



**Australian Government**

**UEERA0021 Design control systems for  
refrigeration or heating, ventilation and air  
conditioning systems**

**Release: 1**

# **UEERA0021 Design control systems for refrigeration or heating, ventilation and air conditioning 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 design control systems for heating, ventilation and air conditioning/refrigeration (HVAC/R) systems.

It encompasses applying processes and methods of HVAC/R control systems components, safety and relevant industry standards. It also includes following design specifications and customer requirements, and documenting system designs.

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**

UEERA0060 Produce HVAC/R control system diagrams

UEERA0001 Analyse the operation of HVAC air and hydronic 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

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

### PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

#### **1 Prepare to design control systems for HVAC/R**

- 1.1** WHS/OHS requirements and workplace procedures for a given work area are identified, obtained and applied
- 1.2** Scope of the HVAC/R system is determined from design specifications and/or in consultations with relevant person/s
- 1.3** Safety and systems are identified, obtained and applied in accordance with relevant industry standards

- 1.4 Work supervisor and/or customer/s are consulted to determine functions and parameters of the system required in accordance with design specifications and workplace documentation
      - 1.5 Design development work is planned in accordance with workplace procedures for timelines in consultation with others involved
- 2 Design control systems for HVAC/R**
  - 2.1 WHS/OHS risk control measures and workplace procedures for carrying out the work are followed
  - 2.2 Relevant control system components are applied to developing the system design in accordance with workplace procedures and relevant industry standards
  - 2.3 Safety, functionality and budgetary considerations are incorporated into the design
  - 2.4 Control equipment required is selected in accordance with design specifications and workplace procedures
  - 2.5 Location of components are documented in accordance with workplace procedures and operation of system functions
  - 2.6 Control system design draft is checked for compliance in accordance with the design brief and relevant industry standards
  - 2.7 Control system design is documented and submitted to relevant person/s for approval
  - 2.8 Unplanned events are dealt with in accordance with problem-solving techniques and workplace procedures
- 3 Obtain approval for control systems for HVAC/R systems design**
  - 3.1 Control system design is presented and explained to customer and/or relevant person/s
  - 3.2 Requests for alterations to the design are negotiated with relevant person/s in accordance with workplace procedures
  - 3.3 Final design is documented and approval obtained from relevant person/s
  - 3.4 Quality of work is monitored in accordance with workplace procedures and relevant industry standards

## 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.

Designing control systems for HVAC/R must include at least the following:

- two different HVAC/R systems, including one of the following:
  - condenser
  - compressor
  - evaporator
  - associated components and controls

## Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ135A Design control systems for refrigeration or heating, ventilation and air conditioning systems.

## Links

Companion Volume implementation guides are found in VETNet - -

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