



Australian Government

UEERA0036 Establish the basic operating conditions of vapour compression systems

Release: 1

UEERA0036 Establish the basic operating conditions of vapour compression systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to determine operating conditions of vapour compression system.

It includes working safely; determining refrigerant pressures and temperatures, and relevant air and water temperatures using measurement and calculation methods. It also includes working with the three states of matter at each point in the refrigeration cycle (liquid, vapour and liquid-vapour mixture).

The skills and knowledge in this unit will be applied by refrigeration and air conditioning technicians during the commissioning, service and repair of refrigeration and air conditioning systems.

To undertake this unit, the learner must have a Trainee Refrigerant Handling Licence as it includes work on refrigeration and air conditioning equipment that carries the risk of a fluorocarbon refrigerant being emitted.

The skills and knowledge described in this unit require a national Refrigerant Handling Licence as it includes work on refrigeration and air conditioning equipment that carries the risk of a fluorocarbon refrigerant being emitted while decanting the refrigerant or manufacturing, installing, commissioning, servicing, maintaining or decommissioning refrigeration and air conditioning equipment.

The skills and knowledge described in this unit may, in some jurisdictions, also require a licence or permit to practice in the workplace subject to regulations for undertaking refrigeration and air conditioning work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to determine operating condition of vapour compression system

2 Determine operating condition of vapour compression system

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1** WHS/OHS hazards, risk control methods, relevant standards, codes and legislation are obtained and applied in accordance with workplace procedures
- 1.2** Safety hazards which have not previously been identified are assessed, reported and advice on risk control measures is sought from supervisor
- 1.3** System design operating conditions are obtained from documentation or supervisor to determine scope of work to be undertaken
- 1.4** Advice is sought from the supervisor to ensure work is coordinated effectively with others
- 1.5** Materials required for the work are identified and obtained in accordance with workplace procedures
- 1.6** Tools, equipment and testing devices needed to determine operating conditions are obtained and checked for correct operation and safety in accordance with workplace procedures
- 2.1** System operating conditions, including refrigerant pressures and temperatures and ambient temperatures, are measured in accordance with job requirements and workplace safety procedures
- 2.2** Compression system is checked and isolated in accordance with workplace procedures
- 2.3** Actual and specified range of operating conditions are determined from measured and calculated values as they apply to vapour compression system in accordance with workplace procedures

- 2.4** Methods for dealing with unplanned situations/events are discussed with appropriate person/s and documented
- 2.5** Unplanned events are dealt with safely and with the approval of a relevant person/s
- 2.6** Operating conditions for vapour compression system are determined without damage to apparatus, circuits, the surrounding environment or services using relevant workplace sustainable energy practices in accordance with workplace procedures
- 3 Complete work and report**
- 3.1** Worksite and equipment are cleaned and made safe in accordance with workplace procedures
- 3.2** Operating conditions are documented, including identification of any parameter that is not within the specified range for the vapour compression system, in accordance with workplace procedures
- 3.3** Supervisor is notified of completion of work in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Determining operating conditions of vapour compression system must include at least the following:

- measurement and basic calculation methods of vapour compression system whether used for refrigeration or air conditioning
- suction and discharge pressures
- ambient, evaporator and condensing temperatures
- evaporator and condenser temperature difference

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ103A Establish the basic operating conditions of vapour compression systems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEERA0036 Establish the basic operating conditions of vapour compression systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- applying relevant work, health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- applying safe working practices and relevant industry standards, codes of practice and regulations
- applying sustainable energy principles and practices
- completing documentation and reporting requirements
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- determining operating conditions of vapour compression system
- documenting operating conditions
- identifying conditions of a refrigerant at various locations in the vapour compression system
- measuring and calculating actual and specified range of operating condition values, including recording measurements
- selecting and using appropriate measuring devices correctly
- using calculation methods accurately.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- operating condition of vapour compression systems, including:
 - basic vapour compression systems operation and major components
 - common refrigerant metering devices, including capillary tube, thermostatic expansion (TX) valve, electronic expansion valve, function, types and applications
 - condenser function, types and applications
 - cooling tower function, types and applications
 - evaporator function, types and applications

- hazards and risk control measures
- heat and heat transfer
- liquid receiver function, types and applications
- pressure, scales and measurement devices
- refrigerant conditions, including saturation, superheat, sub-cooling and pressure/temperature relationships
- refrigerant leak detector types, applications, hazards and safe working practices, care and maintenance, and leak detection procedures
- refrigeration compressor function, types and applications
- refrigeration compressor oil function, types and applications
- risk management principles and processes
- safe handling techniques, including safety data sheets (SDS)/material safety data sheets (MSDS)
- sensible and latent heat
- service gauge manifold hose fitting, purging, pressure reading and removal
- service gauge types, applications, care and maintenance, reading and calibration
- sustainable energy principles and practices
- system access fittings types, care, maintenance and connection
- temperature and relative humidity, scales and measurement devices
- vapour compression system operating conditions and pressure, temperature, state and enthalpy graphs
- vapour compression system symbols/diagrams, design ambient and storage/space conditions
- working safely with refrigeration vapour compression system relevant industry standards, codes of practice, regulations and WHS/OHS legislated requirements
- relevant manufacturer specifications
- relevant risk mitigation processes
- relevant workplace documentation
- relevant workplace policies and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy

requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>