



Australian Government

UEERA0002 Analyse the psychrometric performance of HVAC/R systems

Release: 1

UEERA0002 Analyse the psychrometric performance of HVAC/R 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 analyse the psychrometric performance of heating, ventilation and air conditioning/refrigeration (HVAC/R) systems.

It includes analysing HVAC/R system to provide solutions to psychrometric performance issues. It also includes working safely, gathering and analysing psychrometric performance data, applying problem-solving techniques, and developing and documenting results and solutions.

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

Pre-requisite Unit

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

UEECD0042 Solve problems in ELV single path circuits

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.

1 Prepare to analyse psychrometric performance of HVAC/R system

PERFORMANCE CRITERIA

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

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) processes and workplace procedures for a given work area are identified and applied
- 1.2** WHS/OHS risk control measures and workplace procedures are followed in preparation for HVAC/R work
- 1.3** Extent of the psychrometric issues are determined from performance specifications and situation reports and in consultation with relevant person/s
- 1.4** HVAC/R activities are planned to meet scheduled timelines in consultation with other person/s involved in the work
- 1.5** Strategies are formed to ensure HVAC/R analysis and solution implementation is carried out efficiently in accordance with workplace procedures

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|---|---|
| 2 Analyse psychrometric performance of HVAC/R system | <ul style="list-style-type: none">2.1 WHS/OHS risk control measures and workplace procedures for carrying out HVAC/R work are followed2.2 Psychrometric principles are applied to analytical solutions to HVAC/R system2.3 Parameters, specifications and performance requirements in relation to HVAC/R system are obtained in accordance with workplace procedures2.4 Analysis of HVAC/R psychrometric parameters is carried out to provide effective solutions2.5 Unplanned situations are responded to in accordance with regulatory requirements and workplace procedures in a manner that minimises risk to personnel and equipment2.6 Quality of work is monitored against performance agreement and/or workplace procedures and industry standards |
| 3 Document and report results of the HVAC/R psychrometric performance analysis and actions taken | <ul style="list-style-type: none">3.1 Solution/s to HVAC/R psychrometric issues are evaluated to determine their effectiveness and modified, as required3.2 HVAC/R analysis is documented and includes details of findings, calculations and assumptions3.3 HVAC/R analysis is reported to appropriate person/s to determine appropriate action to be taken based on findings3.4 Justification for findings and any actions to be undertaken in relation to the HVAC/R equipment is documented for inclusion in work/project or development records in accordance with industry standards and 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.

analysing psychrometric parameters of HVAC/R systems must include at least the following:

- two different refrigeration and air conditioning systems

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ192A Analyse the psychrometric performance of HVAC/R 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 UEERA0002 Analyse the psychrometric performance of HVAC/R systems

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:

- understanding the psychrometric performance issues
- forming effective strategies for analysing refrigeration and air conditioning systems performance
- obtaining psychrometric performance parameters, specifications and performance requirements appropriate to each situation
- evaluating the results of the analysis
- documenting analysis details of all findings, calculations and assumptions
- documenting justification of actions to be implemented in accordance with professional standards
- dealing with unplanned events
- applying problem-solving techniques
- 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.

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:

- heating, ventilation and air conditioning/refrigeration (HVAC/R) psychometrics, safe working practices and relevant standards, codes and regulations, including:
 - fundamentals and terms:
 - sensible heat factor (conditioned space and grand total)
 - quantity of air
 - effective surface temperature
 - bypass factor
 - coil characteristics:

- processes
- sensible cooling
- cooling and dehumidification
- sensible heating
- spray processes:
 - saturation efficiency
 - processes
 - adiabatic/evaporative cooling
 - cooling and humidification
 - sensible cooling
 - chemical dehumidification process: dehumidification and heating
 - cooling tower characteristics: humidification and cooling
 - indirect evaporative cooling process
- system analysis:
 - partial load
 - reheat control
 - bypass control
 - volume control
 - dump back systems
 - low velocity coils
- psychrometric formulae and charts:
 - properties of air
 - gas constants
 - derivation of air constants
 - combined gas laws
 - Dalton's law of partial pressures
 - carrier's equation
 - psychrometric property tables
 - air mixing equations
 - air quantity equations
- problem-solving techniques
- psychrometric physical and thermodynamic properties of gas-vapor mixtures, including psychrometric principles
- relevant job safety assessments or risk mitigation processes
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- typical psychrometric performance issues.

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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