



Australian Government

UEERA0049 Install and start up single head split air conditioning and water heating heat pump systems

Release: 1

UEERA0049 Install and start up single head split air conditioning and water heating 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 position, assemble, install, start up and decommission single head split air conditioning systems and water heating heat pump split systems, up to a maximum of 18 kilowatt (kW) refrigeration capacity.

It includes following standards, codes of practice, regulatory requirements and routine procedures to install equipment, connect pipe work, pressure test, evacuate, perform functional checks and complete required documentation.

To undertake this unit, the learner must have a Trainee Refrigerant Handling Licence as 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 as 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 may, in some jurisdictions, also 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.

Pre-requisite Unit

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

UEERA0059 Prepare and connect refrigerant tubing and fittings

UEERA0064 Recover, pressure test, evacuate, charge and leak test refrigerants - split systems

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to assemble, install and start up split air conditioning and water 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 in accordance with workplace procedures
- 1.2** Safety hazards which have not previously been identified are assessed, reported and advice on risk control measures sought from supervisor
- 1.3** Work activities are sequenced in accordance with job schedule
- 1.4** Relevant person/s is consulted to ensure the work is coordinated effectively with others involved on the worksite
- 1.5** Layout of pipe work to be installed is determined from job/task details, including manufacturer specifications and diagrams
- 1.6** Materials needed to carry out the work are obtained in accordance with workplace procedures and checked against job/task requirements
- 1.7** Tools, equipment and testing devices are obtained in accordance with workplace procedures and checked for operation and safety
- 1.8** Appropriately licensed electrician is confirmed to carry out electrical work for the air conditioning and water heat pump system
- 1.9** Appropriately licensed plumber is confirmed to carry out mains water piping work for the heat pump hot water system
- 1.10** Preparatory work is checked to ensure no damage has occurred and complies with job/task requirements in

- accordance with workplace procedures
- 2 Assemble, install and start up split air conditioning and water heat pump system**
- 2.1** Split air conditioning and water heat pump system components are positioned and assembled in accordance with workplace procedures, manufacturer instructions and industry standards
- 2.2** Interconnecting refrigerant piping/tubing is prepared and installed in accordance with workplace procedures, manufacturer instructions and industry standards
- 2.3** Components are pressure tested and evacuated in strict accordance with manufacturer instructions, industry standards and codes of practice
- 2.4** Condensate drains are prepared and installed to the units in accordance with workplace procedures, manufacturer instructions, industry standards and local regulatory requirements
- 2.5** The refrigerant service valves are opened on the pre-charged outdoor unit to enable the refrigerant to enter the evacuated pipe work and the connected unit in strict accordance with manufacturer instructions and industry standards
- 2.6** Unplanned situations are discussed with relevant person/supervisor, documented and dealt with safely in accordance with workplace procedures
- 2.7** Quality checks of installation and start-up are undertaken in accordance with workplace procedures
- 2.8** Notification is given to relevant person/s that the split air conditioning and water heat pump system is ready for electrical and/or mains water connection in accordance with workplace procedures
- 2.9** Split air conditioning and water heat pump work is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services using relevant workplace sustainable energy principles in accordance with workplace procedures
- 3 Test single head split air conditioning and water heat pump system**
- 3.1** Split air conditioning and water heat pump system performance is inspected and tested in accordance with workplace procedures to ensure compliance with industry technical standards, manufacturer specifications

- and job/task requirements
- 3.2** Worksite and equipment are cleaned and made safe in accordance with workplace procedures
- 3.3** Work completion is documented and appropriate person/s notified in accordance with workplace procedures
- 4 Decommission split air conditioning and water heat pump system**
 - 4.1** Refrigerant is pumped down and/or recovered from indoor unit, interconnecting refrigerant piping/tubing is removed, and indoor and outdoor refrigerant circuits are sealed in accordance with workplace procedures, manufacturer instructions and industry standards
 - 4.2** Licensed electrician is engaged in accordance with workplace procedures to isolate and disconnect electrical supply and cabling from air conditioning and water heat pump system
 - 4.3** Indoor and outdoor refrigerant pipework, water pipework, condensate drains and electrical conduits/cables are unmounted in accordance with workplace procedures
 - 4.4** Unplanned situations are discussed with appropriate person/s, documented and dealt with safely in accordance with workplace procedures
 - 4.5** Split air conditioning and water heat pump work is carried out efficiently without waste of materials or damage to apparatus, circuits, the surrounding environment or services using relevant workplace sustainable energy principles
 - 4.6** Worksite and equipment are cleaned and made safe in accordance with workplace procedures
 - 4.7** Work completion is documented and appropriate 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.

Assembling, installing, starting up and decommissioning single head split air conditioning and water heat pump system (hot water or swimming pool) up to a maximum of 18 kW refrigeration capacity must include at least the following:

- condensate drain installation
- decommissioning
- evacuation
- functional performance check
- installation/regulatory documentation
- pipe work connection
- pressure test
- refrigerant pipework installation
- use of safe working procedures and industry standards and code of practice
- unrestricted licensed electrician
- appropriately licensed plumber
- leak testing and fitting of caps to all refrigerant access ports, which could allow refrigerant to escape into the environment

Electrical connection must be carried out by:

Mains water connection must be carried out by:

Making area/worksite safe must include at least the following:

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ105A Position, assemble and start up single head split air conditioning and water heating 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>

Assessment Requirements for UEERA0049 Install and start up single head split air conditioning and water heating heat pump 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 (OHS) requirements, including using risk control measures
- applying safe working practices and relevant legislation, industry standards, codes of practice and regulations
- applying sustainable energy principles and practices
- assembling, installing and starting up split air conditioning and/or water heat pump system
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- decommissioning split air conditioning and/or water heat pump system
- determining job/work task requirements and applying workplace procedures, including making equipment/worksites safe
- documenting work activities
- giving notification to appropriate person/s for electrical connections to be completed
- implementing risk control measures
- inspecting and testing single head split air conditioning and/or water heat pump system and documenting performance to manufacturer specifications, including undertaking functional performance checks
- making equipment and worksites safe through leak testing and fitting of caps to refrigerant access ports to stop refrigerant escaping into the environment
- positioning and assembling system components to specifications
- installing and connecting refrigerant piping
- installing and connecting condensate drain piping
- preparing to assemble, install and start up a single head split air conditioning system and/or water heat pump system with a maximum cooling/heating capacity of less than 18 kilowatt (kW)
- pressure testing and evacuating system using manufacturer instructions.

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:

- condensate drain pipe work installation and connections
- refrigerant pipe work installation and connections
- relevant A1 and A2L class refrigerant, systems, piping, tools and equipment
- relevant codes of practice, industry standards, regulations and WHS/OHS legislated requirements, including:
 - AS/NZS 5141 Residential heating and cooling systems - Minimum applications and requirements for energy efficiency, performance and comfort criteria
 - AS/NZS 5149.3 Refrigerating systems and heat pumps - Safety and environmental requirements - Installation site
 - AS/NZS 5149.4 Refrigerating systems and heat pumps - Safety and environmental requirements - Operation, maintenance, repair and recovery
 - Australia and New Zealand Refrigerant Handling Code of Practice - Part 2 Systems other than self-contained low charge systems
 - Ozone Protection and Synthetic Greenhouse Gas Management Regulations
- relevant manufacturer specifications and instructions relevant risk mitigation processes, including safe working practices and risk control measures
- relevant workplace documentation
- relevant workplace policies and procedures
- role of licensed electrician/plumber
- split air conditioning and water heat pump (maximum plant capacity for each system is 18 kW), including:
 - decommissioning split system requirements and procedures installing split systems, including manufacturer instructions, location, mounting and connecting pipe work
 - single head split air conditioning system (up to 18 kW) types, applications, major components, controls, operation and operating conditions
 - split system start-up, including manufacturer instructions, pressure testing, evacuation, checking refrigerant charge, adding refrigerant, leak detection and checking function and performance.
 - split water heating heat pump system (up to 18 kW) types, applications, major components, controls, operation and operating conditions
- sustainable energy principles and practices.

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, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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