

Refrigeration Air Conditioning and Heat Pump Engineering Technician

1. Typical job titles -

Refrigeration Technician/Engineer, Air Conditioning Technician/Engineering, Heat pump Technician/Engineer, Service Technician/Engineer, Maintenance Technician/Engineer, Commissioning Engineer.

2. Occupational profile -

The Refrigeration Air Conditioning and Heat Pump (RACHP) Engineering Technician is a specialist occupation involved in planning, preparing and safely carrying out work activities in process, product and space cooling. Knowledge must be transferrable between any of the core activities of refrigeration, air conditioning or heat pumping.

The work is carried out in a variety of applications essential for key UK business activities such as food production, product distribution, retail storage and display, transport and office climate control, manufacturing processes (eg petrochemical, pharmaceutical), IT/Datacentres and medical/healthcare services temperature and environmental control.

Key activities are: the design, installation, routine maintenance, reactive service, commissioning and de-commissioning of Refrigeration, Air Conditioning and Heat Pump systems. Technicians require a thorough competency in their understanding of the engineering principles of thermodynamics and the vapour compression cycle in order to perform operations. A fully competent technician works without immediate supervision, and liaises effectively with other trades and with end users.

Environmental, legislation and technology changes mean that the requirements for technicians in this sector are constantly evolving. European and UK Safety and Environmental legislation are key drivers in rapid technology changes in the sector which is responsible for an estimated 10% of UK greenhouse gas emissions and 16% of electricity use. RACHP Engineering Technicians have important responsibilities for the safety of themselves, work colleagues and the general public as well as minimising the environmental impact of cooling systems.

3. Requirements: Knowledge, Skills and Behaviours –

Knowledge	What is required
Legislation, Regulations and Standards	<ul style="list-style-type: none"> Understanding of relevant UK and international standards, technical and environmental legislation including health & safety, environmental protection, working with pressure systems, electrical circuits and flammable substances. Familiarity with industry Codes of Practice and other sources of up to date information and advice on technical safety and legislative aspects of their work.
Underpinning principles	<ul style="list-style-type: none"> Sound understanding of principles of thermodynamics, gas laws, psychrometrics, fluid flow, electricity, properties of refrigerant fluids and lubricants.
Data analysis	<ul style="list-style-type: none"> Ability to understand relevant diagrams, calculations, tools, charts, tables and formulae and apply them as appropriate.
System fundamentals	<ul style="list-style-type: none"> Understanding of the function and operation of system components and how they interact in a range of different systems and applications.
Sustainability	<ul style="list-style-type: none"> Understanding of environmental impact of refrigerants, maximising efficient system performance and mitigation of direct and indirect carbon emissions. Understanding of environmental technologies employed in the sector such as heat recovery, low GWP refrigerants, and other equipment which can be used to reduce heat gain, cooling load or energy use.
Skills	What is required
Safe working practices	<ul style="list-style-type: none"> Installation, commissioning, testing, fault diagnostics, rectification of systems, component/refrigerant suitability and selection Working with pressure systems and electrical circuits and systems Evaluating and mitigating risks of refrigerants including toxicity, flammability

	<p>and other potential risks or hazards to self and the general public.</p> <ul style="list-style-type: none"> Decommissioning, safe recovery and disposal of equipment and hazardous waste transfer
Control circuit application	<ul style="list-style-type: none"> Electrical and electronic control systems setting, testing and fault finding; and their integration with system-associated communication networks.
Mechanical operations	<ul style="list-style-type: none"> Positioning, fixing, jointing and testing of pipework, electrical circuits and water circuits where relevant.
Application of mathematical principles	<ul style="list-style-type: none"> Determining heating and cooling loads and selecting and balancing appropriate components and systems for maximum performance and efficiency.
Sustainable system operation	<ul style="list-style-type: none"> Using system operating parameters for efficient performance to achieve measurable and sustained reductions in carbon emissions. Routine and reactive service and maintenance, testing, fault finding, reporting and rectification. Retrofitting and refilling of existing equipment to lower GWP refrigerants including safety, reliability and environmental considerations.
Behaviours	What is required
Safety approach	<ul style="list-style-type: none"> Disciplined approach to assessing, managing, mitigating and avoiding risk in a variety of situations to themselves, colleagues, the public and the environment.
Strong work ethic	<ul style="list-style-type: none"> Positive ethical attitude and behaviours including reliability, willingness to take responsibility. Commitment to completing tasks and ability to work as part of a multidisciplinary team.
Logical problem solver	<ul style="list-style-type: none"> Employs logical thinking, and determined attitude to problem solving and technical challenges.
Focus on quality	<ul style="list-style-type: none"> Attention to detail, following procedures, planning and preparation, verifying compliance.
Personal responsibility	<ul style="list-style-type: none"> Takes responsibility for work and interactions with colleagues, customers, suppliers or subcontractors.
Communicates well	<ul style="list-style-type: none"> Uses a range of communications methods effectively, positively and in timely fashion.
Adaptable	<ul style="list-style-type: none"> Able to adapt to changes in conditions, technologies, situations and a wide variety of different working environments.
Self motivated	<ul style="list-style-type: none"> Willingness to learn and commitment to professional development and to applying principles of sound engineering and sustainability of engineering systems.

4. Duration – typically 36 months would be required to gather sufficient practical experience.

5. Mandatory Qualifications

All apprentices must achieve a “Level 2 Certificate in F Gas and ODS Regulations Category 1” as this is a legal requirement under the EU F Gas Regulation 517/2014 to work on equipment containing Fluorinated Refrigerants.

Employers who recruit candidates without English or Maths at Level 2 or above must ensure that the apprentice achieves this standard prior to the completion of the Apprenticeship.

6. Link to professional registration

This standard is designed to meet the professional standards of the Engineering Council for registration as an Engineering Technician (EngTech) in partnership with the Institute of Refrigeration and CIBSE.

7. Level – Level 3 is the appropriate level for Engineering Technicians who need to work without supervision and have a high level of responsibility.

8. To be reviewed – after three years