

## **UEERE9989Y Install photovoltaic power conversion equipment to grid Modification History**

Release 1. This is the first release of this unit of competency in the Electrotechnology Training Package.

### **Application**

This unit involves the skills and knowledge required to install and commission photovoltaic (PV) power conversion equipment (PCE) to grid.

It includes working safely and to industry installation standards, installing components in accordance with design, placing and securing system components accurately, making required circuit connections, testing and commissioning the installation and completing the necessary installation 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, is 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.

Note: Those holding an Unrestricted Electrician's Licence or equivalent issued in an Australian state or territory meet the prerequisite requirements of UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories. All other prerequisite requirements must be met.

### **Pre-requisite Unit**

UEERE9999Y Conduct site survey for grid-connected photovoltaic and battery storage systems  
UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories

### **Competency Field**

Renewable Energy

## Unit Sector

Electrotechnology

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

#### **1 Plan to install photovoltaic power conversion equipment to grid**

### PERFORMANCE CRITERIA

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

- 1.1** Nature of the installation is verified from design documentation and any design concerns identified are referred to designer
  - 1.2** WHS/OHS processes and procedures for work are identified and applied in accordance with workplace procedures
  - 1.3** Work is planned in consultation with the customer and others impacted by the work and sequenced appropriately
  - 1.4** Location of components is verified within the constraints of the building structure, design and industry standards and regulations
  - 1.5** Material, tools, equipment and measuring devices required for the installation are obtained in accordance with design requirements
  - 1.6** Live testing, measurement and isolation requirements determined and applied in accordance with WHS/OHS requirements and workplace procedures
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- 2.1** Circuits/machines/plant are isolated in accordance with WHS/OHS requirements and workplace procedures
  - 2.2** System installed in compliance with industry standards, regulations and job/manufacture specifications, and with sufficient access to enable terminations, adjustment and maintenance
  - 2.3** Wiring is terminated at components and associated equipment in accordance with manufacturer specifications and functional and regulatory requirements

#### **2 Install grid-connected systems**

- 2.4 Quality checks of installed apparatus are conducted in accordance with workplace procedures
- 2.5 Testing and commissioning of the system is conducted in accordance with design documentation, regulations, relevant industry standards and manufacturer specifications
- 2.6 Worksite is cleaned and made safe in accordance with workplace procedures
- 2.7 'As-installed' system and associated equipment are documented, manuals produced, and system is handed over to required person/s as per legislation, regulations, industry standards and job requirements

## 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.

Installation of PV  
PCE must include:

- installing, configuring and commissioning at least two different LV grid-connected PCEs to the grid

## Unit Mapping Information

New unit

## Links

UEE - Electrotechnology Training Package Companion Volume Implementation Guide at:  
[sector webpage link here]

# Assessment Requirements for UEERE9989Y Install photovoltaic power conversion equipment to grid

## 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 and performance criteria on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- verifying design, drawings and documentation and resolving any issues with designer
- installing grid-connected system safely
- testing and commissioning in accordance with industry standards and regulations
- completing documentation according to regulatory and industry standards.

## Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- power conversion equipment (PCE), including:
  - types of PCEs used in grid-connected systems
  - the basic AC specifications and functions of an PCE
- PCE operation, including:
  - connection of a grid connected PCE and measurement of the PCE parameters for various loads
  - Industry Standards and regulation relevant to PCEs
- PV grid-connected system operation, including:
  - operation of grid interactive PV systems, including synchronisation, safety feature, power flow control, passive and active anti-islanding, secondary protection and metered energy for systems
  - schematic diagrams of common grid-connected PCE circuit configurations, including metering arrangements, isolation and connection with respect to residual current devices (RCDs) in accordance with relevant industry standards
- installation of grid-connected PCEs, including:

- major installation requirements for all system components which will ensure correct operation, long life, safety and ease of maintenance consistent with relevant industry standards and WHS/OHS guidelines
- typical installation configurations for grid connection of energy systems via PCEs
- the function and operation of a grid protection device as specified by relevant industry standards
- labelling and signage requirements for switchboards supplied with power from grid connected PCEs, as set out in the relevant industry standards
- system commissioning and maintenance, including:
  - the isolation procedures required for grid-connected PCEs
  - relevant commissioning procedures, including start-up and shutdown procedures for grid-connected PCE systems in accordance with relevant industry standards
  - testing a grid-connected PCE system for correct operation
  - performing commissioning work on a PV power system in accordance with relevant industry standards.
- relevant workplace documentation, policies, procedures and standards.

## 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

UEE - Electrotechnology Training Package Companion Volume Implementation Guide at:  
[sector webpage link here]