



Australian Government

UEERA0028 Determine noise and vibration encountered in HVAC/R applications

Release: 1

UEERA0028 Determine noise and vibration encountered in HVAC/R applications

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 determine noise and vibration encountered in heating, ventilation and air conditioning/refrigeration (HVAC/R) applications.

It includes measuring sound, noise and vibration encountered in HVAC/R systems. It also includes working safely, using problem-solving procedures, applying appropriate theorems and providing interpretations derived from measurements and calculations and justification for such interpretations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEERA0001 Analyse the operation of HVAC air and hydronic systems

UEERA0002 Analyse the psychrometric performance of HVAC/R systems

UEERA0003 Analyse the thermodynamic performance of HVAC/R systems

or

UEERA0094 Verify functionality and compliance of refrigeration and air conditioning installations

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

UEERA0081 Select refrigerant piping, accessories and associated controls

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.

PERFORMANCE CRITERIA

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

1 Prepare HVAC/R system to determine noise and vibration encountered in application

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| 1.1 | Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for a given work area are obtained and applied |
| 1.2 | WHS/OHS risk control work preparation measures and workplace procedures are followed |
| 1.3 | Nature of the problem is obtained from documentation or from work supervisor to determine the scope of work to be undertaken |
| 1.4 | Advice is sought from the work supervisor to ensure the work is coordinated effectively with others |
| 1.5 | Sources of equipment and products required for HVAC/R work are established in accordance with workplace procedures |

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| | 1.6 | Tools, equipment and testing devices needed to carry out HVAC/R work are obtained and checked for correct operation and safety |
| 2 | Determine HVAC/R application noise and vibration measurements | |
| | 2.1 | WHS/OHS risk control work measures and workplace procedures are followed |
| | 2.2 | Need to test or measure active HVAC/R systems is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace safety procedures |
| | 2.3 | HVAC/R systems are checked and isolated in accordance with WHS/OHS requirements and workplace procedures |
| | 2.4 | Relevant technique or process methods are used to determine noise and vibration measurement encountered in HVAC/R application |
| | 2.5 | Unexpected situations are dealt with safely in accordance with workplace procedures and with the approval of authorised person/s in a manner that minimises risk to personnel and equipment |
| | 2.6 | Measurements are taken without damage to HVAC/R apparatus, circuits, the surrounding environment or services using sustainable energy practices with minimum waste and re-work |
| 3 | Document HVAC/R application noise and vibration measurements and calculations | |
| | 3.1 | WHS/OHS work completion risk control measures and workplace procedures are followed |
| | 3.2 | Worksite is cleaned and made safe in accordance with workplace procedures |
| | 3.3 | Justification for alternative approach to determine noise and vibration measurements is documented and appropriate person/s notified in accordance with workplace procedures |
| | 3.4 | 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.

Providing sound, noise and vibration measurements must include at least the following:

- two HVAC/R applications

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ131A Determine noise and vibration encountered in HVAC/R applications.

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 UEERA0028 Determine noise and vibration encountered in HVAC/R applications

Modification History

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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 one occasion and include:

- identifying the dynamic characteristics of systems/materials and the effects due to different operating parameters
- using established measurement methods
- taking relevant measurements accurately
- interpreting measured values appropriately
- providing correct interpretation of data taken from measurements and calculations
- dealing with unplanned events
- applying problem solving procedures including using appropriate theorems
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices
- determining noise and vibration encountered in heating, ventilation and air conditioning/refrigeration (HVAC/R) applications.

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:

- noise and vibration fundamentals, safe working practices and relevant standards, codes and regulations, including:
 - fundamentals of sound:
 - properties of sound: wavelength, amplitude, frequency, period, velocity, sound (intensity, pressure and power) and decibels
 - sound pressure level
 - sound power level
 - addition of sound levels
 - loudness and weighting networks

- sound spectrum and octave bands
- single value representation of sound spectrum
- noise rating (NR) curves
- sound meters
- fundamentals of vibration:
 - terminology: spring-mass system, spring in series and/or parallel, stiffness, effective stiffness, viscous frictional coefficient, mass, period, frequency (angular, natural, damped and forced), amplitude, static deflection, damping ratio, damping factor and frequency ratio
 - simple harmonic motion (SHM)
 - damped vibration
 - forced vibration
 - maximum amplitude and resonance
 - transmissibility and isolation efficiency
 - vibration isolators
- relevant HVAC/R manufacturer specifications
- relevant job safety assessments or risk mitigation processes
- relevant techniques, processes or measurement methods to obtain sound, noise and vibration data, including problem-solving procedures and appropriate theorems
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies 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 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, equipment specifications, regulations, codes of practice and operation manuals.

Links

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