

Qualification Specification

ProQual Level 3 Diploma in Refrigeration and Air Conditioning

QAN: 610/8222/3

ProQual Level 3 Diploma in Refrigeration and Air Conditioning

This qualification is part of ProQual's broad offer of qualifications in the Engineering Sector.

To find out more about other qualifications in this, or any other sector, or for our latest fees; check our Fees Schedule via the QR code below:

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Summary of Changes

Version	Date	Section	Nature of Change
V1.1	October 2026	All	First published version

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Please note that this document may contain live links to external guidance and supporting documentation. Any links included within the specification have been verified and are current at the time of issue and review. Centres are responsible for checking that these remain active, accessible, and current before use, as guidance may be updated, withdrawn, or replaced over time.

Introduction

The ProQual Level 3 Diploma in Refrigeration and Air Conditioning provides a nationally recognised qualification and progression pathway for those working in the engineering industry.

Qualification objectives:

- To develop a learning experience that offers candidates opportunities to acquire the practical and technical skills required for refrigeration and air conditioning activities.
- To offer candidates opportunities to develop knowledge, understanding and occupational competence in refrigeration and air conditioning systems.
- To provide a progression route within the refrigeration, air conditioning and engineering industries.

The awarding organisation for this qualification is ProQual AB. The qualification is approved for delivery in England and is regulated by Ofqual. It is recognised on the Regulated Qualifications Framework (RQF) and published on the Ofqual Register of Regulated Qualifications.

Qualification Terminology

ProQual uses a common set of command verbs across its regulated qualifications. Command verbs indicate the nature of the response or performance required by an assessment criterion. Their application should be considered in the context of the qualification level and the complete assessment criterion.

Qualification Profile

Qualification Title:	ProQual Level 3 Diploma in Refrigeration and Air Conditioning
Qualification Number:	610/8222/3
Level:	Level 3
Guided Learning Hours (GLH):	500 Hours
Total Qualification Time (TQT):	660 Hours
Credit Value:	66 Credits
Assessment:	Pass/Fail
	Internally quality assured by centre staff
	External quality assured by ProQual EQA
Qualification Start Date:	01/11/2026
Qualification Review Date:	01/11/2029

Equality, Diversity and Inclusion (EDI)

ProQual AB is committed to ensuring that its qualifications are accessible to candidates who are able to meet the required standards. Approved centres must apply equality, diversity and inclusion principles throughout delivery, assessment and quality assurance and must avoid unnecessary barriers to access, achievement or progression.

Centres must consider requests for reasonable adjustments and special consideration in accordance with the current ProQual policy and must ensure that any arrangements maintain the validity, reliability and integrity of assessment.

Aims of the Qualification

On successful completion of this qualification, the candidate will be able to:

- Apply health, safety and risk management principles when carrying out refrigeration and air conditioning (RAC) installation and fabrication tasks.
- Plan RAC activities effectively, manage resources and materials and apply quality assurance processes to meet industry requirements.
- Install, maintain and diagnose faults in air conditioning systems and associated control equipment.
- Install, commission and maintain portable air conditioning systems and ventilation ductwork systems.
- Carry out electrical installation activities, apply control system principles and diagnose faults within RAC electrical and control systems.

Quality and Standards

The ProQual Level 3 Diploma in Refrigeration and Air Conditioning has been developed in accordance with the Royal School of Military Engineering and the following regulatory guidance:

- BS EN 378 Refrigerating Systems and Heat Pumps Safety and Environmental Requirements.
- UK F-Gas Regulations and certification requirements.
- Institute of Refrigeration (IOR) technical guidance.
- REFCOM codes of practice and certification requirements.
- Pressure Systems Safety Regulations (PSSR).
- Health and Safety at Work legislation.
- PUWER and COSHH requirements.
- Occupational Standards for Refrigeration, Air Conditioning and Heat Pump engineering developed by the Royal School of Military Engineering.

The technical detail, entry requirements and practical restrictions have been designed to align with the regulatory standards and reflect best practice.

This qualification provides a nationally recognised programme for the development and recognition of occupational competence in refrigeration and air conditioning engineering. It is designed to support the development of knowledge, skills and competence required to safely plan, install, commission, maintain, service, diagnose faults in and repair refrigeration, air conditioning and heat pump systems in accordance with industry standards and regulatory requirements.

The qualification is suitable for candidates undertaking part-time study while in the workplace and for full-time candidates who are able to participate in formal work placements or part-time employment. Successful candidates may progress into employment, either directly following achievement of the qualification or through progression to employment within the refrigeration, air conditioning and heat pump industry in installation, commissioning, service, maintenance and fault diagnosis roles. They may also progress to higher-level technical qualifications in refrigeration, air conditioning, heat pump engineering, building services engineering or related engineering disciplines, supporting career progression into senior technical, supervisory and management positions.

Qualification Delivery

Centres must be approved by ProQual AB to deliver this qualification. Centres that are not currently approved to offer the qualification must complete and submit the **ProQual Additional Qualification Approval Form**.

Approved centres must be able to support candidates throughout the delivery and assessment of the qualification and must ensure that:

- suitably qualified and experienced assessors and Internal Quality Assessors (IQAs) are in place to ensure valid, consistent and reliable assessment decisions are made.
- appropriate physical, learning and assessment resources are available to support delivery of the qualification.
- candidates must be supported to generate evidence that meets the requirements of the qualification and demonstrates achievement of the relevant learning outcomes and assessment criteria.

Materials produced by centres to support candidates must:

- Enable them to track their achievements as they progress through the learning outcomes and assessment criteria.
- Provide information on where ProQual's policies and procedures can be viewed.
- Provide a means of enabling internal and external quality assurance staff to authenticate evidence.

Where practical or face-to-face delivery is required, centres must ensure that the delivery environment is appropriate for the activities being undertaken. This includes ensuring that:

- Relevant health and safety requirements are met.
- Appropriate equipment and resources are available.
- The venue has sufficient capacity and facilities for the number of candidates.
- Appropriately qualified and experienced staff are available to support candidates undertaking practical activities.

Any learning or assessment materials developed by the centre must be clear, accurate and appropriate to the qualification and must adequately support the requirements of the relevant units.

Access to Study

Centres must provide candidates with a clear induction at the start of the programme. This must introduce the qualification, its structure, assessment requirements, delivery arrangements and the support available from tutors and centre staff.

Candidates should be given appropriate programme information, including a candidate handbook, timetable and details of their personal tutor or main point of contact. Centres must ensure that candidates are placed on the most appropriate qualification, taking account of their prior knowledge, skills, experience and progression aims.

Centres must check qualification structures and permitted unit combinations carefully when advising candidates, to ensure that all registration and achievement requirements can be met.

Candidates must have access to accurate information, advice and guidance before and during their programme. At recruitment, centres must provide clear information about the qualification title, level, content, assessment approach and intended progression opportunities so candidates can make informed decisions.

Centres must register candidates in line with ProQual's Registration and Certification Policy and Procedure. Centres are expected to register candidates as early as possible following enrolment and normally within 30 calendar days of the start of the programme or course.

Assessment must not commence until registration has been completed.

Internal Resource Requirements

Centres must have appropriate staffing, resources, policies and quality assurance arrangements in place to deliver, assess and quality assure this qualification effectively. Centres must ensure:

- Staff involved in delivery and assessment have relevant knowledge, occupational competence and access to continuing professional development.
- Appropriate health and safety policies are in place and adhered to, including arrangements for the safe use of equipment by candidates.
- Robust safeguarding policies and procedures are in place, including appropriate checks where required.
- Delivery of the qualification is in accordance with current equality legislation and ProQual requirements.
- Sufficiently robust internal quality assurance systems are in place to support consistent and reliable assessment decisions.

Delivery and Assessment Staff

Centre staff delivering and assessing this qualification must be **occupationally competent, knowledgeable and qualified** to make assessment decisions.

Occupationally competent means possessing relevant experience to deliver and assess the full practical requirements contained within a unit.

Occupationally knowledgeable means possessing relevant knowledge to effectively deliver and assess the full requirements contained within a unit.

Occupationally qualified means holding the relevant subject-specialist qualifications, at the appropriate level, required to deliver the qualification.

Assessors must hold an appropriate **regulated assessor qualification** and have sufficient **occupational competence** to assess the requirements of this qualification.

Required occupational competence and knowledge	Current occupational competence and experience in refrigeration, air conditioning and heat pump installation, commissioning, service, maintenance and fault diagnosis relevant to the units being delivered and/or assessed.
Required occupational qualification(s)	
Required assessor qualification(s)	Assessors must hold one of the following regulated qualifications or equivalents: • Level 3 Award in Assessing Competence in the Work Environment • Level 3 Award in Assessing Vocational Achievement, • Level 3 Certificate in Teaching, Training and Assessment. • Level 3 Award in Education and Training. •
CPD requirements	Maintain continuing professional development to ensure technical knowledge, industry practice, legislation, standards and assessment practice remain current.

Internal Quality Assurance

Candidate portfolios must be internally quality assured by centre staff who are **occupationally competent, knowledgeable and qualified** to make quality assurance decisions.

IQAs must hold an appropriate **regulated internal quality assurance qualification** and have **sufficient occupational knowledge** to quality assure assessment decisions for this qualification.

Required occupational competence and knowledge	Current occupational competence and experience in refrigeration, air conditioning and heat pump installation, commissioning, service, maintenance and fault diagnosis relevant to the units being delivered and/or assessed
Required occupational qualification	Level 4 Award in the Internal QA of Assessment Processes and Practice OR Level 4 Certificate in Leading the Internal QA of Assessment Processes and Practice.
CPD requirements	Maintain continuing professional development to ensure technical knowledge, industry practice, legislation, standards and assessment practice remain current.

Candidate Profile

The ProQual Level 3 Diploma in Refrigeration and Air Conditioning has been developed for individuals working, or seeking to work, in the refrigeration and air conditioning industry. Throughout the qualification, candidates will participate in a range of learning, assessment and practical activities designed to develop the knowledge, skills and competence required to plan, install, commission, maintain, service, diagnose and rectify faults in refrigeration and air conditioning systems safely and in accordance with industry requirements. Candidates will also develop an understanding of health and safety requirements, environmental responsibilities, relevant legislation, industry standards, system performance, resource management and quality assurance principles associated with refrigeration and air conditioning operations.

Candidates will be required to demonstrate their competence through a combination of formative and summative assessments including observations.

On completion of this qualification candidates can progress to higher-level technical qualifications in refrigeration, air conditioning, heat pump engineering, building services engineering or related engineering disciplines, supporting career progression into senior technical, supervisory and management positions or pursue work in the industry.

Age Requirements

Candidates must be aged at least **16 years old** on the day that they are registered for this qualification.

English Language Requirements

Centres must ensure that all candidates have sufficient English language skills to understand the requirements of the qualification and to produce evidence that meets the required standard.

Evidence of English language competence may be demonstrated through:

- Achievement of a recognised English language qualification.
- Previous qualifications completed and assessed in English.
- An appropriate centre-conducted initial assessment.
- An English language proficiency test, such as IELTS, with an overall score of 6 or above.

Centres must retain evidence of the method used to determine that the candidate has the necessary English language proficiency to undertake the qualification successfully.

Entry Requirements

Candidates for this qualification should:

- Hold 3 GCSE passes in English Language, Mathematics and Science and Technology or equivalent qualifications.

Centres should carry out an initial assessment of candidates to determine their existing knowledge, skills and experience in refrigeration and air conditioning (RAC). Where gaps are identified, learners may be required to undertake additional learning or gain relevant industry experience before commencing the qualification

Delivery Requirements

Candidates for this qualification must be:

- Employed in a role where they will have the opportunity to carry out the required number of observations

OR

- Enrolled with a training provider that enables access to appropriate refrigeration and air conditioning systems, equipment, tools and workplace environments, allowing the learner to generate valid, reliable and sufficient evidence to meet the assessment requirements of the qualification, including direct observation of performance.

Candidate Support

Centres must support candidates throughout their registration on the qualification and promote appropriate behaviour throughout their learning and assessment.

Centres must have appropriate policies and procedures in place to support candidate needs, including:

- Safeguarding.
- Reasonable adjustments and special considerations.
- Health and safety.
- Attendance and conduct.

Recognition of Prior Learning

Centres should recognise, where appropriate, candidates' previous achievements, knowledge, skills and experience gained through work, formal study, informal learning or other relevant activities. Recognition of Prior Learning (RPL) provides a valid route for assessing, whether a candidate has already met the requirements of a unit/s, provided that the evidence presented is mapped clearly to the relevant learning outcomes and assessment criteria.

Evidence used for RPL must be valid, authentic, reliable, current and sufficient. Centres must apply the same assessment and quality assurance standards to RPL evidence as they do to evidence generated through any other assessment method.

If a candidate wishes to claim RPL, centres are required to support them through this process. Normal assessment and quality assurance systems will need to be applied to RPL, to ensure it is fit for purpose and appropriate. Candidates will need to provide evidence of their prior formal/informal learning, and the assessor will need to work with them to map this to the learning outcomes of the unit it relates to. If there are any gaps the assessor and candidate should find a suitable way to fill these with additional learning.

For all ProQual qualifications, RPL evidence must have been generated within the last three years. For the purpose of clarity, the three-year count starts from the date a candidate registers for the new ProQual qualification/unit they wish to complete.

EQA may ask to see evidence of the recording process and support materials approved centres have in place to explain RPL to their candidates. EQA will also check that RPL has been included in the approved centre's internal quality assurance processes.

Where RPL has been applied, this must be evidenced and recorded clearly in the portfolio. For further information on RPL assessment, please see the ProQual Recognition of Prior Learning Policy and Procedure.

Enquiries, Appeals and Adjustments

Adjustments to standard assessment arrangements are made on the individual needs of candidates. ProQual's Reasonable Adjustments and Special Consideration Policy and Procedure sets out the steps to follow when implementing reasonable adjustments and special considerations.

All enquiries relating to assessment or other decisions should be dealt with by centres, with reference to ProQual's Appeals Policy and Procedure.

Data Protection

All personal information obtained from candidates, centres and other relevant sources in connection with the delivery, assessment and quality assurance of this qualification will be processed securely and in accordance with applicable data protection legislation. Information may be used during the candidate's programme and after completion for purposes including registration, assessment, certification, quality assurance, regulatory compliance and the maintenance of qualification records. Where required, information may be shared with regulators or other relevant bodies. Centres must ensure that candidates are informed, during the enrolment and induction process, how their personal information will be collected, used, stored and shared. For further information, centres and candidates should refer to ProQual's Data Protection and Privacy Notice.

Centres must retain accurate records to evidence candidate registration, assessment, internal quality assurance and certification in line with ProQual's' Retention of Records Policy for ProQual Centres.

Qualification Structure and Requirements

The ProQual Level 3 Diploma in Refrigeration and Air Conditioning is made up of 66 credits, which equates to 660 hours of Total Qualification Time (TQT).

Total Qualification Time (TQT) represents the overall estimated time an average learner is expected to spend to achieve the qualification, including both supervised and independent learning. Guided Learning Hours (GLH) form part of TQT and refer only to learning or assessment that takes place under the guidance of a tutor or other appropriate provider. In practice, GLH identifies the supervised delivery and assessment time, while TQT provides the wider measure of qualification size by also including independent study, preparation, research, revision, portfolio development, e-learning and directed activities completed without supervision.

TQT may include a range of activities which, when combined, contribute to the development of the knowledge, understanding and competence required to achieve the qualification. The following list is not exhaustive:

- Guided learning activities.
- Pre-course reading and e-learning.
- Independent research and revision.
- Portfolio development and evidence collection.
- Coursework and assignments completed independently.
- Watching pre-recorded learning materials.
- Work-based learning and practice.
- Preparation for assessment activities.
- Reflective practice and self-directed study.

Guided Learning Hours (GLH) are the number of hours during which a candidate is provided with direct instruction, supervision, tuition or assessment by a tutor, trainer, assessor or other appropriate member of centre staff.

Guided learning may include:

- Tutor-led teaching sessions.
- Workshops and practical demonstrations.
- Supervised practical training.
- Tutorials delivered in person or online.
- Supervised assessments, observations and professional discussions.
- Competence-based training activities.
- Demonstrations and supervised practice.
- Approved simulation activities, where permitted within the requirements of the qualification.

Qualification Structure

Rules of Combination

This qualification consists of 5 mandatory units. Candidates must complete all mandatory units to complete this qualification.

Unit Number	Unit Title	Level	TQT	GLH	Credits
Mandatory Units – Candidates must complete **all** units in this group.					
Y/652/4252	Health, Safety and Risk Management for RAC Installation and Fabrication Tasks	3	240	180	24
A/652/4253	Planning, Resource Management and Quality Assurance for RAC activities	3	120	100	12
D/652/4254	Installation, Maintenance and Fault Diagnosis of Air Conditioning Systems and Controls	3	90	60	9
F/652/4255	Portable Air Conditioning and Ventilation Ductwork Systems	3	90	60	9
H/652/4256	Electrical Installation, Control Systems and Fault Diagnosis for RAC	3	120	100	12

Achievement and Certification

Achievement Requirements

To achieve this qualification, candidates must successfully meet all learning outcomes and assessment criteria for each required unit, in accordance with the rules of combination. Centres must ensure that assessment evidence is sufficient, valid, authentic, reliable and current before claiming certification.

Candidates who achieve the requirements for this qualification will be awarded:

- A certificate listing all units achieved, and
- A certificate giving the full qualification title:

ProQual Level 3 Diploma in Refrigeration and Air Conditioning

Claiming certificates

Centres may claim certificates for candidates who have been registered with ProQual and who have successfully achieved the qualification. All certificates will be issued to the centre for successful candidates.

Unit certificates

If a candidate does not achieve all of the units required for a qualification, the centre may claim a unit certificate for the candidate which will list all of the units achieved.

Replacement certificates

If a replacement certificate is required a request must be made to ProQual in writing, in line with the Registration and Certification Policy and Procedure. Replacement certificates are labelled as such and are only provided when the claim has been authenticated. Refer to the Fee Schedule for details of charges for replacement certificates.

Assessment Requirements

Each candidate is required to produce evidence which demonstrates their achievement of all of learning outcomes and assessment criteria for each unit. Assessment is the process of measuring a candidate's skill, knowledge and understanding against the standards set in the qualification.

Formative and Summative Assessment

The practical skills delivered in this qualification must be assessed through both formative and summative assessment. Formative assessment offers candidates opportunities to practise and develop their skills, often through simulated activities, until they are considered ready for summative assessment.

Assessment evidence can include:

- Observation report by assessor.
- Assignments/projects/reports.
- Professional discussion.
- Candidate work product.
- Workbooks.
- Record of oral and written questioning.
- Recognition of prior learning.

Candidates must demonstrate the level of knowledge and competence for all units through evidence submitted for summative assessment. This evidence must be sufficient, valid, authentic, reliable and current, and must show that the candidate can meet the learning outcomes and assessment criteria consistently and independently. Where assessment criteria require practical competence, evidence should confirm that the candidate can apply the required skills safely, professionally and in accordance with regulatory guidance, organisational procedures and the requirements set out in this qualification.

Units – Learning Outcomes and Assessment Criteria

Title:	Health, Safety and Risk Management for RAC Installation and Fabrication Tasks					**Level:**	3
Unit Number:	Y/652/4252	**TQT:**	240	**Credits:**	24	**GLH:**	180
Unit Purpose and Aims:	The aim of this unit is to develop the knowledge and practical competence required to carry out refrigeration and air conditioning (RAC) fabrication and workshop activities safely and effectively. Candidates will apply health, safety and risk management requirements when preparing materials and components, selecting and using appropriate tools and techniques. Candidates will learn about the technical competence required to produce and evaluate work against relevant specifications and industry requirements, supporting progression and employment within the RAC industry. This unit has been written in alignment with The Royal School of Military Engineering Occupational Standards and relevant regulation and legislation.						

Learning Outcomes *The learner will be able to:*		**Assessment Criteria** *The learner can:*	
1	Understand and apply health, safety and risk management requirements for RAC activities.	1.1	Explain health and safety responsibilities, requirements and sources of information relevant to RAC tasks.
		1.2	Describe safe working practices for RAC tasks, including: • Working areas and personal protective equipment. • Storage, signage and hazardous areas. • Working at height and in restricted spaces. • Waste disposal.

1	*Continued*	1.3	Assess hazards and risks associated with RAC tasks and determine control measures, including accident and emergency procedures.
		1.4	Describe safe working and emergency requirements associated with: • Material preparation, shaping and drilling. • Fastening and assembly. • Oxy-fuel brazing.
2	Select and prepare materials and components for RAC fabrication tasks using safe working practices.	2.1	Prepare and maintain a safe working area and use appropriate personal protective equipment for RAC tasks.
		2.2	Prepare metal materials, components and ancillary equipment for RAC tasks.
		2.3	Use appropriate tools and techniques to shape and drill materials to meet given dimensions and task requirements.
		2.4	Store materials, consumables and equipment safely in line with task requirements.
3	Join and assemble RAC components using safe working practices and industry-standard fabrication techniques.	3.1	Select and apply appropriate mechanical and permanent fastening methods to assemble RAC components in line with technical specifications and task requirements.
		3.2	Set up and operate oxy-fuel equipment safely to cut and join metal components using brazing techniques selecting appropriate materials and operating parameters.
		3.3	Produce, test and evaluate joints and seals to confirm compliance with RAC system specifications, quality requirements and pressure integrity standards.
		3.4	Demonstrate appropriate accident and emergency procedures for routine and non-routine RAC fabrication and workshop activities.

Additional Assessment Information

Learning Outcome 1 is **knowledge** based**.** This means that evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcome 2 and 3 are **competency** based**.** This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Evidence should primarily be generated through direct observation by an assessor who is occupationally competent, knowledgeable and qualified in the area being assessed.

Assessment checklists and evidence matrices may be used to support the organisation and tracking of assessment evidence but do not, in themselves, constitute evidence of competence.

An assessor's report alone is unlikely to be sufficient evidence of achievement. Reports and statements should always be accompanied by photographic and/or video evidence.

Assessment decisions should be based on evidence gathered through both formative and summative assessment opportunities. Each assessment criterion must be evidenced a minimum of twice to ensure the evidence is valid, reliable, and sufficient. One piece of evidence must come from direct observation of performance, and the second may be generated through an alternative assessment method, such as professional discussion, questioning, case study, reflective account, or additional observation.

Title:	Planning, Resource Management and Quality Assurance for RAC activities					**Level:**	3
Unit Number:	A/652/4253	**TQT:**	120	**Credits:**	12	**GLH:**	100
Unit Purpose and Aims:	The aim of this unit is to apply the knowledge and competence required to plan and prepare refrigeration and air-conditioning (RAC) work activities safely and effectively. Candidates will interpret task information, evaluate methods and resource requirements, develop work plans, assess risks and prepare appropriate resources for RAC tasks. Candidates will learn about the application of quality control requirements to ensure work is planned, prepared and completed in accordance with technical specifications, organisational procedures and relevant industry requirements. This unit has been written in alignment with The Royal School of Military Engineering Occupational Standards and relevant regulation and legislation.						

Learning Outcomes *The learner will be able to:*		**Assessment Criteria** *The learner can:*	
1	Evaluate planning, resource and quality assurance for RAC tasks.	1.1	Describe the health and safety requirements relevant to planning and preparing for RAC tasks.
		1.2	Describe the resource requirements for RAC tasks, including: • Materials and consumables. • Tools and equipment. • Storage and preparation.
		1.3	Explain quality control measures relevant for RAC tasks.
		1.4	Interpret working drawings, sketches and diagrams to determine task requirements.
		1.5	Evaluate methods, sequence and resource requirements for RAC tasks.

1	*Continued*	1.6	Describe the requirements for producing: • Working sketches. • Work programmes. • Risk assessments.
2	Develop and justify plans for the safe and efficient completion of RAC tasks.	2.1	Interpret and produce working sketches to support the planning and completion of an RAC task.
		2.2	Produce and sequence a works programme for an RAC task, taking account of resources, timescales, dependencies and safety requirements.
		2.3	Carry out and review a risk assessment for an RAC task and justify control measures in accordance with relevant legislation and industry requirements.
		2.4	Evaluate planned RAC tasks, identify changes or issues that may affect their completion, and communicate observations to the appropriate person.
3	Select, obtain and prepare materials, consumables and equipment for RAC tasks in accordance with technical and operational requirements.	3.1	Select materials and consumables to meet the requirements for an RAC task in accordance with technical specifications, system requirements and manufacturer instructions.
		3.2	Obtain, inspect and organise the storage of materials, consumables and equipment, ensuring compliance with safety, environment and workplace procedures.
		3.3	Prepare, check and verify the suitability of tools and equipment for an RAC task identifying and rectifying any defects or non-conformities in accordance with workplace procedures.
		3.4	Evaluate the suitability and availability of materials, consumables and equipment and communicate issues that may prevent task requirements from being met to the appropriate person.

4	Apply and monitor quality control requirements for RAC tasks.	4.1	Plan and prepare RAC tasks in accordance with job specifications, manufacturer's instructions, organisational procedures and relevant industry standards and regulations.
		4.2	Apply appropriate quality checks during RAC tasks to confirm compliance with specified requirements.
		4.3	Inspect completed RAC work to confirm it meets specified quality standards and technical requirements.
		4.4	Identify non-conformities and take appropriate action within own level of responsibility, including reporting issues to the appropriate person where required.

Additional Assessment Information

Learning Outcome 1 is **knowledge** based**.** This means that evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcomes 2-4 are **competency** based**.** This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Evidence should primarily be generated through direct observation by an assessor who is occupationally competent, knowledgeable and qualified in the area being assessed.

Assessment checklists and evidence matrices may be used to support the organisation and tracking of assessment evidence but do not, in themselves, constitute evidence of competence.

An assessor's report alone is unlikely to be sufficient evidence of achievement. Reports and statements should always be accompanied by photographic and/or video evidence.

Assessment decisions should be based on evidence gathered through both formative and summative assessment opportunities. Each assessment criterion must be evidenced a minimum of twice to ensure the evidence is valid, reliable, and sufficient. One piece of evidence must come from direct observation of performance, and the second may be generated through an alternative assessment method, such as professional discussion, questioning, case study, reflective account, or additional observation.

Title:	Installation, Maintenance and Fault Diagnosis of Air Conditioning Systems and Controls					**Level:**	3
Unit Number:	D/652/4254	**TQT:**	90	**Credits:**	9	**GLH:**	60
Unit Purpose and Aims:	The aim of this unit is to apply the knowledge and practical competence required to install, maintain and diagnose faults in air conditioning systems and associated controls. Candidates will prepare and install components, equipment and refrigerant pipework, carry out maintenance and diagnose and rectify faults using appropriate techniques and technical information. Candidates will learn about and develop the competence required to verify operation and complete work safely and in accordance with technical and industry requirements. This unit has been written in alignment with The Royal School of Military Engineering Occupational Standards and relevant regulation and legislation.						

Learning Outcomes *The learner will be able to:*		**Assessment Criteria** *The learner can:*	
1	Evaluate the requirements for air conditioning installation, maintenance and fault diagnosis tasks.	1.1	Evaluate materials, equipment and requirements for preparing and marking out installation tasks and the safe use of access equipment.
		1.2	Explain requirements for installing: • Air conditioning components and equipment. • Refrigerant pipework.
		1.3	Describe maintenance and fault diagnosis methods for air conditioning systems.
		1.4	Describe installation, maintenance and fault diagnosis methods for air conditioning controls.
2	Prepare, install and verify air conditioning systems and refrigerant pipework.	2.1	Prepare and use access equipment safely to carry out air conditioning installation tasks in accordance with task and safety requirements.

2	*Continued*	2.2	Prepare and mark out materials and surfaces, checking accuracy, identifying and correcting errors in line with task requirements.
		2.3	Install and verify air conditioning components, equipment and refrigerant pipework in accordance with installation requirements, technical information and manufacturer instructions.
3	Maintain, diagnose and rectify faults in air conditioning systems.	3.1	Carry out and verify maintenance activities on air conditioning systems in accordance with task requirements, maintenance schedules and technical information.
		3.2	Diagnose faults in air conditioning systems using appropriate fault-finding methods, test equipment and technical information.
		3.3	Rectify faults in air conditioning systems and verify correct systems operation following rectification.
4	Install, maintain, diagnose and rectify faults in air conditioning control systems.	4.1	Install and verify air conditioning control systems in accordance with task requirements, technical information and manufacturer's instructions.
		4.2	Maintain air conditioning control systems in accordance with maintenance requirements, technical information and manufacturer's instructions.
		4.3	Diagnose faults in air conditioning control systems using appropriate fault-finding techniques, test equipment and technical information.
		4.4	Rectify faults in air conditioning control systems and verify correct system operation following rectification.

Additional Assessment Information

Learning Outcome 1 is **knowledge** based**.** This means that evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcomes 2-4 are **competency** based**.** This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Evidence should primarily be generated through direct observation by an assessor who is occupationally competent, knowledgeable and qualified in the area being assessed.

Assessment checklists and evidence matrices may be used to support the organisation and tracking of assessment evidence but do not, in themselves, constitute evidence of competence.

An assessor's report alone is unlikely to be sufficient evidence of achievement. Reports and statements should always be accompanied by photographic and/or video evidence.

Assessment decisions should be based on evidence gathered through both formative and summative assessment opportunities. Each assessment criterion must be evidenced a minimum of twice to ensure the evidence is valid, reliable, and sufficient. One piece of evidence must come from direct observation of performance, and the second may be generated through an alternative assessment method, such as professional discussion, questioning, case study, reflective account, or additional observation.

Title:	Portable Air Conditioning and Ventilation Ductwork Systems					**Level:**	3
Unit Number:	F/652/4255	**TQT:**	90	**Credits:**	9	**GLH:**	60
Unit Purpose and Aims:	The aim of this unit is to apply the knowledge and practical competence required to carry out tasks on portable air conditioning units and ventilation systems. Candidates will prepare and complete tasks on portable air conditioning units and install, maintain and verify ventilation ductwork systems. Candidates will learn about and develop the competence required to diagnose and rectify faults, verify completed work and work safely in accordance with technical information and relevant industry requirements. This unit has been written in alignment with The Royal School of Military Engineering Occupational Standards and relevant regulation and legislation.						

Learning Outcomes *The learner will be able to:*		**Assessment Criteria** *The learner can:*	
1	Understand air conditioning, ventilation systems and task requirements.	1.1	Describe the equipment and components used in air conditioning and ventilation systems and their applications.
		1.2	Describe the functions and applications of air conditioning and ventilation systems.
		1.3	Describe the processes and equipment requirements for portable air conditioning tasks, including: • Preparation and task completion. • Operation and condition checks.
		1.4	Describe requirements for ventilation ductwork systems, including: • Installation and completion checks. • Maintenance and fault diagnosis.
2	Carry out and verify tasks on a portable air conditioning unit.	2.1	Select and prepare materials, components, equipment and the work area for tasks on a portable air conditioning unit, in accordance with task requirements and technical information.

2	*Continued*	2.2	Carry out required tasks on portable air conditioning units in line with task requirements and relevant procedures, including: • Installation. • Operation and condition checks. • Fault diagnosis.
		2.3	Check and verify the operation and condition of the portable air conditioning equipment on completion of the tasks, identifying and rectifying any non-conformities in accordance with task requirements and technical information.
3	Install and verify ventilation ductwork systems.	3.1	Select and prepare materials, components and the work for the installation of ventilation ductwork systems in accordance with technical information.
		3.2	Install ventilation ductwork components in line with task requirements, technical information, and relevant installation procedures.
		3.3	Inspect and verify the completed ventilation ductwork installation against task requirements, technical information and rectifying any non-conformities.
4	Maintain, diagnose, and rectify faults in ventilation ductwork systems.	4.1	Carry out and verify maintenance activities on ventilation ductwork systems in accordance with task requirements and technical information.
		4.2	Diagnose faults in ventilation ductwork systems using appropriate methods, equipment, and technical information.
		4.3	Rectify faults in ventilation ductwork systems in line with task requirements and technical information, verifying correct operation following rectification.

Additional Assessment Information

Learning Outcome 1 is **knowledge** based**.** This means that evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcomes 2-4 are **competency** based**.** This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Evidence should primarily be generated through direct observation by an assessor who is occupationally competent, knowledgeable and qualified in the area being assessed.

Assessment checklists and evidence matrices may be used to support the organisation and tracking of assessment evidence but do not, in themselves, constitute evidence of competence.

An assessor's report alone is unlikely to be sufficient evidence of achievement. Reports and statements should always be accompanied by photographic and/or video evidence.

Assessment decisions should be based on evidence gathered through both formative and summative assessment opportunities. Each assessment criterion must be evidenced a minimum of twice to ensure the evidence is valid, reliable, and sufficient. One piece of evidence must come from direct observation of performance, and the second may be generated through an alternative assessment method, such as professional discussion, questioning, case study, reflective account, or additional observation.

Title:	Electrical Installation, Control Systems and Fault Diagnosis for RAC					**Level:**	3
Unit Number:	H/652/4256	**TQT:**	120	**Credits:**	12	**GLH:**	100
Unit Purpose and Aims:	The aim of this unit is to apply the knowledge and practical competence required to work with electrical and control systems used in refrigeration and air conditioning (RAC). Candidates will interpret electrical information, construct, test and diagnose faults in control circuits and apply electrical installation and safe isolation procedures. Candidates will learn and develop the required competence in accordance with technical and industry requirements. This unit has been written in alignment with The Royal School of Military Engineering Occupational Standards and relevant regulation and legislation.						

Learning Outcomes *The learner will be able to:*		**Assessment Criteria** *The learner can:*	
1	Evaluate electrical installation and control systems used in RAC.	1.1	Describe health and safety requirements in RAC installation and control systems.
		1.2	Evaluate the types, functions and applications of electronic components and protective devices used in RAC control systems.
		1.3	Interpret circuit symbols and schematics in control systems.
2	Evaluate electrical principles, testing and fault-finding requirements for RAC systems.	2.1	Explain the electrical quantities, properties and effects relevant to RAC tasks.
		2.2	Describe the principles, characteristics and applications of electrical circuits and control systems used in RAC.
		2.3	Evaluate requirements, equipment and methods for testing and fault-finding electrical circuits and control systems.

3	Construct, test and diagnose faults within electrical control circuits for RAC systems.	3.1	Assemble refrigeration electrical control circuits for RAC systems in accordance with task requirements.
		3.2	Verify the operation of refrigeration electrical control circuits for RAC systems using appropriate test equipment and techniques.
		3.3	Diagnose faults in refrigeration electrical control circuits for RAC systems using appropriate fault-finding techniques.
		3.4	Rectify faults in refrigeration electrical control circuits and verify correct system operation following rectification.
		3.5	Maintain refrigeration electrical control circuits in accordance with maintenance requirements, technical information and manufacturer's instructions.
4	Apply electrical installation, isolation, testing and diagnostic procedures for RAC systems.	4.1	Select electrical components, conductors, and protective devices appropriate to RAC task requirements.
		4.2	Apply safe systems of work and carry out electrical supply isolation procedures in accordance with relevant requirements.
		4.3	Select and use appropriate electrical testing and diagnostic equipment to carry out testing and identify faults.
		4.4	Carry out and verify electrical tasks on RAC equipment in accordance with task requirements and safe working practices, recording results as required.

Additional Assessment Information

Learning Outcome 1 and 2 are **knowledge** based**.** This means that evidence is expected to take the form of candidate's written work and/or records of appropriate professional discussions.

Learning Outcomes 3 and 4 are **competency** based**.** This means that the candidate is expected to perform the tasks, and demonstrate the level of competence, outlined in the assessment criteria.

Evidence should primarily be generated through direct observation by an assessor who is occupationally competent, knowledgeable and qualified in the area being assessed.

Assessment checklists and evidence matrices may be used to support the organisation and tracking of assessment evidence but do not, in themselves, constitute evidence of competence.

An assessor's report alone is unlikely to be sufficient evidence of achievement. Reports and statements should always be accompanied by photographic and/or video evidence.

Assessment decisions should be based on evidence gathered through both formative and summative assessment opportunities. Each assessment criterion must be evidenced a minimum of twice to ensure the evidence is valid, reliable, and sufficient. One piece of evidence must come from direct observation of performance, and the second may be generated through an alternative assessment method, such as professional discussion, questioning, case study, reflective account, or additional observation.



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