



Australian Government

**UEERA0080 Select basic commercial
refrigeration system equipment,
components and accessories**

Release: 1

UEERA0080 Select basic commercial refrigeration system equipment, components and accessories

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 select commercial refrigeration system equipment, components and accessories.

It includes selecting commercial refrigeration system equipment and components, pipe work and controls. It also includes selecting refrigerant, condensing unit, evaporator, refrigerant controls, accessories, refrigerant and condensate pipe work, and system controls based on specifications, industry standards and manufacturer catalogues to determine calculated and deemed-to-comply solutions and documenting all selection information.

The skills and knowledge described in this unit may, in some jurisdictions, 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.

No other licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEERA0081 Select refrigerant piping, accessories and associated controls

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

UEERA0036 Establish the basic operating conditions of vapour compression systems

UEERA0034 Establish heat loads for commercial refrigeration and/or air conditioning applications

UEERA0038 Establish the thermodynamic parameters of refrigeration and air conditioning systems

UEERA0002 Analyse the psychrometric performance of HVAC/R systems
and

UEERA0003 Analyse the thermodynamic performance of HVAC/R systems
or

UEERA0094 Verify functionality and compliance of refrigeration and air conditioning installations

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

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0042 Solve problems in ELV single path circuits

UEECD0020 Fix and secure electrotechnology equipment

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work

UEERA0059 Prepare and connect refrigerant tubing and fittings

UEERA0036 Establish the basic operating conditions of vapour compression systems

UEERA0035 Establish the basic operating conditions of air conditioning systems

UEERA0050 Install refrigerant pipe work, flow controls and accessories

UEERA0081 Select refrigerant piping, accessories and associated controls

UEERA0031 Diagnose and rectify faults in air conditioning and refrigeration control systems

UEERA0092 Solve problems in low voltage refrigeration and air conditioning circuits

UEERL0005 Locate and rectify faults in low voltage (LV) electrical equipment using set procedures

UEERL0004 Disconnect - reconnect electrical equipment connected to low voltage (LV) installation wiring

UEERL0001 Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply

UEERL0002 Attach cords, cables and plugs to electrical equipment for connection to 1000 V a.c. or 1500 V d.c.

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

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

- | | |
|--|--|
| 1 Identify commercial refrigeration system equipment and components | 1.1 Extent and nature of refrigeration installation is determined from job specifications |
| | 1.2 Refrigeration system safety and regulatory compliance requirements are identified and applied |
| 2 Develop refrigeration pipe work arrangements | 2.1 Location of refrigeration equipment is determined from regulatory requirements, job specifications and site drawings |
| | 2.2 Refrigeration piping is arranged to ensure safe and functional operation of the system |
| | 2.3 Pipe work is arranged to comply with technical industry standards, job specifications and requirements |
| 3 Select commercial refrigeration system equipment and components | 3.1 Pipe and tubing are selected for suitability for the commercial environments it is to be installed |
| | 3.2 Pipe and tubing are sized to meet refrigeration parameters and capacity requirements for the refrigerant to be used |
| | 3.3 Pipe and tubing quantities are determined from equipment location diagrams and job specifications |
| | 3.4 Refrigeration system equipment and components are selected to meet load requirements based on calculated or deemed-to-comply solutions |
| | 3.5 Refrigerant liquid expansion valves are selected to meet functional, specified and regulatory requirements |
| | 3.6 Automatic control devices are selected to meet functional, specified regulatory requirements, current voltage and ingress protection (IP) ratings |
| | 3.7 Evidence is obtained that the selected refrigeration equipment and components comply with job requirements and industry standards |
| 4 Document selection of system equipment and components | 4.1 Reasons for selections made including calculations are documented in accordance with workplace procedures |

- 4.2** Refrigeration installation arrangements and specifications for selected items are documented in accordance with workplace procedures and forwarded to appropriate person/s

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.

Selecting commercial refrigeration system equipment and components, pipe work and controls must include at least the following:

- two different refrigeration systems, including:
 - refrigerant
 - condensing unit
 - evaporator
 - refrigerant controls
 - accessories
 - refrigerant and condensate pipe work
 - system controls

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ190A Select basic commercial refrigeration system equipment, components and accessories.

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 UEERA0080 Select basic commercial refrigeration system equipment, components and accessories

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 one occasion and include:

- arranging pipe work to comply with regulatory and functional requirements
- selecting appropriate type, size and quantity of pipe and tubing
- selecting refrigeration equipment and components that meets load requirements
- selecting automatic control devices that meet functional and regulatory requirements
- documenting pipe work arrangement, specification for items selected and reasons for the selections made
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices.

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:

- basic commercial refrigeration system equipment, components, accessories selection, piping selection, safe working practices and relevant standards, codes and regulations, including:
 - calculation of capacity in heat exchangers:
 - $Q = UA \text{ (LMTD)}$
 - $Q = mc\Delta t$
 - $Q = m \Delta h$
 - evaporators:
 - commercial types and applications
 - coil bypass factor
 - effects of evaporator TD on space humidity
 - effects of air circulation on product conditions

- selection criteria and selection tables
- condensers:
 - commercial types and applications
 - effects of ambient conditions
 - condenser control
 - heat rejection factor
 - condenser TD
 - selection criteria and selection tables
- compressors:
 - types and applications
 - capacity
 - displacement
 - volume flow rate
 - theoretical capacity
 - total volumetric efficiency
 - effect of operating conditions, including suction pressure drop and superheating
 - actual capacity
 - power
 - theoretical requirement
 - effects of operating conditions
 - actual requirements
 - post defrost loads
 - pull down torque requirements, high, medium and low back pressure compressors
 - selection tables, motor selection
- refrigerant flow controls:
 - types, operation and applications
 - effects from sub-cooling
 - distributor types, operation and applications
 - selection tables
- system load balance point:
 - graphical representation
- line sizing and design:
 - quick selection tables
 - velocity tables
 - pressure drop in lines and fittings
 - oil migration stabilisation
 - refrigerant velocity
 - effect of varying system capacity
 - oil traps

- risers
- liquid migration
- automatic controls:
 - fin spacing, suction temp to evaporator suction
 - hot-gas bypass valves
 - electronic control of valves programmable logic controller (PLC) control
 - refrigerant regulating valves
 - solenoid valves
 - condenser pressure regulating valves
 - evaporator pressure regulating valves
 - crankcase pressure regulating valves
 - cycling controls
 - pressure-stats
 - thermostats
 - defrost controls
 - monitoring and alarm controls
 - refrigeration automation systems
 - control strategies
 - control modes
- relevant industry standards, including industry practices and technologies
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- 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, 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>