



Australian Government

**UEERA0068 Repair and service
self-contained carbon dioxide refrigeration
and heat pump systems**

Release: 1

UEERA0068 Repair and service self-contained carbon dioxide refrigeration and heat pump 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 repair and service self-contained carbon dioxide (CO²) refrigeration and heat pump system.

It includes specialised procedures for servicing and repairing of self-contained refrigeration and heat pump equipment using CO² as a refrigerant. It also includes applying safe working practices and refrigeration principles that apply to CO²; following service manuals; testing, locating and rectifying faults and defective components; and completing the necessary service documentation.

The skills and knowledge in this unit will be applied by refrigeration and air conditioning technicians during the service and repair of self-contained refrigeration systems using CO² refrigerant.

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

UEERA0053 Install, commission, service and maintain medium temperature systems

UEERA0006 Apply safety awareness and legal requirements for carbon dioxide refrigerant

Or

UEERA0089 Service refrigeration appliances

UEERA0006 Apply safety awareness and legal requirements for carbon dioxide refrigerant

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to service self-contained CO² refrigeration and heat pump system

2 Service and repair self-contained CO² refrigeration and heat pump 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
- 1.2** Safety hazards not previously identified are reported, risk assessed and advice on risk control measures sought from work supervisor
- 1.3** Nature of work is obtained from documentation or from work supervisor to determine the scope of work to be undertaken
- 1.4** Advice is sought from work supervisor to ensure the work is coordinated effectively with others
- 1.5** Sources of materials required for the refrigeration work are accessed in accordance with workplace and procedures
- 1.6** Tools, equipment and testing devices needed to carry out refrigeration work are obtained and checked for correct operation and safety
- 2.1** Measuring system operating parameters are conducted in accordance with WHS/OHS requirements and workplace safety procedures
- 2.2** Refrigeration inspection and checks are carried out to ensure the system or component parts are isolated in accordance with WHS/OHS requirements and

workplace procedures

- 2.3 Refrigerant is removed from system safely in accordance with regulatory requirements, industry standards and practices
- 2.4 Precautions are taken to prevent damage to components while pressure testing the refrigeration and heat pump system
- 2.5 Pressure testing is conducted at a pressure compatible with CO₂ and in accordance with industry standards and practices
- 2.6 Refrigerant leaks are located and rectified using testing methods appropriate to the system and in accordance with industry standards and practices
- 2.7 Refrigeration and heat pump system is evacuated to the required level and cleaned of all moisture and other contaminants in accordance with industry standards and practices
- 2.8 Refrigeration and heat pump system is charged safely with refrigerant grade CO₂ and compatible lubricants in accordance with industry standards and practices
- 2.9 Actual and specified range of operating conditions are determined from measured and calculated values as they apply to CO₂ vapour compression systems in accordance with workplace procedures and industry standards
- 2.10 Unplanned situations are dealt with safely and in accordance with workplace procedures and approval of authorised person/s in a manner that minimises risk to personnel and equipment
- 2.11 Operating conditions are determined without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices

3 Complete and report servicing and repair of self-contained CO₂ refrigeration and heat pump system work activities

- 3.1 Worksite is cleaned and made safe in accordance with workplace procedures
- 3.2 Contaminated refrigerant and lubricant are dealt with in accordance with legislative/regulatory and industry

standard requirements

- 3.3 Operation conditions are documented and include identification of any parameter that is not within the specified range for the system
- 3.4 Work supervisor is notified of the 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.

Servicing and repairing self-contained CO₂ vapour compression systems must include at least the following:

- domestic refrigerators and freezers
- refrigerated cabinets
- heat pumps
- water heaters
- checking:
 - suction and discharge pressures
 - ambient, evaporator and condensed/gas cooler temperatures
 - evaporator and gas cooler temperature difference
 - critical point, triple point and trans-critical and sub-critical refrigerant conditions of CO₂
- charging and discharging trans-critical CO₂ system with refrigerant and lubricant in a safe and environmentally responsible manner

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ188A Repair and service self contained carbon dioxide refrigeration and heat pump systems.

Links

Companion Volume implementation guides are found in VETNet - -

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