

<b>Title</b>	<b>Demonstrate knowledge of electronic variable speed drives</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>3</b>

<b>Purpose</b>	People credited with this unit standard are able to demonstrate knowledge of: – electronic VSDs; – VSD applications; and – installation and commissioning requirements of VSDs.
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<b>Classification</b>	Industrial Measurement and Control > Industrial Measurement and Control - Theory
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<b>Available grade</b>	Achieved
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### 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.

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### 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.

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<b>Planned review date</b>	31 December 2021
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**Status information and last date for assessment for superseded versions**

<b>Process</b>	<b>Version</b>	<b>Date</b>	<b>Last Date for Assessment</b>
Registration	1	19 May 2008	31 December 2019
Review	2	28 November 2013	N/A
Rollover	3	28 June 2018	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Comments on this unit standard**

Please contact The Skills Organisation [reviewcomments@skills.org.nz](mailto:reviewcomments@skills.org.nz) if you wish to suggest changes to the content of this unit standard.