

Medium voltage solutions

Transformers, switchgear and customised kiosk solutions that are built to last



MV Solutions

 nhp.com.au | nhpnz.co.nz

 1300 647 647 | 0800 647 647

 nhpsales@nhp.com.au | sales@nhp-nz.com

About NHP

With 55 years of electrical and engineering industry excellence and over 20 branches across Australia and New Zealand, it is NHP's local people and footprint that helps us understand your specific project needs, no matter how big or small.

- **The power of global partners** – with a global network of suppliers, we bring the world's best products and knowledge to your doorstep.
- **The power of local** – in your local community, city and industry, we understand your specific project needs.
- **The power of choice** – choice in product, technology, service and support, enabling customers to customise and push boundaries.

While we go to market with over 20,000 marketed lines, NHP is much more than a product supplier. Together with our extensive network of global partners, we offer choice in product, choice in technology, choice in service, choice in support and ultimately choice in how you deal with us - whether that be in person or online, where and when you need us.

Employees and revenue



\$600M AUD (2023)



NHP employs more than 800 permanent employees

Major industries



Defence



Water and wastewater



Construction



Food and beverage



Manufacturing



Mining



Commercial buildings



Pulp, paper and timber



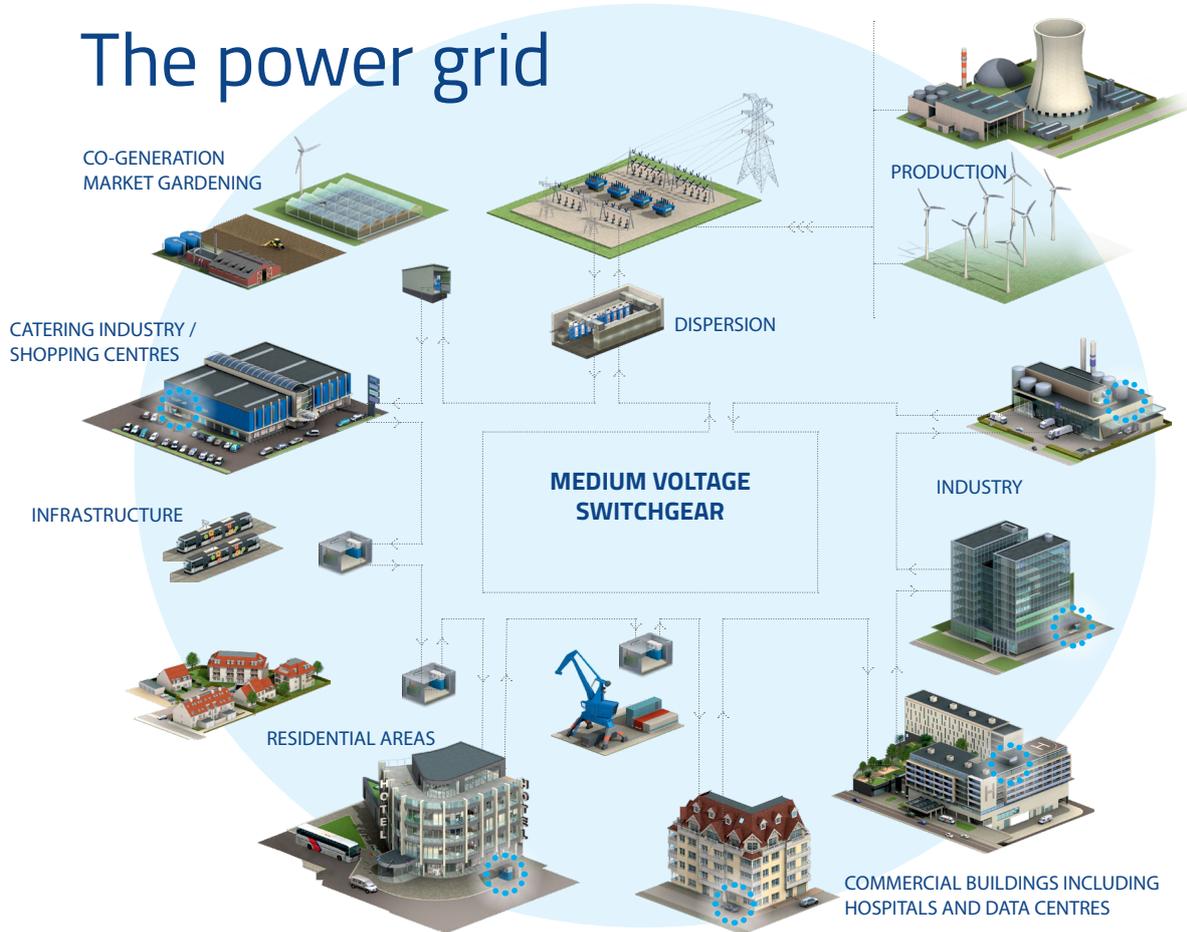
Processing plants



Oil and gas

NHP medium voltage solutions - your number one choice!

The power grid



NHP MV products and solutions

NHP's MV products and solutions include a range of switchgear manufactured in Belgium by Switchgear Company, transformers manufactured in Italy by Trafo Elettro and our customised kiosk solutions manufactured in Australia by NHP.

NHP's MV switchgear is high quality and packed with safety features demanded by:

- Australian defence bases
- Water and wastewater authorities
- Australian correctional facilities
- Food industry
- Oil and gas industry
- Mining and cement quarries
- Heavy steel fabrication industry
- Major infrastructure and many more industries.

The range consists of the 'DF-2' and 'DF-2+' air insulated panels and the 'DR-6' and 'DR-6+' gas insulated ring main units. Our transformers include both cast resin and oil immersed types, which can be supplied enclosed or unenclosed.

NHP can also create customised kiosk solutions including full MV/LV kiosks, outdoor enclosed MV switchgears sub stations and outdoor rated enclosed transformer.

Coupled with a local, experienced, customer centric team of MV experts, NHP excels at providing project solutions that focus on:

-  Safety for people
-  Compliance to standards
-  Reliability of product
-  Customisation of solutions to meet customer needs
-  Availability of power

NHP medium voltage products and manufactured solutions

Medium voltage switchgear				Medium voltage transformers (Tx)	
					
Air insulated switchgear		Gas insulated switchgear		Cast resin transformers	Oil immersed transformers
					
Model type	DF-2 / DF-2+	DR/DT-6-C / DR/DT-6-C +	DR/DT-6-E / DR/DT-6-E +	TES-R	TES-OM
Construction design ⁴⁾	Modular	Compact	Extensible	Cast resin	Hermetically sealed
IP rating ⁵⁾	IP4X	IP6X	IP6X	IP00	IP66
Arc fault performance	Internal arc classification for switchgear ⁷⁾			Arc flash mitigation	
	A-FL(R) 16kA/1s /B-FLR 20kA/1s	A-FL(R) 16kA/1s /B-FLR 20kA/1s	A-FL(R) 16kA/1s /B-FLR 20kA/1s	Arc mitigation by design ²⁾	Arc mitigation by design ²⁾
Max. rated voltage ¹⁾	24kV	24 kV	24 kV	36kV	36kV
	Switchgear max. rated current ¹⁾			Tx rated power	
	1250A	630A	630A	50kVA – 6MVA	50kVA – 7MVA
	Switchgear max. rated short circuit current ¹⁾			Tx partial discharge	
	25kA	25kA	25kA	<5 pC	<10 pC

1) For switchgear, maximum voltage and currents will vary depending on the specific customer selected VCB
 2) Cast resin transformer 'arc mitigation design' is achieved with 'plug in bushings with earth screened HV terminations installed as per NHP recommendations
 3) When installed with DF-2+/DR-6+ (Arc-Killer) switchgear. Published DF2+/DR-6+ B-FLR IAC applies.
 4) For enclosed solutions, an enclosure can be made from either SS = Stainless Steel, MS = Mild Steel, Al = Aluminium



Modern protection system



Improved safety and functionality



Increased system reliability



Serviceability

Medium voltage enclosed solutions for outdoor use			Motor control MV drives	
Enclosed transformers	Enclosed switchgear	MV/LV kiosk substations	All purpose drives	Special purpose drives
DFT	DFS	DFX	PowerFlex 6000T	PowerFlex 7000
Cast resin in MS, SS	MS, SS or AI	MS, SS or AI	Air cooled	Air or liquid cooled
IP43	IP54	IP54/33D and IP54/23D	IP31 or IP42	IP21/NEMA Type 1 or IP42
Arc flash mitigation	Internal arc classification for kiosk ⁶⁾		Arc flash resistant enclosure	
Arc mitigation by design ²⁾	IAC-AB Classification AS62271.202 ³⁾	IAC-AB Classification AS62271.202 ^{2) 3)}	No	Yes, ArcShield option available
36kV	24kV	24kV	11kV	6.6kV
Tx rated power	Max. rated current ¹⁾	Maximum rated power	Max. rated power output	
50kVA – 6MVA	1250A	200kVA – 2.5MVA smaller 200kVA kiosks are required sometimes	10.650kW	6000kW / 5595kW
Tx partial discharge	Switchgear max. rated short circuit current ¹⁾		Drives max. input voltage rating	
<5 pC	25kA	25kA	13.8kV	6.6kV

5) For cast resin Tx - IP54 applies to the MV/LV compartment, IP33D applies to the cast resin Tx compartment for oil immersed Tx - IP54 applies to the MV/LV compartment, IP23D applies to the oil Tx compartment For LRS Tank construction is IP42, control and switchgear panel is IP54

6) IAC-AB for kiosks are by design

7) A-FLR is achieved using an arc duct. Without an arc duct the DF2 achieves an IAC of A-FL 16kA/1s.

Aviation power supplies



AC frequency converters



- 400 Hz output
- Pulse width modulation
- Step wave
- 50/60 Hz low frequency conversion

Pre-conditioned air (PCA)
Diesel ground power (GPU)

- Frequency 400 Hz8
 - VDC and 270 VDC
- DC power supplies**
- 28 VDC through 600
 - FLA converters
 - 270 VDC power converters and military
 - Precision power converters

Combination converters

- 00 Hz/ 28 VDC/ 270 VDC

Medium voltage switchgear

- Air insulated DF-2 and DF-2+ (with Arc-Killer) series of switchgear
- Gas insulated DR-6 and DR-6+ (with Arc-Killer) series of ring main units (RMUs)
- Suitable for 3.3kV, 6.6kV, 11kV and 22kV



MV switchgear



Modular design



2-position load break switch



Arc-Killer option

DF-2 and DF-2+ air insulated switchgear with visual earthing

The DF-2's modular design allows you to create simple and custom-made combinations of medium-voltage cubicles with a rated voltage of up to 24kV. DF-2+ is a special DF-2 model that features Arc-Killer technology.

Key characteristics

- Air insulated switchgear - cubicles with galvanised steel sheets 2mm and between the compartments 4 mm
- Built to withstand extreme weather conditions
- Suits both primary and secondary switchgear applications
- Maximum service voltage is 24kV with a maximum current of 1250A
- Rated short time current of 25kA for 3 seconds
- Demountable VCB design for fast replacement
- 50 year design life meeting the Australian Defence specification MIEE
- Switching in SF₆ for load break switch or vacuum for the vacuum circuit breaker
- DF-2+ internal arc classification is B-FLR 20kA,1s for ultimate safety
- GE Agile or SEL protection relays.

Applications

- Suitable for most industrial and commercial installations
- Distribution switchgear within electrical substations, wind generation, cogeneration and much more
- Replace obsolete installations and expand existing installations.

Applicable standards

- AS 62271-1
- AS 62271-100
- AS 62271-102
- AS 62271-200
- IEC 62271-103
- IEC 62271-105
- IEC 60529



MV ring main units (RMUs)



Compact and extensible



3-position load break switch



Arc-Killer option

Gas Insulated Switchgear DR-6/DT-6 and DR-6+/DT-6+

The DR/DT-6 ring main unit provides a network switching function by load break/earth switch and protection functions by a fuse switch or a dedicated vacuum circuit breaker in applications with rated voltage up to 24kV.

DR-6+ is a special DR-6 model that features Arc-Killer technology.

Key characteristics:

- Gas Insulated Switchgear (GIS) (SF₆) RMU: metal enclosed GIS cubicles with galvanised steel sheets 2mm and between the compartments 4 mm
- Built to withstand extreme weather conditions
- Ease of use with a clear synoptic
- Maximum service voltage is 24kV with a maximum current of 630A
- Rated short time current of 20kA for 1 second
- Three position load break switch
- 30 year design life
- Compact or extensible concept
- Optional: easy to reach injection points (at the top)
- DR-6+ with built-in Arc-Killer has an internal arc classification of B-FLR 20kA, 1s for ultimate safety
- No emission of SF₆ in case of internal arc due to the patented Arc-Killer technology

Applications:

- Suitable for most industrial and commercial installations
- Distribution switchgear within electrical substations, wind generation, cogeneration and much more
- Replace obsolete installations and expand existing installations

Applicable standards:

- AS 62271-1
- AS 62271-102
- AS 62271-200
- IEC 62271-103
- IEC 62271-105
- IEC 61243-5



Key feature - Arc-Killer

Arc quenching system

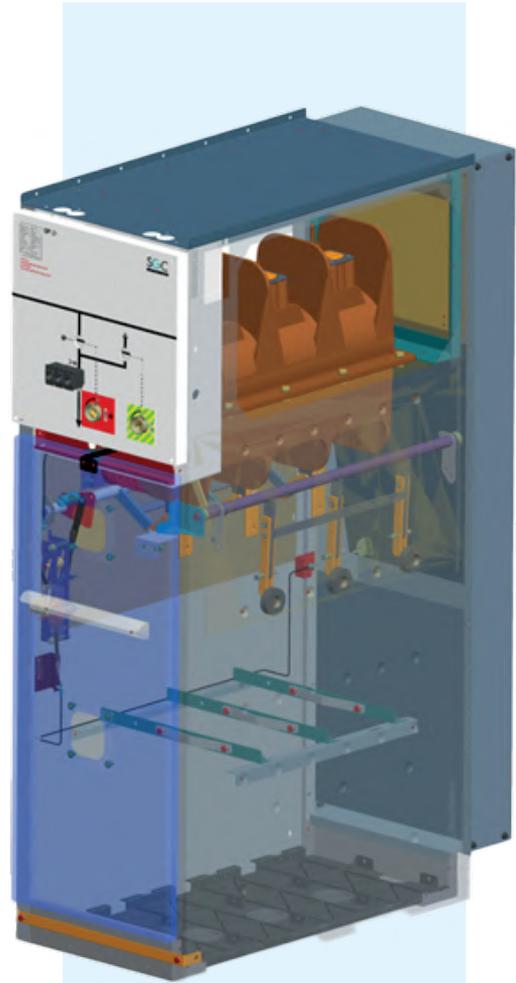
NHP's DF-2+ medium voltage air insulated switchgear panels feature a unique arc quenching system called the 'Arc-Killer', which can quench an arcing fault in less than 50ms. Such a fast arc fault clearance rate not only protects people from danger but also protects the switchgear panels from damage, ensuring maximum power availability.

Benefits of DF-2+ the Arc-Killer:

- **Highest safety of personnel: B-FLR 20kA for 1s**
 - Safe at 100mm from switchgear ('B'), not 300mm ('A')
 - Arc fault protection from all 4 sides ('FLR') and
 - Arc gasses self-containment without ducting or venting => easy to integrate, IAC unaffected by installation
 - NO toxic gases, NO overpressure, NO fire propagation
 - Protection under operating and maintenance conditions

- **Protection of assets**
 - Negligible damage of switchgear => functioning restored after panel cleaning and replacement of faulted component
 - Minimum downtime and minimum repair cost

- **Simple, reliable and versatile**
 - Easily re-settable
 - Robust mechanical system, insensitive to photo flash or vibration
 - Perfect for incoming and ring feeders - signal to upstream switchgear not required





Power Hub



Medium voltage transformers

- Cast resin transformer 50kVA - 6MVA, with voltages up to 36kV
- Oil immersed transformers 50kVA - 7MVA, with voltages up to 36kV



Cast resin transformers

TES-R

NHP TES-R cast resin transformers range from 50kVA to 6MVA with voltages up to 36kV.

Due to the flame-resistant and self-extinguishing materials used, they are perfect for indoor and special applications like rail, hospitals, data centres, high rise buildings and highly ecological environments.

Furthermore, the inherent design provides an additional benefit of reduced maintenance requirements.

Key characteristics

Long service life

- The casting process allows a low level of partial discharge

Custom manufactured

- Voltages, impedances, efficiency, HV plug-in bushings and more

Compact design

- Optimised dimensions and terminals arrangement for critical situation of space

Built for local standards

- Type tested to AS60076, complies with MEPS AS2374.1.2 ensuring minimum energy losses

High environmental resistance

- Specific treatment for magnetic core and frames to withstand the most extreme environmental conditions

Heavy duty

- Special design structure for seismic zones or for using applications with high level vibrations

Eco-friendly

- Research and development of the highest performing materials, combined with an advanced design for high energy efficiency. Safe to use and easy to dispose of.



E3



C2 performance



F1



Compact design



Seismic zones



Long life



Applications

- Indoor installations
- Reduced fire risk (F1 class). Crucial for inside public buildings like hospitals, hotels and airports
- Highly polluted places and atmospheres (E3 class), common in mines, paper mills, off-shore and on-shore sites, oil and gas systems, desalination plants and cement factories
- Extremely low temperatures (C2 class)
- Distribution power grids, railways networks or substations.

Applicable standards

- AS 60076 Power Transformers – Parts 1, 2, 3, 5, 10 and 11
- AS 2374.1.2 Power Tx - Minimum Energy Performance Standard (MEPS)

Oil immersed transformers



Economical



Compact design



Seismic zones



High environmental resistance

TES-OM

NHP TES-OM oil immersed transformers range from 50kVA to 7MVA with voltages up to 36kV.

The traditional oil transformers are available with oil conservator or hermetically sealed type with integral fins.

The insulating oil is mineral type PCB free, preventively treated and dried, filled under vacuum

Key characteristics

- **Economical**
Designed for easy installation with accessories properly wired and positioned, simplifying installation and maintenance, therefore reducing costs
- **Custom manufactured**
Voltages, impedances, efficiency, HV plug-in bushings and more
- **Compact design**
Optimised dimensions and terminals arrangement for critical situation of space
- **Built for local standards**
Type tested to AS60076, complies with MEPS AS2374.1.2 ensuring minimum energy losses
- **High environmental resistance**
Specific coating treatment and use of stainless steel bolts to withstand the most extreme environmental conditions
- **Heavy duty**
Special design structure for seismic zones or for using applications with high level vibrations
- **Eco-friendly**
A combination of the best materials combined with an advanced design provides high energy efficiency. Non-flammable or bio-oil can be used to reduce the environmental risk.



Applications

- Indoor or outdoor installations
- High polluted places and atmospheres
- Common in mines, paper mills, off-shore and on-shore sites, oil and gas systems, desalination plants and cement factories
- Extremely low temperatures (C2 class)
- Suitable for use in seismically unstable and high vibration environments
- Distribution power grids, solar / wind farms, railways networks or substations

Applicable standards

- AS 60076 Power Transformers
– Parts 1, 2, 3, 5, 10
- AS 1767.1 Insulating liquids - Spec for unused mineral insulating oils for Tx
- AS 2374.1.2 Power Tx - Minimum Energy Performance Standard (MEPS)

DFX

Medium voltage kiosk solutions

DFX is a customisable medium voltage kiosk

- Made from rugged materials to withstand extreme conditions
- Applicable service voltage is 11 and 22kV
- Ideal for outdoor applications



DFX MV kiosks



Customer
design



Long
life



Arc-Killer
option

DFX-GP and DFX-S

NHP DFX kiosks are custom designed to suit a wide variety of applications and are available in a general purpose type and a special purpose type. DFX MV kiosks are suitable for network voltages of 11kV and 22kV meeting power requirements from 200kVA up to 2500kVA. Full switchroom solutions, enclosed switchgear and enclosed transformers can also be provided upon request.



Key characteristics

- **Built to last**
Designed and built using quality materials. Also featuring the DF-2+ MV switchgear which has a 50 year design life to meet the Australian Defence standard MIEE
- **Custom manufactured transformer characteristics**
Voltages, impedances, efficiency, HV plug-in bushings and more
- **Compact design**
Optimised dimensions and terminals arrangement for critical situation of space
- **Built for local standards**
Type tested to AS60076, complies with MEPS AS2374.1.2 ensuring minimum energy losses
- **High environmental resistance**
Specific coating treatment and use of stainless steel bolts to withstand the most extreme environmental conditions
- **Arc flash standards**
NHP's DFX kiosk with the DR6+ or DF2+ is designed to comply with IAC-AB internal arc classification and includes the Arc-Killer technology as standard
- **Temperature monitoring**
The health of core components can be tracked 24/7 via optional temperature monitoring sensors

Applications

- Indoor or outdoor installations
- Highly polluted places and atmospheres common in mines, paper mills, off-shore and on-shore sites, oil and gas systems, desalination plants and cement factories
- Ring networks
- Defence, healthcare and heavy industry

Applicable standards

- AS 2067
- AS 62271.202
- MIEE 2011 Amendment 3 (Defence)
- AS 4312
- AS 60529
- AS/NZS 61439
- AS 3000



Project delivering and engineering capabilities

Seamless project delivery

Our dedicated project team ensures seamless project delivery while providing engineering support and flexible customised solutions. We have successfully delivered projects over 10 years in the defence, mining, healthcare, critical infrastructure and food and beverage sectors.

Services include

- Engineering and local customisation
- Analysis and performance simulation
- Electrical and 3D design development
- Local manufacturing and factory acceptance testing
- Low and medium voltage servicing and support
- Training and product familiarisation services



Why NHP?

Safety, reliability, availability, compliance and customisation



Safety - safety of people was the main priority when developing our range of MV switchgear, transformers and kiosks.

Key features - 'Arc Killer', our arc quenching system, visible earth switch and in line isolation, CR transformer with arc mitigation by design, no need to externally vent arc fault gasses in kiosk.



Reliability - NHP MV products are built to last and ensure great reliability.

Key features - switchgear with a 50-year design life, modern vacuum switching and load break technology, the most advanced method in HV winding fabrication, environmental and climate class tested and reduced partial discharge.



Availability - maximising uptime with MV product range.

Key features - modular design - repair or extend panels quickly, minimum moving parts and maintenance, significantly reduce downtime after an arc fault, assemble or repair on site, designed for retrofit with customised, compact designs.



Compliance - CNHP's MV switchgear, cast resin transformers and kiosks meet and exceed global standards.

Key features - switchgear tested to the global standards and a B-FLR classification, kiosks designed to meet the arc fault standards, transformers tested for use in harsh environments.



Customisation - customised solutions from a trusted partner.

Key features - local solutions for local customers, outdoor enclosed switchgear solutions - outdoor and indoor enclosed transformer solutions, NHP can tailor your MV kiosk.



MV solutions for defence applications

Local stock, local manufacturing

NHP has invested in stocking MV switchgear panels at our manufacturing facility in Melbourne, providing us with great flexibility for customisation and helps us to work with you closely to meet your needs.

Key characteristics

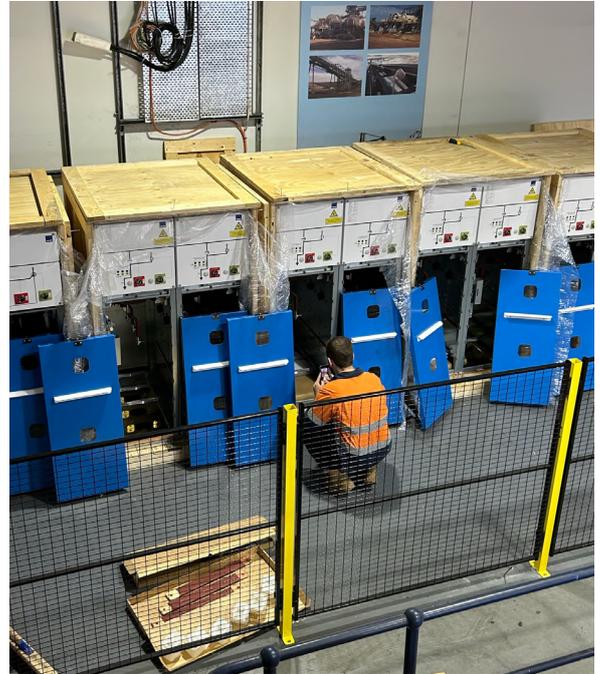
- Fast delivery time
- Wiring done at NHP facility as per approved drawings
- Minimise risk with secure delivery
- Local stock customisation with relays, CTs and other accessories
- Feeder panel, CB panel and metering panel stocked
- Local technical support and service

Capabilities

- We are specialists in power distribution solutions, with expertise in automation and energy management. We have custom solution expertise and have a proven safety and reliability track record
- Custom MV kiosk manufacturer, with an existing install base at defence sites
- Remediation of non-compliant sites to comply with WHS legislation
- LV panelboard supplier with MCCBs, RCDs etc, which have been part of multiple defence infrastructure upgrades
- Hazardous areas and electrical area installations
- Local service and support nationally, with extensive outreach in both metropolitan and regional areas.

Competitive discriminators

- Equipment with a 50-year design life, meeting the Australian Defence Standard Manual of Infrastructure Engineering – Electrical (MIEE)
- 'Arc-Killer' arc quenching system installed in our MV switchgear
- Compliance to ANZ, IEC, and IEEE standards
- Local stockholding and local manufacturing of MV switchgear – feeder panel, metering panel and CB panel stocked at our National Distribution Centre in Melbourne
- High reliability of our equipment in various conditions
- Technical training and engineering support provided throughout the project delivery phase.



Key projects

- HMAS Watson
- HMAS Creswell
- RAAF Richmond
- Holsworthy Barracks
- Defence Establishment Orchard Hills
- RAAF Glenbroo
- RAAF Edinburgh

Associations and memberships

- Dedicated sales team who maintains a close working relationship with major defence engineering consultants
- Partnership with the National Electrical and Communications Association (NECA)
- MV project management and engineering team that include EA certified engineers to help with all queries right from quotation to commissioning stage and beyond.

Our previous projects

Monash Children Hospital and Monash Medical Centre (Victoria)

The Monash facilities are tier 1 hospitals with a trauma centre.

NHP supplied:

- Cast resin transformers
- 24kV DF-2 switchgear
- CUBIC AS/NZS 61439 low voltage switchboard and Concept panelboards
- No power loss 'closed transition' transfer switches



Tasmania based quarry

This quarry based in Hobart mines materials used in the creation of construction products.

NHP supplied:

- 1MVA kiosk substation
- 17.5kV DF-2+ switchgear with Arc-Killer
- 11kV oil immersed transformer and LV switchboard



Department of Defence

NHP has been the MV equipment supplier of choice for many Australian state and federal government critical infrastructure projects due to the general requirement to provide a 50 year switchgear design life as outlined in the MIEE standard.

NHP supplied:

- 24kV DF2 switchgear in kiosk, with Agile P14D feeder protection relays
- Outdoor enclosed cast resin transformers



Australian government project

NHP supplied a complete MV switchroom which not only housed all of the MV/LV equipment typically found in an MV kiosk, but provided the facility for HV operators to safely and easily enter and exit the housing and access the equipment.

NHP supplied:

- Upgrade of MV distribution system
- 17.5kV DF-2+ switchgear with Arc-Killer



Queensland based hotel and casino

This Queensland based complex contains an impressive convention, exhibition and event gala space for up to 2,300 people, restaurants, bars, a 24-hour casino and two luxury 5-star hotels.

NHP supplied:

- Upgrade of MV distribution system
- 17.5kV DF-2+ switchgear with Arc-Killer



Our industry partners



Trafo Elettro

NHP has selected Trafo Elettro as our preferred supplier of transformers. Since 1969, Trafo Elettro has been a tried and proven manufacturer of quality cast resin transformers, which are ideal for medium voltage applications. Trafo Elettro strives every day to improve customer service, product quality and invests in research and development to reduce environmental impacts.

Trafo Elettro can provide custom made transformers meet a customer's specifications.

www.trafoelettro.com

Allen-Bradley

Allen-Bradley has more than 30 years' experience in delivering medium voltage drives to the most demanding industries.

Allen-Bradley medium voltage drives offer inbuilt EtherNet/IP communication and support along with other commonly used communication protocols. Flexible connectivity and control system compatibility helps to deliver seamless control system integration.

SGC

SGC is an independent manufacturer of medium voltage switchgear solutions worldwide, having more than 40 years' experience in the development and production of medium voltage cubicles from 3kV to 36kV.

SGC produce and develops premium switchgear with exceptional quality which is durable and surpasses the existing global standards and product lifespans. Innovation, usability, safety and environmental care are always the driving forces behind SGC's product developments.

showroom.switchgearcompany.eu/showroom cubicle



The NHP logo consists of the letters 'NHP' in a bold, blue, sans-serif font, centered within a white square.

nhp.com.au
1300 647 647
nhpsales@nhp.com.au

nhpnz.co.nz
0800 647 647
sales@nhp-nz.com



MV Solutions

NHP ELECTRICAL ENGINEERING PRODUCTS

A.B.N. 84 004 304 812

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18BCHMV 02/24