



Australian Government

UEERA0048 Install and commission flammable refrigerant air conditioning and refrigeration systems

Release: 1

UEERA0048 Install and commission flammable refrigerant air conditioning and refrigeration 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 install and commission Class A2, A2L and A3 flammable refrigerant air conditioning and refrigeration systems, components and associated equipment in accordance with legislative, standard and code requirements. It includes working safely and installing equipment, components and piping to job specifications. It also includes completing pre-commissioning tests, starting the system, ensuring correct refrigerant charge, adjusting components and controls to efficient operation, completing installation and commissioning documentation.

Some flammable refrigerants, for example, fluorocarbons like R32, are controlled under the national Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995. Therefore, to undertake this unit, the learner must have a relevant Trainee Refrigerant Handling Licence if 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 if 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 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

UEERA0007 Apply safety awareness and legal requirements for flammable refrigerants

UEERA0053 Install, commission, service and maintain medium temperature systems

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to install and commission flammable refrigerant refrigeration and air conditioning systems

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 noted and risk control measures implemented
- 1.3** Scope of work is determined from documentation and/or relevant person/s to establish work to be undertaken
- 1.4** Component, equipment installation and commissioning work are sequenced in accordance with job schedule
- 1.5** Relevant person/s is consulted to ensure the work is coordinated with others involved
- 1.6** Materials required to install pipe work are obtained in accordance with workplace procedures and job specifications
- 1.7** Tools, equipment and testing devices required to install and commission components and equipment are obtained in accordance with workplace procedures and checked for correct operation and safety

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| | 1.8 | System control settings and operating parameters are determined from job specifications |
| | 1.9 | Preparatory work is scheduled to ensure no damage has occurred in accordance with workplace procedures and relevant industry standards |
| 2 | Install flammable refrigerant refrigeration and air conditioning systems | |
| | 2.1 | Circuits/machines/plant are checked and isolated in accordance with WHS/OHS requirements and workplace procedures |
| | 2.2 | Components and equipment are installed with sufficient access to affect electrical and pipe work connections and maintenance in accordance with relevant legislation, standards and code requirements, manufacturer instructions, job specifications and workplace procedures |
| | 2.3 | Components and equipment are installed in the required locations and within acceptable tolerances in accordance with relevant legislation, standards and code requirements, manufacturer instructions, job specifications and workplace procedures |
| | 2.4 | Refrigerant tubing and fittings are silver brazed with dry nitrogen to prevent contamination in accordance with relevant legislation, standards and code requirements, manufacturer instructions, job specifications and workplace procedures |
| | 2.5 | Unplanned situations from installation of components and equipment are dealt with in accordance with workplace procedures |
| | 2.6 | Quality checks of pipe work, pressure testing and repair of leaks are conducted in accordance with relevant legislation, standard and code requirements, manufacturer instructions, job specifications and workplace procedures |
| | 2.7 | Components and equipment are installed efficiently without waste of materials or damage/contamination to apparatus, the surrounding environment or services using sustainable energy practices |
| 3 | Commission flammable refrigerant refrigeration and air conditioning | |
| | 3.1 | Installed system's pipe work and components are evacuated to the required level in accordance with relevant legislation, standards and code requirements |

systems		and manufacturer instruction
	3.2	System is charged with flammable refrigerant to the required level in accordance with relevant legislation, standard and code requirements, manufacturer instructions and job specification
	3.3	Refrigeration system pressure controls, valves and regulators are adjusted in accordance with relevant legislation, standard and code requirements, manufacturer instructions, job specifications and workplace procedures
	3.4	Testing/measuring devices are used to observe operation of the refrigeration system and fine adjustments of controls made, as required, in accordance with relevant legislation, standard and code requirements, manufacturer instructions, job specifications and workplace procedures
	3.5	Unplanned situations are dealt with safely and with the approval of relevant person/s
	3.6	Commissioning is conducted efficiently without waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices
4 Complete installation and commissioning work	4.1	Worksite is cleaned and made safe in accordance with workplace procedures
	4.2	Final check of the installed components and equipment is made in accordance with relevant industry standards and job specifications
	4.3	‘As installed’ components and equipment are documented and relevant person/s notified in accordance with workplace procedures
	4.4	Results of commissioning and final operating parameters are documented and relevant person/s notified 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.

Installing and commissioning major components and associated equipment must include at least the following:

- two refrigeration and/or air conditioning systems operating with a flammable refrigerants refrigerant

Major components must include at least the following:

- refrigeration compressors
- condensers
- condensing units
- evaporators

Associated equipment must include at least the following:

- refrigerant flow controls
- cycling controls
- safety controls
- on-site leak detection equipment
- ventilation systems
- spark isolation systems and electrical isolation
- monitoring equipment
- inspection accessories

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ176A Install and commission hydrocarbon refrigeration systems, components and associated equipment.

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 UEERA0048 Install and commission flammable refrigerant air conditioning and refrigeration 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 (WHS/OHS) requirements, including using risk control measures
- commissioning flammable refrigerants systems
- completing installation and commissioning reports and documentation
- dealing with unplanned events
- discharging/recovering and charging refrigerant/lubricants safely and without damage to components
- evacuating the system to the required level safely and without damage to components
- identifying the conditions of the refrigerant at various locations
- installing flammable refrigerants refrigeration and air conditioning systems
- installing, connecting, securing and aligning components and equipment
- locating and rectifying leaks
- preparing to install and commission flammable refrigerants refrigeration and air conditioning systems
- pressure testing the system to the required level safely and without damage to components
- reading and interpreting drawings to pipe work layouts and apparatus locations
- recording measurements
- selecting and using appropriate measuring devices correctly
- using commissioning techniques
- using 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:

- relevant codes, regulations and standards

- relevant manufacturer specifications
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes
- relevant site arrangements, including pipe work requirements and equipment location
- relevant special features for flammable refrigerant systems, including component compatibility, refrigerant leakage and enclosures
- relevant system diagrams
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace quality, policies and procedures
- sustainable energy principles and practices
- system commissioning requirements and procedures
- system, pipe work and component installation requirements 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 suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable 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 simulations
- relevant and appropriate materials, tools, facilities and equipment currently used in industry
- resources that reflect current industry practices in relation to installing and commissioning flammable refrigerant air conditioning and refrigeration system
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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