

1. Module Details**Module name****Electrical Safety Testing for Refrigeration & Air Conditioning Technicians****Suggested structured learning time**

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 18 to 20 hours.

Module code

NUE359

Field of Education code

031315 Refrigeration and Air Conditioning Mechanic

2. Module purpose

This module provides knowledge and skills to undertake the necessary safety testing of associated electrical installations in accordance with regulations, for workers in the Refrigeration and Air Conditioning Industry. There will be a focus on the responsibilities of the person undertaking the tests, the methods and procedures for conducting the tests on a typical installation and the correct method of reporting the results.

3. Learning Pathway**Intended use in the structured learning program**

This module is intended to supplement exposure to associated electrical work carried out by refrigeration and air conditioning mechanics. In particular it applies to incorporating safety practices as part of the normal way of working.

Therefore, before undertaking this module, a student should have a clear understanding of occupational health and safety requirements, electrical principles and test instruments, power and control circuits, and single and three phase induction motors and control operation.

Recommended prerequisite/s

NR08 Appliance Motors and Circuits and NR12 System Controls

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competence in the National; Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from EEQSBA (EE-Oz Training Standards)

This module supports the development of essential capabilities for restricted electrical licensing required by refrigeration and air conditioning mechanics for associated electrical work.

5. Content

1. Legislated regulations
 - regulations
 - responsibilities
 - testing requirements
2. Testing installations
 - insulation
 - earth continuity
 - polarity
 - transposition of earth and neutral
 - operation of installation
 - Testing accuracy of test equipment
3. Documentation
 - reporting tests
 - minimum requirements

6. Assessment strategy

Assessment method

Multiple choice questions
Short-answer questions
Project/assignments

Conditions of assessment

Normally learning and assessment will take place in a classroom/wiring workshop environment.

7. Learning outcome details

On completion of this module the learner will be able to:

Learning outcome 1

Describe the requirements to ensure electrical installations are safe in accordance with legislation and regulations.

Assessment criteria

- 1.1 Name the legislation and regulations that require installations to be tested to ensure they are safe.
- 1.2 Identify the person/bodies responsible for the various aspects of ensuring electrical installations are safe.
- 1.3 Interpret the legislation and regulations relating to testing.
- 1.4 List the tests to be carried out before an installation or circuit is connected to the supply.

Learning Outcome 2

Demonstrate the ability to conduct the tests required to ensure an electrical installation is safe in accordance with legislative regulations.

Assessment criteria

2.1 Demonstrate tests to ensure:

- insulation resistance is adequate
- earth continuity is such that it will ensure the operation of protection devices under earth fault conditions
- polarity of active/s and neutral for mains, sub-mains and final sub-circuits is correct
- there is no transposition of earthing and neutral conductors

2.2 Demonstrate test to ensure test equipment is operating correctly.

Learning outcome 3

Complete documentation reporting results of tests of an electrical installation as required by local supply authorities.

Assessment Criteria

3.1 Show how the results of tests conducted on an installation comply with requirements and ensure the installation is safe.

3.2 Report the results of testing an installation as required by the local supply authority.

8. Delivery of the module

Delivery Strategy

The learning outcomes of this module require the application of requirements to test installations. Resources such as a simulated installation incorporating refrigeration and/or air conditioning equipment will most effectively facilitate achievement of the module purpose.

It is recommended that learning and assessment be facilitated in a holistic manner which may require a learning sequence other than indicated in the body of this module descriptor.

Resource requirements

Simulated installation including consumers single purpose final subcircuit, separate final subcircuit, accessories and appliances, control board and earthing system. Resources should be sufficient for students to carry out testing exercise on an individual basis.

Occupational health and safety requirements

Useful references include:

- *Standards Australia*, SAA Wiring Rules – AS/NZS 3000, 2000
- *Standards Australia*, Electrical Installation – Testing and Inspection Guidelines – AS/NZS 3017-2001
- State Electricity Act and Regulations
- Local supply authority regulations

WorkCover NSW, WorkCover Code of Practice - Low Voltage Electrical Work Local electricity distributor and authority regulations, or State/Territory equivalent

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EE-Oz Training Standards¹ **User Guides** (*these outline in detail what training and work performance the Learner is required to undertake for the program*).

A safe and healthy environment will be provided for students in regards to classroom and wiring workshop safety.

¹ EE-Oz Training Standards is an ANTA declared Industry Skills Council for the ElectroComms and EnergyUtilities Industry