



**Australian Government**

# **UEERA0033 Diagnose faults in complex HVAC/refrigeration control systems**

**Release: 1**

# UEERA0033 Diagnose faults in complex HVAC/refrigeration control 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 diagnose and rectify faults in complex heating, ventilation and air conditioning (HVAC) or refrigeration control systems.

It includes applying safe working practices, interpreting technical data and applying knowledge of complex refrigeration or HVAC control system operating parameters to logical fault-finding processes. It also includes implementing fault rectification, safety and functional testing; and completing and reporting fault diagnosis and rectification activities and outcomes.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, skills and knowledge described in this unit require a relevant contract of training, such as an Australian Apprenticeship.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to refrigeration, air conditioning or electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Permits may also be required for some work environments, such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

## Pre-requisite Unit

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

UEERA0094 Verify functionality and compliance of refrigeration and air conditioning installations

UEERA0081 Select refrigerant piping, accessories and associated controls

UEERA0032 Diagnose and rectify faults in complex air conditioning/refrigeration systems

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.

#### 1 Prepare to diagnose and rectify faults

### PERFORMANCE CRITERIA

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

- 1.1 WHS/OHS requirements and workplace procedures are identified, obtained and applied
- 1.2 WHS/OHS risk control measures and procedures are followed
- 1.3 Hazards not previously identified are documented and risk control measures devised and implemented in consultation with relevant person/s

- 1.4 Extent of faults are determined from reports/documentation and/or discussions with relevant person/s
  - 1.5 Relevant person/s is consulted to ensure work is coordinated effectively with others involved on the worksite
  - 1.6 Tools, equipment and testing devices required to diagnose faults are obtained and checked for correct operation and safety in accordance with workplace procedures
- 2 Diagnose and rectify faults**
- 2.1 WHS/OHS risk control measures and workplace procedures for carrying out the work are followed
  - 2.2 Need to test and measure live work is determined in accordance with workplace procedures and WHS/OHS requirements
  - 2.3 Circuits/machines/plant are checked and isolated in accordance with workplace procedures and WHS/OHS requirements
  - 2.4 Logical diagnostic methods, measurements and estimations are applied to diagnose control system faults in accordance with system operating parameters and operational requirements
  - 2.5 Suspected fault sources are tested to confirm source of system problems
  - 2.6 Fault causes are identified and appropriately competent person/s engaged to rectify the fault where it is outside the scope of the control system
  - 2.7 Faults in system components are rectified to return the refrigeration or HVAC system to its operational standard
  - 2.8 System is tested to verify that the system operates as intended and to specified requirements and operational standards
  - 2.9 Methods for resolving unplanned events are discussed with appropriate person/s in accordance with job specifications and requirements
  - 2.10 Methods for resolving unplanned situations are selected

on the basis of safety and specified work outcomes

- 2.11** Diagnosis and rectification activities are conducted without waste of materials, damage to apparatus, the surrounding environment and/or services using sustainable energy practices
- 3 Complete and report fault diagnosis and rectification activities**
- 3.1** WHS/OHS work completion risk control measures and workplace procedures are followed
- 3.2** Worksite is made safe in accordance with workplace safety procedures
- 3.3** Fault diagnosis and rectification activities are documented in accordance with workplace procedures
- 3.4** Appropriate person/s is notified that system faults have been rectified 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.

Diagnosing and rectifying faults in complex HVAC and refrigeration control systems must include at least the following:

- four faults in complex refrigeration or HVAC control systems

## Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ122A Diagnose faults in complex HVAC /refrigeration control systems.

## Links

Companion Volume implementation guides are found in VETNet - -

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

