

Title	Fabricate and install busbars in switchboards		
Level	4	Credits	14

Purpose	<p>This unit standard is for people engaged in the manufacture of switchboards in the electrotechnology industry.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – make accurate bends in busbars to meet job specifications; – complete specified busbar sets from drawings; – punch and/or drill holes in busbars in accordance with the requirements of the drawing; – install busbars and bracing support systems in accordance with job specification and industry practice; and – explain and demonstrate busbar jointing methods.
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Classification	Electrical Engineering > Electric Switchboards
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Available grade	Achieved
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Explanatory notes

- 1 This unit standard may be used for learning and assessment off-job or on-job.
- 2 References

Accident Compensation Act 2001;
 AS/NZS 3000:2007, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*;
 AS/NZS 3439.4:2009, *Low-voltage switchgear and control gear assemblies – Particular requirements for assemblies for construction sites (ACS)*;
 Electricity Act 1992;
 Electricity (Safety) Regulations 2010;
 Health and Safety at Work Act 2015;
 The New Zealand Electrical Codes of Practice, available from [WorkSafe New Zealand](#);
 and all subsequent amendments and replacements.
- 3 Definitions

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
Safe and sound practice – this relates to the installation of electrical equipment and is defined in AS/NZS 3000:2007.

Set – a combination of angles, bends, and distances between angles and bends on a busbar.

4 Range

- a Candidates may refer to current legislation and Standards during assessment.
- b Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
- c Competency must be demonstrated on busbar systems with total ampacity of no less than 800 amps per phase.
- d All evidence presented for assessment against this unit standard must be in accordance with:
 - i legislation;
 - ii policies and procedures;
 - iii ethical codes;
 - iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
 - v applicable site, enterprise, and industry practice; and,
 - vi where appropriate manufacturers' instructions, specifications, and data sheets.

Outcomes and evidence requirements

Outcome 1

Make accurate bends in busbars to meet job specifications.

Range busbars – two of different profile sizes;
bends – one on each busbar, each of 90 degrees maximum;
plan – any one of profile drawing, engineer's sketch, own sketch.

Evidence requirements

- 1.1 Bend busbars with bending tools safely.
- 1.2 Bend busbars to the required angle without loss of mechanical or electrical integrity.
- 1.3 Busbar bending radii are consistent and show efficient use of materials.

Outcome 2

Complete specified busbar sets from drawings.

Range two angles and one distance between angles on each of two pre-cut busbars.

Evidence requirements

- 2.1 Bend busbars to specified sets in accordance with job specifications and industry practice.
- 2.2 Demonstrate accurate bending of busbars by close nesting of the two busbars on first attempt.

Outcome 3

Punch and/or drill holes in busbars in accordance with the requirements of the drawing.

Evidence requirements

- 3.1 Accurately punch and/or drill holes in busbars on first attempt without damage to busbars, workstation, self and other persons, and environment.
- 3.2 Create busbar holes in a consistent and safe manner.
- 3.3 Ream edges of holes to remove all burrs in accordance with industry practice.

Outcome 4

Install busbars and bracing support systems in accordance with job specification and industry practice.

Range evidence of two busbar and two bracing systems is required.

Evidence requirements

- 4.1 Install busbar and bracing support systems in accordance with job specification.
- 4.2 Position busbars to achieve specified clearances and creepage distance.
- 4.3 Join busbars to meet job specification.
- 4.4 Install busbars support systems in accordance with fault rating requirements.

Outcome 5

Explain and demonstrate busbar jointing methods.

Evidence requirements

- 5.1 Explain methods of jointing busbars with reference to surface preparation, assembly technique, maintenance of electrical properties, and jointing of dissimilar metals.
- 5.2 Explain busbar jointing requirements in terms of number, positioning, and type of fixings.
- 5.3 Ensure phase rotation and colour coding of busbars complies with job specifications.

Replacement information

This unit standard replaced unit standard 14974.

Planned review date	31 December 2021
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 November 2016	N/A

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

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.