



Australian Government

UEEAS0008 Fabricate and assemble bus bars

Release: 1

UEEAS0008 Fabricate and assemble bus bars

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 fabricate and assemble copper (Cu) and aluminium (Al) electrical bus bars for interconnections in switchboards and specific plant, and that have high current demand.

It includes working safely to industry standards and specifications in making up and fixing electrical bus bars and completing necessary documentation.

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

Pre-requisite Unit

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

Competency Field

Assembly

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Plan to make up and assemble bus bars

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) requirements and workplace procedures

- for a given work area are identified and applied
- 1.2 Hazards are identified, risks assessed and control measures implemented
 - 1.3 Work instructions, including layout and wiring diagrams, are obtained and applied
 - 1.4 Advice is sought from supervisor to ensure work is coordinated effectively with others
 - 1.5 Materials required for the work are obtained in accordance with workplace procedures
 - 1.6 Tools, equipment and testing devices required for the work are obtained and checked for correct operation and safety in accordance with workplace procedures
- 2 Make up and assemble bus bars**
- 2.1 WHS/OHS risk control work measures are followed
 - 2.2 Circuits are checked and isolated in accordance with WHS/OHS requirements and workplace procedures
 - 2.3 Bus bars are formed/made up in accordance with work instructions, industry standards, manufacturer specifications and workplace procedures
 - 2.4 Bus bars are connected in accordance with work instructions, industry standards, manufacturer specifications and workplace procedures
 - 2.5 Quality checks are carried out in accordance with workplace procedures
 - 2.6 Completed bus bar assembly is inspected and tested in accordance with workplace procedures, industry standards and manufacturer specifications
 - 2.7 Unplanned events are referred to supervisor for directions in accordance with workplace procedures
 - 2.8 Work is carried out without waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices
- 3 Check quality of assembled bus bars**
- 3.1 WHS/OHS risk control measures for work completion are followed
 - 3.2 Assembled bus bars are checked against work

instructions, industry standards and manufacturer specifications in accordance workplace procedures

- 3.3** Problem-solving techniques are used where corrective actions to assembled components are required in accordance with regulatory requirements and industry standards
- 3.4** Work report forms are completed accurately and relevant 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.

Fabricating and assembling bus bars must include at least the following:

- two different bus bar assemblies, one of which must be custom made

Unit Mapping Information

This unit replaces and is equivalent to UEENEEA112A Fabricate and assemble bus bars.

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 UEEAS0008 Fabricate and assemble bus bars

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 two separate occasions and include:

- applying problem-solving techniques when determining the nature of a fault
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - using risk control measures
 - checking tools, equipment and testing devices for correct operation and safety
- applying sustainable energy principles and practices
- checking quality and installation of assembled bus bars
- communicating effectively with relevant stakeholders
- completing workplace documentation
- dealing with unplanned events in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- following work instructions
- interpreting electrical layout and wiring diagrams
- inspecting and testing installed bus bars
- making up and assembling electrical bus bars, including:
 - following assembly instructions
 - forming and making up correctly
 - terminating bus bars correctly
 - adhering to quality procedures
 - checking circuits are isolated
 - making interconnections
 - considering designs
 - connecting bus bars correctly
- performing regular quality checks.

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:

- chemical and metallurgical properties of bus bars, including:
 - copper (Cu)
 - aluminium (Al)
 - copper clad aluminium
 - hard drawn copper
 - annealing
 - types of high conductivity copper
- current-carrying capacity, including:
 - standard cross-sections of bar
 - current ratings
 - temperature rise
- design considerations, including:
 - electrical and thermal resistance
 - mechanical strength in tension, compression and shear
 - resistance to fatigue failure
 - electrical resistance of surface films
 - ease of fabrication
 - resistance to corrosion
 - first cost and high eventual recovery value
 - choice of bus bar materials
 - creep properties
 - fatigue properties
 - self-extinguishing arcs in Cu and Al
 - insulated bus bar
 - provision for bus bar expansion
- effects of short circuit, including:
 - temperature rise
 - electromagnetic stresses
 - cleats and structural supports
- electrical bus bar types, including:
 - main bus bars
 - intermediate bus bars
 - cell bus bars
 - droppers
 - flexible joints
 - hanger bars
 - short circuit frames

- jointing types and techniques, including:
 - clamped joints
 - bolted
 - riveted
 - welded
 - soldered or brazed
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- shaping and bending equipment and techniques, including:
 - hand and power tools
 - hydraulic shears
 - hydraulic punches
 - hydraulic notcher
 - machines allowing multiple operations
- stand-off insulators, including:
 - form
 - function
 - physical and electrical properties/characteristics
 - selection.

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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