



Australian Government

Assessment Requirements for UEEIC0043

Solve problems in temperature measurement components and systems

Release: 1

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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:
 - identifying risk control measures
 - applying safe working practices
- applying sustainable energy principles and practices
- completing work and documenting work activities
- coordinating work with others
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- identifying sources of materials
- obtaining tools, equipment and testing devices
- preparing to work on temperature measurement components and systems
- solving problems in temperature measurement components and systems
- solving temperature measurement problems.

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:

- introduction to temperature measurement, including:
 - temperature measurement terms
 - international temperature scale
 - temperature scales
 - conversion of temperature readings
 - temperature measuring elements
 - temperature sensor selection factors

- errors in temperature measurement
- methods used to reduce errors.
- types and applications of temperature transducers
- transducers input/outputs - measurement and evaluation
- transducer connections
- filled system thermometers, including:
 - applications of filled system thermometers
 - calibration of filled systems
 - filled systems operating principles
 - liquid in glass thermometers construction
- other temperature measuring techniques, including:
 - thermistor characteristics and circuit operation
 - thermistor temperature measuring circuits and operation
 - temperature measurement characteristics of solid-state devices and circuits
 - temperature indicators: characteristics and applications
 - liquid crystals
 - thermometers: bimetallic and digital thermistor
- problems in temperature measurement components and systems
- radiation thermometers, including:
 - operating principles, terms and factors affecting its use
 - construction, signal conditioning, and calibration of optical pyrometers and radiation
- relevant manufacturer specifications
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes, including risk control measures and safe working practices
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- resistance temperature detectors (RTDs) and RTD measuring circuits, including:
 - calculating of unbalanced Wheatstone bridge circuits voltage outputs
 - determining RTD standard resistance values or temperature
 - non-linear voltage output compensation methods
 - RTD lead-resistance compensation methods and immersion errors
 - selecting RTD configurations and terms
- sustainable energy principles and practices
- temperature measurement principles, including:
 - terms and international temperature scales, temperature conversions, measuring elements, sensor selection factors, errors in temperature measurement and methods used to reduce them
 - types and applications of temperature transducers, connections, input/outputs (I/O), and measurement and evaluation
- thermocouple measuring circuits, including:

- advantages and disadvantages and the characteristics of thermocouples and connection wires
- calibrating and determining thermocouple measuring instruments, test equipment and junction temperature configurations
- electromagnetic field distribution in thermocouple circuits
- handling and selection of thermocouples, including installation errors
- identification of thermocouple connection wires
- industrial thermocouple assembly and fabrication methods
- thermo-electric effects, principles and laws
- thermowell properties
- relevant industry standards, regulations and codes.

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

Companion Volume implementation guides are found in VETNet - -

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