

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 – 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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Guidance Information

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 (version as cited in the Electricity (Safety) Regulations), *Electrical installations (known as the Australian/New Zealand Wiring Rules)*
- AS/NZS 61439.4:2016, *Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)*, available at [Standards NZ](https://standards.nz)
- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- Health and Safety at Work Act 2015
- The New Zealand Electrical Codes of Practice, available at WorkSafe New Zealand, worksafe.govt.nz 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.

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
 - vi where appropriate manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

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.

Performance criteria

- 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.

Performance criteria

- 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.

Performance criteria

- 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.

Performance criteria

- 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.

Performance criteria

- 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.
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Planned review date	31 December 2026
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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
Rollover and Revision	2	25 July 2024	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>.

Comments on this unit standard

Please contact the Waihanga Ara Rau Construction and Infrastructure Workforce Development Council qualifications@WaihangaAraRau.nz if you wish to suggest changes to the content of this unit standard.