

End-point assessment plan for compressed air and vacuum technician apprenticeship standard

Apprenticeship standard reference number	Apprenticeship standard level	Integrated end-point assessment
ST0817	3	No

Contents

Introduction and overview	2
EPA summary table	3
Length of end-point assessment period	4
Order of assessment methods	4
Gateway	4
Assessment methods	5
Reasonable adjustments	12
Grading	13
Re-sits and re-takes	14
Roles and responsibilities	15
Internal Quality Assurance (IQA)	17
Affordability	17
Professional body recognition	17
Mapping of knowledge, skills and behaviours (KSBs)	18
Grading descriptors	21

Introduction and overview

This document sets out the requirements for end-point assessment (EPA) for the compressed air and vacuum technician apprenticeship standard. It is for end-point assessment organisations (EPAOs) who need to know how EPA for this apprenticeship must operate. It will also be of interest to compressed air and vacuum technician apprentices, their employers and training providers.

Full time apprentices will typically spend 36 months on-programme (before the gateway) working towards the occupational standard, with a minimum of 20% off-the-job training. All apprentices must require and spend a minimum of 12 months on-programme.

The EPA period should only start, and the EPA be arranged, once the employer is satisfied that the apprentice is deemed to be consistently working at or above the level set out in the occupational standard, and all of the pre-requisite gateway requirements for EPA have been met and can be evidenced to an EPAO.

For this apprenticeship, apprentices must compile a portfolio of evidence as a gateway requirement, which will underpin the EPA interview.

For level 3 apprenticeships and above apprentices without English and mathematics at level 2 must achieve level 2 prior to taking their EPA.

The EPA must be completed within an EPA period lasting typically three months, after the EPA gateway.

The EPA consists of three discrete assessment methods.

The individual assessment methods will have the following grades:

Assessment method 1: Practical assessment with questions

- fail
- pass
- distinction

Assessment method 2: Interview underpinned by portfolio of evidence

- fail
- pass
- distinction

Assessment method 3: Multiple-choice test

- fail
- pass

Performance in the EPA will determine the overall apprenticeship standard grade of:

- fail
- pass
- merit
- distinction

EPA summary table

On-programme (typically 36 months)	Training to develop the occupation standard's knowledge, skills and behaviours (KSBs) Training in English and mathematics to level 2, if required Compilation of a portfolio of evidence, to underpin the EPA interview
End-point assessment gateway	Employer is satisfied the apprentice is consistently working at, or above, the level of the occupational standard Achieved English and mathematics level 2, as a minimum Compiled and submitted a portfolio of evidence, to underpin the EPA interview
End-point assessment (which will typically take three-months)	Assessment method 1: Practical assessment with questions With the following grades: . fail . pass . distinction Assessment method 2: Interview underpinned by portfolio of evidence With the following grades: . fail . pass . distinction Assessment method 3: Multiple-choice test With the following grades: . fail . pass
Professional recognition	Aligns with recognition by the Engineering Council for Engineering Technician (EngTech), subject to successfully completing the full approval process

Length of end-point assessment period

The EPA will be completed within an EPA period lasting typically three months, after the EPA gateway.

Order of assessment methods

The assessment methods can be delivered in any order. The result of one assessment method does not need to be known before taking another.

Gateway

The EPA period should only start once the employer is satisfied that the apprentice is consistently working at or above the level set out in the occupational standard, that is to say they are deemed to have achieved occupational competence. In making this decision, the employer may take advice from the apprentice's training provider(s), but the decision must ultimately be made solely by the employer.

In addition to the employer's confirmation that the apprentice is working at or above the level in the occupational standard, the apprentice must have completed the following gateway requirements prior to beginning EPA:

- Achieved English and mathematics Level 2.

For those with an education, health and care plan or a legacy statement the apprenticeships English and mathematics minimum requirement is Entry Level 3 and British Sign Language qualification are an alternative to English qualifications for whom this is their primary language.

- Compiled a portfolio of evidence, to underpin the EPA interview, see requirements below

Portfolio of evidence requirements:

- apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship
- it must contain evidence to demonstrate the KSBs that will be assessed by the interview; it is anticipated there will typically be 10 pieces of evidence
- evidence must be mapped against the KSBs
- evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is required
- evidence sources may include:
 - work documentation/records

- annotated specifications/work instructions
- annotated photographs
- video clips (maximum duration in total 10 minutes)
- continued professional development records; to evidence B7

This is not a definitive list, other evidence sources are allowable

- it cannot include any methods of self-assessment
- any employer contributions should focus on direct observation of evidence, for example witness statements, rather than opinions
- the evidence provided must be valid and attributable to the apprentice; the portfolio of evidence must contain a statement from the employer confirming this
- the portfolio of evidence must be submitted to the EPAO at the gateway point

Assessment methods

Assessment method 1: Practical assessment with questions

Overview

This assessment method has one component: practical assessment with questions

The rationale for using this assessment method is:

- this is a practical role, best demonstrated through the completion of work activities; the activities chosen reflect those completed by a compressed air and vacuum technician on a regular basis and allow for the assessment of key KSBs
- employers and suppliers have existing facilities that may be used for the practical assessment with questions
- it provides a cost-effective approach to assessment through the potential assessment of two apprentices at the same time and so therefore reducing independent assessor travel time
- practical assessment avoids issues with scheduling, availability of a range of systems (air and vacuum) and access to premises that would occur if observation were to be completed in customers' premises and ensures consistent assessment
- questioning component enables the checking of underpinning knowledge and behaviours

Delivery

EPAOs must make scheduling arrangements for the practical assessment with questions with the apprentice's employer.

Apprentices must be assessed against the KSBs assigned to this assessment method – as shown in mapping of KSBs.

Apprentices must complete two activities as part of the practical assessment with questions. The activities must be carried out over an assessment time of five hours; two-hours for activity 1, three hours for activity 2. The practical assessment may be split into discrete sections held

on the same working day. The length of a working day is typically considered to be 7.5 hours. This could be to allow the apprentice to move to different parts of the practical assessment location or for meal/comfort breaks, without the movement time counting towards the assessment duration. Apprentices must be supervised during any breaks in the assessment and must not communicate with anyone else.

The independent assessor has the discretion to increase the time of the practical assessment by up to 10% to allow the apprentice to complete an activity.

The independent assessor may conduct the assessment for, and observe up to two apprentices at one time, if the assessment and assessment environment is conducive to this i.e. the apprentices are completing different assessments, meaning they cannot gain advantage from seeing what each other is doing, an apprentice cannot hear questions being asked of another apprentice and their responses, and the independent assessor is able to see both apprentices at all times. The rationale for being able to assess two apprentices at the same time is that it will require less independent assessor time and reduce the cost of the assessment and as the output from the activity is being assessed it does not require the independent assessor to observe continuously. The independent assessor must be unobtrusive whilst observing the practical assessment.

Apprentices must be provided with both written and verbal instructions on the tasks they must complete, including the timescales they are working to. Time for this instruction is exclusive of the assessment time.

The following activities must be observed during the practical assessment, that is a practical assessment without these tasks would seriously hamper the opportunity for the apprentice to demonstrate occupational competence in the KSBs assigned to this assessment method.

- **Fault diagnosis and repair:** identification and repair of four faults – two electrical/electronic and two mechanical, to a compressed air and vacuum system. Examples of electrical/electronic faults: contactor, solenoid, controller. Examples of mechanical faults: valve, thermostatic valve, split diaphragm valve, drain valve. Two hours for completion.
- **Installation:** installation of compressed air and vacuum pipe systems to a specification. The specification must detail what must be made and the materials to be used. It must require the use of one type of pipe material, for example aluminium or carbon steel; and selection and use of at least three different types of tools and equipment, for example pipe wrench, pipe vice, tube cutters, pipe threaders or press-fit tooling. It must include a leak test and inspection of pressure/vacuum vessels, their safety devices and/or other equipment. Three hours for completion.

Apprentices must have access to manufacturers' manuals relating to the equipment for reference purposes (replicating real life); this may be electronic and/or hard copy.

The independent assessor must ask a minimum of six questions. The purpose of the questioning is to assess underpinning knowledge and behaviours. Independent assessors may ask follow-up questions where clarification is required in relation to a response provided.

Questioning must be completed within the total time allowed for the practical assessment with questions. The questions can be asked by the independent assessor both during and after work completion. In order to remain as unobtrusive as possible, independent assessors should ask questions during natural stops between tasks and/or after completion of work rather than disrupting the apprentice's flow. Where two apprentices are being assessed at the same time, the independent assessor must ensure that an apprentice cannot hear questions and responses in relation to the other apprentice, which may mean that could gain an advantage.

EPAO must produce a bank of sample questions to assist the independent assessor, but these are for illustration only and the independent assessor should target their questions to the apprentice's individual circumstances.

Apprentices are expected to understand and use relevant occupational language.

Practical assessment with questions specifications must be of equal complexity, capable of being completed by a competent person within five hours (two hours for activity 1 and three hours for activity 2).

KSBs observed, and answers to questions, must be documented by the independent assessor, using EPAO documentation.

Evidence from the practical assessment with questions must be assessed holistically using the grading criteria for this assessment method. The independent assessor must make all grading decisions.

EPAOs must ensure that apprentices have a different practical assessment with questions specification and example questions in the case of re-sits/re-takes.

Venue

Practical assessments with questions must be conducted in one of the following locations:

- an employer's premises
- a client's premises
- a suitable venue selected by the EPAO, for example, a supplier's facility, training provider's premises or another employer's premises. The EPAO is responsible for ensuring that the apprentice is assessed under normal conditions, in a familiar environment, which is representative of normal workplace conditions for this occupation.

The EPAO must ensure that the venue has the necessary equipment, tools and controlled conditions to allow practical assessment with questions to take place. The EPAO may liaise with the employer to provide these resources.

Support material

As a minimum, EPAOs must produce the following material to support this assessment method:

- guidance for apprentices, employers and training providers that outlines in detail how the practical assessment with questions will operate
- specifications to outline in detail how the practical assessments with questions will operate, what it will cover and what should be looked for. They must include example questions to assess related underpinning knowledge and behaviours. EPAOs must develop 'practical assessment with questions specification banks' of sufficient size to prevent predictability and review them regularly (and at least once a year) to ensure they, and the specifications they contain, are fit for purpose. The specifications, including questions relating to underpinning knowledge and behaviours must be varied, yet allow assessment of the relevant statements. Specifications must be standardised by the EPAO.
- assessment recording documentation
- guidance for apprentices and employers
- question bank

Questions and resources development

It is recommended that specifications and example questions are developed in consultation with employers. EPAOs should put measures and procedures in place to maintain the security and confidentiality of their specifications if employers are consulted.

Assessment method 2: Interview underpinned by portfolio of evidence

Overview

This assessment method has one component: interview.

The rationale for using this assessment method is:

- it allows the apprentice to be assessed against KSBs that would take too long to observe or do not lend themselves to practical assessment with questions
- the inclusion of a portfolio of evidence enables the apprentice to refer to the application of KSBs
- it allows for testing of responses where there are numerous potential answers that couldn't be tested through the multiple-choice test
- it is a cost effective, as apart from a venue it does not require additional resources

Delivery

EPAOs must make arrangements for the interview underpinned by portfolio of evidence with the apprentice's employer.

Apprentices must be assessed against the KSBs assigned to this assessment method - as shown in the mapping of KSBs.

Independent assessors must conduct and assess the interview on a one-to-one basis. The interview must be appropriately structured to draw out the best of the apprentice's competence.

The interview must last for 90 minutes. The independent assessor has the discretion to increase the time of the interview by up to 10% to allow the apprentice to complete their last answer.

The independent assessor must ask a minimum of 10 open competence-based questions – minimum one per theme. The independent assessor may combine questions from the EPAO's question bank and those generated by themselves, following a review of the portfolio of evidence. Apprentices can refer to and illustrate their answers with evidence from their portfolio, however the portfolio evidence is not directly assessed.

Apprentices are expected to understand and use relevant occupational language.

Questions must cover the following themes:

- maintenance and servicing of compressed air and vacuum equipment (K2, S5)
- commissioning/decommissioning of compressed air and vacuum equipment (K4ii, S2, S3, S4)
- Inventory management (K8, S9.ii)
- planning work (K12, S9.i)
- documentation/reporting and information technology (IT) in the workplace (K13, K17, S10, S15)
- communication and professional relationships (K14, K16, S13, B3, B6)
- training, mentoring and coaching techniques (K15)
- Service Level Agreements (K18)
- team working (B2)
- continued professional development (B7)

The independent assessor must use the assessment tools and procedures that are set by the EPAO to record the interview.

Evidence from the questioning must be assessed holistically using the grading criteria for this assessment method. The independent assessor will make all grading decisions.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

Independent assessors must be developed and trained by the EPAO in the conduct of interviews and reaching consistent judgement.

Venue

The interview, underpinned by portfolio of evidence, can take place in any of the following places:

- employer's premises
- a suitable venue selected by the EPAO, for example a training provider's premises or another employer's premises

Video conferencing can be used to conduct the interview, but the EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided in some way, for example by using a 360-degree camera.

The interview underpinned by portfolio of evidence, must take place in a quiet room, free from distractions and influence.

Support material

EPAOs must produce the following material to support this assessment method:

- a 'question bank.' The 'question bank' must be of sufficient size to prevent predictability and reviewed regularly (and at least once a year) to ensure that it, and its content, are fit for purpose. The questions must be varied, yet allow assessment of the relevant KSBs.
- assessment recording documentation
- guidance for apprentices, employers and training providers

Question development

It is recommended that questions are developed in consultation with employers. EPAOs should put measures and procedures in place to maintain the security and confidentiality of their specifications if employers are consulted.

Assessment method 3: multiple-choice test

Overview

This assessment method has one component: multiple-choice test.

The rationale for using this assessment method is:

- it allows for the efficient testing of knowledge where there is a right or wrong answer
- it does not require independent assessor time, reducing cost; the multiple-choice test can be administered, invigilated and marked by an independent person appointed by the EPAO
- it allows for flexibility in terms of when, where and how it is taken
- it allows larger volumes of apprentices to be assessed at one time

Delivery

Apprentices must be assessed against the knowledge assigned to this assessment method – as shown in mapping of KSBs

The multiple-choice test can be:

- computer based
- paper based

It must consist of 40 questions.

The questions must be closed response - multiple-choice questions. Apprentices must choose one correct answer from a choice of four.

Each question answered correctly will be awarded one mark. Any incorrect or missing answers will be assigned nil marks.

Apprentices must have 60 minutes to complete the multiple-choice test.

Fifteen of the questions must cover health and safety (K10). Apprentices must achieve a minimum score of 12-out-of-15 for the health and safety questions in order to pass.

The multiple-choice test is closed book, which means that the apprentice cannot refer to reference books or materials.

A calculator is permitted during the multiple-choice test, as questions will require the apprentice to complete calculations. The EPAO must supply calculators (basic).

Apprentices must take the test in a suitably controlled environment that is a quiet space, free of distractions and influence, in the presence of an invigilator. The invigilator may be an independent assessor, another independent person employed by the EPAO or specialised (proctor) software, if the test is taken on-line. The EPAO is required to have an invigilation policy that will set out how the multiple-choice test is to be carried out. This will include specifying the most appropriate ratio of apprentices to invigilators, taking into account the setting and security required in administering the multiple-choice test. The EPAO is responsible for ensuring the security of tests they administer, to ensure the test remains valid and reliable (this includes any arrangements made using online tools).

The EPAO must verify the suitability of the venue for taking the test and the identity of the person taking the test.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

Marking

Tests must be marked by independent assessors or markers employed by the EPAO following a marking guide produced by the EPAO. Alternatively, marking by computer is permissible where question type allows this, to improve marking reliability.

Grading boundaries

The following grade boundaries apply to the multiple-choice test:

Grade	Minimum mark	Maximum mark
Fail	0	29
Pass	30, including 12-out-of-15 health & safety questions	40, including 12-out-of-15 health & safety questions

Support material

As a minimum, EPAOs must produce the following material to support this method:

- 'question bank'. The 'question bank' must be of sufficient size to prevent predictability and reviewed regularly (and at least once a year) to ensure they, and the questions they contain, are fit for purpose.
- a test specification
- sample tests and mark schemes
- live tests and mark schemes
- analysis reports which show areas of weakness for completed tests/exams and an invigilation policy

Question development

Questions must be written by EPAOs and must be relevant to the occupation and employer settings. It is recommended that questions are developed in consultation with employers of this occupation. EPAOs must maintain the security and confidentiality of their questions when consulting employers.

Reasonable adjustments

The EPAO must have in place clear and fair arrangements for making reasonable adjustments for this EPA. This should include how an apprentice qualifies for reasonable adjustment and what reasonable adjustments will be made. The adjustments must maintain the validity, reliability and integrity of the assessment methods outlined in this EPA plan.

Weighting of assessment methods

All assessment methods are weighted equally in their contribution to the overall EPA pass grade. Performance in the practical assessment with questions and interview underpinned by portfolio of evidence will determine whether a merit or distinction grade is awarded.

Overall EPA grading

Performance in the EPA will determine the overall apprenticeship grade of fail, pass, merit or distinction.

Independent assessors must individually grade each assessment method, according to the requirements set out in this plan. Restrictions on grading apply where apprentices re-sit/re-take an assessment method – see the re-sit/re-take section.

EPAOs must combine the individual assessment method grades to determine the overall EPA grade.

Apprentices who fail one or more assessment method will be awarded an overall EPA ‘fail.’

In order to gain an overall ‘pass’ apprentices must achieve a pass in all three assessment methods.

In order to gain an overall ‘merit,’ apprentices must achieve a distinction in the practical assessment with questions, and a pass in the other two assessment methods.

In order to achieve an overall ‘distinction’ apprentices must achieve a distinction in the practical assessment with questions and interview underpinned by portfolio of evidence, and a pass in the multiple-choice test.

Grades from individual assessment methods must be combined in the following way to determine the grade of the EPA as a whole:

Assessment method 1 - practical assessment with questions	Assessment method 2 – Interview underpinned by portfolio of evidence	Assessment method 3 – multiple-choice test	Overall grading
Fail	Any grade	Any grade	Fail
Any grade	Fail	Any grade	Fail
Any grade	Any grade	Fail	Fail
Pass	Pass	Pass	Pass
Distinction	Pass	Pass	Merit
Pass	Distinction	Pass	Pass
Distinction	Distinction	Pass	Distinction

Re-sits and re-takes

Apprentices who fail one or more assessment method will be offered the opportunity to take a re-sit or a re-take. A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for the re-sit or a re-take. The apprentice's employer will need to agree that either a re-sit or re-take is an appropriate course of action.

An apprentice who fails an assessment method, and therefore the EPA in the first instance, will be required to re-sit or re-take any failed assessment methods only.

Any assessment method re-sit or re-take must be taken within three-months of the fail notification, otherwise the entire EPA must be taken again, unless in the opinion of the EPAO exceptional circumstances apply outside the control of the apprentice or their employer.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to merit/distinction or merit to distinction.

Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of pass, unless the EPAO determines there are exceptional circumstances requiring a re-sit or re-take.

Roles and responsibilities

Role	Responsibility
Apprentice	<ul style="list-style-type: none"> • participate in development opportunities to improve their knowledge skills and behaviours as outlined in the occupational standard • meet all gateway requirements when advised by the employer • understand the purpose and importance of EPA and undertake EPA
Employer	<ul style="list-style-type: none"> • support the apprentice to achieve the KSBs outlined in the occupational standard to their best ability • determines when the apprentice is working at or above the level outlined in the occupational standard and is ready for EPA • select the EPAO • confirm arrangements with EPAO for the EPA (who, when, where) in a timely manner • ensure apprentice is well prepared for the EPA • Should not be involved in the delivery of the EPA
EPAO	<p>As a minimum EPAOs should:</p> <ul style="list-style-type: none"> • understand the occupational role • appoint administrators/invigilators and markers to administer/invigilate and mark the EPA • provide training and CPD to the independent assessors they employ to undertake the EPA • provide adequate information, advice and guidance documentation to enable apprentices, employers and providers to prepare for the EPA • confirm all EPA gateway requirements have been met • deliver the end-point assessment outlined in this EPA plan in a timely manner • prepare and provide all required material and resources required for delivery of the EPA in-line with best practices • use appropriate assessment recording documentation to ensure a clear and auditable mechanism for providing assessment decision feedback to the apprentice • have no direct connection with the apprentice, their employer or training provider, that means there must be no conflict of interest

	<ul style="list-style-type: none"> • maintain robust internal quality assurance (IQA) procedures and processes, and conducts these on a regular basis • conform to the requirements of the nominated external quality assurance body • organise standardisation events and activities in accordance with this plan's IQA section • organise and conduct moderation of independent assessors' marking in accordance with this plan • have, and operate, an appeals process • arrange for certification with the relevant training provider
Independent assessor	<p>As a minimum an independent assessor should:</p> <ul style="list-style-type: none"> • understand the occupational standard and EPA plan • deliver the EPA in-line with this plan • comply to the IQA requirements of the EPAO • be independent of the apprentice, their employer and training provider(s), that means there must be no conflict of interest • satisfy the criteria outlined in this EPA plan • hold or be working towards an independent assessor qualification, for example A1 and have had training from their EPAO in terms of good assessment practice, operating the assessment tools and grading • have the capability to assess the apprentice at this level • attend the required number of EPAOs standardisation and training events per year (as defined in the IQA section)
Multiple-choice test administrator/ invigilator/ marker	<p>As a minimum an administrator/invigilator/marker should:</p> <ul style="list-style-type: none"> • comply to the IQA requirements of the EPAO • be independent of the apprentice, their employer and training provider(s), that means there must be no conflict of interest • be trained in their role by their EPAO
Training provider	<p>As a minimum the training provider should:</p> <ul style="list-style-type: none"> • work with the employer to ensure that the apprentice is given the opportunities to develop the KSBs outlined in the occupational standard and monitor their progress during the on-programme period • advise the employer, upon request, on the apprentice's readiness for EPA prior to the gateway <p>Plays no part in the EPA itself</p>

Internal Quality Assurance (IQA)

Internal quality assurance refers to the requirements that EPA organisations must have in place to ensure consistent (reliable) and accurate (valid) assessment decisions. EPA organisations for this EPA must:

- appoint independent assessors who have knowledge and competence in the following: selecting, installing, commissioning, servicing, repairing and decommissioning a range of compressed air and vacuum equipment and systems
- appoint independent assessors who have recent relevant experience of the occupation/sector at least the same level as the apprentice gained in the last three years or significant experience of the occupation/sector
- appoint independent assessors who are competent to deliver the end-point assessment
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
- have robust quality assurance systems and procedures that support fair, reliable and consistent assessment across the organisation and over time
- operate induction training and standardisation events for independent assessors when they begin working for the EPAO on this standard and before they deliver an updated assessment method for the first time
- ensure independent assessors attend standardisation events on an ongoing basis and at least once per year

Affordability

Affordability of the EPA will be aided by using at least some of the following practice:

- using an employer's/supplier's existing premises and equipment for the practical assessment with questions where possible
- assessing two apprentices simultaneously during the practical assessment
- the interview underpinned by portfolio of evidence and multiple-choice test can be taken on-line, reducing travel costs
- using an employer's premises for the interview underpinned by portfolio of evidence
- scheduling one or more assessment methods could be completed on the same day

Professional body recognition

This apprenticeship is designed to prepare successful apprentices to meet the requirements for registration as Engineering Technician with the Engineering Council, subject to successfully completing the full approval process.

Mapping of knowledge, skills and behaviours (KSBs)

Assessment method 1: Practical assessment with questions

Knowledge
K3 Fault finding and repair requirements and techniques for compressed air and vacuum equipment, for example diagnostic techniques and testing.
K4.i System installation of compressed air and vacuum equipment, including system components, safe working limits, electrical, mechanical and ventilation requirements, site surveys and leak testing.
K5 Piping specifications; the different materials, joints, fixings and consideration of sizing, pressure, lengths and routing requirements.
K9 Safe correct use and storage of equipment and tools for example hand tools, lifting equipment, calibrated tools, power tools, meters, gauges, Carbon monoxide/Carbon dioxide (CO/CO ₂) monitors and test equipment.
Skills
S1 Install compressed air or vacuum equipment, piping, electrical connections and control systems.
S6 Diagnose; rectify faults and/or repair of compressed air or vacuum equipment, components and systems.
S7 Inspect pressure/vacuum vessels, their safety devices and/or other equipment.
S8 Select and use hand tools, specialist tools and instruments, including test equipment. Check tools and identify and report tool defects where necessary. Store of tools and equipment.
S11 Adhere to health and safety regulations, legislation and safe working practices; identify risks, hazards and control measure.
S12 Read and interpret technical and safety documentation, for example risk assessments, method statements, permits to work, operation and maintenance manuals and wiring diagrams.
S14 House-keeping, including restoring the work area on completion of the activity, returning any resources and consumables, disposal of waste, re-cycling/re-using where appropriate.
Behaviours
B1 Prioritises health, safety and environment.
B4 Takes responsibility for job, for example a desire to see a job through from start to finish and verify that it has been completed to the required standard.
B5 Quality focus, for example attention to detail, accuracy, customer orientated, implements quality and lasting repairs.

Assessment method 2: Interview underpinned by portfolio of evidence

Knowledge
K2 Maintenance requirements and techniques for compressed air and vacuum equipment, for example preventative and predictive maintenance.
K4.ii Commissioning and decommissioning of compressed air and vacuum equipment, including system components, safe working limits, electrical, mechanical, ventilation requirements, site surveys and leak testing.
K8 Inventory management, including the identification of equipment and parts, stock value, stock management systems and the correct handling of parts and returns process.
K12 Planning techniques, including time management skills, work flow, job allocation.
K13 Documentation requirements, for example service reports, checklists, written schemes of examination and vehicle safety checklist.
K14 Communication techniques - verbal and written.
K15 Training, mentoring and coaching techniques; how to pass on knowledge, and provide guidance to customer/stakeholder.
K16 Professional relationships, including; etiquette, expectations, responsibilities. Equality and diversity considerations.
K17 Information Technology (IT) in the workplace, for example hardware devices, software, connectivity protocols, and work management systems.
K18 Service Level Agreements, for example employer/employee responsibilities and commercial contracts.
Skills
S2 Commission compressed air or vacuum equipment and/or components.
S3 Lock off and isolate equipment; electrical and mechanical.
S4 Decommission and disconnect specified equipment or components, for long term shut down or disposal for example. Categorise equipment for reuse, disposal or recycling and when necessary, complete storage measures to prevent deterioration.
S5 Maintain and service compressed air or vacuum equipment or components.
S9.i Plan and prepare for work, for example task delegation, work-flow, route planning and time management.
S9.ii Obtain and check parts.
S10 Report and record work activity, for example asset management records, work sheets, checklists, waste environmental records and any legal reporting requirements.

S13 Communicate with stakeholders - internal and/or external, for example customers, colleagues, managers and the general public.
S15 Use IT, for example document creation, communication and information management.
Behaviours
B2 Team player, for example; integrates and communicates with the team, supports other people, considers implications of their own actions on other people and the business whilst working effectively to get the task completed, reliable, punctual, meticulous, trustworthy, honest, determined, perseveres, acts with integrity
B3 Adaptable, for example, responds to unforeseen circumstances, improvises in environment or time challenged conditions, resilient under pressure.
B6 Professional, represents employer/themselves well for example communicates clearly, presentable, passion for product, ambassadorial nature, instils confidence.
B7 Committed to continuous professional development in order to ensure growth in ability and standards of work.

Assessment method 3: Multiple-choice test

Knowledge
K1 Principles of design and operation of compressed air and vacuum generation, filtration, drying, condensate treatment equipment; the different industry application specification requirements, approved Codes of Practice (ACOP), guidelines including British Compressed Air Society (BCAS) best practice guides and fact-sheets
K6 Electrical system principles, for example, AC single/three phase power, DC power, motors, control systems and system connectivity (i4.0). Techniques in the safe use of electrical test equipment and electrical isolation.
K7 Calculations, conversions, flow rates and equipment sizing used in compressed air and vacuum activities.
K10 Health and Safety and how it must be applied, Control Of Substances Hazardous to Health (COSHH), risk assessments, method statements, permits to work, manual handling, Personal Protective Equipment (PPE), asbestos awareness, working in confined spaces, working at height, slips trips and falls, electric compliance, safety passports, food hygiene, vehicle safety, noise regulation, lone working. Pressure Systems Safety regulations (PSSR) and the Provision of Work Equipment Regulations (PUWER), Lifting operations and lifting equipment regulations (LOLER).
K11 Environmental considerations, including Environmental Protection Act, Waste Electrical and Electronic Equipment Directive (WEEE), fluorinated greenhouse gas (F Gas), hazardous waste regulations and the waste-water Directive (WWD), recycling and waste disposal, energy monitoring, leak detection and equipment data logging to optimise energy performance.

Grading descriptors

Assessment method 1: practical assessment with questions

Q: indicates where a question will need to be asked to demonstrate the grading descriptor

KSBs	Pass, apprentices must demonstrate all the pass descriptors in order to pass	Distinction, in addition to the pass criteria apprentices must demonstrate all the following distinction descriptors in order to get a distinction
Interpret information S12	Identifies task(s) requirements and correct action required from information provided, for example what needs repairing, time restraints, customer constraints/expectations, safety requirements	
Fault finding and repairs K3, S6	Identifies faults correctly; using diagnostic techniques Q. Describes the fault-finding diagnostic procedure followed for one of the faults as identified by the independent assessor Completes repairs that fix the faults	Q. Outlines a further procedure/approach that could identify underlying causes of a fault Q. Explains additional work that could be completed to ensure long term reliability Evaluates the benefits of one diagnostic procedure compared to another
Installation K4.i, K5, S1, S7	Identifies correct materials and processes for installing pipework: material, joints, fixings, size, pressure, lengths and routing requirements, safe working limits, electrical, mechanical and ventilation requirements, site surveys and leak testing Completes task(s) in logical order Completes installation specified in accordance with specifications/instructions, including inspection of pressure/vacuum vessels, their	Q. Evaluates an advantage or disadvantage of one material or process compared to another Uses minimum fittings Installs piping that is level Installs piping joints that are, clean free from burrs and marks Installs piping that is 100% leak free

	<p>safety devices and/or other equipment</p> <p>Labelling completed</p> <p>Leak is within specified tolerance as per the practical assessment specification set by the EPAO</p>	
<p>Equipment K9, S8</p>	<p>Selects correct equipment and tools including test equipment for the job</p> <p>Completes correct safety checks</p> <p>Sets up and uses equipment and tools according to specification/manufacturer's instructions</p> <p>Q. Identifies storage requirements for piece of equipment/tool as identified by the independent assessor</p> <p>Q. Describes correct process for reporting tool defects</p>	
<p>Health, safety and environment S11, S14, B1</p>	<p>Identifies and updates risks and hazards in the workplace and suitable control measures</p> <p>Wears correct personal protective equipment for the task</p> <p>Conducts work in line with health and safety regulations, legislation and safe working practices, risk assessment, method statements and environmental considerations, for example identifies materials and classifies for reuse, disposal or recycling</p> <p>Restores work area upon completion of activities returning any resources and consumables</p>	

Responsibility/ quality focus B4, B5	<p>Demonstrates quality focus, for example attention to detail, accuracy, customer orientated, implements quality and lasting repairs</p> <p>Takes responsibility for job, for example a desire to see a job through from start to finish and verify that it has been completed to the required standard</p> <p>Completes activity within time specified in accordance with specifications/instructions</p>	<p>Makes recommendations for improvements to the process with regards to the efficiency, reliability or communication</p>
Fail: apprentices will fail where they do not meet the pass criteria		

Assessment method 2: Interview underpinned by portfolio of evidence

KSBs	Pass, apprentices must demonstrate all the pass descriptors in order to pass	Distinction, in addition to the pass criteria apprentices must demonstrate all the following distinction descriptors in order to get a distinction
Maintenance and servicing K2, S5	<p>Explains preventative or predictive maintenance that they have completed on a piece of equipment, showing knowledge of applying generic and manufacturer specific requirements</p> <p>Correctly explains potential consequence of not undertaking maintenance/servicing</p>	<p>Explains additional work that could be completed in relation to maintenance and service work completed, to ensure long term reliability Identifies components of the system that may have a high risk of future breakdown failure and the recommendations to avoid this</p>
Commissioning/ decommissioning of compressed air and vacuum equipment K4ii, S2, S3, S4	<p>Explains how they have commissioned and decommissioned equipment or component parts including lock off and isolation, applying their knowledge of system components, safe working limits, electrical, mechanical, ventilation requirements, site surveys and leak testing</p> <p>Identifies potential consequence of not following commissioning / decommissioning procedures for a given equipment or component part</p>	
Inventory management K8, S9.ii	<p>Describes how they have managed inventory, including the identification of equipment and parts, stock value, stock management and the correct handling of parts and returns process</p>	<p>Explains how their decisions impact on the business and the explains the consequences of making poor decisions</p>

<p>Planning work K12, S9.i</p>	<p>Describes factors that influenced scheduling of jobs undertaken on the same day, based on correct application of industry insight and/or company operation</p> <p>Identifies factors that were correctly considered when planning/preparing a job, with reasoned justification</p> <p>Identifies suitable action in relation to change in circumstances, as identified by the independent assessor</p>	<p>Justifies for order of scheduling; shows it has potential to provide best overall outcome in terms of meeting targets across the jobs</p>
<p>Documentation/ reporting and information technology (IT) in the workplace K17, K13, S10, S15</p>	<p>Identifies the correct purpose and requirements for completing two different types of documentation as identified by the independent assessor from the technician's perspective</p> <p>Explains how they use IT in their role, identifies factors that need to be taken into consideration in its use for example, connectivity protocols and its potential benefits</p> <p>Presents completed records and/or technical information related to their role which are complete, technically correct and legible</p>	<p>Explains the purpose and importance of documentation, as identified by the independent assessor from the customer's perspective.</p> <p>Explains the potential use and benefits of IT technology to the Industry as identified by the independent assessor, for example "Industry 4.0" and "Internet of Things"</p>
<p>Communication and professional Relationships K14, K15, K16, K18, S13, B3, B6</p>	<p>Describes how they use a range of communication techniques appropriate to the stakeholder</p> <p>Describes how they have provided training, mentoring or coaching and outlines the techniques they used to pass on knowledge and/or provide guidance and the benefits achieved.</p> <p>Outlines key requirements of a service level agreement</p>	<p>Explains how they would suitably adapt their communication in relation to a customer/stake-holders characteristic or situation, as identified by the independent assessor</p>

	<p>operational within their company and implications for their work</p> <p>Describes how their professionalism impacts on their outcomes and their business.</p> <p>Provides an example of where they have been adaptable and customer focused, due to changing priorities and/or working requirements</p>	
Team working B2	Describes a team working strategy suitable to a situation as identified by the independent assessor	
Continued professional development B7	<p>Explains when they have identified gaps in their skills/knowledge and planned for development in these areas</p> <p>Outlines at least two different types of CPD</p>	
Fail: apprentices will fail where they do not meet the pass criteria		