Title	**Demonstrate knowledge of electronic variable speed drives**		
Level	**4**	**Credits**	**3**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: – electronic VSDs; – VSD applications; and – installation and commissioning requirements of VSDs.

Classification	Industrial Measurement and Control > Industrial Measurement and Control - Theory

Available grade	Achieved

Guidance Information

1 Any type of electronic variable speed drive (VSD) that is capable of implementing the range of outcome 3 may be used for assessment purposes.

2 Definition
Industry requirements – includes all asset owner requirements, manufacturers' specifications, enterprise requirements which cover the documented workplace policies, procedures, specifications, and business requirements, and quality management requirements relevant to the workplace in which the assessment is carried out.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of electronic VSDs.

Performance criteria

1.1 Describe advantages of VSDs.

Range improved efficiency, mechanical simplicity.

1.2 Explain principles of VSDs with the aid of a block diagram.

Range d.c. drives; a.c. drives.

Outcome 2

Demonstrate knowledge of VSD applications.

Performance criteria

2.1 Describe the operation of a three phase induction motor with variable supply frequency.

Range motor speed versus frequency characteristic; voltage-flux relationship; effect of variable speed on motor cooling; motor torque versus speed characteristic.

2.2 Explain the effect of variable speed on driven equipment.

Range typical loads are centrifugal pump; centrifugal fan; positive displacement pump; conveyor belt;
evidence of two is required.

2.3 Explain the need to match capability of the VSD to motor performance parameters.

Range motor transient and long-term current limits; motor maximum flux; minimum motor speed.

2.4 Explain the advantages of VSD in a typical control application.

Range pressure or level control; speed control of conveyor belts;
evidence of two applications is required.

Outcome 3

Demonstrate knowledge of installation and commissioning requirements of VSDs.

Performance criteria

3.1 Identify cabling and earthing requirements in accordance with industry requirements.

3.2 Explain mounting and spacing details in accordance with industry requirements.

3.3 Explain factors relating to electrical interference in accordance with industry requirements.

3.4 Determine configuration details for a given VSD from manufacturers' manuals and apply configuration to the VSD unit.

3.5 Determine and explain connections to power supply and control system interfaces in accordance with manufacturer’s specifications.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 May 2008	31 December 2019
Review	2	28 November 2013	31 December 2027
Rollover	3	28 June 2018	31 December 2027
Review	4	30 January 2025	31 December 2027

Consent and Moderation Requirements (CMR) reference	0003

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.