NECA WEBINAR SERIES

Thought Leaders Webinar

Presented by NECA Business Partner

NHP

New Switchboard Requirements in AS 3000

14/07/2021

national electrical and communications association

Webinar Agenda

1. Switchboard Requirements in AS3000
2. Switchboard Requirement Summary (Appendix K AS/NZS3000)
3. Points to consider when installing an off the shelf switch board

Presenter:

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1. Switchboard Requirements in AS3000

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AS 3000:2018 and AS 61439

AS/NZS3000:2018

AMDT No. 1 JAN 2020

Clause 7.8.2.12

Delete the clause title and text.

AS/NZS61439.1

3.1.1

low-voltage switchgear and controlgear assembly

ASSEMBLY

combination of one or more low-voltage switching devices together with associated control, measuring, signalling, protective, regulating equipment, with all the internal electrical and mechanical interconnections and structural parts

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AS 3000:2018 and AS 61439

AS/NZS3000:2018 ADMT 2

2.10 SWITCHBOARDS

2.10.3 Construction

2.10.3.2 *Suitability*

3 *Add* the following as a new third paragraph, before the Notes:

Switchboards shall comply with AS/NZS 3439 series or AS/NZS 61439 series if one or both of the following exist:

(a) The total of the connected load at the point where the switchboard is installed exceeds 125 A r.m.s. per phase.

(b) The prospective short-circuit current at the incoming terminals of the switchboard is greater than 10 kA r.m.s.

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AS 3000:2018 and AS 61439

AS/NZS3000:2018

1.4.121 Switchboard

An assembly of circuit protective devices, with or without switchgear, instruments or connecting devices, suitably arranged and mounted for distribution to, and protection of, one or more submains or final subcircuits, or a combination of both.

1.4.122 Switchboard, main

A switchboard from which the supply to the whole electrical installation can be controlled.

1.4.46 Distribution board

A switchboard other than a main switchboard.

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Yes

No
(should be less than 125A and less than 10kA)

Yes
(or derate to less than 125A and less than 10kA)

No
(Not a "Switchboard")

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AS 3000:2018

1.4.8 Alteration

* **A modification to part(s) of an electrical installation.**

NOTE: Repairs are not alterations. A repair is defined in Clause 1.4.101.

1.9.3.1 *Alterations*

Alterations to electrical installations shall comply with all relevant provisions of this Standard.

1.4.101 Repair

The work to restore the electrical installation to safe and sound working condition after deterioration or damage has occurred.

1.9.3.2 *Repairs*

Repairs to existing electrical installations or parts thereof may be effected using methods, fixtures and fittings that were acceptable when that part of the electrical installation was originally installed or with methods, fixtures and fittings currently available as direct replacement, provided that the methods satisfy the fundamental safety principles of Part 1 of this Standard.

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2. Switchboard Requirement Summary

(Appendix K AS/NZS3000:2018)

AS 3000:2018

APPENDIX K

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SWITCHBOARD REQUIREMENT SUMMARY

(Informative)

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AS 3000:2018

K3 APPLICATION OF THE AS/NZS 61439 SERIES

K3.1 General rules

AS/NZS 61439.1 applies to all parts of the series, except as varied in Part 2 or Part 3 of that series.

A verification of the short-circuit withstand strength is not required for ASSEMBLIES having a rated short-time withstand current or rated conditional short-circuit current not exceeding 10 kA r.m.s or 17 kA peak. Tests for other characteristics such as current rating apply to all switchboards.

K3.2 Power switchgear and controlgear (PSC)

AS/NZS 61439.2 applies to industrial, commercial and similar applications where operation by ordinary persons is not intended.

NOTE: An ordinary person is a person who is neither a skilled person nor an instructed person.

K3.3 Distribution boards intended to be operated by ordinary persons (DBO)

AS/NZS 61439.3 applies to ASSEMBLIES with rated currents (I_{nA}) not exceeding 250 A, and rated currents of a circuit (I_{nc}) not exceeding 125 A. This includes—

(a) type A, DBO designed to accept single-pole devices; and

(b) type B, DBO designed to accept multi-pole and/or single-pole devices.

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AS 3000:2018

K4 GUIDELINES FOR THE ASSESSMENT OF SWITCHBOARDS

K4.1 User template

For a user information template, refer to AS/NZS 61439.1:2016, Annex C.

K4.2 Items subject to agreement

For items subject to agreement, refer to AS/NZS 61439.2:2016, Appendix BB and AS/NZS 61439.3:2016, Annex AA.

AS 61439.3

This objective can be achieved through one of two typical processes; the user will either select a catalogue product, the characteristics of which meet the required user needs, or make a specific agreement with the manufacturer.

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Out with the old

Annex C
(informative)

Specification guidance for IEC 61439-2

C.1 Standard options

Table C.1 compiles information that the standard identifies as subject to an agreement between the ASSEMBLY manufacturer and the user. Unless specified otherwise, the default arrangement will apply. In some cases, information declared by the ASSEMBLY manufacturer may take the place of an agreement.

Table C.1 – Items subject to agreement between the ASSEMBLY manufacturer and the user

Characteristics	Reference clause or subclause	Default arrangement [b]	Options listed in standard	User requirement[a]
Electrical system	**5**			
Earthing system	5.2	Manufacturer's standard, selected to suit local requirements	TT / TN-C / TN-C-S / IT, TN-S	
Nominal voltage (V)	5.3	Local, according to installation conditions	Max. 1 000 V a.c. or 1 500 V d.c.	
Transient overvoltages	5.4, 5.5	Determined by the electrical system	Overvoltage category I / II / III / IV	
Temporary overvoltages	5.5	Nominal system voltage = 1 200 V	None	
Rated frequency f_n (Hz)	5.6	According to local installation conditions	d.c. / 50 Hz / 60 Hz	
Additional on site testing requirements: wiring, operational performance and function	5.7	Manufacturer's standard, according to application	None	
Short-circuit withstand capability	**6**			
Prospective short-circuit current at supply terminals I_{cp} (kA)	6.2	Determined by the electrical system	None	
Prospective short-circuit current in the neutral	6.3	Max. 60 % of phase values	None	
Prospective short-circuit current in the protective circuit	6.4	Max. 60 % of phase values	None	
SCPD in the incoming functional unit	6.5	According to local installation conditions	Yes / No	
Co-ordination of short-circuit protective devices including external short-circuit protective device details.	6.6	According to local installation conditions	None	
Data associated with loads likely to contribute to the short-circuit current	6.7	No loads likely to make a significant contribution allowed for	None	

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More User's Utilising SA/SNZ-TR 61439-0

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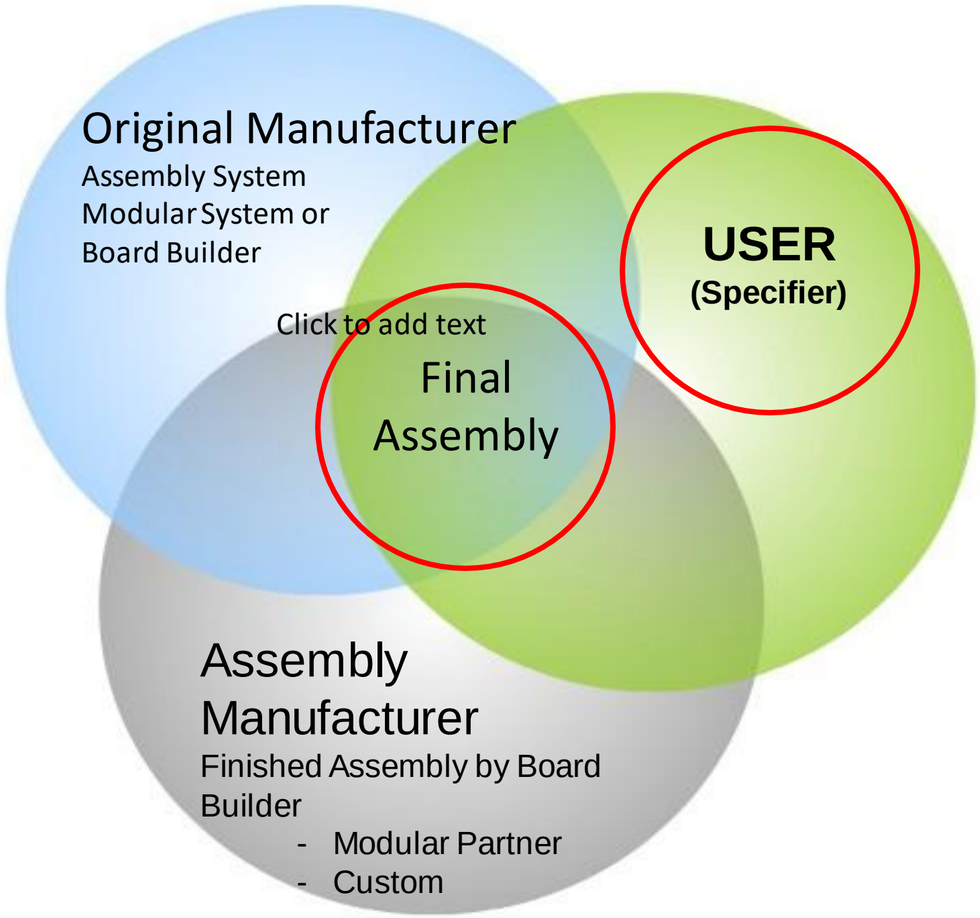
SA/SNZ 61439-0



SA/SNZ 61439-0 assists the End User, Original Manufacturer, Device Manufacturer and Assembly Manufacturer to reach an agreement on the requirements of a switchboard

AS/NZS 3000:2018

K4.3 Design verification

For a list of design verifications to be performed, refer to AS/NZS 61439.1:2016, Annex D. This list shows characteristics to be verified with associated clause numbers. The verification options for compliance are—

(a) testing;

(b) comparison with a tested reference design; and

(c) verification assessment, i.e. confirmation of the correct application of calculations and design rules, including use of appropriate safety margins.

- construction of the enclosure -
- arrangement and wiring of electrical equipment for safety
- electrical properties
- temperature rise

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Context IEC & CUBIC

Design verification
(In accordance with IEC/EN 61439-2)

		Verified by
1	**Strength of material and parts** Tested for corrosion, thermal stability, resistance of insulting materials to normal heat, resistance to abnormal heat and fire due to internal electric effects. Lifting tests performed for assembly sections up to 1750 kg.	KEMA / DEKRA
2	**Degree of protection** The CUBIC modular system has in its standard version been tested at different IP ratings up to IP56.	KEMA / DEKRA
3	**Clearances** Clearances tested for rated impulse withstand voltage Uimp maximum 12 kV to 14 mm, depending on the used components.	KEMA / DEKRA
4	**Creepage distances** Creepage distance tested for rated insulating voltage Ui maximum 1000 V, pollution degree 3, material group II to 16 mm, depending on the used components.	KEMA / DEKRA
5	**Protection against electric shock** Protection against electric shock and integrity of protective circuits: Effective continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit. Measured below the maximum of 0.1 Ω Effectiveness of the assembly for external faults. Tested for I_{cc} 70 kA for 100 ms, 158.4 kA peak	KEMA / DEKRA
6	**Incorporation of switching devices and components** Inspection made and found in accordance with the standard.	KEMA / DEKRA
7	**Internal electric circuits and connections** Inspection made and found in accordance with the standard.	KEMA / DEKRA
8	**Terminals for external conductors** Inspection made and found in accordance with the standard.	KEMA / DEKRA
9	**Dielectric properties** Power-frequency withstand voltage: Tested with maximum 3.5 kV depending on the used components without any disruptive discharge. Impulse withstand voltage: Tested with up to maximum 12 kV for each polarity without any disruptive discharge depending on the used components.	KEMA / DEKRA
10	**Temperature rise limits** Compline ASSEMBLIES up to 6300 A including incoming ACB and outgoing units up to 1600 A. Horizontal main busbars up to 4000 A. Vertical distribution busbars up to 2000 A.	KEMA / DEKRA
11	**Short circuit withstand strength** Incoming unit including main busbars up to Icw 120 kA, 264 kA peak, Icc 120 kA prospective. Neutral tested to 60% of above. Outgoing units, type MD and MPI are tested with different brands of components up to 1600 A for Icc up to 120 kA.	KEMA / DEKRA
12	**EMC** Verification of the EMC is done in conformity with EN/IEC 61439-2, clause 10.12. According to these clauses it is verified that EMC sensitive parts are applied in accordance with manufacturer's recommendation and the guidelines of the IEC 61000-5-2 - Technical Report Type 3.	KEMA / DEKRA
13	**Mechanical operation** Tested for 200 times without impair of the structure.	KEMA / DEKRA

Your Guarantee

The products from CUBIC are tested and certified

Our assertions about CUBIC's products do not stand alone. The products from CUBIC are all tested and/or type approved by several of the most recognized test laboratories, including KEMA, ASTA, UL, DNV, Russian Maritime Register of Shipping and Germanischer Lloyd. KEMA and UL take current spot tests from CUBIC's production of the modular system.

In addition, the quality system with CUBIC Modulsystem A/S has been certified according to ISO 9001. The quality system is currently checked by the Danish Standards Association.

CUBIC

national electrical and communications association

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K4.3 Design Verification

MANUFACTURER INFO

SDoC Identification Number: NHPCPL.003

NHP Electrical Engineering Products (N.Z.) Ltd
118a Carbine Road, Mt Wellington
Auckland 1060
New Zealand
NZ Company No: 931377
Telephone +64 9 276 1967

NHP Electrical Engineering Products Pty Ltd
43-67 River Street, Richmond
Victoria 3121
Australia
A.B.N. 84 004 304 812
Telephone +61 3429 2999
www.n

PRODUCT PRODUCT NO

Product details:

Product model:

CPL24M250G, CPL24M250O
CPL36M250G, CPL36M250O
CPL48M250G, CPL48M250O
CPL60M250G, CPL60M250O
CPL72M250G, CPL72M250O
CPL84M250G, CPL84M250O
CPL96M250G, CPL96M250O

TECHNICAL RATINGS

Description/Ratings:

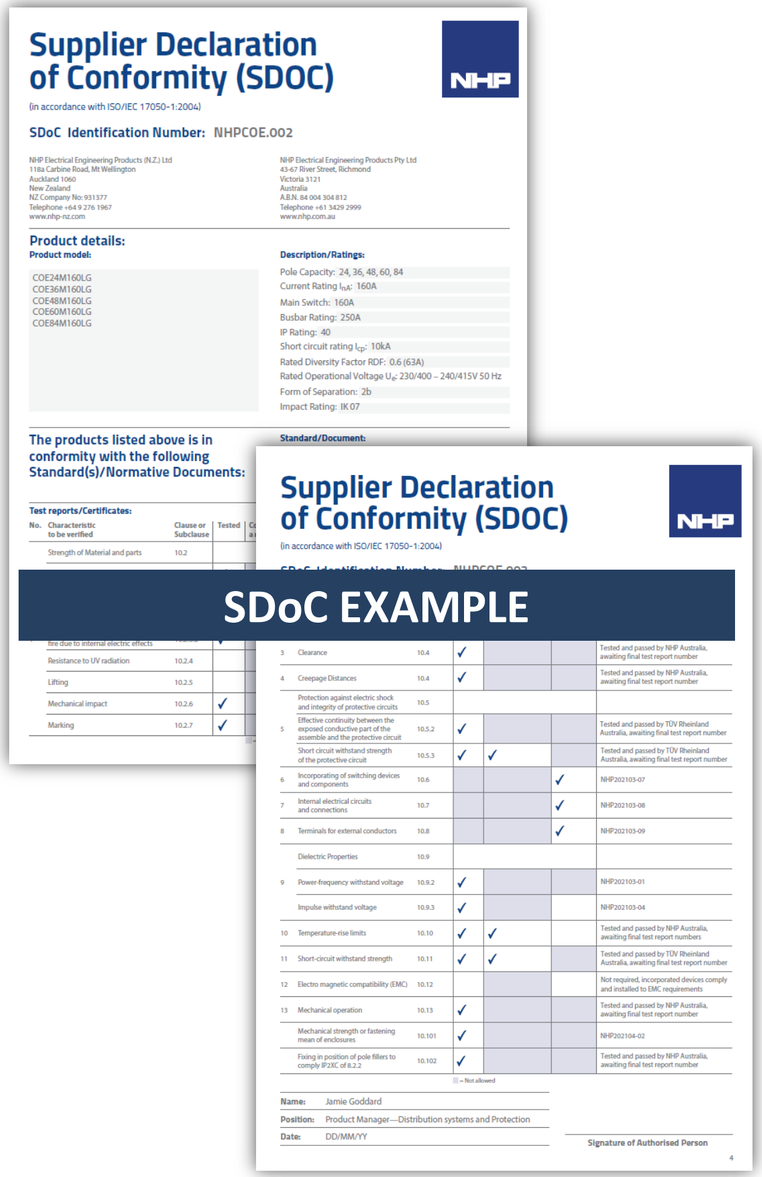
Pole Capacity: 24, 36, 48, 60, 72, 84, 96
Current Rating I_{nA}: 250A
Main Switch: 250A
Busbar Rating: 250A
IP Rating: 42 (52 with kit)
Short circuit rating I_{cw}: 6.5kA 1s (for higher ratings refer to NHP)
Rated Diversity Factor RDF: 0.6 (63A)
Rated Operational Voltage U_e: 230/400 – 240/415V 50 Hz
Form of Separation: 2b

COMPLIANCE SECTION

The products listed above is in conformity with the following Standard(s)/Normative Documents:

Standard/Document:

- AS/NZS: 61439.1:2016, Annex D Table D.1 List of design verification to be performed
- AS/NZS: 61439.2:2016, CL10 Design verification
- AS/NZS: 61439.3:2016, CL10 Design verification (Product is marked AS/NZS 61439.3)



Supplier Declaration of Conformity (SDOC)

(in accordance with ISO/IEC 17050-1:2004)

SDoC Identification Number: NHPCOE.002

NHP Electrical Engineering Products (N.Z.) Ltd
118a Carbine Road, Mt Wellington
Auckland 1060
New Zealand
NZ Company No: 931377
Telephone +64 9 276 1967
www.nhp-nz.com

NHP Electrical Engineering Products Pty Ltd
43-67 River Street, Richmond
Victoria 3121
Australia
A.B.N. 84 004 304 812
Telephone +61 3429 2999
www.nhp.com.au

Product details:

Product model:

COE24M160LG
COE36M160LG
COE48M160LG
COE60M160LG
COE84M160LG

Description/Ratings:

Pole Capacity: 24, 36, 48, 60, 84
Current Rating I_{nA}: 160A
Main Switch: 160A
Busbar Rating: 250A
IP Rating: 40
Short circuit rating I_{cp}: 10kA
Rated Diversity Factor RDF: 0.6 (63A)
Rated Operational Voltage U_e: 230/400 – 240/415V 50 Hz
Form of Separation: 2b
Impact Rating: IK 07

The products listed above is in conformity with the following Standard(s)/Normative Documents:

Standard/Document:

Test reports/Certificates:

No.	Characteristic to be verified	Clause or Subclause	Tested
	Strength of Material and parts	10.2	
	fire due to internal electric effects		✓
	Resistance to UV radiation	10.2.4	
	Lifting	10.2.5	
	Mechanical impact	10.2.6	✓
	Marking	10.2.7	✓

Supplier Declaration of Conformity (SDOC)

(in accordance with ISO/IEC 17050-1:2004)

3	Clearance	10.4	✓			Tested and passed by NHP Australia, awaiting final test report number
4	Creepage Distances	10.4	✓			Tested and passed by NHP Australia, awaiting final test report number
	Protection against electric shock and integrity of protective circuits	10.5				
5	Effective continuity between the exposed conductive part of the assemble and the protective circuit	10.5.2	✓			Tested and passed by TÜV Rheinland Australia, awaiting final test report number
	Short circuit withstand strength of the protective circuit	10.5.3	✓	✓		Tested and passed by TÜV Rheinland Australia, awaiting final test report number
6	Incorporating of switching devices and components	10.6			✓	NHP202103-07
7	Internal electrical circuits and connections	10.7			✓	NHP202103-08
8	Terminals for external conductors	10.8			✓	NHP202103-09
	Dielectric Properties	10.9				
9	Power-frequency withstand voltage	10.9.2	✓			NHP202103-01
	Impulse withstand voltage	10.9.3	✓			NHP202103-04
10	Temperature-rise limits	10.10	✓	✓		Tested and passed by NHP Australia, awaiting final test report numbers
11	Short-circuit withstand strength	10.11	✓	✓		Tested and passed by TÜV Rheinland Australia, awaiting final test report number
12	Electro magnetic compatibility (EMC)	10.12				Not required, incorporated devices comply and installed to EMC requirements
13	Mechanical operation	10.13	✓			Tested and passed by NHP Australia, awaiting final test report number
	Mechanical strength or fastening mean of enclosures	10.101	✓			NHP202104-02
	Fixing in position of pole fillers to comply IP2XC of 8.2.2	10.102	✓			Tested and passed by NHP Australia, awaiting final test report number

– Not allowed

Name: Jamie Goddard
Position: Product Manager—Distribution systems and Protection
Date: DD/MM/YY

Signature of Authorised Person

4

SDoC EXAMPLE

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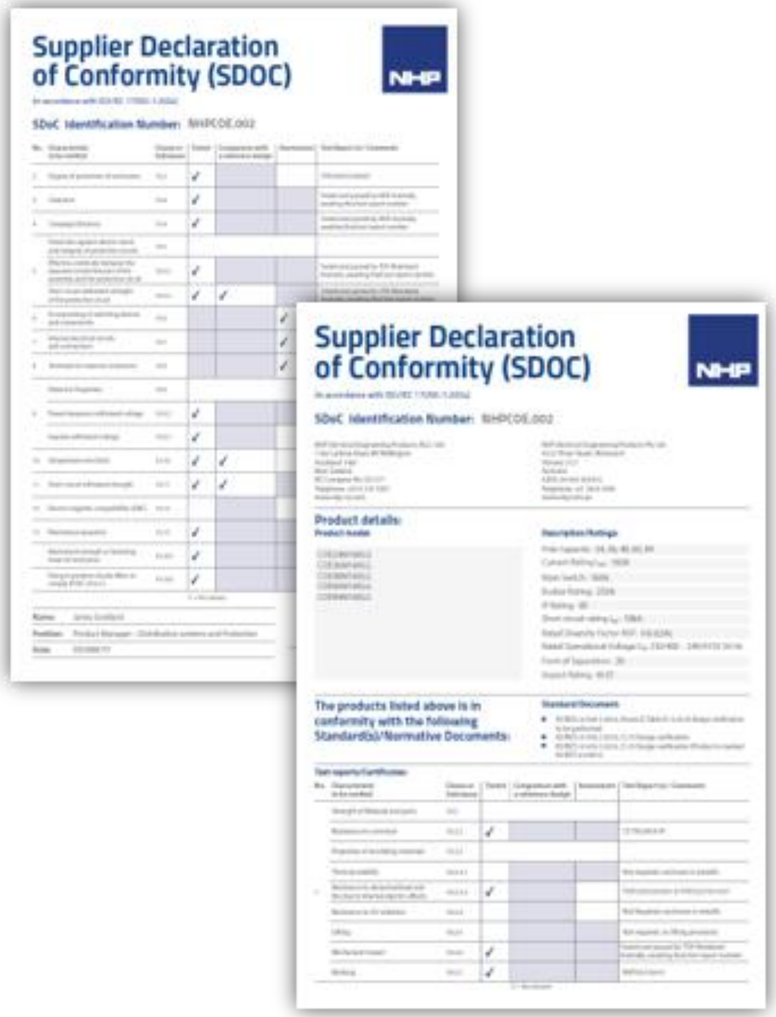
IP Rating: 42 (52 with kit)
Short circuit rating I_{cw}: 6.5kA 1s (for higher ratings refer to NHP)
Rated Diversity Factor RDF: 0.6 (63A)
Rated Operational Voltage U_e: 230/400 – 240/415V 50 Hz
Form of Separation: 2b
Impact Rating: IK 10



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Standard/Document:

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- AS/NZS: 61439.2:2016, CL10 Design verification
- AS/NZS: 61439.3:2016, CL10 Design verification (Product is marked AS/NZS 61439.3)

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K4.3 Design Verification

Test reports/Certificates:

No.	Characteristic to be verified	Clause or Subclause	Tested	Comparison with a reference design	Assessment	Test Report (s) / Comments
10	Temperature-rise limits	10.10	✓			NHP201908-01
11	Short-circuit withstand strength	10.11	✓	✓		TUV AU215JJ8 001 & TUV AU210NHE001 & TUV AU210RIA001 & TUV AU21CWIR001 & TUV AU211OT0001 & TUV AU21DMNT001 &
12	Electro magnetic compatibility (EMC)	10.12				Not required, incorporated devices comply and installed to EMC requirements
13	Mechanical operation	10.13	✓			NHP202105-06
	Mechanical strength or fastening mean of enclosures	10.101	✓			NHP202104-02
	Fixing in position of pole fillers to comply IP2XC of 8.2.2	10.102	✓			NHP202104-03

= Not allowed

TEST REPORTS/CERFIFICATIONS

Name: Jamie Goddard

Position: Product Manager—Distribution systems and Protection

Date: 24/05/2021

Signature of Authorised Person

SIGNED DOCUMENTATION

Supplier Declaration of Conformity (SDOC)

(in accordance with ISO/IEC 17050-1:2004)

SDoC Identification Number: NHPCOE.002

NHP Electrical Engineering Products (N.Z.) Ltd
118a Carbine Road, Mt Wellington
Auckland 1060
New Zealand
NZ Company No: 931377
Telephone +64 9 276 1967
www.nhp-nz.com

NHP Electrical Engineering Products Pty Ltd
43-67 River Street, Richmond
Victoria 3121
Australia
A.B.N. 84 004 304 812
Telephone +61 3429 2999
www.nhp.com.au

Product details:

Product model:

COE24M160LG
COE36M160LG
COE48M160LG
COE60M160LG
COE84M160LG

Description/Ratings:

Pole Capacity: 24, 36, 48, 60, 84
Current Rating I_{cu}: 160A
Main Switch: 160A
Busbar Rating: 250A

SDoC EXAMPLE

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K4.3 Design Verification

Test reports/Certificates:

No.	Characteristic to be verified	Clause or Subclause	Tested	Comparison with a reference design	Assessment	Test Report (s) / Comments
10	Temperature-rise limits	10.10	✓			NHP201908-01
11	Short-circuit withstand strength	10.11	✓	✓		TUV AU21S3J6 001 & TUV AU210NHE001 & TUV AU210RA001 & TUV AU21CWIR001 & TUV AU211OT0001 & TUV AU21OMNT001 & TUV AU21RIS6001 & TUV AU21YGYD00 & TUV AU21ZK4Q001
12	Electro magnetic compatibility (EMC)	10.12				Not required, incorporated devices comply and installed to EMC requirements
13	Mechanical operation	10.13	✓			NHP202105-06
	Mechanical strength or fastening mean of enclosures	10.101	✓			NHP202104-02
	Fixing in position of pole fillers to comply IP2XC of 8.2.2	10.102	✓			NHP202104-03

= Not allowed

Name: Jamie Goddard

Position: Product Manager—Distribution systems and Protection

Date: 24/05/2021

Jamie Goddard

Signature of Authorised Person

national electrical and communications association

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APPENDIX K

SWITCHBOARD REQUIREMENT SUMMARY

(Informative)

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K8 MARKING

K9 OTHER RELEVANT CHARACTERISTICS TO BE DECLARED BY THE ASSEMBLY MANUFACTURER

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AS/NZS 3000:2018

K6.8 Current rating by testing and temperature limits

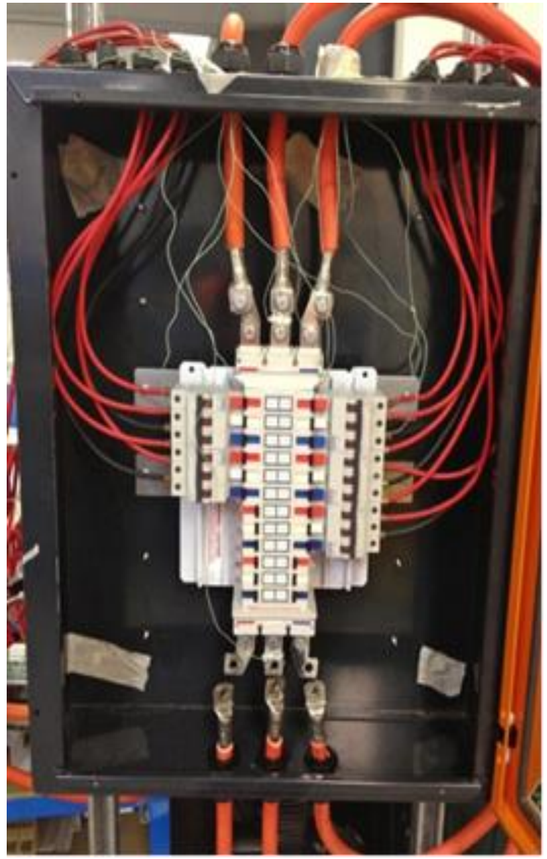
Clause 10.10 and Table 6 of AS/NZS 61439.1:2016 provide current-carrying capacity requirements that are to be satisfied by rated current of the switchboard ASSEMBLY (I_{nA}), rated current of outgoing circuits (I_{nc}), and maximum demand after diversity factor (RDF). These requirements may meet the requirements of this Standard.

This test from AS/NZS 61439.1 establishes the following:

(a) That I_{nA} is the rated current of the ASSEMBLY and the current that the busbar is capable of distributing, for example, I_{nA} = 1600 A.

(b) That I_{nc} is the maximum rated current of an individual circuit, for example, I_{nc} = 534 A for a MCCB marked I_n 630 A.

No.	Characteristic to be verified	Clause or Subclause	Tested	Comparison with a reference design	Assessment	Test Report (s) / Comments
10	Temperature-rise limits	10.10	✓	✓		NHP202105-11 & NHP202105-02



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K7 SHORT-CIRCUIT WITHSTAND STRENGTH

No.	Characteristic to be verified	Clause or Subclause	Tested	Comparison with a reference design	Assessment	Test Report (s) / Comments
11	Short-circuit withstand strength	10.11	✓	✓		TUV AU21C7KJ001 & TUV AU214UDO001

I_{cp} Rating: Incoming Device is Protective
Unconditional

I_{cw} Rating: Incoming Device not Protective
Unconditional

I_{cc} Rating: Any Incoming Device
Conditional

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K8 MARKING

Look out for a AS/NZS 61439 Compliance Label

Required markings AS/NZS 61439.2 (items 1-4)

1) Manufactures name
2) Identification number
3) Means of identifying date of manufacturer
4) 61439 standard that it is built to, part 2 or 3

Required markings AS/NZS 61439.3 (items 1-6)

5) Rated current of DBO I_{nA}
6) IP rating if greater than IP 2XC

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K9 OTHER RELEVANT CHARACTERISTICS TO BE DECLARED BY THE ASSEMBLY MANUFACTURER

The following characteristics apply to PSC and DBO (for a full listing, see Clause 5 of AS/NZS 61439.1:2016):

(a) U_e is the rated operational voltage, for example, 240/415 V.

(b) I_{nA} is the rated current of the ASSEMBLY, for example, 1600 A.

(c) I_{nc} is the rated current of a circuit, for example, I_{nc} of 534 A for a device marked I_n 630 A.

(d) RDF is the rated diversity factor, for example, RDF 0.9 × three circuits.

NOTE: In the absence of an agreement, the values of assumed loading of the outgoing circuits may be based on Table 101 of AS/NZS 61439.1:2016.

(e) I_{cw} is the rated short time withstand current, for example, 25 kA for 0.1 s.

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K9 OTHER RELEVANT CHARACTERISTICS TO BE DECLARED BY THE ASSEMBLY MANUFACTURER

Description/Ratings:

Pole Capacity: 24, 36, 48, 60, 72, 84, 96

Current Rating I_{nA}: 250A

Main Switch: 250A

Busbar Rating: 250A

IP Rating: 42 (52 with kit)

Short circuit rating I_{CW}: 6.5kA 1s (for higher ratings refer to NHP)

Rated Diversity Factor RDF: 0.6 (63A)

Rated Operational Voltage U_e: 230/400 – 240/415V 50 Hz

Form of Separation: 2b

Impact Rating: IK 10

Standard/Document:

- AS/NZS: 61439.1:2016, Annex D Table D.1 List of design verification to be performed
- AS/NZS: 61439.2:2016, CL10 Design verification
- AS/NZS: 61439.3:2016, CL10 Design verification (Product is marked AS/NZS 61439.3)

Supplier Declaration of Conformity (SDOC)

Supplier Declaration of Conformity (SDOC)

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AS/NZS 3000:2018

APPENDIX K

SWITCHBOARD REQUIREMENT SUMMARY

(Informative)

TABLE OF CONTENTS

K1 GENERAL

K2 SWITCHBOARD STANDARDS

K3 APPLICATION OF THE AS/NZS 61439 SERIES

K4 GUIDELINES FOR THE ASSESSMENT OF SWITCHBOARDS

K5 CORRESPONDING PROVISIONS OF THIS STANDARD AND THE AS/NZS 61439 SERIES

K6 PARTICULAR CLAUSES RELEVANT TO THIS STANDARD

K7 SHORT-CIRCUIT WITHSTAND STRENGTH

K8 MARKING

K9 OTHER RELEVANT CHARACTERISTICS TO BE DECLARED BY THE ASSEMBLY MANUFACTURER

K10 DEVICE SUBSTITUTION

K11 REPAIRS TO EXISTING SWITCHBOARDS

K12 ROUTINE VERIFICATION BY THE SWITCHBOARD MANUFACTURER

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K11 REPAIRS TO EXISTING SWITCHBOARDS

Where repairs are needed to an existing switchboard and the original devices are no longer available, and equivalent devices suitable for the installation conditions are fitted, then the requirements for repairs in this Standard apply.

In doing this, the principles of device substitution may be taken into account as per Paragraph K10.

1.4.101 Repair

* **The work to restore the electrical installation to safe and sound working condition after deterioration or damage has occurred.**

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AS/NZS 3000:2018

K12 ROUTINE VERIFICATION BY THE SWITCHBOARD MANUFACTURER

Routine verification is intended to detect faults in materials and workmanship and to ascertain proper functioning of the manufactured ASSEMBLY. It is made on every ASSEMBLY during and/or after manufacture.

Where appropriate, routine verification confirms that design verification is available.

Routine verification does not need to be carried out on devices and self-contained components incorporated in the ASSEMBLY when they comply with the relevant standards, and have been selected in accordance with Clause 8.5.3 of this Standard, and are installed in accordance with the instructions of the device manufacturer.

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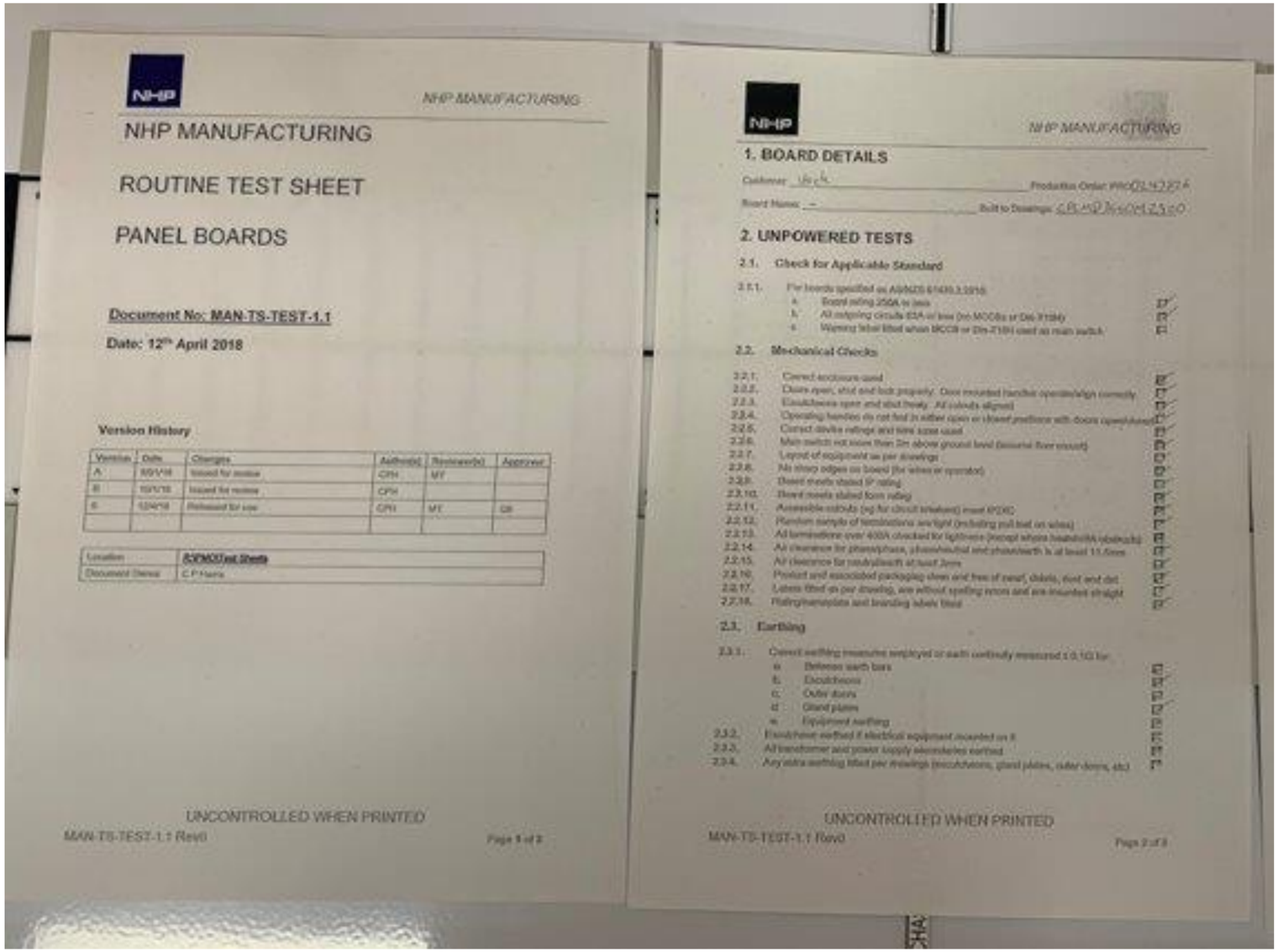

NHP MANUFACTURING

NHP MANUFACTURING

ROUTINE TEST SHEET

PANEL BOARDS

Document No: MAN-TS-TEST-1.1

Date: 12th April 2018

Version History

Version	Date	Changes	Author(s)	Reviewer(s)	Approver
A	05/1/18	Issued for review	CPH	MT	
B	10/1/18	Issued for review	CPH		
C	12/4/18	Released for use	CPH	MT	GB

Location	S:\DMS\Test Sheets
Document Owner	C P Hans

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MAN-TS-TEST-1.1 Rev0

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NHP MANUFACTURING

1. BOARD DETAILS

Customer: Uc c h

Production Order: PRO0142274

Board Name: –

Built to Drawings: CB-MP-Rev001Z3.c0

2. UNPOWERED TESTS

2.1. Check for Applicable Standard

2.1.1. For boards specified as AS/NZS 61439.3:2016

a. Board rating 250A or less

b. All outgoing circuits 63A or less (no MCCBs or Din-Z15H)

c. Warning label fitted when MCCB or Din-Z15H used as main switch

2.2. Mechanical Checks

2.2.1. Correct enclosure used

2.2.2. Doors open, shut and lock properly. Door mounted handles operate/align correctly

2.2.3. Escutcheons open and shut freely. All cutouts aligned

2.2.4. Operating handles do not foul in either open or closed positions with doors open/closed

2.2.5. Correct device ratings and wire sizes used

2.2.6. Main switch not more than 2m above ground level (assume floor mount)

2.2.7. Layout of equipment as per drawings

2.2.8. No sharp edges on board (for wires or operator)

2.2.9. Board meets stated IP rating

2.2.10. Board meets stated form rating

2.2.11. Accessible cutouts (eg for circuit breakers) meet IP2XC

2.2.12. Random sample of terminations are tight (including pull test on wires)

2.2.13. All terminations over 400A checked for tightness (except where busbar/MA cable lugs)

2.2.14. Air clearance for phase/phase, phase/neutral and phase/earth is at least 11.5mm

2.2.15. Air clearance for neutral/earth at least 3mm

2.2.16. Product and associated packaging clean and free of swarf, debris, dust and dirt

2.2.17. Labels fitted as per drawing, are without spelling errors and are mounted straight

2.2.18. Rating/nameplate and branding labels fitted

2.3. Earthing

2.3.1. Correct earthing measures employed or each continuity measured ≤ 0.1Ω for:

a. Between earth bars

b. Escutcheons

c. Outer doors

d. Gland plates

e. Equipment earthing

2.3.2. Escutcheon earthed if electrical equipment mounted on it

2.3.3. All transformer and power supply secondaries earthed

2.3.4. Any extra earthing fitted per drawings (escutcheons, gland plates, outer doors, etc)

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K12 ROUTINE VERIFICATION BY THE SWITCHBOARD MANUFACTURER

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Off the Shelf Switchboards

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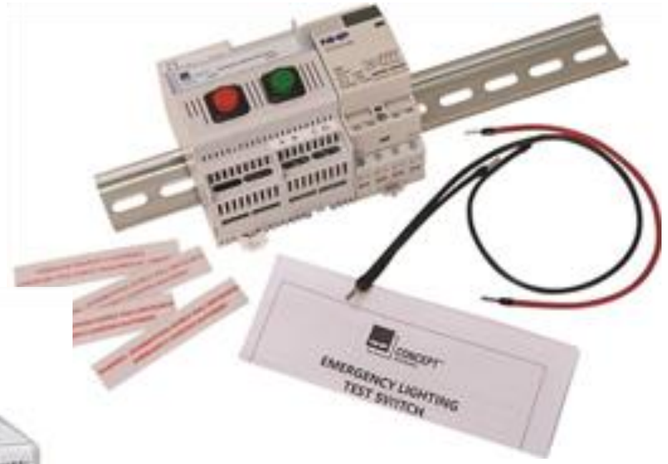
Points to consider!

Stay within the scope of the verification



For catalogue models [1)]

Installing

- NHP MOD6 MCBs and RCBOs or NHP DIN-T MCBs and RCBOs in Concept One Panelboard (COE)
- NHP DIN-T MCBs and RCBOs in Concept Plus (CPL) or Concept Premier (CPR) Panelboard
- Emergency lighting kits on horizontal DIN rail – Models CELAELKxx
- External lighting kits on horizontal DIN rail – Models CELEXTKxx
- Surge protection kit on horizontal DIN rail – Models CELSURGExx
- Safety service mechanical kit on horizontal DIN rail CPL, CPR–CELASSEDx [2)]
- DIN contactors on horizontal DIN rail – Models DTCxxxx [2)]
- Attaching an accessory module beside, above or below Panelboard
- Fitting mullions, E/N kits or gear trays into accessory modules.

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Panelboard & AS/NZ61439 Brochure

- Great reference brochure
- Background info. on AS/NZS61439
- Process required for NHP Concept PB
- Supplier declaration of Compliance

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AS/NZS 61439 - Quick facts

What is AS/NZS 61439?

AS/NZS 61439 is a series of standards for low voltage switchgear and control gear assemblies that is replacing the AS/NZS 3439 series. It is a copy of International Electrotechnical Commission (IEC) 61439 series with some changes specific to Australia and New Zealand. There are 8 parts to the series.

STANDARDS NEW ZEALAND STANDARDS Australia

Low-voltage switchgear and controlgear assemblies

Part 0	Guide to specifying assemblies
Part 1	General rules
Part 2	Power switchgear and controlgear assemblies
Part 3	Distribution boards intended to be operated by ordinary persons (DBO)
Part 4	Assemblies for construction sites
Part 5	Assemblies for power distribution in public networks
Part 6	Busbar trunking systems
Part 7	Marina, camping, market and charging

Transition Period

Either 3439 or 61439 was allowed during the transition period of 5 years which expired in May 2021.

After May 2021

- 3439 is superseded by 61439

For upgrades to existing switchboards built to previous standards:

- Replacing like for like electrical components is allowable
- Any alterations to the switchboard itself may require that section to be upgraded to the new standard, which may require replacing with a new switchboard

Why the Change?

The objective of the 61439 series of standards is to harmonise as far as practicable all rules and requirements of a general nature applicable to low-voltage switchgear and controlgear assemblies (ASSEMBLIES), in order to obtain uniformity of requirements and verification for ASSEMBLIES, and avoid the need for verification to other standards *(as referenced 61439.0 introduction)*.

AS/NZS 61439 is more thorough and detailed, clarifying the specific requirements for testing and verification removing some grey areas of interpretation found in AS/NZS 3439.

The new standard aims to clarify legal and financial responsibilities in specification, testing, design and construction between the user and the assembly manufacturer.

What is the process required for NHP Concept Panelboards?

NHP have tested an extensive number of onerous configurations which allows a large range of combinations to be used, providing verified ratings. This allows NHP to:

- Declare ratings for standard catalogued models
- Provide ratings for engineered to order assemblies that are to be agreed between NHP and the end user

Information in NHP documentation may take the place of some agreements, as an example for performance of co-ordination of protective devices. This documentation is used in case of no user specification.

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Assembly Verification

The requirements in the AS/NZS 61439 series include verification of the assembly. Verification covers two main aspects:

- **Design Verification** – this ensures that the design meets the relevant requirements of the standard.
- **Routine Verification** – this ensures that the assembly has been constructed correctly and checked before despatch. (e.g. checking electrical connections)

Design Verification

AS/NZS 61439.2 Cl10 (see also AS/NZS 61439.1 Annex D table D.1) and AS/NZS 61439.3 Cl10 provide characteristics that are to be verified. There are 3 methods available:

Verification by Test	The Distribution Panelboard is designed and assembled in the same configuration as the test assembly.
Verification by Comparison	The Distribution Panelboard is designed in a similar but different configuration to a tested configuration, where the (tested) reference designs are more onerous than the Distribution Panelboard being verified.
Verification by Assessment	This requires the correct application of design rules and calculations, including use of appropriate safety margins.

Points to consider!

- NHP Concept Panelboards are designed and verified to meet AS/NZS 61439
- If a user modifies the Panelboard outside the scope of the NHP design then they are deemed to be the original manufacturer and are responsible for compliance to AS/NZS 61439
- If a user accepts a Panelboard without suitable verification they may be putting their facility and persons at risk, and may be liable for any issues that arise
- Test certification to AS/NZS 3439 may be used for verification purposes to AS/NZS 61439 but only if the test methods required are the same (For example certain short circuit tests)

What modifications can I do that are within scope?

For catalogue models [1]

Installing

- NHP MOD6 MCBs and RCBOs or NHP DIN-T MCBs and RCBOs in Concept One Panelboard (COE)
- NHP DIN-T MCBs and RCBOs in Concept Plus (CPL) or Concept Premier (CPR) Panelboard
- Emergency lighting kits on horizontal DIN rail – Models CELAELKxx
- External lighting kits on horizontal DIN rail – Models CELEXTKxx
- Surge protection kit on horizontal DIN rail – Models CELSURGExx
- Safety service mechanical kit on horizontal DIN rail CPL, CPR–CELASSEDx [2]
- DIN contactors on horizontal DIN rail – Models DTCxxxx [2]
- Attaching an accessory module beside, above or below Panelboard
- Fitting mullions, E/N kits or gear trays into accessory modules.
- Use DINTT100A to feed a DTCB10H 80A or 100A 3P MCB on horizontal DIN rail [2]
- Rainhoods and floor mounting plinths

Installing or interchanging

- Main switch Isolator- Models CEL3160, CEL3250, CEL3160M, CEL3250M
- Main switch MCCB (up to 200A)- Models S160NJ, S250NJ, E250, A250, P250
- Door handles CL001, 92268, Pad lockable, PWD lock ETC–Models CELHDxxx
- Gland-plates or Gland-plate gasket

For more options or information refer to NHP.

For engineered to order models upon request

Note
1) Not applicable for engineered to order models contact NHP for more information
2) Refer to NHP for more information on maximum quantities/ratings

AS/NZS 64139 – Which part applies to my Concept Panelboard?

NHP catalogued Concept Panelboards have been verified to both AS/NZS 61439.2 and AS/NZS 61439.3. The Concept Panelboards are marked to AS/NZS 61439.3 unless it falls outside the scope of this standard.

AS/NZS 61439.3 Distribution boards are intended to be operated by ordinary persons (DBO) so have additional requirements over and above of AS/NZS 61439.2.

AS/NZS 61439.3 Distribution Panelboards

- Intended to be operated by ordinary persons
- Current rating not exceeding 250A (I_{nA} 250A)
- An outgoing circuit not exceeding 125A (I_{nc} 125A)
- Outgoing protective circuits must be suitable to be operated by ordinary persons (eg MCBs to AS/NZS 60898)
- No form of separation (if needed must be to part 2)

AS/NZS 61439.2 Distribution Panelboards

- Any current rating. NHP's Concept Range is most commonly available in 160A, 250A, 400A or 630A
- No current limit on an outgoing circuit
- Specified to have a form of separation

What to look for on the Panelboard

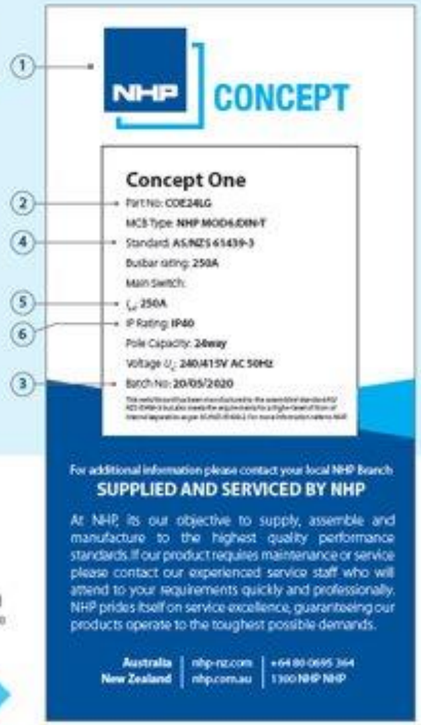
The assembly should be marked in a durable manner (not simple paper label) and be visible and legible when installed and in operation.

Required markings AS/NZS 61439.2 (Items 1-4)

1) Manufactures name
2) Identification number
3) Means of identifying date of manufacturer
4) 61439 standard that it is built to, part 2 or 3

Required markings AS/NZS 61439.3 (Items 1-6)

5) Rated current of DBO I_{nA}
6) IP rating if greater than IP 20C



Example of a Declaration of Compliance

When design verification is requested it can be presented as a supplier declaration of conformity as per the example on the following page.

Declaration of Compliance on next page

Q&A

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communications
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