



**Australian Government**

# **UEEEL0005 Develop and connect electrical control circuits**

**Release: 2**

# UEEEL0005 Develop and connect electrical control circuits

## Modification History

Release 2. This is the second release of this unit of competency in the UEE Electrotechnology Training Package.

Workplace evidence requirements updated in Performance Evidence and Assessment Conditions.

Assessor requirements updated in Assessment Conditions.

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 develop, connect and functionally test electrical power and control circuits that perform specific control functions.

It includes working safely, developing schematic diagrams and converting them to wiring diagrams, selecting and connecting contactors and control devices to perform a specific function. It also includes testing electrical control circuits and completing circuit development activities documentation.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, may be required.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

## 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

UEEEL0003 Arrange circuits, control and protection for electrical installations

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UEEEL0024 Test and connect alternating current (a.c.) rotating machines

UEEEL0025 Test and connect transformers

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

## Competency Field

Electrical

## Unit Sector

Electrotechnology

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

#### **1 Develop electrical control circuits**

### PERFORMANCE CRITERIA

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

- 1.1** WHS/OHS requirements and workplace procedures for a given work area are identified obtained and applied
- 1.2** Control circuit/s requirements are determined from discussions with relevant person/s and documented in accordance with workplace procedures
- 1.3** Agreement for the control circuit/s requirement is sought from appropriate person/s and documented in accordance with workplace procedures
- 1.4** Schematic arrangement of control circuits that complies with agreed requirement is documented in accordance with workplace procedures
- 1.5** Wiring diagram of control circuits is developed from schematic diagram in accordance with workplace

procedures

- 1.6 Materials needed to connect control circuit/s are obtained in accordance with workplace procedures and checked against job requirements
        - 1.7 Tools, equipment and testing devices needed to connect control circuit/s are obtained in accordance with workplace procedures and checked for correct operation and safety
        - 1.8 Preparatory work is checked to ensure no damage has occurred and complies with control circuit/s application requirements
  - 2 Connect and test electrical control circuits**
    - 2.1 WHS/OHS risk control measures and workplace procedures for carrying out work are followed
    - 2.2 Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted within established safety workplace procedures
    - 2.3 Circuits/machines/plant are checked and isolated as required in accordance with WHS/OHS requirements and workplace procedures
    - 2.4 Control circuit component/s are connected to comply with the agreed control requirements
    - 2.5 Control circuit operation is tested for functionality and in accordance with WHS/OHS requirements and workplace safety procedures
    - 2.6 Non-compliant control functions are rectified
    - 2.7 Unplanned situations are dealt with safely and with the approval of an authorised person in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
    - 2.8 Control circuits are connected, inspected and tested without unnecessary waste of materials or damage to apparatus, circuits, the surrounding environment or services using sustainable energy practice
  - 3 Complete and document circuit development activities**
    - 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 'As-connected' control circuits are documented using standard drawing conventions 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.

Developing, connecting and functional testing must include at least four of the following electrical control circuits:

- machine interlocked circuit
- machine safety circuit
- motor jogging circuit
- multiple stop-start circuit
- single stop-start circuit
- time controlled circuit

Developing, connecting and functional testing must include at least three of the following components and electrical devices:

- contactors
- electromechanical relays
- programmable relays
- push buttons
- reduced voltage starters
- soft starters
- three phase starters
- variable speed drives

Developing, connecting and functional testing must include at least two of the following transducers/sensors:

- float switches
- light sensors
- limit switches
- photoelectric cells
- pressure switches
- proximity switches
- temperature sensors
- timers

## Unit Mapping Information

This unit replaces and is equivalent to UEENEEG109A Develop and connect electrical control circuits.

## Links

Companion Volume Implementation Guides are found in VETNet -

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