



Australian Government

UEERA0053 Install, commission, service and maintain medium temperature systems

Release: 1

UEERA0053 Install, commission, service and maintain medium temperature 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 safely and effectively install, commission, service and maintain medium temperature cabinets and cool rooms employing a single evaporator and single condensing unit. It includes the ability to source relevant data and schematics; install components, pipe work, accessories and controls to create a functional medium temperature system; commission the system to ensure it operates at the specified design conditions; locate and rectify faults; and carry out routine maintenance procedures.

The skills and knowledge in this unit will be applied by refrigeration and air conditioning technicians during the installation, commissioning and servicing of medium temperature refrigeration systems.

To undertake this unit, the learner must have a current 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 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 and 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

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to install medium temperature cabinet or cool room systems

2 Install medium temperature cabinet or cool room systems

PERFORMANCE CRITERIA

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

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| 1.1 | WHS/OHS risk control measures and procedures for carrying out the work are obtained and implemented in accordance with workplace procedures |
| 1.2 | Work details are determined from documentation and/or supervisor to establish scope of work to be completed in accordance with workplace procedures |
| 1.3 | Components, piping, accessories, controls and consumables for the installation work are obtained and checked against job requirements in accordance with industry standards and codes of practice |
| 1.4 | Tools, equipment and testing devices to complete work are obtained in accordance with workplace procedures and checked for operational safety in accordance with workplace procedures |
| 2.1 | Major components are securely mounted in the locations identified by the documentation or supervisor in accordance with workplace procedures |
| 2.2 | Refrigerant pipe work and associated components are installed according to specifications ensuring all connections and tube cleanliness are in accordance with job requirements and workplace procedures |

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| | <p>2.3 Pressure testing of the installed components and pipe work is conducted to the required level for the type of refrigerant being used in accordance with relevant codes of practice and industry standards</p> <p>2.4 Leaks are located and rectified employing appropriate methods in accordance with relevant codes of practice and industry standards</p> <p>2.5 Refrigeration system is evacuated to remove moisture and other contaminants in accordance with relevant codes of practice and industry standards</p> <p>2.6 Vacuum drop test is carried out to verify all moisture and other contaminants have been removed from the system in accordance with relevant codes of practice and industry standards</p> <p>2.7 Power and control circuit wiring is checked to ensure it conforms to circuit diagram specifications and system is electrically safe to energise in accordance with relevant codes of practice and industry standards.</p> |
| <p>3 Commission medium temperature cabinet or cool room systems</p> | <p>3.1 Refrigeration system is charged with the appropriate type and quantity of refrigerant in accordance with relevant codes of practice, industry standards and manufacturer specifications</p> <p>3.2 Operation of the refrigerant metering device is adjusted, as necessary, to ensure operating low side superheat is in accordance with industry standards, codes of practice and/or workplace documentation or supervisor</p> <p>3.3 Safety and cycling controls are adjusted to ensure the operational values are in safe and efficient operation in accordance with codes of practice and/or workplace documentation or supervisor</p> <p>3.4 Measurements are obtained and recorded to confirm that the refrigerant charge is optimal and the system is operating within specified parameters in accordance with codes of practice and industry standards</p> |
| <p>4 Locate and rectify faults and carry out maintenance on medium temperature cabinet or cool room systems</p> | <p>4.1 Fault diagnosis is carried out in a logical and effective manner in accordance with relevant codes of practice, industry standards and workplace procedures</p> |

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| 4.2 | Fault-finding and rectification processes are carried out effectively without damage to the system and components in accordance with relevant codes of practice, industry standards and workplace procedures | | | | | | | | |
| 4.3 | System is returned to an operational state in accordance with workplace procedures and manufacturer specifications | | | | | | | | |
| 4.4 | Components that require routine maintenance are identified and regularly maintained in accordance with relevant timeframes, industry standards and workplace procedures | | | | | | | | |
| 5 | Complete work and report activities <table border="0" style="margin-left: 20px;"> <tr> <td style="vertical-align: top; padding-right: 20px;">5.1</td> <td>WHS/OHS risk control measures continue to be applied in accordance with workplace procedures</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">5.2</td> <td>Worksite and equipment are cleaned and made safe in accordance with workplace procedures</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">5.3</td> <td>Refrigerant usage is recorded in accordance with relevant industry regulations and codes of practices</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">5.4</td> <td>Supervisor is notified of task completion in accordance with workplace procedures</td> </tr> </table> | 5.1 | WHS/OHS risk control measures continue to be applied in accordance with workplace procedures | 5.2 | Worksite and equipment are cleaned and made safe in accordance with workplace procedures | 5.3 | Refrigerant usage is recorded in accordance with relevant industry regulations and codes of practices | 5.4 | Supervisor is notified of task completion in accordance with workplace procedures |
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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, commissioning, servicing and maintaining medium temperature cabinets and cool rooms must include one of the following:

- medium temperature upright or under-bar refrigerated cabinet with a single evaporator
- medium temperature refrigerated cool room with a single evaporator

Condensing unit employed must include one of

- directly mounted single condensing unit
- remotely mounted single condensing unit

the following:

Refrigerant metering device employed must include one of the following:

- electronic expansion valve
- externally equalised thermostatic expansion valve
- internally equalised thermostatic expansion valve

Electrical supply to the installed medium temperature refrigeration systems must include one of the following:

- single phase 240 V
- three phase 415 V

Fault finding and rectification of medium temperature refrigeration systems must include at least two of the following mechanical faults:

- component failure, including compressor not pumping
- incorrect control setting
- incorrect high side sub-cooling
- incorrect low side superheat
- incorrect refrigerant charge
- non-condensables
- restriction within refrigerant circuit, including filter drier and refrigerant metering device (RMD)

Fault finding and rectification of medium temperature refrigeration systems must include at least two of the following electrical faults:

- earthing short, including load circuit has connected with casing or frame
- incorrect circuit wiring
- open circuit, including load, conductor and/or control
- shunted short, including load is internally shorted causing lower resistance

Unit Mapping Information

No equivalent unit.

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 UEERA0053 Install, commission, service and maintain medium temperature 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 relevant requirements, legislation, standards, codes of practice and industry procedures
- commissioning a medium temperature refrigeration system
- installing a medium temperature refrigeration system
- locating and rectifying mechanical faults and electrical faults on a medium temperature cabinet or cool room system
- maintaining a medium temperature cabinet or cool room system
- recording values and reporting completion of work.

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:

- commissioning typical general-purpose medium temperature refrigeration system requirements and procedures, including:
 - techniques to determine operating values for a medium temperature system operating with a 2°C product
 - typical cycling and safety control settings for a 2°C product temperature, 6K evaporator td
 - typical cycling and safety control settings for a 2°C product temperature, 6K evaporator td
 - typical initiation and termination settings for forced off-cycle defrost method
- common items identified on a preventative maintenance schedule for a medium temperature cabinet or cool room
- definition and purpose of hazard analysis and critical control points (HACCP)
- defrost methods, including natural off-cycle defrost and forced off-cycle defrost employing a

time initiated and time terminated control

- fault finding and rectification of medium temperature systems requirements and procedures, including:
 - symptoms and rectification of typical abnormal system conditions:
 - earthing short (load circuit has connected with casing or frame)
 - high side sub-cooling too low/too high
 - inefficient compressor
 - low side superheat too low/too high
 - non-condensables
 - open circuit
 - refrigerant overcharge and undercharge
 - restricted air flow through condenser
 - restricted air flow through evaporator
 - restricted filter drier/thermostatic expansion valve (TEV) strainer
 - shunted short, including load is internally shorted causing lower resistance
 - typical controller fault codes and use of manufacturers data
- medium temperature cool rooms, including construction and ancillary fittings
- medium temperature display cabinet types, construction and applications, including solid door cabinets, glass door displays, countertops, under-bars and open decks
- medium temperature merchandiser types, construction and applications, including single deck, multi-deck, island, reach-in and serviced
- off-cycle pump-down, including thermostat controlling liquid line solenoid valve purpose and components required
- range of products stored in medium temperature cabinets and cool rooms and required storage conditions, including fresh meat, dairy, delicatessen, mixed drinks, fruit and vegetables
- reading and interpreting single phase wiring and pipe work schematics for a typical medium temperature cabinet or cool room incorporating basic off-cycle, including thermostat controlling compressor
- reading and interpreting single phase wiring and pipe work schematics for a typical medium temperature cabinet or cool room incorporating off-cycle pump-down, including thermostat controlling liquid line solenoid valve
- reading and interpreting three phase wiring schematics for a typical medium temperature cool room incorporating off-cycle pump-down, including thermostat controlling liquid line solenoid valve
- refrigeration equipment installation requirements and procedures, including:
 - maintenance of fire rating integrity
 - relevant legislation, industry standards, codes of practice and regulations
 - self-contained and remote installations
- requirements for condensate removal/drainage.

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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