



NHP CUBIC Switchboard solutions

Simplify the future

ENCLOSURES & CLIMATE CONTROL



CUBIC



NHP NATIONAL MANUFACTURING AND DISTRIBUTION CENTRE

NHP Electrical Engineering Products (NHP) specialises in motor control, power distribution and automation systems.

NHP offers the Australasian market the complete industrial electrical and automation solutions package. As authorised distributors for Rockwell Automation and their Allen-Bradley® products in our designated areas of Australia and throughout all of New Zealand, NHP is partnered with the leading global provider of industrial automation solutions and switchgear components.

An Australian owned company, NHP is committed to serving the Australasian industry with quality products and customer support. This is achieved through an 900+ strong team which is distributed across 25 branches and 24 regional locations throughout Australia and New Zealand.

While NHP stock an impressive 70,000+ line items, we are much more than a component supplier. NHP source the highest quality products from leading global suppliers, and customise these into solutions for the local Australian and New Zealand markets, providing a complete fit to purpose systems and solutions service.

At NHP we have a strong customer focus and we look to provide the right product and product solutions for our customers' requirements and applications, all at a competitive price. We value and care for our customers and support them by offering personalised service and assistance to meet their every need and demand. Our customers can have 100% confidence in our ability to support them when, where and how it is needed.

Put simply, NHP is 'easy to do business with'.

NHP CUBIC switchboard systems

NHP can now offer its leading range of switchgear, motor control and automation products together with the CUBIC modular switchboard system to provide industry with a solution to the wide and varying requirements within Australasia.

CUBIC represents the very best in main switchboard and motor control centre design.

CUBIC's unique assembly method allows for speedy and fully modular construction.

CUBIC offers a fully type tested modular system for the New Zealand, Australian and international markets.

NHP CUBIC

FULLY TYPE TESTED UP TO 7000 A AT 120 kA

TECHNICAL SUPPORT FROM NHP

RATED OPERATING VOLTAGE 1000 V AC as STANDARD

RATED INSULATED VOLTAGE 1000 V AC as STANDARD

FAST AND EASY TO ASSEMBLE

QUICK DELIVERY OF COMPONENTS

SUITABLE FOR MAIN SWITCHBOARD, DISTRIBUTION BOARD, MOTOR CONTROL CENTRE, POWER FACTOR CORRECTION AND CONTROL PANEL USE

CUBIC CAN BE ASSEMBLED ON-SITE IN DIFFICULT TO ACCESS LOCATIONS

WITHDRAWABLE, PLUG-IN AND FIXED CELLS

DESIGNED TO MEET STRICT SAFETY DEMANDS

CUBIC IS SUPPORTED BY CUBIC GALAXY SOFTWARE

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CUBIC features

Applications

- MSB, DB MCC, PF and control panels
- MCCs: up to 27 starters per tier

Switchboard design

- Fully modular design
- Enclosure and type tested busbar system
- Fast and easy to assemble - smart design

Segregation

Form 1 up to Form 4 b according to AS/NZS 3439-1, 2002

Construction

- Fixed, plug-in and withdrawable functional units
- Fully withdrawable cells have a three position racking system
- Wide range of latching and locking devices
- Coating: Epoxy-polyester powder, CUBIC RAL 7035 light grey or RAL 2000 orange
- Full range of CUBIC assembly tools available

Ingress of liquids and solids

- IP 43 standard, IP 54 optional
- Plastic or metal gland plates up to IP 54

Busbar system

- Main bars up to 7000 A at 120 kA
- Clamped busbar connections minimising drilling requirements

Type tested design

- Arc fault containment of ingoing and outgoing units to AS/NZS 3439.1-2002, Annex ZD
- Type tested busbar systems
- Type tested cells for motor starter co-ordinated applications

Type tested flexible busbar

- Cuflex flexible busbar

Design tools

- Comprehensive applications software available for switchboard design
- Full engineering documentation available

Who builds CUBIC

- CUBIC is built by accredited and trained switchboard builders

CUBIC

Getting started with CUBIC

NHP can offer a comprehensive switchboard and motor control centre solution

- Circuit breaker products - Terasaki, Sprecher + Schuh
- Transfer switches - Terasaki, Socomec
- Motor control - Sprecher + Schuh, Ghisalba, Microelettrica, Santerno, Aucom
- Isolators and load break switches - Socomec, Sprecher + Schuh, Katko
- Fusegear and bases - NHP
- Time clocks and metering - IME, Grasslin
- Timers - Sprecher + Schuh, Carlo Gavazzi
- Pushbuttons - Sprecher + Schuh, Austrol
- Cam switches - Sprecher + Schuh, Elektra
- Terminals - Sprecher + Schuh, Wago
- Monitoring relays - Carlo Gavazzi
- Relays - Finder, Sprecher + Schuh, Carlo Gavazzi
- Motor protection - Sprecher + Schuh, NHP AmpCom
- Arc detection relays - Selco
- Proximity sensors - Carlo Gavazzi
- Integrated control and visualisation
- PLCs
- Graphic display panels
- SCADA
- Cable duct - Iboco
- Flexible busbar - CUBIC , Erico
- Climate control - Stego, Cosmotec
- Power factor correction - Beluk, Electronicon
- Surge protection devices - NHP
- Stack lights - Sirena
- Sirens - Klaxon
- Beacons - Moflash



CUBIC



Specifications

GENERAL

CUBIC applications	Main switchboard, distribution boards, motor control centres, power factor correction and control panels
Standards built to	AS/NZS 3439.1: 2002 IEC 60439-1: 2004

ELECTRICAL

Main horizontal and vertical busbar ratings	Up to 7000 A
Poles	3 or 4 pole
Rated short time withstand current (I _{cw})	Up to 120 kA for 1 second
Rated peak withstand current (I _{pk})	Up to 264 kA
Voltages	Rated insulation voltage: 1000 V AC as standard Rated operating voltage: 1000 V AC as standard
Rated impulse withstand voltage	8 kV
Rated Frequency	50 - 60 Hz
Arc fault containment of outgoing cells	AS/NZS 3439.1: 2002, Annex ZD

DESIGN TOOLS

CUBIC Galaxy software includes:	Spica - Switchboard design Alcor - Commercial and pricing aspects Proxima - Power loss and temperature calculations
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MECHANICAL

Construction of switchboard	Panel type 100 % modular designs
Degree of protection	IP 43, IP 54 optional
Segregation	Form 1 up to Form 4 b
Mounting types	Fixed, plug-in or fully withdrawable
Sheet steel construction	Outside cover 1.25 mm, doors 1.5 mm and the base 3 mm steel Mounting plates are of 2.5 mm galvanised steel
Colours/finish	Exterior: Grey RAL 7035 Orange RAL 2000 Interior: Gear trays - <i>galvanised</i> , dividing panels - <i>powder coated grey</i>
70 micron lacquered powder coat. Other colours available on request.	

DIMENSIONS

All CUBIC width, height and depth dimensions are measured in multiples of 192 mm which are called "modules". Multiples of modules are indicated by the designations: 1M, 2M, 3M... 12M etc. For example, individual tiers for motor control applications can be up to three modules wide.

Panel construction type (with frame + covers)	Maximum modules per plinth: W: 10M, H: 12M, D: 4M There are no limits on multiples of the above being used for Width, Height, Depth when using panel types.
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CUBIC



CUBIC



OPERATIONAL SAFETY

The CUBIC switchboard system is characterised by a high degree of operational dependability and safety.

NHP CUBIC safety features

TYPE TESTING CERTIFICATION

System is tested to the various standards by the manufacturer.

ACCREDITED SWITCHBOARD BUILDERS

Designed and built by accredited switchboard builders only.
Visit nhp.com.au/cubic for details

CUBIC

Operational safety

The CUBIC switchboard system is characterised by a high degree of operational dependability and safety. The switchboard builder has the option of combining fixed, plug-in and withdrawable units according to their customers requirements.

MD (Multi Drawer), One system - all possibilities

The MD is used worldwide where electrical energy is distributed with the highest possible personal and operation safety; typical within the process industry, mining, navigation, hospitals infrastructure, where even a short interruption of the electricity supply may be crucial to human lives and cause huge operation disadvantages and economic losses.

The MD system provides the possibility to offer versatile and compact solutions, which simultaneously meet the end users demand for competitive products.

MD is designed and constructed in concert with the users, and so the product appears with the optimum combination of user-friendliness, high level of operational safety and economy.

- Possibility of rebuilding while live, subject to site and operational requirements
- Minimum maintenance
- Operationally dependable
- Compact design
- Fewer operational stops

MD is designed with optimum utilisation of the space in the panel and with the possibility of choosing drawers in sizes from 16 A to 630 A.

The MD drawers are prepared for installation of all communication bus systems on the market, including Profibus and future use of Ethernet.

MD drawers are delivered with:

- Main plug, 3 P or 4 P
- Holes for component installation
- Alignment connections
- Interlock
- Fixed or hinged front

Withdrawable

- Full functionality and total safety
- Switchboard down time is eliminated
- Mechanically separated, test and run positions

In the case of withdrawable starters, each individual starter can be supplied with a unique coding system to prevent the risk of it being inadvertently placed into the wrong location. Each withdrawable starter is also provided with a front plate where the pushbuttons, indicating lights and instruments can be fitted. CUBIC Motor Control Centres can be assembled with a type tested busbar system up to 7000 A at 120 kA.



Two stage draw-out to 'Test Position' and 'Disconnect Position'

"For a complete Integrated MCC solution, combine CUBIC Multi-Drawer with NHP AmpCom – Networkable Motor Protection and Energy Management System. Available in Ethernet Modbus/TCP and Profibus-DP. Scan the QR code for more details".





NHP CUBIC accredited switchboard builders

Designed and built by accredited, experienced switchboard builders only.

System Accreditation

End users, consultants and specifiers can be certain that switchboard builders are trained and accredited to assemble CUBIC. This ensures switchboard builders follow best assembly practices and CUBIC guidelines when using the modular system. Builders receive accreditation only after attending extensive training using the CUBIC software and documentation. Accredited switchboard builders are listed on the NHP website nhp.com.au/cubic

Quality

CUBIC provides products of very high quality. All CUBIC products have been tested and/or type approved by several of the most recognised test laboratories in the world including **KEMA, ASTA, UL, Germanischer Lloyds, Russian Maritime Register of Shipping and DNV.**

Quality is CUBIC's main aim. Their quality system has been certified according to DS/ISO 9001. This certification is your guarantee of high quality products from development, to finished goods, administration and service.



NHP switchboard engineers work in conjunction with CUBIC

CUBIC



CUBIC Galaxy

Design software

The electronic software tool: "Galaxy" software is designed for use by switchboard builders. CUBIC Galaxy Software contains a number of important sub programs that greatly increases the usefulness of this software.

PROXIMA

With **PROXIMA** it is possible to calculate and document power loss and temperatures in a switchboard section. With the Proxima program, the user can also ascertain that the components can function satisfactorily in the switchboard environment.

SPICA

SPICA is an application which makes designing switchboards easy. All components in the switchboard are exported into the calculation program Alcor with a complete list of parts. The price is then automatically generated from the drawings list of parts.

ALCOR

ALCOR is a calculation program that makes it possible to make an overview of the commercial aspects of the switchboard.



CUBIC



Type test certificates

The MNS low-voltage switchgear system is subjected to extensive type tests in compliance with the standards in order to ensure the highest possible degree of safety.

The screenshot shows a web browser window with the URL <http://www.nhp-nz.com/cubic/certificates.asp>. The page header features the NHP CUBIC logo and navigation links: Home, Overview, Busbar, Tools & Downloads, Cubic Partners, Training & FAQ's, and Contacts. A sidebar on the left lists 'Tools & downloads', 'Galaxy Software', 'Cubic Manuals', 'Development Packages', and 'Type Test Certificates'. The main content area is titled 'Type Test Certificates' and is divided into two sections: 'Electrical Type Test Certificates' and 'Structural Mechanical Type Test Certificates'. The electrical section includes links for 'Arc Fault', 'Short Circuit Withstand', and 'Temperature Rise'. The structural mechanical section includes links for 'Kema certification for manufacture', 'SP - Vibration - P400870', 'SP-F110470 Degree of protection', and 'TLA218 Vibration Test'. A red circular callout on the right side of the page contains the text: 'TO ACCESS FULL CUBIC CERTIFICATION CLICK ONTO: nhp.com.au/cubic'. The footer of the page includes copyright information for 2008 NHP and links to 'Disclaimer', 'Privacy Policy', 'NHP Australia', 'NHP New Zealand', and 'Print Friendly Page'.

Accredited SBB

A list of NHP CUBIC Accredited Switchboard Builders for Australia and New Zealand is available online at nhp.com.au/cubic/asb_nsw.asp. You will be able to view the contact details and also the level of accreditation associated with each company.



CUBIC

NHP CUBIC education

Applications

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Busbar system

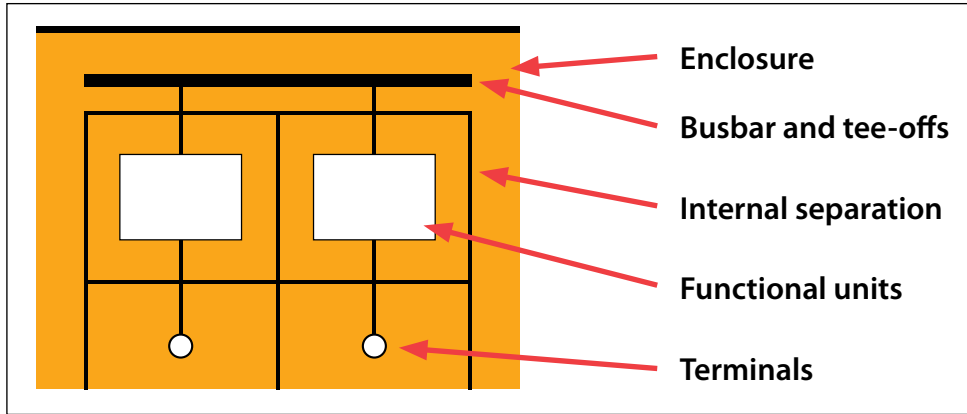
- Main bars up to 7000 A at 120 kA
- Clamped busbar connections minimising drilling requirements

Fault levels

TRANSFORMER KVA	FULL CURRENT (A)	4% IMPEDANCE	4.5% IMPEDANCE	5% IMPEDANCE	6% IMPEDANCE	6.5% IMPEDANCE	7% IMPEDANCE
200	278	7	6.2	5.6	4.6	4.3	4
300	417	10	9.3	8.3	7	6.4	6
400	556	14	12	11	9.3	8.6	7.9
500	696	17	15	14	12	11	9.9
750	1043	26	23	21	17	16	15
1000	1391	35	31	28	23	21	20
1500	2087	52	46	42	35	32	30
2000	2782	70	62	56	46	43	40

Forms of segregation

Definition of symbols



MAIN CRITERIA	FORM
	<p>Form 1 No Internal Separation</p>
	<p>Form 2a Separation of busbars from functional units <i>Terminals not separated from Busbars</i></p>
	<p>Form 2b Terminals not separated from Busbars <i>Terminals separated from Busbars</i></p>
	<p>Form 3a Separation of busbars from functional units Separation of functional units from one another Separation of terminals from functional units <i>Terminals not separated from Busbars</i></p>

MAIN CRITERIA	FORM
	<p>Form 3b Separation of busbars from functional units Separation of functional units from one another Separation of terminals from functional units <i>Terminals separated from Busbars</i></p>
	<p>Form 4a Separation of busbars from functional units and terminals Separation of functional units from one another Separation of term's from functional unit and those of other functional units <i>Terminals in same compartment as associated functional unit</i></p>
	<p>Form 4b Separation of busbars from functional units and terminals Separation of functional units from one another Sep of term's from funct. unit and those of other funct. units <i>Terminals not in same compartment as associated functional unit</i></p>

Degrees of Protection provided by enclosures (IP Rating)

The degree of protection provided by any assembly against contact with live parts, ingress of solid foreign bodies and liquid is indicated by the designation IP... according to IEC 60529 (IEC 60439-1 Paragraph 7.2.1.1).

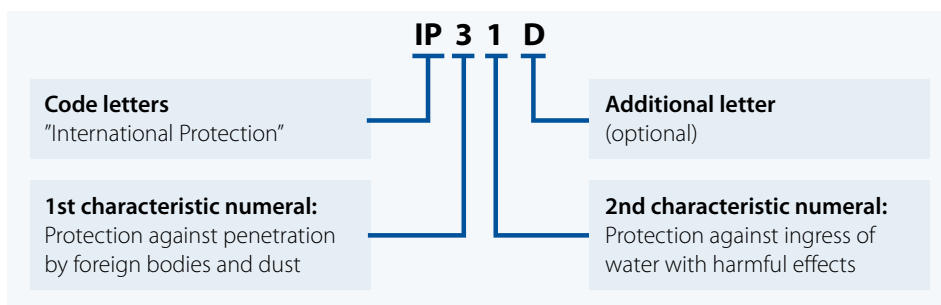
The degree of protection is also a criteria for type tests (IEC 60439-1 paragraph 8.2.7.). It is subject to agreement between the manufacturer and user (IEC 60439-1 Annex E).

Definitions

Degrees of protection provided by enclosures of electrical equipment in accordance with IEC 60529:

1. Protection of persons against access to hazardous parts inside the enclosure;
2. Protection of the equipment inside the enclosure against ingress of solid foreign objects;
3. Protection of the equipment inside the enclosure against harmful effects due to the ingress of water.

Designations for the degrees of protection



Remark

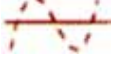




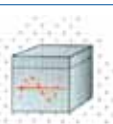

Where a characteristic numeral is not required to be specified, it shall be replaced by the letter "X" ("XX" if both numerals are omitted).

MNS – Available standard degrees of protection

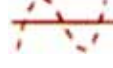




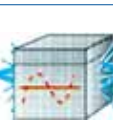

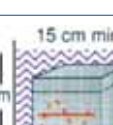
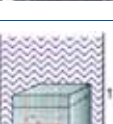
As MNS is designed for indoor applications, no IP degrees covering water jetting and total water immersion are foreseen.

VENTILATED		NON-VENTILATED
Ventilation grids in: doors, covers and roof plate		Sealed; no ventilation openings
IP 30	IP 40	
IP 31	IP 41	
IP 32	IP 42	
		IP 54
Maximum heat dissipation (by air convection)		Low heat dissipation (heat emission via enclosure only)

1st number protection against solid objects

IP RATING	TESTS
0	 No protection
1	 Protected against solid objects up to 50 mm. (eg. accidental touch by hands).
2	 Protected against solid objects up to 12 mm (eg. fingers).
3	 Protected against solid objects over 2.5 mm (tools + small wires).
4	 Protected against solid objects over 1 mm (tools + small wires).
5	 Protected against dust - limited ingress permitted (no harmful deposit).
6	 Totally protected against dust.

2nd number protection against liquids

IP RATING	TESTS
0	 No protection
1	 Protected against vertical falling drops of water.
2	 Protected against direct sprays of water up to 15 ° from the vertical.
3	 Protected against spray of water up to 60 ° from the vertical.
4	 Protected against water sprayed from all directions - limited ingress permissible.
5	 Protected against low pressure jets of water from all directions - limited ingress permissible.
6	 Protected against strong jets of water eg. for use on shipdecks - limited ingress permissible
7	 Protected against the effects of immersion between 15 cm and 1 m.
8	 Protected against long periods of immersion under pressure.

Temcurve 6.0

Selectivity analysis software

NHP has released a new and updated version of its **TemCurve 6** MCCB selectivity applications software. This new version includes many enhanced features that will make **TemCurve 6** a more versatile applications tool compared to previous versions. Device types available in **TemCurve 6** include Terasaki MCBs, MCCBs, ACBs, NHP fuses, as well as generic IEC protection relay curves.

NOW ON CD

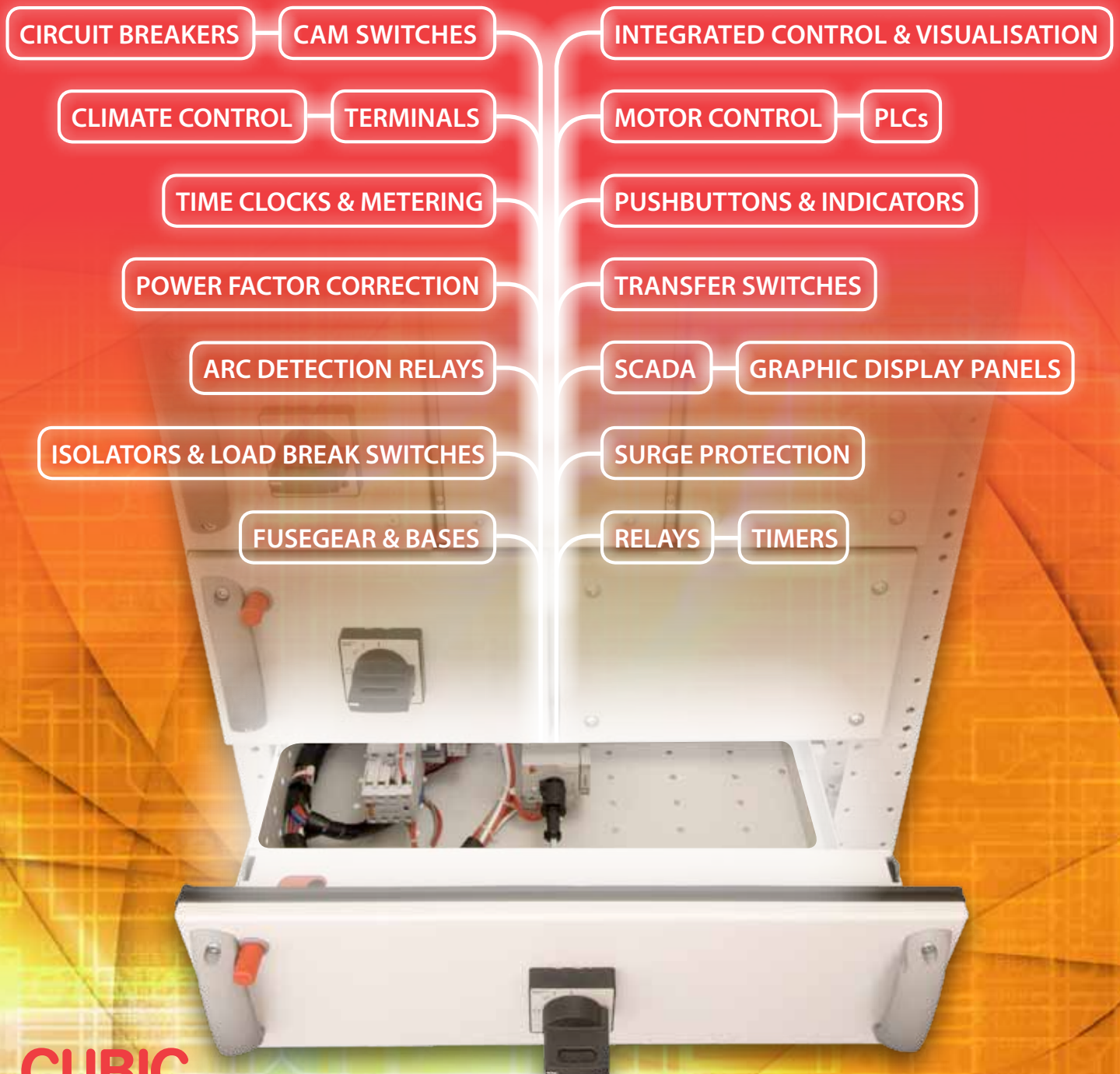
TemCurve 6 includes

- Circuit line-diagrams
- Cable fault calculations
- TemCurve file sharing
- Distribution schematic
- Supply fault calculations
- Supply voltage options
- Catalogue data prints
- Time current curves
- Motor start applications
- Device photos
- User defined curves
- Internet update capability
- I2T curves
- Supply device type options
- Exports to AutoCad
- Circuit breaker setting detail
- A calculator

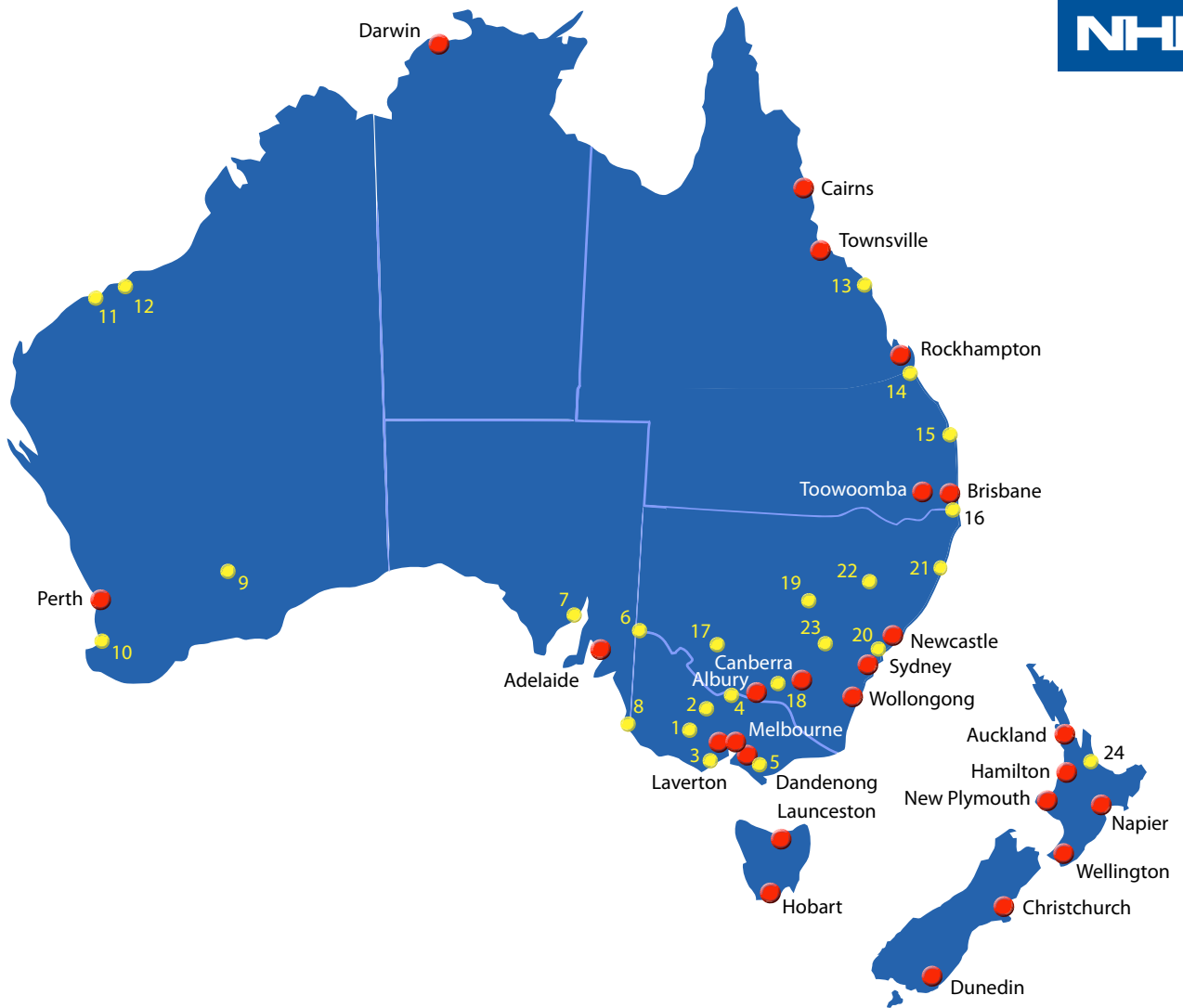
TemCurve 6 software can also be downloaded from the NHP TemBreak 2 website: nhp.com.au/tembreak2

NHPP

Switchboard Systems.



CUBIC



● Australian Branches

● Australian Regional Representation

Victoria

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Albury / Wodonga

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Launceston

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Christchurch
Dunedin

- 24 Bay of Plenty



AUSTRALIA

nhp.com.au

SALES 1300 NHP NHP

FAX 1300 NHP FAX

VICTORIA

Melbourne

43-67 River Street
Richmond
VIC 3121
Tel +61 3 9429 2999

Laverton

104-106
William Angliss Drive
Laverton North
VIC 3026
Tel +61 3 9368 2901

Albury / Wodonga

847 Ramsden Drive
Albury
NSW 2640
Tel +61 2 6049 0600
Fax +61 3 6025 0592

Dandenong

40-42 Cyber Loop
Dandenong South
VIC 3175
Tel +61 3 8773 6400
Fax +61 3 8768 8522

TASMANIA

Hobart

Unit 2
65 Albert Street
Moonah
TAS 7009
Tel +61 3 6228 9575
Fax +61 3 6228 9757

Launceston

Unit 3
13-17 Merino Street
Kings Meadows
TAS 7249
Tel +61 3 6345 2600
Fax +61 3 6344 6324

NEW SOUTH WALES

Sydney

30-34 Day Street North
Silverwater
NSW 2128
Tel +61 2 9748 3444

Newcastle

575 Maitland Road
Mayfield West
NSW 2304
Tel +61 2 4960 2220
Fax +61 2 4960 2203

Wollongong

34 Industrial Road
Unanderra
NSW 2526
Tel +61 2 4272 5763
Fax +61 2 4272 5957

ACT

Canberra

Unit 1
187 Gladstone Street
Fyshwick
ACT 2609
Tel +61 2 6280 9888
Fax +61 2 6280 9588

WESTERN AUSTRALIA

Perth

38 Belmont Ave
Rivervale
WA 6103
Tel +61 8 9277 1777

NORTHERN TERRITORY

Darwin

3 Steele Street
Winnellie
NT 0820
Tel +61 8 8947 2666
Fax +61 8 8947 2049

QUEENSLAND

Brisbane

16 Riverview Place
Murarrie
QLD 4172
Tel +61 7 3909 4999

Townsville

5 Leyland Street
Garbutt
QLD 4814
Tel +61 7 4779 0700
Fax +61 7 4775 1457

Rockhampton

1 Lawson Street
Parkhurst
QLD 4702
Tel +61 7 4927 2277
Fax +61 7 4922 2947

Toowoomba

Cnr Carroll Street and
Struan Court
QLD 4350
Tel +61 7 4634 4799
Fax +61 7 4633 1796

Cairns

Unit 2
1 Bramp Close
Portsmith
QLD 4870
Tel +61 7 4035 6888
Fax +61 7 4035 6999

SOUTH AUSTRALIA

Adelaide

36-38 Croydon Road
Keswick
SA 5035
Tel +61 8 8297 9055

NEW ZEALAND

nhp-nz.com

SALES 0800 NHP NHP

FAX 0800 FAX NHP

PO Box 62-009

**Sylvia Park
Auckland 1644
New Zealand**

Auckland

118a Carbine Road
Mt Wellington 1060
Tel +64 9 276 1967

Hamilton

78 Rostrevor Street
Hamilton 3204
Tel +64 7 849 0257
Fax +64 800 329 647

Napier

126 Taradale Road
Onekawa 4110
Tel +64 6 843 6928
Fax +64 800 329 647

New Plymouth

2 Dean Place
Waiwhakaiho 4312
Tel 0800 NHP NHP
Fax +64 800 329 647

Wellington

52 Victoria Street
Lower Hutt 5010
Tel +64 4 570 0634
Fax +64 800 329 647

Christchurch

27 Iversen Terrace
Waltham 8011
Tel +64 3 377 4407
Fax +64 3 377 4405

Dunedin

30 Fox Street
South Dunedin 9012
Tel 0800 NHP NHP
Fax +64 800 329 647

NHP Electrical Engineering Products Pty Ltd

A.B.N. 84 004 304 812

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