



Australian Government

Assessment Requirements for UEERA0001

Analyse the operation of HVAC air and hydronic systems

Release: 1

Assessment Requirements for UEERA0001 Analyse the operation of HVAC air and hydronic 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 one occasion and include:

- understanding the operating performance
- forming effective strategies for analysing air conditioning systems performance
- obtaining operating 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
- analysing the operation of heating, ventilation and air conditioning (HVAC) air and hydronic systems
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- preparing to analyse the operation of HVAC air and hydronic systems.

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:

- HVAC air systems, safe working practices and relevant standards, codes and regulations, including:
 - air distribution principles:
 - air diffuser selection
 - factors affecting the design of ductwork systems
 - types of ductwork systems
 - static, velocity and total pressure
 - laminar and turbulent flow

- moody diagram
- parameters that control cost
- pressure loss:
 - friction and dynamic
 - colebrook - White formula
 - in ducts and friction charts
 - in fittings and loss co-efficient
 - fitting selection criteria
 - diffuser pressure loss
- system sizing:
 - velocity method
 - equal friction method
 - static regain method
 - balanced pressure drop method
 - circular to rectangular equivalent
 - standard duct sizes and gauges
 - balancing
- heat and leakage losses:
 - heat gain/loss calculation
 - bare vs. insulated
 - leakage
- overview of noise in duct systems:
 - noise sources in duct systems
 - attenuation
 - impact on design
 - methods of control
- fans:
 - types and characteristics
 - fan laws
 - system effect
 - fan selection
 - fan and system curves
- air systems:
 - dual and single duct constant volume
 - variable volume
 - induction units
 - multi-zone
 - diversity factors
- HVAC systems
- HVAC hydronic systems, safe working practices and relevant standards, codes and

regulations, including:

- systems operation
 - closed/open systems
 - pump head/lift and static head (high-rise building)
 - system friction losses
 - nett positive suction head
 - system curves
- pumps:
 - types
 - selection criteria
 - performance characteristics
 - bladder tanks
 - coil characteristics
 - heat exchangers: plate, shell and tube, and tube in tube
 - flow measurements: types
 - flow switchers
 - builders: types and performance characteristics
 - cooling towers: elementary cooling thermodynamics and types
- valves - flow control devices:
 - types and applications
 - throttling characteristics
 - flow measurements
 - selection and applications
- piping systems:
 - balancing and commissioning
 - air venting
 - water treatment
 - vacuum breaking and air breaks
- relevant industry standards
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace quality, 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 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
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>