESFA who issue the certificate on behalf of the Secretary of State.
12. The apprentice has been directed to the EUIAS Appeals Policy and Complaints Policy.
13. The employer/training provider has given the EUIAS at least three months' notice of requesting this EPA for this apprentice.
14. If the Gateway Eligibility Report is not completed in full, meeting all requirements, and submitted to EUIAS, the end-point assessment cannot take place.



Signed on behalf of the employer (print name):	Signature:	Date:
Signed on behalf of the training provider (print name):	Signature:	Date:
Apprentice's name (print):	Signature:	Date:
EUIAS use only:		
EUIAS Sign off:		
Comments/actions:		





## Appendix C: Practice Multiple-choice Test

## Level: 3

### Low Carbon Heating Technician

### Supporting Document: Practice Paper

This examination consists of 40 multiple-choice questions.

The Pass mark is 28 correct answers.

A mark of 35 or more is a Distinction.

The duration of this examination is 60 minutes.

You must use a **pencil** to complete the answer sheet - pens must NOT be used.

When completed, please leave the examination answer sheet and question paper on the desk.

For this paper:

- the use of a scientific calculator (non-programmable) is permitted
- access to the internet or intranet is NOT allowed

For each question, fill in ONE answer ONLY.

If you make a mistake, ensure you erase it thoroughly.

You must mark your choice of answer by shading in ONE answer circle only. Please mark each choice like this:

<b>MARKING INSTRUCTIONS</b>	
(A) (B) (C) ●	<b>ANSWER COMPLETED CORRECTLY</b>
Examples of how NOT to mark your examination sheet. <b>These will not be recorded</b>	
(A) (B) (C) ◐	<b>DO NOT</b> partially shade the answer circle.
(A) (B) (C) (D) ✕	<b>DO NOT</b> use ticks or crosses.
(A) (B) (C) (D) ○	<b>DO NOT</b> use circles.
(A) (B) ● ●	<b>DO NOT</b> shade over more than one circle.



You may use this page for rough work. This page must not be removed.

**Question 1**

When reporting a work-related accident according to Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) the report must be received within how many days of the incident?

**Possible answers**

a)	7 days
b)	10 days
c)	14 days
d)	30 days

**Question 2**

What does the warning sign in the image indicate?



**Possible answers**

a)	A corrosive material
b)	An explosive material
c)	A radioactive material
d)	A toxic material

**Question 3**

According to Control of Substances Hazardous to Health (COSHH) 2002, the refrigerant R290 is:

**Possible answers**

a)	toxic
b)	an irritant
c)	flammable
d)	poisonous

**Question 4**

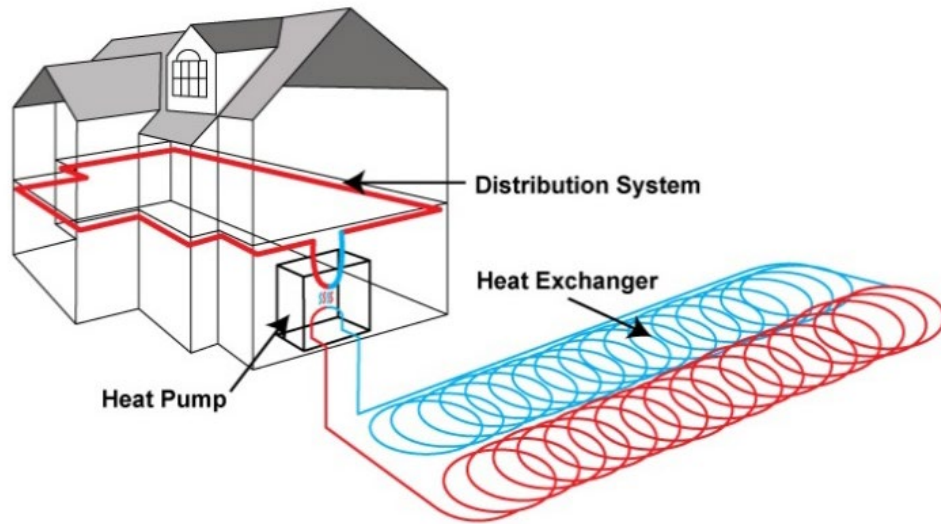
Which ONE of the following components can reduce the risk of undue noise from an Air Source Heat Pump during operation?

**Possible answers**

a)	Insulation on exposed pipework
b)	A filter on the primary return pipework
c)	Anti-freeze valves on the primary pipework
d)	Flexible hose connections to the distribution pipework

**Question 5** K3 3.2 Common installation practices and techniques used in the installation of Ground Source Heat Pump Systems: various types of ground source heat pump collector circuits

The configuration of the collector in the image is known as:



**Possible answers**

a)	Open loop horizontal collector
b)	Open loop compact collector
c)	Closed loop borehole collector
d)	Closed loop slinky collector

**Question 6**

When installing an unvented hot water cylinder, the D2 pipework must fall vertically by a:

**Possible answers**

a)	minimum of 300 mm before any bend
b)	maximum of 300 mm before any bend
c)	minimum of 600 mm before any bend
d)	maximum of 600 mm before any bend

**Question 7**

If a solar collector is to be connected to a dual-fuel hot water cylinder, what is the appropriate point of connection for the solar system?

**Possible answers**

a)	To the lowest coil
b)	To the highest coil
c)	To the cold water inlet
d)	To the hot water outlet

**Question 8**

Which ONE of the following components directly modulates the flow temperature of a heating appliance?

**Possible answers**

a)	Zone valves
b)	On/Off thermostats
c)	Compensation controls
d)	Thermostatic radiator valves



**Question 9**

What is the main purpose of using a close-coupled tee for hydraulic separation?

**Possible answers**

a)	To allow the domestic water and heating water to remain separated
b)	To allow glycol and water to be present within the same system
c)	To allow the temperature of the appliance to be reduced
d)	To allow differing flow rates within the system

**Question 10**

The ideal gas law states that as pressure increases:

**Possible answers**

a)	mass increases
b)	weight increases
c)	volume increases
d)	temperature increases

**Question 11**

Within a heat pump system, which component is responsible for transferring heat energy from the refrigerant to the heating system?

**Possible answers**

a)	Condenser
b)	Compressor
c)	Evaporator
d)	Expansion valve



**Question 12**

Which ONE of the following can decrease the coefficient of performance (COP) of an air source heat pump?

**Possible answers**

a)	A low flow temperature
b)	A low external temperature
c)	A low cold-water temperature
d)	A low target room temperature

**Question 13**

Which ONE of the following can increase the Seasonal Performance Factor (SPF) rating of a low temperature heating system?

**Possible answers**

a)	A buffer tank
b)	The addition of glycol
c)	A well-adjusted heat curve
d)	The installation of a flow meter

**Question 14**

What is the role of a refrigerant 4-way valve?

**Possible answers**

a)	To adjust the fan speed
b)	To increase the temperature of the refrigerant
c)	To switch the function of the evaporator and condenser
d)	To allow the flow and return pipework to maintain the correct Delta-T

**Question 15**

For a technician to repair a leak of refrigerant they must:

**Possible answers**

a)	be F-Gas qualified
b)	hold a Gas Safe Registration
c)	have experience in the heat pump industry
d)	be Microgeneration Certification Scheme (MCS) registered

**Question 16**

A technician must apply for planning permission when installing an air source heat pump when:

**Possible answers**

a)	the heat pump's compressor housing is 0.7 m <sup>3</sup>
b)	the heat pump is installed 1.9 m from a boundary
c)	the heat pump is installed 100 mm from the ground
d)	the heat pump produces 34 dB of sound pressure at the assessment point

**Question 17**

Who should be notified about the installation of the electrical connection for a heat pump?

**Possible answers**

a)	Local Authority
b)	Health and Safety Executive
c)	Distribution Network Operator
d)	Microgeneration Certification Scheme

**Question 18**

Which building regulation should be consulted to ensure the stability of the roof is not compromised when installing a solar thermal on a roof-space?

**Possible answers**

a)	Approved Document Part A
b)	Approved Document Part B
c)	Approved Document Part F
d)	Approved Document Part H

**Question 19**

Which document provides guidance for the sizing of a hot water storage system?

**Possible answers**

a)	BS 7671
b)	BS 8558
c)	BS 12831
d)	BSEN 14336

**Question 20**

Before connecting a newly installed heating system to a heat pump, it is essential to conduct a pressure test. What is the recommended pressure level that the heating system should be tested up to?

**Possible answers**

a)	0.5 times the design operating pressure
b)	1.5 times the design operating pressure
c)	2 times the design operating pressure
d)	3 times the design operating pressure

**Question 21**

When undertaking a noise assessment for a proposed air source heat pump installation, what distance is the **noise level measured** from the centre point of the nearest habitable room in the neighbouring property?

**Possible answers**

a)	1 metre
b)	5 metres
c)	10 metres
d)	30 metres

**Question 22**

When installing a central heating filling loop to a direct cold water system which device must be installed?

**Possible answers**

a)	Single Check Valve
b)	Double Check Valve
c)	Pressure Reducing Valve
d)	Reduced Pressure Zone (RPZ) Valve

**Question 23**

To ensure there is no risk of contamination due to warming, cold water pipework should never be allowed to exceed:

**Possible answers**

a)	10°C
b)	15°C
c)	20°C
d)	25°C

**Question 24**

A property has a heat loss of 7 kW when the external temperature is  $-3^{\circ}\text{C}$  and the internal temperature is  $21^{\circ}\text{C}$ . If the external temperature increased to  $4^{\circ}\text{C}$  but the internal temperature remained at  $21^{\circ}\text{C}$ .

What is new the heat loss? **(to the nearest kW)**

**Possible answers**

a)	3 kW
b)	4 kW
c)	5 kW
d)	6 kW

**Question 25**

Calculate the reheat time of a 210 litre hot water cylinder from  $37^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  when a 35 kW cylinder coil is fed via an 8 kW heat pump.

**Possible answers**

a)	23.86 minutes
b)	24.45 minutes
c)	26.30 minutes
d)	28.21 minutes

**Question 26**

What flow rate is required in litres per second to deliver 8 kW worth of energy at a Delta-T of  $5^{\circ}\text{C}$  assuming the specific heat capacity of the water is  $4.186 \text{ kJ/kg}^{\circ}\text{C}$ ?

**Possible answers**

a)	0.28 litres per second
b)	0.30 litres per second
c)	0.38 litres per second
d)	0.40 litres per second

**Question 27**

Which ONE of the following could potentially increase cycling of a heat pump and therefore decrease the efficiency of the appliance?

**Possible answers**

a)	A system with a volumiser installed
b)	A system with multiple zone valves installed
c)	A system that is open-loop with underfloor heating
d)	A system running on weather compensation controls

**Question 28**

When sizing a circulating pump, which description best describes the index circuit?

**Possible answers**

a)	The primary pipework resistance only
b)	The resistance within the heating appliance only
c)	The sum of all of the resistance within the heating system
d)	The route from the appliance to the emitter that has the highest resistance

**Question 29**

Select the correct equation for the complete combustion of natural gas?

**Possible answers**

a)	$2\text{H}_4 + \text{O}_2 = 2\text{H}_2\text{O}$
b)	$\text{N}_2 + \text{O}_2 = 2\text{NO}$
c)	$\text{C}_3\text{H}_8 + 5\text{O}_2 = 3\text{CO}_2 + 4\text{H}_2\text{O}$
d)	$\text{CH}_4 + 2\text{O}_2 = \text{CO}_2 + 2\text{H}_2\text{O}$

**Question 30**

According to the Paris Agreement 2015, by what date is a 45% reduction in greenhouse gas emissions required?

**Possible answers**

a)	2025
b)	2030
c)	2045
d)	2050

**Question 31**

After how many years does an Energy Performance Certificate (EPC) on a property expire?

**Possible answers**

a)	1 year
b)	5 years
c)	10 years
d)	20 years

**Question 32**

The current building regulations Part L, June 2022, state that all new heating systems must be designed to a maximum flow temperature of:

**Possible answers**

a)	35°C
b)	55°C
c)	75°C
d)	95°C

**Question 33**

What is the main focus of the Montreal Protocol?

**Possible answers**

a)	Reducing the toxicity of refrigerants
b)	Reducing the flammability of refrigerants
c)	Reducing the effect of refrigerants on the ozone layer
d)	Reducing the effect of refrigerants on global warming

**Question 34**

What state will the refrigerant enter the compressor of a heat pump when in heating mode?

**Possible answers**

a)	Subcooled liquid
b)	Subcooled vapour
c)	Superheated liquid
d)	Superheated vapour

**Question 35**

Which ONE of the following refrigerants is a hydrofluorocarbon (HFC)?

**Possible answers**

a)	R12
b)	R32
c)	R290
d)	R502



**Question 36**

According to current F-Gas Regulations, which ONE of the following is a key requirement for companies handling F-gases?

**Possible answers**

a)	Companies must replace all F-gases with natural alternatives by 2030
b)	Companies are required to phase down their F-gas usage by a certain percentage annually to limit emissions
c)	Companies must use F-gases only in industrial refrigeration systems and are banned from using them in household products
d)	Companies must ensure that personnel handling F-gases are certified and trained in their safe use and recovery

**Question 37**

A Heat Pump is using 1.5 kW worth of electricity and is fed from a 230 volts supply. What current in Amps is being drawn?

**Possible answers**

a)	5.43 amps
b)	5.89 amps
c)	6.52 amps
d)	6.78 amps

**Question 38**

In an S-plan system, which wire colour from the valve represents the permanent live connection in a normally-closed two port motorised valve?

**Possible answers**

a)	Brown
b)	Orange
c)	White
d)	Grey

**Question 39**

Which ONE of the following works require the technician to hold a part P qualification?

**Possible answers**

a)	Installation of a room thermostat
b)	Issuing of a minor works certificate
c)	Safe isolation of a heating appliance
d)	Replacement of a Printed Circuit Board

**Question 40**

What is the condition of a circulation pump on a solar thermal installation if it has a resistance reading of 2 ohms between the live and neutral connections?

**Possible answers**

a)	The circulating pump motor is operating successfully
b)	The circulating pump motor has a short circuit
c)	The circulating pump motor is burnt-out
d)	The circulating pump motor is seized

End of Questions.



## Practice Multiple-choice Test

### Answer scheme

Question	Answer	Question	Answer
1	B	21	A
2	D	22	B
3	C	23	D
4	D	24	C
5	D	25	A
6	A	26	C
7	A	27	B
8	C	28	D
9	D	29	D
10	D	30	B
11	A	31	C
12	B	32	B
13	C	33	C
14	C	34	D
15	A	35	B
16	A	36	D
17	C	37	C
18	A	38	D
19	B	39	B
20	B	40	B

## Appendix D - Level 3 Low Carbon Heating Technician Practical Assessment with Questions Planning and Approval Form

### Instructions

This form has two purposes:

1. To help you plan a practical assessment with questions for your apprentices
2. To inform EUIAS of the proposed task(s) for the live assessment

### Important information

- The apprentice is assessed in a simulated environment, approved by EUIAS, which relates to the apprentice's natural working environment
- A total of 28 hours + 10% is permitted for the practical assessment with questions
- The practical assessment with questions may be split into discrete sections held on different working days but must be completed over 4 working day(s), if necessary, it may continue into 5 working days, if the assessor increases the time by 10%
- The practical assessment is assessed by an EUIAS approved independent assessor
- The ratio of assessor to apprentice may be 1:4
- The employer/training provider representative must be present or immediately contactable for the duration of the assessment
- During the assessment, the independent assessor will be asking questions which are part of the assessment

The activities should be designed to assess a broad range of the knowledge, skills and behaviours developed over the period of the apprenticeship. However, as a minimum the practical assessment with questioning must cover the activities and KSBs listed in the planning and approval form below. EUIAS will review and discuss with the employer/training provider the various low carbon heating and hot water systems that the apprentice installs and services as part of their regular duties in the workplace. EUIAS will then use this information to choose a suitable assessment task for the apprentice.

Task variations: If you have more than one apprentice being assessed, use the 'Practical Task Variations' section of the form to indicate what the task variations that will be put in place so that apprentices are not asked to complete identical tasks.

Complete the 'Level 3 Low Carbon Heating Technician with Questions Planning and Approval Form' and submit it to the Service Delivery team via [enquiries@euias.co.uk](mailto:enquiries@euias.co.uk), for **review at least 2 months before the start** of the end-point assessment. Further details can be found in the LCHT EPA Specification.

## Level 3 Low Carbon Heating Technician Practical Assessment with Questions Planning and Approval Form

Employers/training providers are recommended to arrange for apprentices to carry out a practice practical assessment prior to end-point assessment. The form below is for the use of the training provider setting up the practical assessment. Task briefs are available for EUIAS registered customers to assist with completing this form, please contact the Service Delivery Team via [enquiries@euias.co.uk](mailto:enquiries@euias.co.uk)

Employer name and site address	
Training provider (if applicable)	
Contact details of Employer/training provider representative, email address and contact number overseeing the setup of the practical (documents and site).	

### Practical Assessment with Questions Checklist

This checklist will assist the employer and/or training provider with planning and discussing the activity with EUIAS. **Please confirm all required elements are covered:**

#### Component 1: Installation (Typically 23 hours)

The apprentice must be provided with a written brief detailing a customer's low carbon heating and hot water installation specification. The specification will include a low carbon heating and hot water system, which could include but is not limited to the list below. Please check the boxes below to confirm and provide additional information where necessary:	
I confirm a written brief detailing a customer's low carbon heating and hot water installation specification has been produced and submitted to EUIAS for review.	<input type="checkbox"/>
<b>I confirm that the type of low carbon heating and hot water systems installed to be used in this assessment is:</b>	
Ground source heat pump	<input type="checkbox"/>
Air source heat pump	<input type="checkbox"/>
Water source heat pump	<input type="checkbox"/>
Solar thermal system	<input type="checkbox"/>
If other low carbon heating and hot water system is to be used, please list them here and check the box:	<input type="checkbox"/>



The apprentice will then carry out planning and installation practices, including the following: (Please check the boxes below to confirm and provide additional information where necessary)

Compliance with health and safety regulations	<input type="checkbox"/>
Production of a work programme, risk assessment and method statement	<input type="checkbox"/>
Planning, sizing and selecting the system	<input type="checkbox"/>
Installing the system	<input type="checkbox"/>
Testing and commissioning the system	<input type="checkbox"/>
Conducting a customer handover	<input type="checkbox"/>

Additional information:

Brief task(s) description of installation task:  
Box will expand to allow further detail

Special requirements and site access arrangements for the assessor:  
Box will expand to allow further detail



## Component 2: Maintenance (Typically 5 hours)

The independent assessor will pre-install **two commonly found faults** on a low carbon heating and hot water installation that could include but is not limited to the list provided below. Please check the boxes below to confirm and provide additional information where necessary:

I confirm the independent assessor will be able to pre-install two commonly found faults on a low carbon heating and hot water installation	<input type="checkbox"/>
---	--------------------------

**I confirm that the type of low carbon heating and hot water systems installed to be used in this assessment is:**

Ground source heat pump	<input type="checkbox"/>
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Air source heat pump	<input type="checkbox"/>
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Water source heat pump	<input type="checkbox"/>
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Solar thermal system	<input type="checkbox"/>
----------------------	--------------------------

If other low carbon heating and hot water system installation is to be used, please list them here and check the box:	<input type="checkbox"/>
---	--------------------------

Additional information:

The apprentice will then carry out maintenance practices on the low carbon heating and hot water installation, including the following: (Please check the boxes below to confirm and provide additional information where necessary)

Safe isolation of electrical supply	<input type="checkbox"/>
-------------------------------------	--------------------------

Compliance with health and safety regulations	<input type="checkbox"/>
---	--------------------------

Servicing the system	<input type="checkbox"/>
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The independent assessor will be able to pre-install two commonly found faults to allow the apprentice to diagnosis: <ul style="list-style-type: none"><li>o a minimum of two commonly found faults (for example, wrong pipe size, wrong type of insulation, etc.)</li></ul>	<input type="checkbox"/>
--	--------------------------

Rectification of two commonly found faults	<input type="checkbox"/>
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Additional Information:

Brief task(s) description for discussion and review:

Box will expand to allow further detail

Special requirements and site access arrangements for the assessor:

Box will expand to allow further detail

Task briefs are available for EUIAS registered customers to assist with completing this form, please contact the Service Delivery Team via [enquiries@euias.co.uk](mailto:enquiries@euias.co.uk)

The following requirements should be covered in the activity:

Health and safety requirements	Describe where in the activity the independent assessor will observe the requirements
Prioritises and promotes health and safety by applying safe working practices and complying with health and safety regulations and approved codes of practice throughout the practical tasks, ensuring the working environment is safe for themselves and others. (S1, B1)	
<b>The independent assessor will ask a question on the following:</b> Explain the benefits for individuals and the business of compliance with health and safety regulations and procedures and the consequences of non-compliance. (S1)	



Planning for installation	Describe where in the activity the independent assessor will observe the requirements
Produces a work programme in line with the installation specification, manufacturer instructions and installation time. (K24, S3, S4)	
Produces a method statement and risk assessment reflective of the installation specification, manufacturers guidance and recommended control measures. (K24, S3, S4)	
Plans, sizes and selects a suitable carbon heating and hot water system in line with the installation specification, manufacturer guidance and legislative requirements. (K21, S13)	
<b>The independent assessor will ask a question on the following:</b> Justifies the control measures chosen to minimise hazards and risks during the work programme. (S4)	
Installation and testing	Describe where in the activity the independent assessor will observe the requirements
Applies techniques to install, test and commission the selected low carbon heating and hot water system in line with manufacturer guidance, legislative requirements and the programme of work. (K11, S5, S6, B4)	
Hands over the installation and provides operational advice in line with manufacturer operational instructions. (K11, S5, S6, B4)	
<b>The independent assessor will ask a question on the following:</b> Justifies the use of installation, testing and commissioning techniques to ensure the system is operating at maximum efficiency. (K11, S5, S6)	



Planning for installation	Describe where in the activity the independent assessor will observe the requirements
Service and maintenance	Describe where in the activity the independent assessor will observe the requirements
Applies techniques to perform routine servicing, maintenance, fault diagnosis, and fault rectification on a low carbon heating and hot water system. (K16, K19, S9)	
Ensures the safe isolation of the electrical supply and the work is carried out in line with manufacturer guidance and legislative requirements. (K16, K19, S9)	
<b>The independent assessor will ask a question on the following:</b> Justifies the diagnostic methods they use in the identification and resolution of faults. (K19, S9)	

### Practical Task Variations

Describe how you can vary the task(s) to ensure that the task does not become predictable.

**Variation 1:**

**Variation 2:**

**Variation 3:**

Special requirements (for example: authorisations/access arrangements/PPE):



The practical assessment with questions task(s) must take 28 hours. The assessment may be split into discrete sections held over different days but must be completed over 4 working day(s). If necessary, it may continue into 5 working days if the independent assessor increase the time by 10%. Please complete the following to confirm:

Please state the total hours for the practical task(s): \_\_\_\_\_

Please state the hours planned for Component 1 – Installation (Typically 23 hours): \_\_\_\_\_

Please state the hours planned for Component 2 – Maintenance (Typically 5 hours) \_\_\_\_\_

Please state if the assessment will be split into discrete sections:

Yes  No

Provide details of the split:

Please state the number of days the total assessment will be completed in:

Additional information:

#### Assessment Centre Setup Confirmation – Subject to EUIAS Approval:

The number of apprentices that the Independent assessor will observe during the practical is (maximum of 4 at any one time): \_\_\_\_\_

#### Layout confirmation:

Please provide evidence that the workshop layout allows for the assessment of more than one apprentice at the same time:

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#### Privacy Confirmation:

Please confirm that the workshop layout ensures apprentices cannot see each other or gain advantage by hearing what the assessor is asking and what the apprentice is answering:



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**Resource Availability Confirmation:**

Please provide information to confirm that there is sufficient equipment tools, manuals, and other necessary resources for each apprentice to use during the assessment without sharing resources:

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**Safety Measures Confirmation:**

Please confirm that all necessary safety measures are in place to protect apprentices during the assessment:

**Equipment Functionality Confirmation:**

Please provide evidence that all equipment and tools are in good working condition and regularly maintained:

**Space Adequacy Confirmation:**

Please confirm that there is adequate space for each apprentice to work comfortably without interference from others:

**Independent Assessor-to-Apprentice Ratio Confirmation:**

Please confirm that there is an appropriate ratio of apprentices allocated to assessors to ensure effective supervision and assessment:

**Emergency Procedures Confirmation:**

Please confirm that emergency procedures are in place and that all apprentices are aware of them:

**Accessibility Confirmation:**

Please confirm that the assessment area is accessible to all apprentices, including those with disabilities:

**IMPORTANT INFORMATION TO REMEMBER:** The specific detail of the task(s) to be undertaken should be **kept confidential from the apprentices.**

Practical task(s): include relevant photographs to illustrate task(s) to be discussed and reviewed

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EUIAS Office use only

Date received	
Date signed off	

## Appendix E: Practice Practical Assessment with questions Template

Employers/training providers are recommended to arrange for apprentices to carry out a practice Practical Assessment with Questions prior to end-point assessment. The form below is for use by the person playing the part of the independent assessor.

### Instructions

This should be read in conjunction with the LCHT Specification.

This template has been designed to help the suitable person playing part of the independent assessor and has three purposes:

1. To prepare for a practice assessment with questions
2. Designed to holistically assess a broad range of the skills, knowledge and behaviours developed over the period of the apprenticeship by the apprentice
3. To provide feedback to the apprentice in preparation for the live assessment

The assessor should:

- complete the form below which has two parts to assess the apprentice's Practical Assessment with questions.

### Quick Tip – How to complete the form below:

Name of Apprentice	
Location(s) of Practice Practical Assessment with Questions	
Name of Person Playing the Role of an Independent Assessor	
Date	
Start Time	
End Time	
Practice: Person Playing the Role of an Independent Assessor - Additional comments:	

It is important to ensure that the page illustrated is completed by the assessor.

The assessor should write additional comments to support the practice grade decision, sign and date to confirm.

Please indicate the apprentice's practice practical assessment with questions grade	Distinction	Pass	Fail
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

By signing below, I confirm that the information provided is correct and the practice grade awarded is a true reflection of the performance by the apprentice.

<b>The person playing the role of the Independent Assessor</b> Full Name and Signature:	<b>Date:</b>

Theme and KSBS: Installation and testing – K11; S5; S6 and B4 To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors		P/D	Assessor comments to justify the evidence seen and outcomes achieved
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the distinction descriptors			
<u>Pass</u> Applies techniques to install, test and commission the selected low carbon heating and hot water system in line with manufacturer guidance, legislative requirements and the programme of work. Hands over the installation and provides operational advice in line with manufacturer operational instructions. (K11, S5, S6, B4)	<input type="checkbox"/>		
<u>Distinction</u> Justifies the use of installation, testing and commissioning techniques to ensure the system is operating at maximum efficiency. (K11, S5, S6)	<input type="checkbox"/>		
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBS that did not occur naturally during the Practical Assessment with questions.			
<b>Summary of response to question(s):</b>			
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
		<b>Time of observation</b>	
		<b>Fail</b>	<input type="checkbox"/>
		<b>Pass</b>	<input type="checkbox"/>
		<b>Distinction</b>	<input type="checkbox"/>

Check the box for each descriptor the apprentice achieves.

Include the time of observation for the descriptors.

Check the relevant box if failed; pass or distinction is achieved.

Provide feedback for the apprentice to show where they could improve their skills.

Summarise the response that the apprentice provided.

Develop some open ended questions in relation to the KSBS.

Assessor to include comments to justify the evidence seen that meets the descriptors for the outcomes achieved.





Name of Apprentice	
Location(s) of Practice Practical Assessment with Questions	
Name of Person Playing the Role of an Independent Assessor	
Date	
Start Time	
End Time	
Practice: Person Playing the Role of an Independent Assessor - Additional comments:	

Please indicate the apprentice's practice practical assessment with questions grade	Distinction	Pass	Fail
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

By signing below, I confirm that the information provided is correct and the practice grade awarded is a true reflection of the performance by the apprentice.

<b>The person playing the role of the Independent Assessor Full Name and Signature:</b>	<b>Date:</b>

**Please Note:**

Fail: the apprentice does not demonstrate the Pass descriptors.

To achieve a Pass, the Apprentice must achieve **all** the Pass descriptors.

To achieve a Distinction an apprentice must successfully achieve **all** the Distinction descriptors and **all** of the Pass descriptors.

Assessor questions: during the live assessment, the assessor must ask at least 5 open questions.

## Introduction

At the start of the practical assessment with questions the assessor will:

- Introduce themselves
- Confirm their role
- State the date of the practical assessment with questions
- Provide apprentice with information on the format of the practical assessment with questions, including the timescales they will be working to

The apprentice will:

- Give their full name
- Give their date of birth
- Give their employer's name
- Confirm they are prepared for the practical assessment with questions; and confirm they can continue with the practical

The apprentice will be asked to show their identification to the assessor prior to beginning the assessment.

## Important points to inform the apprentice

- If at any point during the practical you perform an unsafe act/task which contravenes Health and Safety, I will immediately stop the practical.
- Please do not judge anything by me taking notes and you should not infer anything positive or negative from how long the observation lasts.
- Ensure that your mobile is turned off or placed somewhere where you will not be interrupted during the practical

## Assessor Guidance

### Delivery

- The practical assessment with questions
  - must take 28 hours. The assessor may increase the time by up to 10% to allow the apprentice to complete a task or respond to a question if necessary

- May be split into discrete sections held over 4 working days

You must:

- provide the apprentice with a written brief detailing a customer's lower carbon heating and hot water installation specification. This specification will include a low carbon heating and hot water system, which could include but is not limited to:
  - ground source heat pump
  - air source heat pump
  - water source heat pump
  - solar thermal system
- for component 1 observe the apprentice carrying out planning and installation practices, including the following:
  - compliance with health and safety regulations
  - production of a work programme, risk assessment and method statement
  - planning, sizing and selecting the system
  - installing the system
  - testing and commissioning the system
  - conducting a customer handover
- for component 2 pre-install two commonly found faults on a low carbon heating and hot water installation that could include but is not limited to:
  - ground source heat pump
  - air source heat pump
  - water source heat pump
  - solar thermal system
- observe the apprentice carrying out maintenance practices on the low carbon heating and hot water installation, including the following:
  - safe isolation of electrical supply
  - compliance with health and safety regulations
  - servicing the system

- diagnosis of a minimum of two commonly found faults (for example, wrong pipe size, wrong type of insulation, etc.)
- rectification of two commonly found faults
- observe apprentices (maximum, subject to EUIAS confirmation) 1:4 ratio
- be as unobtrusive as possible
- explain to the apprentice the format and timescales of the practical before they start
- ask at least 5 questions. Questioning can occur both during and after the practical
- use open-ended questions to suit individual circumstances. Follow-up questions may be asked to clarify answers given by the apprentice
- ask questions about KSBs that were not observed to gather assessment evidence. These questions are in addition to the set number of questions for the observation and should be kept to a minimum
- write down the question to be asked

At the end of the practical assessment with questions - Thank the apprentice for their time.

Theme and KSBS: Health and Safety – S1 and B1		
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors		
<u>Pass</u> Prioritises and promotes health and safety by applying safe working practices and complying with health and safety regulations and approved codes of practice throughout the practical tasks, ensuring the working environment is safe for themselves and others. (S1, B1)	<input type="checkbox"/>	
<u>Distinction</u> Explains the benefits for individuals and the business of compliance with health and safety regulations and procedures and the consequences of non-compliance. (S1)	<input type="checkbox"/>	
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the Practical Assessment with questions.		
<b>Summary of response to question(s):</b>		
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		
<b>Time of observation</b>		
<b>Fail</b>		<input type="checkbox"/>
<b>Pass</b>		<input type="checkbox"/>

<b>Distinction</b>	<input type="checkbox"/>
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**S1** Operate in a safe working manner by complying with health and safety legislation, approved codes of practice and guidance and applying safe working practices.

**B1** Takes personal responsibility for and promotes health and safety.

Theme and KSBS: Planning for installation – K21; K24; S3; S4 and S13		
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors		
<u>Pass</u> Produces a work programme in line with the installation specification, manufacturer instructions and installation time. Produces a method statement and risk assessment reflective of the installation specification, manufacturers guidance and recommended control measures. (K24, S3, S4)	<input type="checkbox"/>	
<u>Pass</u> Plans, sizes and selects a suitable carbon heating and hot water system in line with the installation specification, manufacturer guidance and legislative requirements. (K21, S13)	<input type="checkbox"/>	
<u>Distinction</u> Justifies the control measures chosen to minimise hazards and risks during the work programme. (S4)	<input type="checkbox"/>	
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBS that did not occur naturally during the Practical Assessment with questions.		
<b>Summary of response to question(s):</b>		
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

<b>Time of observation</b>	
<b>Fail</b>	<input type="checkbox"/>
<b>Pass</b>	<input type="checkbox"/>
<b>Distinction</b>	<input type="checkbox"/>

**K21** Planning, sizing and selecting practices for low carbon heating and hot water systems and components.

**K24** Risk assessments, method statements and work programmes: production methods and requirements.

**S3** Produce work programmes for tasks within low carbon heating and hot water industry.

**S4** Produce risk assessments and method statements for the low carbon heating and hot water systems work.

**S13** Plan, size and select low carbon heating and hot water systems.



Theme and KSBS: Installation and testing – K11; S5; S6 and B4		
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors		
<u>Pass</u> Applies techniques to install, test and commission the selected low carbon heating and hot water system in line with manufacturer guidance, legislative requirements and the programme of work. Hands over the installation and provides operational advice in line with manufacturer operational instructions. (K11, S5, S6, B4)	<input type="checkbox"/>	
<u>Distinction</u> Justifies the use of installation, testing and commissioning techniques to ensure the system is operating at maximum efficiency. (K11, S5, S6)	<input type="checkbox"/>	
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBS that did not occur naturally during the Practical Assessment with questions.		
<b>Summary of response to question(s):</b>		
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		
<b>Time of observation</b>		
<b>Fail</b>		<input type="checkbox"/>
<b>Pass</b>		<input type="checkbox"/>
<b>Distinction</b>		<input type="checkbox"/>

**K11** Testing and commissioning practices and techniques applicable to low carbon heating and hot water systems.

**S5** Install, low carbon heating and hot water systems.

**S6** Test, commission and handover low carbon heating and hot water systems, including providing operational advice.

**B4** Takes responsibility for completing work.

Theme and KSBS: Service and maintenance – K16; K19 and S9	
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors  To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors	P/D
<b>Assessor comments to justify the evidence seen and outcomes achieved</b>	
<u>Pass</u> Applies techniques to perform routine servicing, maintenance, fault diagnosis, and fault rectification on a low carbon heating and hot water system. Ensures the safe isolation of the electrical supply and the work is carried out in line with manufacturer guidance and legislative requirements. (K16, K19, S9)	<input type="checkbox"/>
<u>Distinction</u> Justifies the diagnostic methods they use in the identification and resolution of faults. (K19, S9)	<input type="checkbox"/>
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBS that did not occur naturally during the Practical Assessment with questions.	
<b>Summary of response to question(s):</b>	
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.	
<b>Time of observation</b>	
<b>Fail</b>	<input type="checkbox"/>
<b>Pass</b>	<input type="checkbox"/>
<b>Distinction</b>	<input type="checkbox"/>

**K16** Routine service and maintenance practices and techniques applicable to low carbon heating and hot water systems.

**K19** Fault finding, diagnosis and rectification practices and techniques applicable to low carbon heating and hot water systems.  
**S9** Service, maintain, diagnose faults and rectify low carbon heating and hot water systems, including safe isolation of supply.

## Appendix F: Practice Professional Interview Based on an EPA Portfolio Template

Employers/training providers are recommended to arrange for apprentices to carry out a practice Professional Interview based on an EPA portfolio prior to end-point assessment.

### Instructions

This should be read in conjunction with the LCHT Specification.

This template has been designed to help the suitable person playing part of the independent assessor and has three purposes:

1. To prepare for a practice assessment
2. Designed to holistically assess a broad range of the skills, knowledge and behaviours developed over the period of the apprenticeship by the apprentice
3. To provide feedback to the apprentice in preparation for the live assessment

The assessor should:

- complete the form below which has two parts to assess the apprentice's Interview.
- review the apprentice's portfolio of evidence before the practice assessment

### Quick Tip – How to complete the form below:

Full Name of Apprentice	
Apprentice ID checked	
Location of Practice Professional Interview	
Employer Company Name	
Training Provider Name	
Full Name of Person Playing the Role of an Independent Assessor	
Date of Interview	
Start Time	
End Time	
Practice: Person Playing the Role of an Independent Assessor - Additional Comments:	

Please indicate the apprentice's practice professional interview grade	Distinction <input type="checkbox"/>	Pass <input type="checkbox"/>	Fail <input type="checkbox"/>
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By signing below, I confirm that the information provided is correct and the practice grade awarded is a true reflection of the performance by the apprentice.

Person playing the role of an Independent Assessor Full Name and Signature:	Date:
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It is important to ensure that the page illustrated is completed by the assessor.

The assessor should write additional comments to support the practice grade decision, sign and date to confirm.

Theme and KSBS: Environment and sustainability – K2; S2 and B2	
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors	P/D
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors	Assessor comments to justify the evidence seen and outcomes achieved
<b>Pass</b> Describes how they consider and apply environmental and sustainability principles in their work. Explains how they apply the principles in line with organisational procedures, regulations and standards on energy efficiency, material reuse, recycling, and management of emissions and waste. (K2, S2, B2)	<input type="checkbox"/>
<b>Distinction</b> Justifies the need to apply environmental and sustainability principles to the industry and their work. (K2, S2)	<input type="checkbox"/>
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above.	
<b>Write down the follow up questions asked:</b>	
<b>Summary of response to question(s):</b>	
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.	
<b>Portfolio reference</b>	<b>Time of question(s)</b>
	<b>Fail</b> <input type="checkbox"/>
	<b>Pass</b> <input type="checkbox"/>
	<b>Distinction</b> <input type="checkbox"/>

Check the box for each descriptor the apprentice achieves.

Person playing the Independent Assessor to provide comments to justify the evidence seen.

Check the fail or pass box to confirm the grade for this group.

Include the page number(s) of where in the portfolio of evidence has been seen that meets the descriptor above.

Develop some open ended questions in relation to the KSBS.

If follow up questions are asked include them here.

Record the time the question is asked.

## Low Carbon Heating Technician Professional Interview

Full Name of Apprentice	
Apprentice ID checked	
Location of Practice Professional Interview	
Employer Company Name	
Training Provider Name	
Full Name of Person Playing the Role of an Independent Assessor	
Date of Interview	
Start Time	
End Time	
Practice: Person Playing the Role of an Independent Assessor - Additional Comments:	

Please indicate the apprentice's practice professional interview grade	Distinction	Pass	Fail
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

By signing below, I confirm that the information provided is correct and the practice grade awarded is a true reflection of the performance by the apprentice.

<b>Person playing the role of an Independent Assessor Full Name and Signature:</b>	<b>Date:</b>

### Please Note:

To achieve a Pass, the Apprentice must achieve **all** of the Pass descriptors.

To achieve a Distinction the Apprentice must achieve **all** of the Pass and Distinction descriptors.

Fail: The apprentice does not demonstrate the Pass descriptors.

## Introduction

At the start of the professional interview the assessor will:

- Introduce themselves
- State their role
- State the date of the professional interview
- Request and confirm ID from the apprentice prior to beginning the assessment
- Provide apprentice with information on the format of the with questions, including the timescales they will be working to

The apprentice will:

- Confirm their full name
- Confirm their date of birth
- Give their employer's name
- Confirm their location and that no one else is present in the room, if remote apprentice to pan camera 360°
- Confirm they are prepared for the professional interview; and confirm they can continue with the professional interview
- Confirm that the evidence within the portfolio relates to the KSB's that will be assessed during the professional interview

## Important points to inform the apprentice

- Please do not judge anything by the notes being taken, nor infer anything positive or negative from how long the professional interview lasts
- Please do not consider me rude if I tell you that we need to move onto the next question. This will ensure that you get the opportunity to fully demonstrate your competencies within the time allowed
- Ensure the apprentice has a drink of water to hand
- Please ensure that your mobile is switched off or placed somewhere where you will not be interrupted during the professional interview
- Confirm that a sign is placed on the door of the assessment room. 'Assessment in progress 'Do not disturb'
- The live professional interview will be fully recorded for the purpose of audit and quality assurance



## Independent Assessor Guidance

### Delivery

- The interview will last 75 minutes. An additional 10% is allowed for the apprentice to complete their last answer
- You must be in full control. Time management is key! If the apprentice veers off track, they need to be reined back in
- You must ask a minimum of eight open questions
- The purpose of the questions is to cover the following tasks: Environment and sustainability; Electrical and electronic control systems; Decommissioning; Communication and collaboration; CPD and well-being
- Please work through the sections in the order they appear within this document
- Answers to questions must be recorded. Timeline each question to the recording. Only log the time for the start of each question asked
- Additional follow-up questions are allowed to seek clarification and to make a judgement against grading descriptor
- The text of additional questions must be recorded on this document
- Adapt the questions to the apprentice's circumstances following your review of their EPA portfolio evidence
- Write each question asked in the form below
- Supply brief written notes where each descriptor has been met
- If the apprentice does not achieve a descriptor, provide written notes that EUIAS can feed back to the apprentice to help the apprentice prepare for a resit
- Both the recording and the written notes will be subject to IQA

At the end of the professional interview - Thank the apprentice for their time and wish them good luck

Theme and KSBs: Environment and sustainability – K2; S2 and B2			
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors		P/D	Assessor comments to justify the evidence seen and outcomes achieved
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors			
<u>Pass</u> Describes how they consider and apply environmental and sustainability principles in their work. Explains how they apply the principles in line with organisational procedures, regulations and standards on energy efficiency, material reuse, recycling, and management of emissions and waste. (K2, S2, B2)		<input type="checkbox"/>	
<u>Distinction</u> Justifies the need to apply environmental and sustainability principles to the industry and their work. (K2, S2)		<input type="checkbox"/>	
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above.			
<b>Write down the follow up questions asked:</b>			
<b>Summary of response to question(s):</b>			
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
Portfolio reference		Time of question(s)	
		<b>Fail</b>	<input type="checkbox"/>
		<b>Pass</b>	<input type="checkbox"/>
		<b>Distinction</b>	<input type="checkbox"/>

Theme and KSBs: Electrical and electronic control systems K12; K13; K18; K20; K22; S7; S8 and S10	
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors	P Assessor comments to justify the evidence seen and outcomes achieved
<u>Pass</u> Describes how they follow processes and apply techniques to install, test and commission electrical and electronic control systems applicable to low carbon heating and hot water systems, whilst working within the limits of their own competence. Explains how they carry out the work in line with manufacturer guidance and legislative requirements. (K12, K13, K22, S7, S8)	<input type="checkbox"/>
<u>Pass</u> Describes how they apply techniques to carry out routine servicing, fault diagnosis, fault rectification and maintenance, on electrical and electronic control systems applicable to low carbon heating and hot water systems. Explains how they safely isolate the supply and carry out the work in line with manufacturer guidance and legislative requirements. (K18, K20, S10)	<input type="checkbox"/>
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above.	
<b>Write down the follow up questions asked:</b>	
<b>Summary of response to question(s):</b>	
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.	
<b>Portfolio reference</b>	<b>Time of question(s)</b>
	<b>Fail</b> <input type="checkbox"/>
	<b>Pass</b> <input type="checkbox"/>

**K12** Installation practices and techniques of electrical and electronic control systems applicable to low carbon heating and hot water systems.

**K13** Testing and commissioning practices and techniques of electrical and electronic control systems applicable to low carbon heating and hot water systems.

**K18** Routine service and maintenance practices and techniques of electrical and electronic control systems applicable to low carbon heating and hot water systems

**K20** Fault finding, diagnosis and rectification practices and techniques of electrical and electronic control systems applicable to low carbon heating and hot water systems including safe isolation procedures.

**K22** Processes and procedures of electrical supply and control systems applicable to low carbon heating and hot water systems and work including limits to operative competence.

**S7** Install electrical and electronic control systems applicable to low carbon heating and hot water systems.

**S8** Test and commission electrical and electronic control systems applicable to low carbon heating and hot water systems.

**S10** Perform routine service, maintenance, fault diagnosis and rectification procedures and techniques on electrical and electrical control systems applicable to low carbon heating and hot water systems including carrying out safe isolation procedures.

Theme and KSBs: Decommissioning – K14; K15; S11 and S12			
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors		P/D	Assessor comments to justify the evidence seen and outcomes achieved
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors			
<u>Pass</u> Describes how they apply techniques to decommission low carbon heating and hot water systems, in line with legislative requirements. Explains the limitations of their competence when decommissioning alternative fuel systems, components and appliances. (K14, S11)		<input type="checkbox"/>	
<u>Pass</u> Describes how they apply techniques to decommission electrical and electronic control systems applicable to low carbon heating and hot water systems in line with legislative requirements. (K15, S12)		<input type="checkbox"/>	
<u>Distinction</u> Justifies the importance of following legislative requirements when decommissioning low carbon heating and hot water systems, and the consequences of not doing so. (K14, S11)		<input type="checkbox"/>	
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above.			
<b>Write down the follow up questions asked:</b>			
<b>Summary of response to question(s):</b>			
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
<b>Portfolio reference</b>		<b>Time of question(s)</b>	

	<b>Fail</b>	<input type="checkbox"/>
	<b>Pass</b>	<input type="checkbox"/>
	<b>Distinction</b>	<input type="checkbox"/>

**K14** Decommissioning practices applicable to heating and hot water systems including limitations to operative competence with regard to other fuel systems supply, components and appliances.

**K15** Decommissioning practices of electrical and electronic control systems applicable to heating and hot water systems.

**S11** Decommission heating and hot water systems.

**S12** Decommission electrical and electrical control systems applicable to heating and hot water systems.

Theme and KSBs: Communication and collaboration – K7; K25; S14; S15; B3; B5 and B7				
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors		P/D	Assessor comments to justify the evidence seen and outcomes achieved	
To achieve a Distinction apprentice must demonstrate <b>all</b> of the Pass descriptors and <b>all</b> of the Distinction descriptors				
<u>Pass</u>	Describes how they communicate with others using verbal and written techniques suitable for the context and how they adapt their style of communication to suit the audience. (K7, S14)	<input type="checkbox"/>		
<u>Pass</u>	Describes how they work ethically, collaboratively and promote teamwork with stakeholders or clients to solve problems. Explains how they are supportive of the needs and concerns of others, especially where this relates to diversity and inclusion. (K25, S15, B3, B5, B7)	<input type="checkbox"/>		
<u>Distinction</u>	Justifies the use of collaborative, relationship management and problem-solving techniques when managing client or stakeholder contact and describes the impact this can have on the organisation. (K25, S15)	<input type="checkbox"/>		
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above.				
<b>Write down the follow up questions asked:</b>				
<b>Summary of response to question(s):</b>				
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.				
<b>Portfolio reference</b>			<b>Time of question(s)</b>	

	<b>Fail</b>	<input type="checkbox"/>
	<b>Pass</b>	<input type="checkbox"/>
	<b>Distinction</b>	<input type="checkbox"/>

**K7** Communication techniques used with different audiences.

**K25** Collaborative and ethical working, relationship management with clients and stakeholders and mutual problem-solving techniques.

**S14** Communicate with others verbally and in writing.

**S15** Works collaboratively with clients or stakeholders to solve problems.

**B3** Collaborates and promotes teamwork.

**B5** Supports an inclusive culture.

**B7** Act ethically.



Theme and KSBs: CPD and well-being K23 and B6			
To achieve a Pass apprentice must demonstrate <b>all</b> of the Pass descriptors		P	Assessor comments to justify the evidence seen and outcomes achieved
<u>Pass</u> Explains the learning they have completed and recorded to support competence in their role, showing a commitment to future CPD. (B6)		<input type="checkbox"/>	
<u>Pass</u> Explains the mental and physical health considerations in self and others and how to access support. Explains how mental health can impact the construction industry. (K23)		<input type="checkbox"/>	
<b>Questions asked:</b> Develop open ended questions to help evidence the descriptors above.			
<b>Write down the follow up questions asked:</b>			
<b>Summary of response to question(s):</b>			
<b>Feedback</b> that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
Portfolio reference		Time of question(s)	
		<b>Fail</b>	<input type="checkbox"/>
		<b>Pass</b>	<input type="checkbox"/>

**K23** Well-being: mental and physical health considerations in self and others and how to access support. Impact of mental health on the construction industry

**B6** Committed to continued professional development (CPD)



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