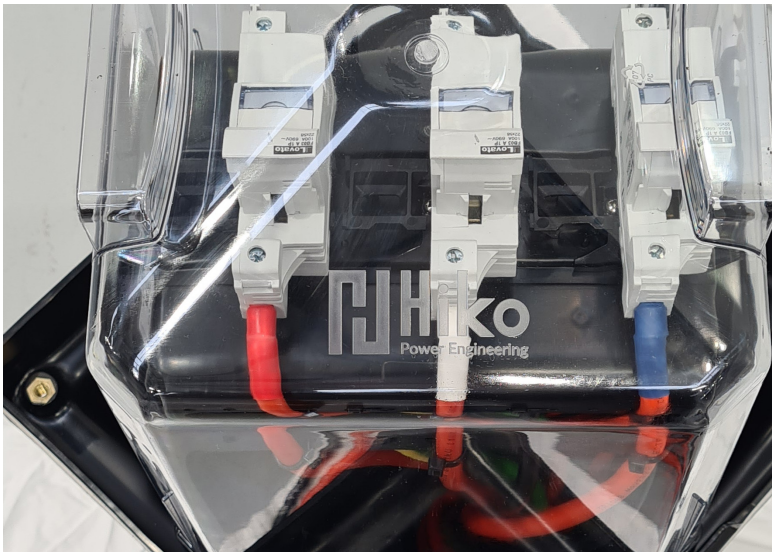
HIKO POWER ENGINEERING

CATALOGUE



SAFELY CONNECTING COMMUNITIES TO POWER THE FUTURE.

Hiko®
Power Engineering

hikopower.co.nz

Safe and efficient delivery of electricity needs networks to be built with products that provide protection, performance and reliability over the long run.

That's why we partner with leading manufacturers of quality products and work with you to deliver safe and lasting solutions for your network.

At Hiko Power Engineering we deliver certainty, reliability and long-term value based on the products that we supply and on the technical support that we provide.

Contents

Solutions and value engineering

Our approach is to actively identify value engineering opportunities for our customers – adding value throughout the asset lifecycle by reducing overall cost while continuing to meet technical specifications.

Hiko engineers design custom connection solutions for each individual network's requirements by combining our local low voltage design and manufacturing expertise with our range of high quality, precision-built LV to EHV electrical equipment to provide its customers with safe, reliable and easy to install assets.

This breadth of supply means we're engaged with the power industry at all levels and at all stages of the asset lifecycle: from project engineering, through installation and commissioning, inspection and test, maintenance and refurbishment.

We understand the needs of electricity distribution companies and their contractors in terms of quality, time, cost and safety.

Working with the University of Canterbury (through our partnership with the EPECentre) and with other external facilities we have access to a wide range of electrical, thermal and mechanical test laboratories, which we use as required to provide assurance that our engineering solutions are fully compliant, appropriately rated, fit for purpose and reliable over the long term.

EPECentre
ELECTRIC POWER ENGINEERING CENTRE

eea Electricity Engineers' Association

cigre

Geoffrey Sullivan
General Manager

Partners

We are proud to partner with specialist international connection and cable management suppliers, as well as trusted New Zealand contract manufacturing partners, to deliver solutions, peace of mind and long-term reliability for electricity distribution companies.

Bowthorpe line taps are the industry standard split bolt system for connecting conductors in NZ & overseas. With more than 70 plus years of service and greater than 16 million connections, Bowthorpe line taps, have an indefinite life and are simple to install.

EFEN makes energy distribution systems safe, whether you are active in the field of infrastructure or in the power supply sector, EFEN offers optimised safety systems and components for power distribution – tailored to the respective field of application.

GridKey is a low voltage multi-feeder monitoring system that remotely monitors substation feeders. Increased insight of the low voltage network data via real time warnings, status alerts and loading information helps improve network planning, reduce network maintenance costs and prevent unplanned outages.

HellermannTyton is a global manufacturer that specialises in cable management and identification solutions for various markets including automotive, solar, and electrical. Their integrated approach to product design, sustainability, and quality assurance sets them apart.

Insulect manufactures a range of tough, modular, reliable network switchgear for overhead substation and underground applications requiring minimal maintenance for long-lasting performance. Helping electricity transmission and distribution customers strengthen their networks for over twenty years.

Langmatz develops and manufactures innovative, high quality cabinets and underground systems for the power supply, telecommunications and traffic engineering sectors. Langmatz cabinets and modular, structural pits employ extremely durable and environmentally benign polycarbonate.

Lucy Electric is a leader in secondary power distribution solutions specialising in high-performance medium voltage switchgear for utility, industrial and commercial applications. Lucy Electric enable the safe and reliable distribution of energy to homes and businesses worldwide.

NKT is a global supplier to the energy sector developing and manufacturing high quality cables, accessories and solutions for electricity transmission and distribution, construction and railway applications.

Pfisterer can be found wherever electrical current flows for the supply of energy. Pfisterer manufactures high-quality products, which find reliable, long-term and virtually maintenance-free service in the sensitive interfaces of energy supply networks.

Polaris is well known among those in the electrical industry for its unique design and high quality. This leading position affords Polaris the opportunity to develop new cutting-edge technology in manufacturing insulated products.

"Low voltage network switchgear assets are often located in publicly accessible places: on berms, in footpaths and driveways, in town centres, where public safety as well as operator safety is a paramount consideration."

Low Voltage: Frames, Pillars and Cabinets

Hiko LV Distribution/Transformer Frames

Modular, precision-built and custom built for pad, tank or wall mount applications

Hiko low voltage switchgear frames for transformer and distribution applications are designed, engineered and built for safety and reliability to deliver value through the asset lifecycle.

Safety is embedded into Hiko LV switchgear frames through:

- Fully insulated busbars
- Generously sized high temperature rated polycarbonate transparent covers
- Latest generation EFEN vertical fuse-switch disconnects (and optional circuit breakers and other arc-flash mitigating treatments)
- Integral CT's, high voltage CT wiring and fully rated CT test blocks.

Safe operating performance and long-term reliability are assured by our design methodology that includes mechanical, electrical and thermal modelling and testing, and our manufacturing process in line with the requirements of AS/NZS61439.1 and 61439.5.

A modular range of precision-built pad mount, wall mount and tank mount frames are available, using laser-cut stainless steel structural components and accommodating a wide range of sizes and configurations. Precisely engineered design is combined with light weight construction to support ease of installation. An almost unlimited variety is available.

Service panels are available for all frames to suit customer requirements. These can be fitted pre-wired with analogue or digital metering, MDIs, street-lighting and hot water pilot wire connections and LV network monitoring systems.

Hiko LV switchgear frames are fully modelled in 3D to simplify, speed up and deliver certainty through the design-in process. One-off frames can also be produced for unique situations.

Materials

Component	Material	Comments
Frame	Stainless steel 304	Hot dip galvanised frames also available
Fixings	Stainless steel 304	
Protective covers	Polycarbonate (transparent), PVC (grey)	For accidental flashover protection
Busbar heat-shrink	Polyolefin	For accidental flashover protection

Standard Configurations: Pad Mounted, Bolted Frames, Type LVF

Rating (kVA)	Busbar Size (mm)	N/E Bar Size[1] (mm)	Bushing Cable Cross Section[1] (mm^2)	Earth Cable Cross-Section[1] (mm^2)	Incoming Isolator (A)
100-300	30 x 10	40 x 6	185	120	630
500	50 x 10		2x 150	185	1000
750	80 x 10	50 x 10	2x 240	300	2000
1000	100 x 10	80 x 10	3x 240	300	2000
1500	80 x 20	80 x 20	4x 240	300	2500[4]

Standard Dimensions: Pad Mounted, Bolted Frames, Type LVF

Frame Width (mm^3)	Service Panel Width (mm)	Max Number of Feeders[2]	
		With Service Panel	Without Service Panel
600	200	4	6
700		5	7
800		6	8
900		7	9
1000		8	10
1200		10	12

Options

DIN-style switchgear (EFEN or third-party brand)
Street lighting and other auxiliary supplies
MDI's / metering / monitoring
Other switchgear or controlgear

Notes

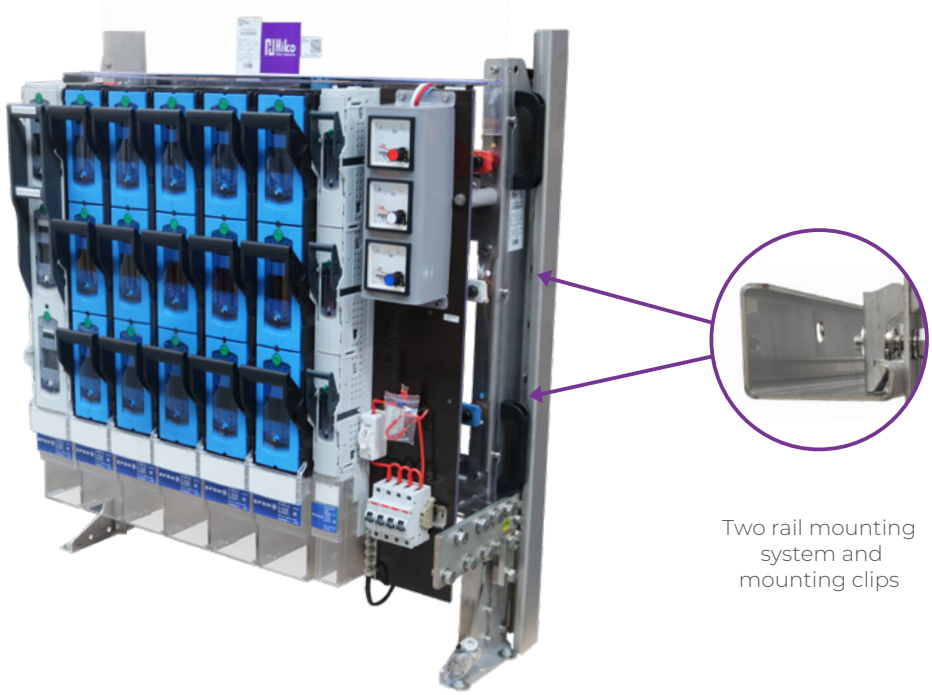
1. Other cross sections available on request
2. DIN2/3 fuse-switch-disconnects (max 630 A), pitch 100 mm; alternatively 2x DIN00 (max 160 A), pitch 50 mm
3. Frame width / height made to order
4. With circuit breaker

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Hiko Universal Tank Mount Frames

100kVA to 750kVA designed to be installed safely in less than 30 minutes



Two rail mounting system and mounting clips

Hiko's universal tank mount frame builds on its extensive range of low voltage switchgear frames for transformers designed to be installed safely in less than 30 minutes.

The universal frame fits typical transformers including 100 to 750 kVA Etel Minipad, 200 to 500 kVA Hitachi / ABB Mini as well as the 300 and 500 kVA Tyree cubicle transformers. Key to installing the frame and its universal fit is the two-rail system devised by the Hiko engineering team. These stainless steel rails are simply bolted to the mounting bosses on the transformer and the Universal frame is then lifted onto the rails where the open clamps on the frame make positioning easy. The frame is then secured in place with a long nut driver tightening the spring-loaded clamp bolts.

Because of the tank mounting, there is no need to drill the concrete pad. This speeds up installation, but it can be bolted to the concrete if required. The earth bar is on the right-hand side close to the neutral bushing and earth stud, making it easier to connect the earth.

This frees up access to the neutral bar for testing and results in a quicker install.

The frame incorporates advanced safety features which are embedded in Hiko designs to improve handling and access for installers and operators such as handles and lifting eyes for ease of manoeuvrability.

Safe operating performance and long-term reliability are assured by our design methodology which includes mechanical, electrical, and thermal modelling and testing before a design is released to production and is in line with the requirements of AS/NZS 61439.1 and AS/NZS 61439.5.

The frame is available for PEN networks and options for separate Earth / Neutral connections. The disconnects keep live terminals and fuses fully shrouded from touch at all times and can be pre-installed with internal CTs and a Gridkey LV monitoring device. The new design also provides clearer access to the drain tap for changing the oil as and when maintenance is required.

For frames and single supply over 500kVA circuit breaker options are available for added protection and are specified by each network.

Transformers

Make	Model	kVA
Etel	Minipad	100 - 750
Hitachi / ABB	Mini Sub	200 - 750
Tyree	Cubicle Type	300 - 500

Materials

Component	Material
Frames	Stainless Steel 304
Fixings	Stainless Steel 304
Protective Covers	Polycarbonate (transparent)
Busbar heat-shrink	Polyolefin

Standard Configurations

Rating (kVA)	Busbar Size (mm)	N/E Bar Size (mm)	Bushing Cable Cross Section (mm^2)	Incoming Isolator (A)
100 - 300	30 x 10	30 x 10	185	630
500	50 x 10	30 x 10**	2 x 150	1000
750*	80 x 10	50 x 10**	2 x 240	1250

* Frame without circuit breakers

** Can be provided same size as busbars

Standard Dimensions

Frame Width (mm)	Service Panel Width (mm)	Max. No. of Fuse Switch Disconnects	
		With Service Panel	Without Service Panel
800	100	6	8
900	200	7	9

Options

Fits DIN-style switchgear
Street lighting and Ripple Relay control
MDI's / metering / LV monitoring
CTs fitted to the disconnects
Other switchgear or control gear
Auxiliary supplies
Direct bus connection with covers
PEN and separate Earth Neutral connections
Customisation of the design to suit network requirements

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Distribution Pillars and Link Pillars

For up to 9.5x DIN3 style vertical disconnects and other switchgear and control gear

Hiko Distribution Pillars and Link Pillars use extremely secure, robust, fully insulated, weatherproof Langmatz polycarbonate outdoor cabinets and DIN-style switchgear, including EFEN E3 double break, fully enclosed disconnects.

They are fully compliant with the requirements of AS/NZS 61439.1 and 61439.5, which includes particular requirements for LV switchgear in public places. In addition, Hiko has conducted extensive independent performance testing.

The result is a high level of assurance of LV asset safety that represents taking “all reasonably practicable steps” to protect the public and operators alike.

By contrast, aluminium or steel pillars deliver a lower level of assurance.

In terms of long-term reliability, the unique Langmatz polycarbonate two-piece cabinet has proven its worth for well over 25 years in installations throughout Europe, Australia and New Zealand, and in many networks is the only approved option. This is an enviable record that cannot be matched by GRP (glass reinforced polyester) cabinets.

The modular design of Hiko Distribution Pillars and Link Pillars enables a wide range of configurations, from single switch link pillars to double-bus distribution boards. With options available for ground plant and surface mount bases, the two-piece construction facilitates quick installation and secure, straightforward inspection throughout the life of the asset.

Cabinet & Door Specifications

Parameter	Test method	Requirement	Comments
Impact resistance (all sides)	AS/NZS 3439-5	15 kg sandbag from 1 m height	
		2 kg steel ball from 1 m height	
		5 kg sharp point from 0.4 m (20 J)	
Lateral tensile strength (top edge)	AS/NZS 3439-5	1,200 N for 5 minutes	
Distributed top load	AS/NZS 3439-5	8,500 N/m^2 for 5 minutes	
Torsional strength	AS/NZS 3439-5	2,000 N for 30 seconds	
Base mechanical strength	AS/NZS 3439-5	1,000 N	Pipe test
Heat resistance	AS/NZS 3439-5	100°C / 125°C	3.2 mm rod dent impact test / 2 kg steel ball point test
Ingress protection rating (cabinet)	DIN 40050	IP43	When installed in accordance with instructions[1]
Ingress protection rating (lock)	DIN 40050	IP65	Waterproof and dust proof
Flame resistance	UL 94	V1	Burning stops within 30 seconds, no flaming drips
Flame resistance (surface)	DIN 53483 Part 3	K1 / 8 mm	Flame does not reach measuring mark at 150 mm
Flame resistance (edge)	DIN 53483 Part 2	F1 / 8 mm	
Dielectric strength	DIN 53481 Part 4.2.2	30 kV/mm	
Chemical resistance	-	Resistant to hydrocarbons including oil, grease, petrol	
Weather resistance	EN 50298 and 60439-5	No change in resistance	
	ISO 4892-2 Process A	>70% retained flexural strength	

Materials

Component	Material	Comments
Cabinet, door	Structural, foamed polycarbonate	Zero residual stress
Fixings	Stainless steel 316 / 1.4301	
Tie-bars	Galvanised steel	
Internal protective covers	Polycarbonate (transparent), PVC (grey)	
Busbar heat-shrink	Polyolefin	Colour Coded

Configurations

Maximum Number of Ways (vertical disconnects)		Width (mm)	Height Above Ground[2] (mm)	Depth (front to back) (mm)	Base Depth (below ground) (mm)
DIN2/3	DIN00				
3	7	460	1170	330	600
4	10	595			
6-7	14	795			
10	20	1120			

Options

DIN-style switchgear (EFEN or third-party brand)
Street lighting and other auxiliary supplies
MDIs / metering / monitoring
Other switchgear or control gear
Colour (as supplied: natural grey RAL 7035; Rainforest green (AS2700 G15) RAL 6003 and other colours available on request)
Identification / warning labels to network requirements
Locking arrangements
Inspection window

Notes

1. On request, cabinets can be supplied with degree of protection up to IP54
2. Nominal, using standard in-ground base; using surface mount base gives overall height 1200

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Langmatz EFEN Hiko Power Engineering

Langmatz Polycarbonate Equipment Cabinets

For LV network switchgear, telecoms, traffic control and general

Langmatz reinforced polycarbonate equipment cabinets are made from an extremely robust, heat resistant, flame retardant, corrosion-resistant and weather resistant engineering thermoplastic: structural foamed polycarbonate.

This material has excellent impact strength and is resistant to chemicals, oils and greases including cracking from solvents and aerosols.

It is completely safe to handle, cut, drill and tap. It is also fully recyclable.

Langmatz polycarbonate cabinets have proven their worth for well over 25 years and in installations throughout Europe, Australia and NZ. Polycarbonate is a long-lasting, weather-resistant material, unlike GRP (glass reinforced polyester) which is not generally suitable for New Zealand outdoor applications.

For LV network switchgear applications, where cabinets are often located in publicly accessible places, assurance of safety is provided by compliance with the requirements of AS/NZS 3439-5.

Safety and security are assured by the absence of exposed fixings, and the hinged lockable doors with fully insulated lock and 5-point latching. All mounting screws and fixings are 316 grade stainless steel. The lifetime of the doors is the same as the lifetime of the cabinet.

Mounting points are provided for fastening of vertical or horizontal DIN standard disconnects and fuse holders that withstand all normal forces applied during cable fastening and the installation / removal of fuses.

Ground planted and surface mount cabinets are available in a range of colours. Cabinets can be pre-fitted with busbars, mounting panels and equipment as required.

Cabinet & Door Specifications

Parameter	Test method	Requirement	Comments
Impact resistance (all sides)	AS/NZS 3439-5	15 kg sandbag from 1 m height	
		2 kg steel ball from 1 m height	
		5 kg sharp point from 0.4 m (20 J)	
Lateral tensile strength (top edge)	AS/NZS 3439-5	1,200 N for 5 minutes	
Distributed top load	AS/NZS 3439-5	8,500 N/m^2 for 5 minutes	
Torsional strength	AS/NZS 3439-5	2,000 N for 30 seconds	
Base mechanical strength	AS/NZS 3439-5	1,000 N	Pipe test
Heat resistance	AS/NZS 3439-5	100°C / 125°C	3.2 mm rod dent impact test / 2 kg steel ball point test
Ingress protection rating (cabinet)	DIN 40050	IP44	When installed in accordance with instructions[1]
Ingress protection rating (lock)	DIN 40050	IP65	Waterproof and dust proof
Flame resistance	UL 94	V1	Burning stops within 30 seconds, no flaming drips
Flame resistance (surface)	DIN 53483 Part 3	K1 / 8 mm	Flame does not reach measuring mark at 150 mm
Flame resistance (edge)	DIN 53483 Part 2	F1 / 8 mm	
Dielectric strength	DIN 53481 Part 4.2.2	30 kV/mm	
Chemical resistance	-	Resistant to hydrocarbons including oil, grease, petrol	
Weather resistance	EN 50298 and 60439-5	No change in resistance	
	ISO 4892-2 Process A	>70% retained flexural strength	

Materials

Component	Material	Comments
Cabinet, door	Structural, foamed polycarbonate	Zero residual stress
Fixings	Stainless steel 316 / 1.4301	
Tie-bars	Galvanised steel	

Product Selection Tables

Cabinets

Hiko Code[2]	Max. Number of Ways (vertical disconnects)		Width (mm)	Height Above Base (mm)	Depth (front to back) (mm)
	DIN2/3	DIN00			
LA460CAB	3	7	460	870	330
LA595CAB	5	10	595		
LA795CAB	7	14	795		
LA1120CAB	10	20	1120		

In-ground Base

Hiko Code[2]	Height Above Ground (mm)	Depth Below Ground (mm)
LA460IGB	300	600
LA595IGB		
LA795IGB		
LA1120IGB		

Surface Mount Base

Hiko Code[2]	Height Above Ground (mm)
LA460SMB	330
LA595SMB	
LA795SMB	
LA1120SMB	

Accessories

Door stay: LAA0005 (door stay)
Black door handle: LAA0004 (black handle)

Colour

Refer to note 2; other colours available on request

Options

Pre-fitted with busbars, neutral-earth bar
Street lighting and other auxiliary supplies
MDIs / metering / monitoring
Identification / warning labels to network requirements
Locking arrangements
Inspection window

Notes

1. On request, cabinets can be supplied with degree of protection up to IP54
2. Colour: add suffix GY for Grey RAL 7035; add suffix GN for rainforest green (AS2700 G15) RAL 6003; add "A" for anti-graffiti formula

Other literature available on request

Test reports, drawings, technical data sheets, installation instructions, O&M guidelines

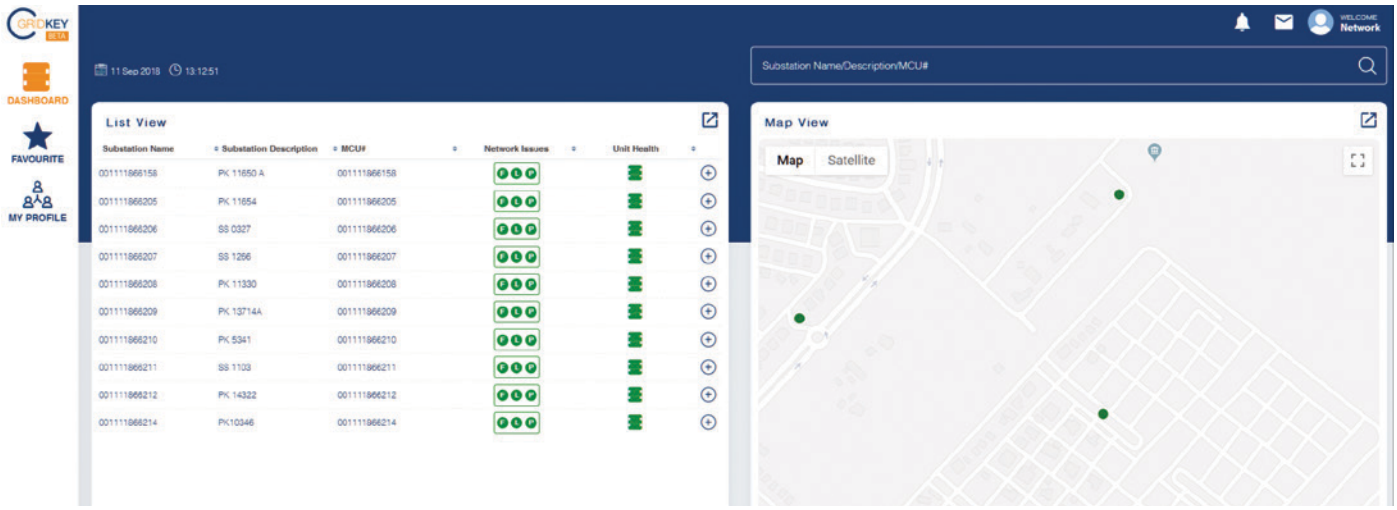
Langmatz

“The GridKey monitoring system and analytics are designed to be highly configurable and offer flexibility."

Low Voltage: Network Monitoring

GridKey Data Centre

Unlocking the smart grid - A collaboration between Lucy Electric and Sentec



Introduction

Increasingly Network Operators are adding automation and monitoring systems to their networks to increase efficiency, manage distributed energy sources and to restore faults more quickly. As a result, the amount of data being generated and collected by companies is increasing exponentially.

One example of this is Low Voltage monitoring which allows companies to view what is happening on the last mile of their network. Lucy Electric's LV monitoring system, GridKey, has alone generated over 100 billion data points to date. To be meaningful and valuable this data needs to be stored, analysed and presented in a way that is actionable and easy to understand.

Data analytics is a very specialised area and many companies do not have the capabilities or capacity to manage this activity. To address this challenge the GridKey team has developed its own Data Centre which delivers a high integrity solution for effective data management.

Data storage and management

To manage and safely store the volume of data collected we use a NoSQL database technology similar to that used by Amazon, Google and eBay. The design of the database balances data 'read and write' – ensuring that no data is lost when the units report and balancing this with the ability to read the data to allow the analytics to operate.

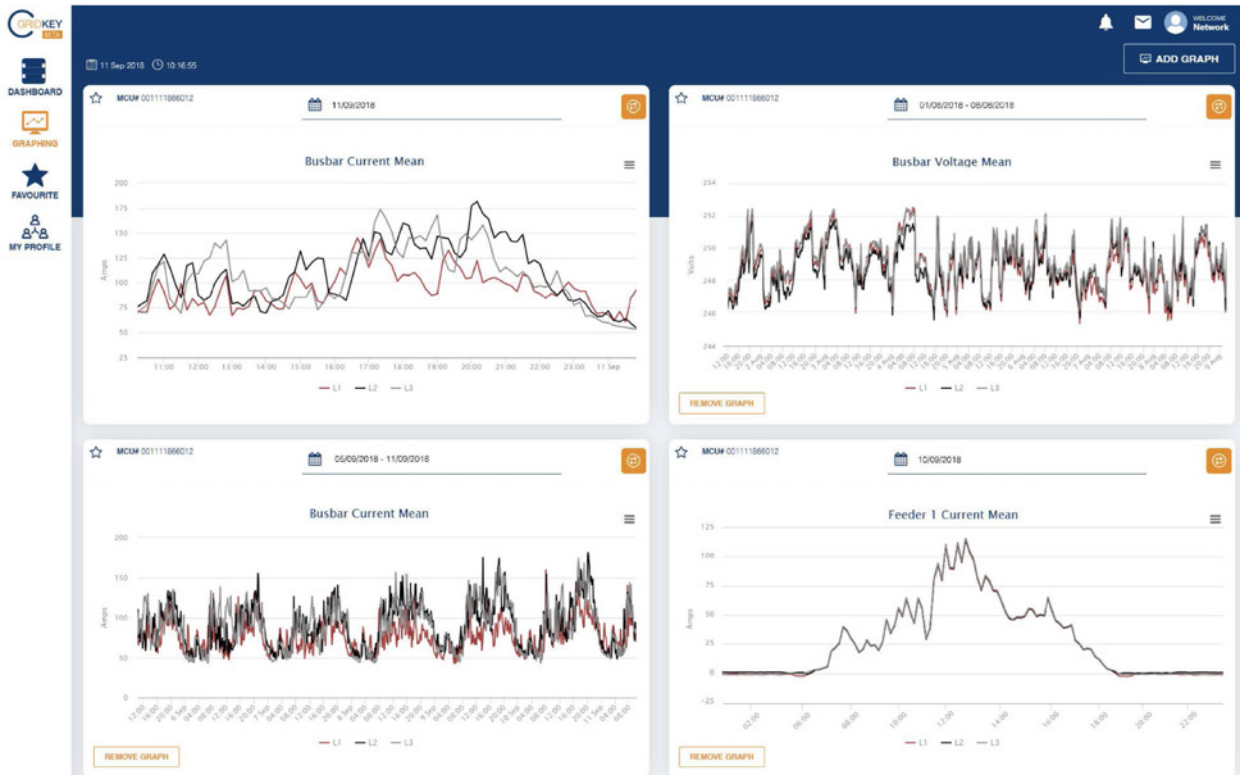
The GridKey Data Centre uses a variety of techniques to ensure this balance is maintained, including pre-processing to store the data in different forms as well as the raw data. It can manage in excess of 10,000 systems, reporting simultaneously without losing any data.

Analytics and alarms

A powerful analytics engine has been included in the Data Centre, carefully integrated with the NoSQL data storage. A series of analytics are in development – using both the data collected as well as monitoring the health of the GridKey units. Further packages are planned around the four themes of actionable information:

- Faults – detection of faults, assistance in determining the cause and potentially predicting faults before they happen
- Losses – calculation of losses caused by phase imbalance and harmonic content, with the ability to identify energy theft when combined with data from domestic and commercial meters
- Power Quality – supporting compliance with statutory requirements for voltage control and harmonic content
- Planning – helping network operators safely maximise the use of their assets allowing for changing load profiles from low carbon technologies and to manage replacement or reinforcement of assets.

GRIDKEY



Graphical User Interface (GUI)

Displaying information in an intuitive way is essential. Learning from best practice in other sectors such as web design, the team have developed a highly visual user interface that presents data in clear, simple and easy-to-read screens. This facilitates decision-making and allows users to quickly see business and safety-critical information.

The GUI can be customised to business needs and the user's role and personal preferences.

Key facts:

- It is a web-based solution so runs on any computer/tablet/phone with a wide variety of browsers
- It displays information in a wider variety of ways – from a top down overview of all the monitoring systems reporting through to detailed analysis of the raw data of specific units.

Hosting

To improve resilience and protect against hardware failures we have created a four-core system hosted on the cloud with a number of data protection features:

- A high integrity solution that ensures collected data is safe against a number of scenarios
- A safety back up regime – both locally and off-site to allow full disaster recovery
- Hosted on Amazon Web-Services based in Ireland.

Security

Security of both the complete system and the data has been designed in from the start. We use a number of methods to ensure that the system cannot be compromised by unauthorised personnel either through the GridKey unit communications or through the web interface. The Amazon cloud solution is verified to ISO27000 and our cyber security measures have also been independently verified.

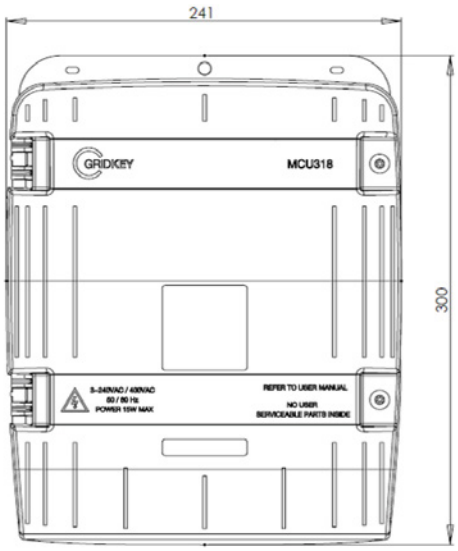
Data from individual customers is managed into separate accounts and can only be accessed by verified users. Varying levels of administration rights ensure that data access levels, by user, can be controlled within the Data Centre.

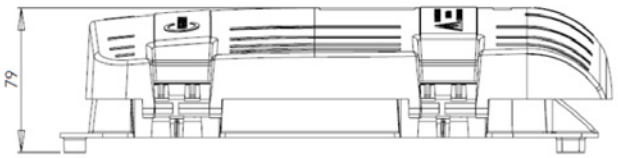
Integration with other systems

The GridKey Data Centre has been designed to integrate with other systems – both accepting and passing data and information to third party systems. The system integrates with a wide range of sources including internet and real devices with outputs managed through an OpenAPI interface.

GridKey MCU318 Metrology and Comms Unit

Unlocking the smart grid - A collaboration between Lucy Electric and Sentec





Why Choose the GridKey MCU318?

GridKey is a custom designed continuous monitoring solution for low voltage (LV) networks. It consists of a number of current sensors on each feeder together with voltage taps, connected to a Metrology and Communications Unit (MCU) which processes the sensor data and generates and logs substation loading and condition parameters.

This information is relayed to a remote data centre where the data is securely stored. Substation performance and feeder cable condition can be analysed, enabling access graphically via our customer web portal.

The GridKey MCU318 LV monitoring system is designed for purpose, offering a flexible and highly configurable information system with the following benefits:

- Safe and easy retrofit solution for installations indoors and out – lightweight and compact with no interruption of customer supply
- Built to be weather resistant– IP54 rated, meeting relevant electrical standards for external and internal substation use
- When used with SlimSensor modified Rogowski sensors the system provides class 2 metering accuracy – on three phases of up to 6 feeders
- Comprehensive reporting of substation feeder and calculated busbar parameters, giving better information to drive evidence-based decision making for grid management
- Compact design allows the system to be fitted internally within LV cabinets reducing the risk of theft or vandalism. A built-in GPRS modem and antenna provides reliable communications
- A secure Wi-Fi connection to the unit is provided to allow configuration and testing whilst installing
- For some countries GridKey are able to supply a cost effective roaming SIM card, however any SIM card can be fitted during manufacture for the customer's chosen mobile network(s). These can be soldered directly onto the PCB to improve security and reliability.

The customer can choose to configure and generate alert messages that would be sent via the data network system for multiple grid measurement states, for example to provide indications and warnings of any over voltage or power phase imbalance conditions.

The information and alerts provided enable network managers to make evidence-based decisions and plan effectively for future preventive maintenance and capital expenditure.

GRIDKEY

The Metrology and Communications Unit

The MCU318 continuously and accurately measures and calculates a wide range of grid condition data including:

- Busbar min / max / averaged voltages
- Minimum, maximum and rms current and phase angle for individual phases per feeder
- Active and reactive powers per feeder
- Stores calculated values and alarms for up to 180 days.

The MCU318 is fully configurable at installation time via a Wi-Fi link with a laptop. Parameters that can be set include:

- Substation identification and location information
- Feeder connections used
- Reporting intervals and alert message settings
- Measurement parameters

At any point in operation, the data reporting and alert messaging settings for each MCU can be individually re-configured remotely via its network interface. The operator can select the MCU measurement reporting interval from 1 minute, 10 minute or 30 minute periods as needed.

Metrology

Measurement Standards	Class 2 in accordance with EN 62053-21
Electrical Safety Standards	EN 61010-1: 2010, with corrigendum May 2011 EN 61010-2-030: 2010
Over Voltage	300 V rms Category IV. pollution degree 3
Current Measurement Range	Accurate up to 720 A AC per feeder phase No damage at any over-current condition
Operating Voltage and Measurement Range	230V AC + 15%. -20% rms Phase to Neutral
Line Frequency	50Hz (nominal)

Protection, Environmental & Compatibility

Ip Rating	IP54
Electromagnetic Compatibility	EN 61000-6-2 immunity EN 61000-6-4 Emissions
Surge Protection	IEC61000 6kV
Operating Temperature Range	- 20°C to 55°C (<93% RH, non-condensing)
Storage Temperature Range	- 25°C to 70°C
Altitude	Up to 2000m

Mechanical

Size (h x w x d)	300mm x 245mm x 80mm
Weight	1.35 kg
IP Category	IP54 IEC 60529
Impact	EN 62262 IK06
Power	Power from single phase only, 6W typical, 11W maximum (GPRS enabled)
Communications Interfaces	GSM/GPRS quad band 850/900/1800/1900 MHz Any network SIM can be provided by customer

GridKey SlimSensor

Unlocking the smart grid - A collaboration between Lucy Electric and Sentec

Why choose the GridKey SlimSensor?

The GridKey system includes a family of high-accuracy current sensors that are quick and easy to install without the need to disconnect power.

With the Monitoring and Control Unit (MCU) the sensors form part of the innovative GridKey Low Voltage Substation Monitoring System. GridKey will revolutionise substation monitoring, providing continuous real time data on all feeder cables and is designed to connect LV monitoring to the Smart Grid.

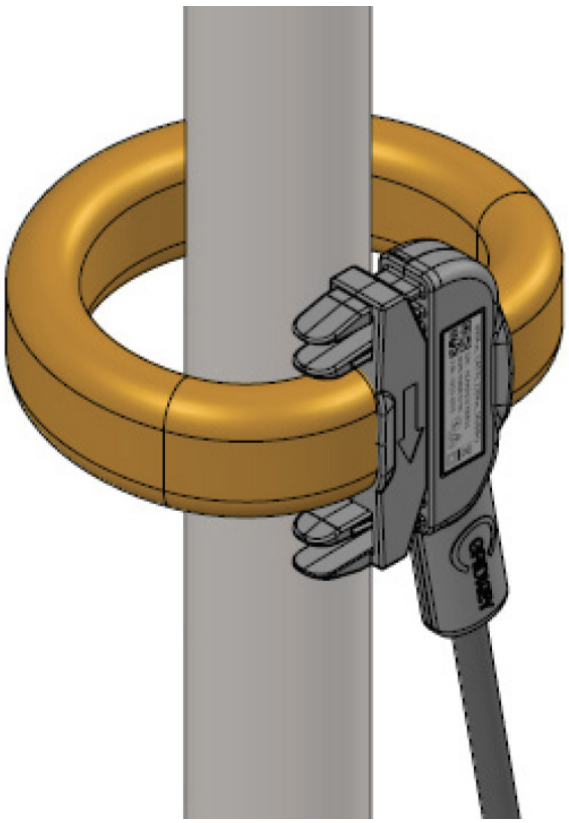
GridKey SlimSensors are rugged enough to survive 20 years of continuous use indoors or outdoors (IP65) and provide up to Class 1 metrology accuracy. With a unique footprint suitable for installation in most substation locations, Sensors are available with cable lengths of 2m, 4m and 6m to accommodate most common installations. Our SlimSensor is the most accurate flexible current sensor of its type.

Easy to fit and compact – Custom-designed for monitoring LV substations. Fitting our sensors is straightforward and quick; the flexible geometry and small size mean substations, where access is restricted and more traditional sensor technologies are problematic, can now be instrumented efficiently. The sensor clips around the conductor with no need to disconnect supply, saving time, cost and customer inconvenience. Fitting is carried out without the need for tools or extensive training and typical installation time is less than 1 minute per sensor. The SlimSensors are specifically designed to fit on tightly-packed feeder cables, requiring only 14mm of cable separation.

Robust and durable – Our sensors will continue to operate in conditions where other sensors fail, such as fault currents and in external locations.

Based on a proprietary technology, and using proven low-cost manufacturing processes, the sensors will continue to perform accurately throughout their lifetime. The unit is sealed and fully weatherproofed to operate for 20 years inside a substation or on a pole-mounted install.

No calibration or maintenance – Once fitted, there is no need for further site visits. The GridKey system produces accurate current data in all conditions, is tolerant of interference from adjacent current



sources, and unlike some alternatives, is insensitive to the position of the sensor around the conductor. It produces accurate readings up to 2000A, providing valuable data for use in diagnosis and root cause analysis of overload and catastrophic failures.

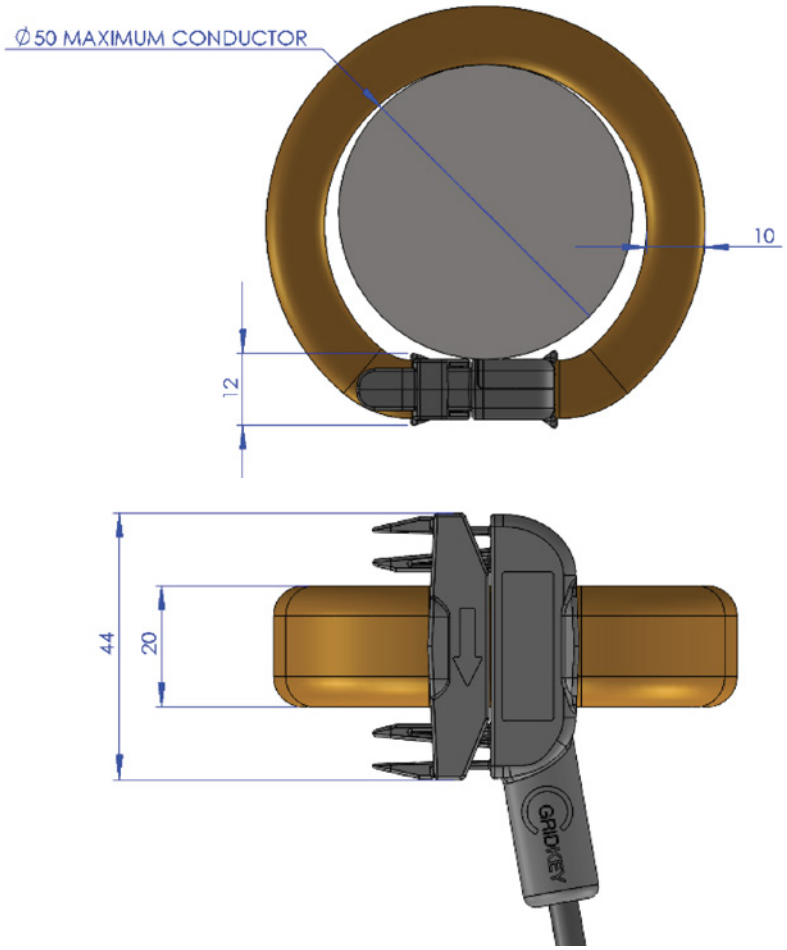
The GridKey SlimSensor

Our sensors' key features and benefits:

- Quick and easy to fit – one-handed installation on tightly packed cables
- Designed for retrofit and live fit
- Low cost of installation and ownership – no calibration, no maintenance required
- Most accurate flexible current sensor; not position sensitive, no cross-coupling
- Robust, durable – designed for 20 years continuous indoor or outdoor life (IP65)
- Monitor all feeder cables simultaneously

GRIDKEY

Dimensions (mm)



Metrology

Measurement Standards	IEC Standard 60044-8
Electrical Safety Standards	BS EN 61010-1: 2001, BS EN 61010-2-032: 2002
Sensor Type	Type B sensor as defined in BS EN 61010-2-032:2002, Category IV, Pollution degree 3
Accuracy Class	Class 1 (calibrated), Class 2 (uncalibrated)
Rated Current	600 A
Maximum Current	2000 A
Output Strength	150 mV ac at rated current
Line Frequency	50 Hz

Protection, Environmental & Compatibility

Surge Protection	IEC61000 6 kV
Operating Temperature Range	- 20°C to 55°C (<93% RH, non-condensing)
Storage Temperature Range	- 25°C to 70°C
Altitude	Up to 2000 m

Mechanical

Minimum Required Clearance Between Conductors	14 mm
Cable Length	2 m, 4 m, 6 m
Aperture	50 mm maximum conductor diameter
Weight	N/A
IP Category	IP65 IEC 60529

IP67 Waterproof Split Core Current Transformer

Size 4, up to 72.5 kV

The IP67 waterproof split core current transformer (CT) from Hiko Power has multiple applications including power quality monitoring for pole top applications and ground base transformers.

The split unit design allows for user friendly set up and can be installed live. The CT provides protection against moisture, humidity and rain allowing access to critical data for proactive maintenance and optimisation.

Applications

- IP67 Waterproof
- Existing System Current Monitoring
- Outdoor Current Monitoring
- Power Pole Current Monitoring
- Transformer LV Current Monitoring

Product features

- Standard: GB/T 20840.1 and .2
- Voltage Rating: 0.4/0.66 / 0.69 / 0.72KV
- Current Rating: 100-3000A
- Frequency: 50 / 60HZ
- IP Rating: IP67
- Operating Temperature: -25°C – +50°C

Specifications

Model	FSCT-T36	**Equipment Maximum Voltage**	0.66/0.72kV
Standards	GB 20840 (IEC 61869), GB4208	**Rated Output**	5A, 1A,mA,mV,V
Window Size	36mm	**Wire Lead**	2*1.5mm² or 2*2.5mm² sheathed wire
IP Rating	IP67	**Insulation Strength**	3kV VAC/min
Burden	1.5VA-5VA	**Insulation Impedance**	DC500V/100MΩ
Rated Current	100-600 Arms	**Rated Frequency**	50-400HZ
Max Current	600 Arms	**Working Temperature**	-40°C to 70°C
Turns	100-3000T	**Storage Temperature**	-40°C to 90°C
Accuracy Class	0.5, 1.0		

Dimensions

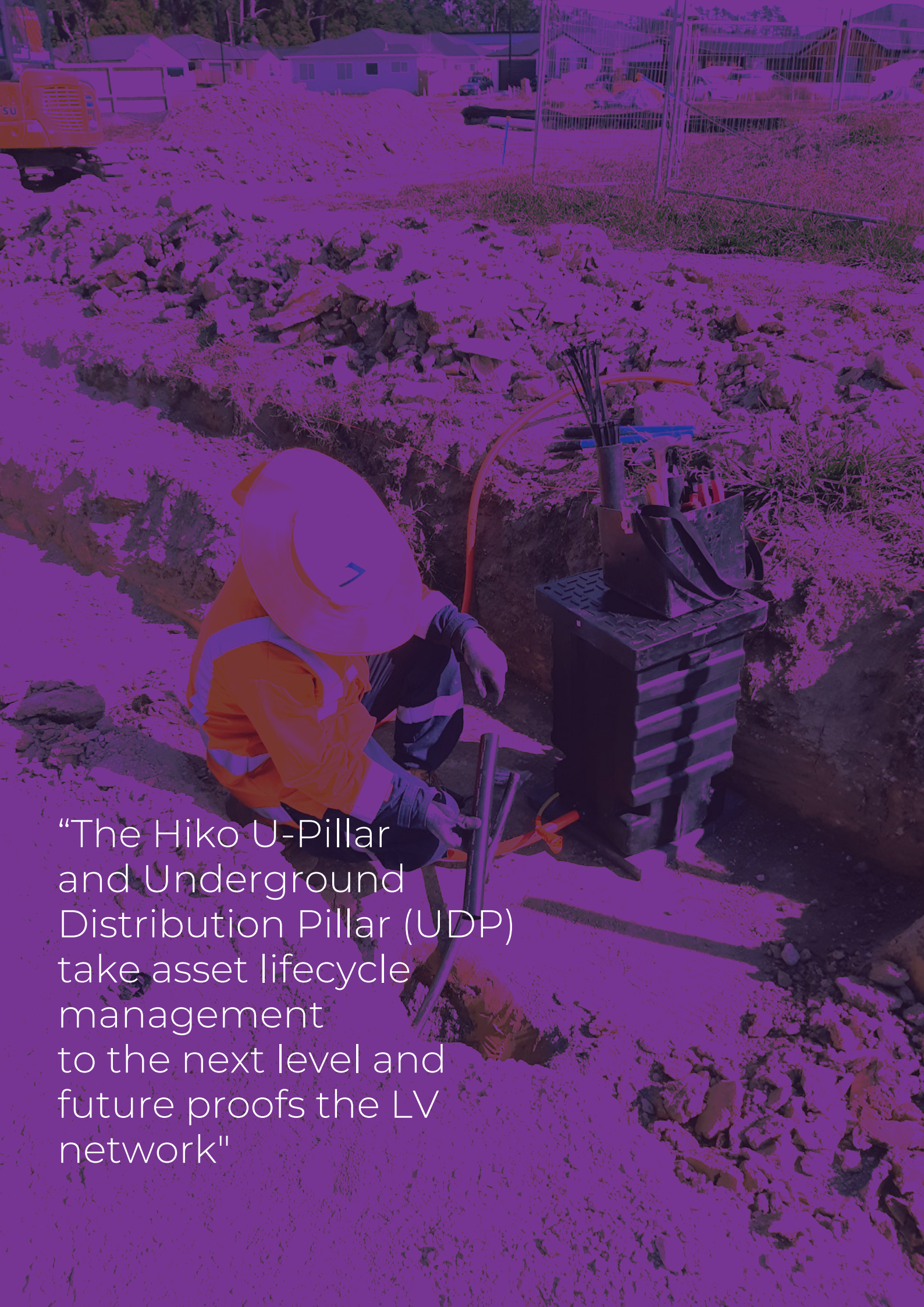
Model	Current Range (A)	Dimension (mm)			
		L	W	H	D
FSCT36	100-600	42	107	108	36
FSCT60	100-3000	58	179	172	60

Electrical Characteristics

Hiko Code	Model	Primary/Secondary (A)	Class	Burden (VA)	Class (m)
METCT0003	FSCT36 250/5A	250/5	3	5	5
METCT0007	FSCT36 600/5A	600/5	1	5	5
METCT0005	FSCT60 400/5A	400/5	1	2.5	5
METCT0006	FSCT60 800/5A	800/5	1	5	5

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines



“The Hiko U-Pillar and Underground Distribution Pillar (UDP) take asset lifecycle management to the next level and future proofs the LV network"

Low Voltage: Underground Network Equipment

UDP In-Ground Distribution Boxes

Secure, watertight underground distribution link switches and services up to 400 A

The Hiko UDP takes asset lifecycle management to the next level and future proofs the LV network by eliminating the risks associated with above ground pillars.

The design of the pit eliminates the need for a concrete vault or collar, reducing time and cost on site.

Fusegear / switchgear is housed horizontally under a watertight composite “bell” which allows continuous operation even in flood conditions. Monitoring equipment can also be accommodated. In some configurations, the “bell” is hinged allowing fusegear / switchgear to be lifted up vertically for inspection and operation.

Installation is facilitated by the structural foamed polycarbonate (SFPC) pit elements, which can be easily separated into layers and reconnected if required, and by the provision of tool-free conduit knock outs and an adjustable lid height.

The UDP is available with lids rated to AS3996 Class B for footpaths and driveways right up to Class E for application in carriageways.

The UDP uses industry standard fusegear / switchgear and Langmatz structural pits to provide a safe, robust, reliable, flexible and future-proof solution for underground urban distribution reticulation and service supplies up to 400 A.

Langmatz pits are made in Germany and are engineered for a lifetime of over 40 years. Their use of SFPC in a honeycomb modular design delivers outstanding performance under dynamic and static load conditions. The SFPC material is extremely strong, heat resistant, flame retardant and resistant to solvents including petrol, diesel and oil. It has been shown by independent testing to be completely non-toxic to ground water.

Mechanical Specifications

Specification	Test Method	Requirement
Lid load class	AS 3996	Up to Class E400 (40 tonnes)
Transfer of vertical loads to ground base	DIN 1054:2005-01	min 200 kN/m^2
Transfer of adjacent static and dynamic loads to ground base	DIN FB 101	Load class 2 (96 kN with area 40x40 cm using set up RStO road class)
Active ground pressure (transfer of vertical loads to pit elements)	DIN 4085	Ground types V1 to V3 acc to ATV-DVWK-A 127

Materials

Component	Material
Lid	Cast iron, cast aluminium, galvanised steel paved or composite
Bell	Composite
Head Frame	Hot dip galvanised steel (≥ 70 µm) or Stainless steel 304
Fixings	Stainless steel 304
Structural pit elements	Structural foamed polycarbonate (PC/PBT blend with 6% GRP)

Structural Pit Element Material Properties

Specification	Test Method	Requirement
Density	ISO 1183	0.95 – 1.25 g/cm^3
Water absorption	DIN 53495	< 0.5 %
Hardness	ISO 2039/1	90 MPa
Tensile strain at break	ISO 527	38 MPa
Elongation at break	ISO 527	12 %
Elastic modulus	ISO 527	2,000 MPa
Notched impact strength	DIN 53453	6 kJ/m^2 (20°C), 4 kJ/m^2 (-20°C)
Vicat softening temperature	ISO 306	110°C (B50 method)
Flammability	(Surface flame)	Self-extinguishing after flame is withdrawn
Groundwater compatibility	(Independent test)	Non-toxic (no leaching of heavy metals, phenol, polycyclic aromatic hydrocarbons or BTEX)

Configurations and Dimensions (mm)

Hiko Code	Typical Configurations				Internal Length (mm)	Internal Width (mm)	Nominal Depth (mm)	Typical Weights (kg)				Cable Tails (mm^2)
	63 / 100 A	160 A	250 A	400 A				Total (exc cable tails)	Head Frame	Lid(s)	Switchgear Assembly	
UDP03xx	2x 3P or 6x 1P	1x 3P			550	250	600	62	18	10	5	25-70
UDP04xx	2x 3P or 6x 1P	2x 3P	1x 3P		800	250	600	80	22	12	8	25-95
UDP05xx				1x 3P	400	400	700	110	18	15	30	150-240
UDP07xx			3x 3P	3x 3P	800	400	700	160	25	15	50	95-240
UDP10xx				6x 3P	800	800	700	300	40	2x 50	150	150-240

Notes

Network link box configurations, with optional bus coupler, are also available.
No special tools or spare parts are required.

Options

Service fuses up to 100 A or EFEN DIN-type horizontal disconnectors 160 A or 250 A. Lid type (composite, steel, steel with concrete fill / paveable) Locking and latching arrangements.

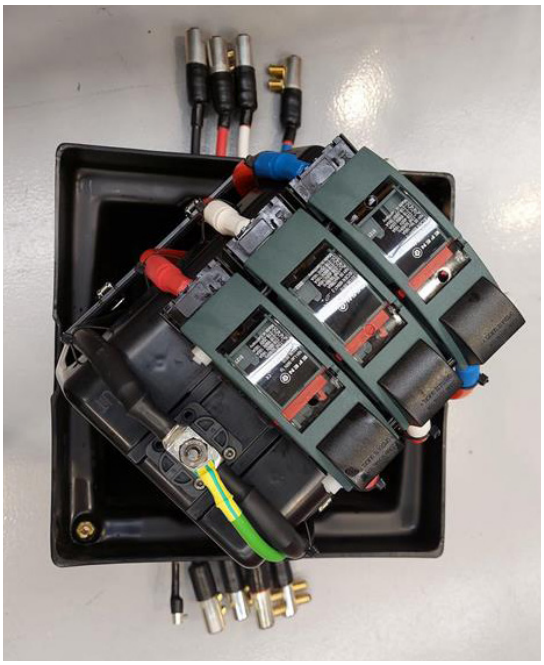
Other literature available on request.

Type test reports, drawings, technical data sheets, installation instructions, O&M guidelines.

Langmatz EFEN Hiko Power Engineering

U-PILLAR Underground Service Connection Boxes

Branching, looping and conduit versions available



The Hiko U-Pillar is a new concept in service connections for branching and looping networks. Building on Hiko's expertise in underground switchgear, the U-Pillar delivers a simple, robust, secure, cost effective and fully underground solution for 63 A / 100 A service fuses and 160 A DIN standard disconnects.

In the U-Pillar, fusegear is locked and protected below ground level in an air chamber, where it is kept clean and dry, even in flood conditions.

The unique design also provides for safe and convenient inspection and maintenance above ground level, without the need to pump out water.

Another key feature of the U-Pillar is the free movement of air around the fusegear, which eliminates concerns around operational safety and long-term reliability associated with other underground solutions that rely on so-called "waterproof" fuse housings. These typically include seals that may be vulnerable to the pressure cycling that occurs as the temperature of the service fuse varies between hot and cold. When air is drawn in, moisture condenses inside the housing, and is not expelled when the fuse heats up again. Water in contact with a fuse causes operational hazards, reduced asset lifetime, and elevates the risk of in-service failure.

The U-Pillar comes complete with water-blocked, pre- terminated flexible tails for both the incomer and service supplies, so network operators can be certain that the integrity of the asset is not compromised by water ingress via a damaged or poorly maintained service cable. And service connection contractors do not need to open the box.

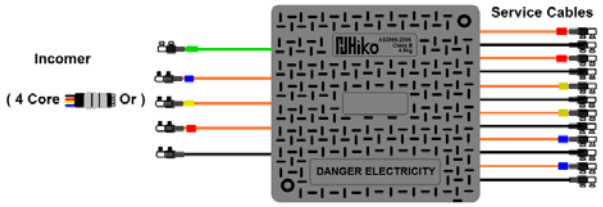
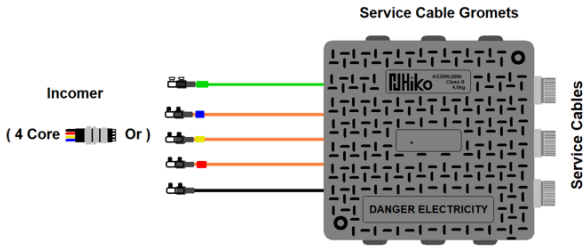
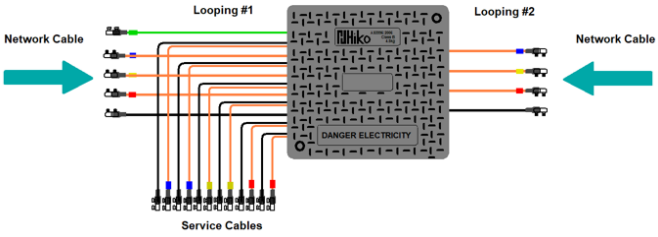
The reinforced lid of the U-Pillar is extremely robust, for installation in footpaths and driveways.

The pit is shaped to provide structural strength and long-term stability. Materials used are benign to the environment, and resistant to engine oil, petrol and diesel.

U-Pillar Features

- Current rating from 63A to 160A
- Single or four core connections for branching network
- From 1 to 6-way service connection
- Single core connection for looping network
- U-Pillar is an Arc Initiation Protected Zone
- IP: IP4x / Flammability: UL94
- Service connection: single phase or three phase
- Looping maximum current rating: 230A
- Dimension: 375 mm x 375 mm
- Lid load: class B and D
- Designed to have an air chamber (water bell principle) for switch gear to guard against underground water level
- Unique design provides a “pull up” feature to allow inspection, maintenance and later connection above ground level
- Conduit U-Pillar also provides 1-to-3-way internal connection solution for drive way and footpath
- Service cable can be changed to any three directions of U-Pillar

U-Pillar Models

Model	Description	Drawing image
UDPxx02x063/100xx/L0	63A 1 to 6 way/100A 1 to 4 way (Branching & Looping network)	 *Figure 1 - Branching U-Pillar*
UDPxx02x160xx/Lx	160A 1 x 3P (Branching & Looping network)	 *Figure 2 - Conduit U-Pillar*
UDPxx02x063/100Cx	63A/100A 1-to-3-way Conduit (Branching & Looping network)	 *Figure 3 - Looping U-Pillar*

Mechanical Specifications

Parameter	Test method	Requirement	Comments
Lid load class	AS3996	Class B080 (8 tonnes) Class D (40 tonnes)	Suitable for footpaths and driveways (nominal wheel loading 2,670 kg)
Lid slip resistance	AS/NZS4586	Classification V (P5)	Represents a very low risk of slipping when wet
Colour	-	Black	Other colours available on request
Weather resistance	ASTM D2565 / ISO 4892-2	Greater than UV8	Long term UV stable
Chemical resistance	-	Engine oil, petrol, diesel	Maintains structural integrity after exposure to small and occasional spills
Flammability	UL94	HB	Very difficult to ignite without a sustained source of ignition
Thermal stability	AS/NZS4766	Pass	Melt flow index remains within ±20% after 100 days at 100°C

Materials

Component	Material	Comments
Lid	Polyethylene	UV stabilised grade UV20
Pit	Polyethylene	UV stabilised grade UV8
Bell	Polycarbonate	-
Stand	Polycarbonate	-
Fusegear holders	ABS, various	-
Fixtures and fittings	Stainless steel	304, (1.4301)
Cable insulation	Thermoset elastomeric PVC	Submersible, splash resistant to petrol and oil, ozone resistant, abrasion resistant

Configurations and Dimensions

Branching Connection

Hiko Code	Number of Services					Approx. Weight	Cable tail sections		In-Line connectors	
	63A		100A	160A						
	1- Phase	3- Phase	1- Phase	1- Phase	3- Phase	(kg)	Incomers (mm^2)	Service (mm^2)	Incomers (mm^2)	Service (mm^2)
UDP02A100xx			1			14.4	25*	16	10-50	10-50
UDP02B100xx			2			15.3				
UDP02C100xx			3			16.2				
UDP02D100xx			4			17.1				
UDP02E063xx	5					17.6				
UDP02F063xx	6					19.0				
UDP02F063xx		2x3P								
UDP02F063xx		1x3P+1x1P								
UDP02F063xx		1x3P+2x1P								
UDP02F063xx		1x3P+3x1P								
UDP02G160xx				3x1P		25.0				
UDP02G160xx					1x3P		70	70	50-185SM	50-185SM

* Incomer cable has two options – single core cable 25mm² or 4-core cable 25mm²

Conduit Connection

Hiko Code	Number of Services	Approx. Weight (kg)	Cable tail sections		In-Line connectors	
	100A 1- Phase		Incomers (mm^2)	Service (mm^2)	Incomers (mm^2)	Service (mm^2)
UDP02A100Cx	1	14.4	25*	16	10-50	10-50
UDP02B100Cx	2	15.3				
UDP02C100Cx	3	16.2				

* Incomer cable has two options – single core cable 25mm^2 or 4-core cable 25mm^2

Looping Connection*

Hiko Code	Number of Services					Approx. Weight	Cable tail sections		In-Line connectors	
	63A		100A	160A						
	1- Phase	3- Phase	1- Phase	1- Phase	3- Phase	(kg)	Looping (mm^2)	Service (mm^2)	Lopping (mm^2)	Service (mm^2)
UDP02A100Lx			1			14.4	70	16	50-185SM	10-50
UDP02B100Lx			2			15.3				
UDP02C100Lx			3			16.2				
UDP02D100Lx			4			17.1				
UDP02E063Lx	5					17.6				
UDP02F063Lx	6					19.0				
UDP02F063Lx		2x3P								
UDP02F063Lx		1x3P+1x1P								
UDP02F063Lx		1x3P+2x1P								
UDP02F063Lx		1x3P+3x1P								
UDP02G160Lx				3x1P		25.0		70		50-185SM
UDP02G160Lx					1x3P					

* Looping CU cable maximum size 70mm^2 and maximum looping current rating 230A

Options
Security bolts / internal padlock
Identification (on lid and bell)
Incomer and service cable tail lengths (0.2 m and 0.3 m as standard)[1]
Branch joint[2]
Service fuses
Street lighting and other auxiliary supplies

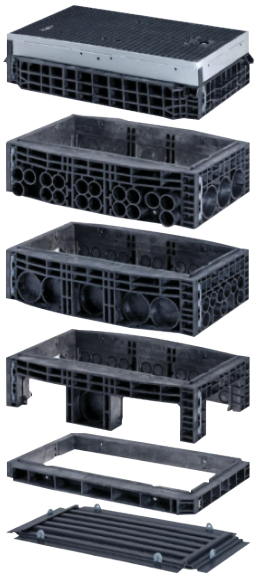
Notes
1. Capped incomer and water-blocked service connectors included as standard
2. Hiko product code KP8033 (Pfisterer ISICOMPACT single-shear-bolt connector and resin joint kit) for main 50-240 / branch 10-70 mm^2.

Other literature available on request
Test reports, drawings, technical data sheets, installation instructions, O&M guidelines.

Scan this QR code to watch the U-Pillar video animation.

Langmatz Modular Structural Pits and Equipment Vaults

Adaptable and robust solutions for underground services



Langmatz modular pits are made in Germany and are engineered for a lifetime of over 40 years.

The use of structural foamed polycarbonate (SFPC) in a honeycomb modular design delivers outstanding performance under dynamic and static load conditions. The SFPC material is extremely strong, heat resistant, flame retardant and resistant to solvents including petrol, diesel and oil. It has been shown by independent testing to be completely non-toxic to ground water.

Langmatz modular pits withstand all foreseeable environmental conditions, including extreme temperatures, rain, salt, petrol and oil.

They also withstand all foreseeable mechanical conditions, including vertical and horizontal static and dynamic forces from trucks and accelerating / decelerating traffic.

Lids are available from AS3996 Class B80 for footpaths and driveways up to Class E400 for application in carriageways. Lids can be cast iron, galvanised steel, composite or paved.

The pit design eliminates the need for a concrete vault or collar, reducing time and cost on site. The head frame can also provide for a height adjustable lid.

The modular design of the pit components provides for a huge range of applications, including building over existing services. Pit components are available in a range of lengths from 250 mm to 2200 mm.

Installation is made easy by the SFPC pit elements, which can be easily separated into layers for manual handling and reconnected as required. No tools are required, thanks to the design of the modular blocks and the provision of tool-free conduit knockouts.

Langmatz modular pits are used in huge numbers worldwide for a wide variety of applications, including electricity (for LV distribution, service connections, pop-up power supplies, cable jointing and cross bonding boxes) telecoms, water, gas and control gear.

Materials

Component	Material
Pit components	Structural foamed polycarbonate
Pit component connectors (dowel pins)	Polypropylene
Head frame	Hot-dip galvanised steel (greater than or equal to 70 µm) or Stainless steel 304
Fixings	Stainless steel 304
Lid	Cast iron, cast aluminium, galvanised steel, paved or composite

Available Sizes

<table>
<tr><th rowspan="2">Length[1,2] (Internal)</th><th colspan="3" rowspan="2">Height (layers)</th><th colspan="2" rowspan="2">Height
(head-frame support layer)</th><th colspan="3">Height (head frame) for Lid Type</th></tr>
<tr><th>Composite</th><th>Cast Iron,
Galvanised Steel</th><th>Paved</th></tr>
<tr><td>250</td><td rowspan="6">70</td><td>151</td><td>250</td><td rowspan="6">66</td><td rowspan="6">140</td><td rowspan="4">105</td><td rowspan="6">95</td><td rowspan="6">As required</td></tr>
<tr><td>400</td><td rowspan="4">220</td><td rowspan="2">580</td></tr>
<tr><td>650</td></tr>
<tr><td>800</td><td rowspan="3">-</td></tr>
<tr><td>1165</td><td rowspan="2">-</td></tr>
<tr><td>1400</td></tr>
</table>

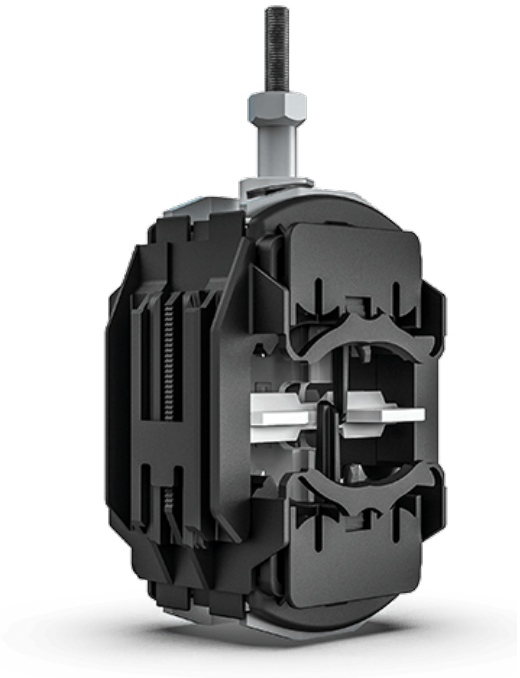
Notes
1. Other sizes available on request up to 2,200 mm length
2. External length add 100 mm (nom)

Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Langmatz

Pfisterer ISICOMPACT LV Branch Joints

Four safe and secure tap connections with one single shear bolt



Tapping off low voltage electricity supplies to premises has become safer, faster and easier with new Pfisterer ISICOMPACT connectors.

With just one shear bolt in the new Pfisterer ISICOMPACT connector it's now possible to clamp and connect all conductors with the right torque for a guaranteed connection. Pfisterer developed the new ISICOMPACT L30 and L40 single bolt connectors which are ideally suited to New Zealand cables. Unlike ring connectors the new ISICOMPACT units do not require insulation to be stripped from the branch conductors.

Once the ISICOMPACT moulded plastic body is assembled around the main cables and the four cores are locked in position, the service cable cores are simply aligned and inserted into their clamping apertures fully sheathed. There are no exposed live parts.

A single shear bolt then clamps all cores in unison. The bolt shears off when the right torque is reached for the teeth to penetrate all the stranded conductors, locking the joints securely and making sure of a successful connection every time.

With a plastic body encasing the metal clamping system and no cores having to be stripped of their insulation, the new ISICOMPACT connectors take risk out of live work and speed up installation times.

Pfisterer LV branch joints incorporate the ISICOMPACT connector inside hinged polycarbonate shells filled with resin. Two generously dimensioned shells sizes are available, designed to accommodate a wide range of cable sizes and types, including large branch cross sections and armour cables requiring earthing and short circuit continuity kits. The shells are filled with polyurethane hard resin, or polybutadiene soft resin, which allows the joint to be re-entered if required.

LV Branch Joints: Connectors

Hiko Code	Connector Type	Description	Main	Branch
			(mm^2) (sector stranded)	
KP1533	ISICOMPACT L30	Single shear-bolt ring connector	50–240	10–70
KP1534	ISICOMPACT L40	Single shear-bolt ring connector	95–240	70–150

Complete LV Branch Joint Kits

Hiko Code	Connector Type	Shells Size	Resin Type	Container	Main	Branch
KP8033	ISICOMPACT L30	140/420	PUR	Bag	50 - 240	10 - 70
KP8053		160/500				
KP8034	ISICOMPACT L40	140/420			95 - 240	70 - 150
KP8054		160/500				

Resin and Shells Kits (without connector)

Hiko Code	Shells Size	Resin Type	Container	Application Notes
KP8103	140 / 420	PUR	Bag	Accommodates either L30 or L40 ISICOMPACT connector
KP8105	160 / 500			Can be used to accommodate armour cables requiring earth and short circuit continuity kit

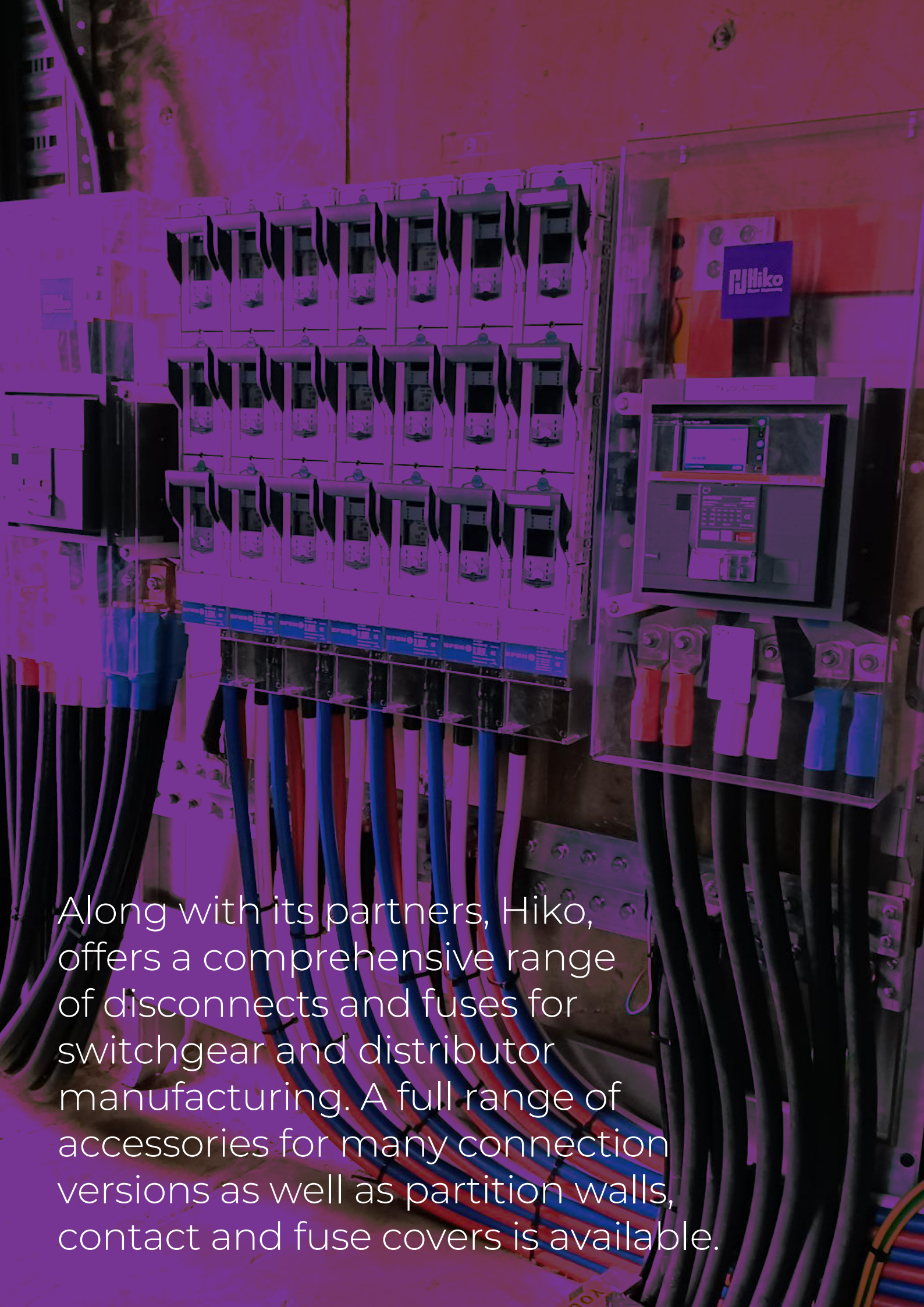
Notes

Shell sizes are given as diameter/length
Max cable diameters: 140/420: main 60 mm, branch 45 mm; 150/600: main 65 mm, branch 50 mm
PUR = Polyurethane (hard resin)
ISICOMPACT L30 and L40 connectors can be used with aluminium or copper cable; solid, stranded or fine stranded; application ranges and cable types are the subject of continuous development.

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

PFISTERER



Along with its partners, Hiko, offers a comprehensive range of disconnects and fuses for switchgear and distributor manufacturing. A full range of accessories for many connection versions as well as partition walls, contact and fuse covers is available.

Low Voltage: Disconnects and Fuses

EFEN LV Vertical Fuse Switch Disconnects

EFEN E3 Disconnector is the next practicable step in LV network safety

Closed | Open | Visual Break

Isolating electricity supply at distribution substations can be made safer with the latest generation of EFEN disconnectors.

The new E3 disconnector keeps live terminals fully shrouded from touch at all times.

In the open position the E3 disconnector holds the disconnected fuse under its cover, which maintains an IP2x barrier preventing finger touch of either source or load terminal. With distributed generation on the rise and more connected solar feeding into the LV network from residential and commercial premises, a fully shrouded approach better protects operators by eliminating the risk of exposed live fuse terminals.

In the E3 disconnector the whole fuse is withdrawn in a parallel direction by levering the manually dependent switch in a way that opens both terminals of each fuse blade at the same time. This halves the arc voltage by creating two smaller arcs – one at each terminal.

E3 disconnectors also manage heat more effectively, reducing the risk of over-heating. Heat build-up is minimised by improved housing ventilation and busbar design.

The improved design also delivers improved switching capacity with non-resistive loads, and higher short-circuit rating for improved performance in fault conditions.

The versatile range includes both simultaneous three phase switching as well as individual single phase switching from 100 A to 630 A. E3 disconnectors are available as either 1000 A or 2000 A isolators with knife links in place of fuses.

Other ratings are available on request, including parallel arrangements. Rear-connect and side connect configurations are also available.

E3 Fuse Switch Disconnectors: Characteristics and Ratings

For Fuse-Links ACC. TO DIN 43620/1		Unit Size	00/100	00/185	2	3
			000/00	000/00	2	3
Rated Operational Current L_e	400V	A	160	160	400	630
	500V	A	160	160	400	630
	690V	A	160	160	315	500
Conventional Free Air Thermal Current I_{th}		A	220	220	400	630
Rated Operational Voltage U_e		V	690	690	690	690
Rated Insulation Voltage U_i		V	1000	1000	1000	1000
Rated Impulse Withstand Voltage U_{imp}		KV	8	8	12	12
Rated Conditional Short Circuit Current	400V	KA	100	120	120	120
	500V	KA	100	120	120	120
	690V	KA	100	100	100	100
Utilisation Category VDE 0660 T107/EN/IEC 60947-3	400V		AC–23B	AC–23B	AC–23B	AC–23B
	500V		AC–22B	AC–22B	AC–22B	AC–22B
	690V		AC–22B	AC–22B	AC–21B	AC–21B
Mechanical Durability		Cycles	1400	1400	800	800
Electrical Durability		Cycles	200	200	200	200
Type Of Protection ACC. DIN/EN 60529/VDE 0470 T1		IP	30	30	20	20
Maximum Power Dissipation Of The NH Fuse-Links		W	12	12	34	48
Total Power Loss At I_{th} (without fuse links)		W	20	22	56	111
Degree Of Pollution			3	3	3	3
Overvoltage Category			IV	IV	IV	IV
Rated Frequency		Hz	50–60	50–60	50–60	50–60
Weight Without NH Fuse-Links		KG	1.30	2.00	95–240	70–150

E3 Isolators: Characteristics and Ratings

Description		Size	Unit	1000A	2000A
Rated Operational Voltage		U_e	Vac	690	690
Rated Operational Current		I_e	A	1000	2000
Rated Insulation Voltage		U_i	Vac	1000	1000
Rated Impulse Withstand Voltage		U_{imp}	kV	12	12
Rated Frequency		I_{cw}	Hz	5–60	5–60
Rated Withstand Short Circuit Current			kA	15 25[2]	22 40[2]
Utilisation Category AC	400 V			AC–22B	AC–22B
	500 V			AC–21B	AC–21B
	690 V			AC–21B	AC–21B
Mechanical Durability – Cycles			N	800	600
Electrical Durability - Cycles			N	200	200
Maximum Power Dissipation Without Fuse Links			W	270	540
IP Protection (With Front Lid Open)		IP		20	20
Degree Of Pollution				3	3
Overvoltage Category				IV	IV
Material		All Material Conforms To RoHS			

Notes
1. Switch disconnects (isolators) are to be used with knife switches
2. With handle lock

Also available
Fuse links
Solid copper (knife) links
CTs with non-standard ratings and for external mounting
LV switchgear assembly frames, cabinets and underground pits

Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

EFEN

Product Selection Table And Dimensions

Din Size	Hiko Code	Function	Current Rating (A)	Busbar Pitch (mm)	Nominal Width (mm)	Cable Clamps	Cable Connection Adaptors		3-Phase	Low Profile	Removable Links	Busbar Connections			
						V-Clamps	Extended	Compact				Rear	Side (L)	Side (R)	Bus Coupler
00	EFV00160	Fuse Switch Disconnect	160	185	50										
00	EFV00160P	Fuse Switch Disconnect	160	185	50				P						
00	EFV00160H100	Fuse Switch Disconnect	160	100	50										
00	EFV00160H100P	Fuse Switch Disconnect	160	100	50				P						
00	EFV00320CDH100	Fuse Switch Disconnect	320	100	100			C							
2	EFV2400	Fuse Switch Disconnect	400	185	100										
2	EFV2400C	Fuse Switch Disconnect	400	185	100			C							
2	EFV2400CP	Fuse Switch Disconnect	400	185	100			C	P						
2	EFV2400P	Fuse Switch Disconnect	400	185	100				P						
2	EFV2400V	Fuse Switch Disconnect	400	185	100	V									
2	EFV2400VP	Fuse Switch Disconnect	400	185	100				P						
3	EFV3630	Fuse Switch Disconnect	630	185	100										
3	EFV3630C	Fuse Switch Disconnect	630	185	100			C							
3	EFV3630CP	Fuse Switch Disconnect	630	185	100			C	P						
3	EFV3630E	Fuse Switch Disconnect	630	185	100		E								
3	EFV3630L	Fuse Switch Disconnect	630	185	100					L					
3	EFV3630P	Fuse Switch Disconnect	630	185	100				P						
3	EFV3630R	Fuse Switch Disconnect	630	185	100							R			
3	EFV3630SL	Fuse Switch Disconnect	630	185	200								SL		
3	EFV3630SR	Fuse Switch Disconnect	630	185	200									SR	
3	EFV3630V	Fuse Switch Disconnect	630	185	100	V									
3	EFV3630VP	Fuse Switch Disconnect	630	185	100				P						
3	EFV3800	Switch Disconnect[1]	1,000	185	100										
3	EFV3910C	Fuse Switch Disconnect	910	185	100			C							
3	EFV3910CP	Fuse Switch Disconnect	910	185	100				P						
3	EFV31000	Switch Disconnect[1]	1,000	185	100										
3	EFV31000B	Switch Isolator	1000	185	100										B
3	EFV31000C	Switch Isolator	1000	185	100			C							
3	EFV31000E	Switch Isolator	1000	185	100		E								
3	EFV31000L	Switch Isolator	1000	185	100					L					
3	EFV31000R	Switch Isolator	1000	185	100										
3	EFV31000SL	Switch Isolator	1000	185	200								SL		
3	EFV31000SR	Switch Isolator	1000	185	200									SR	

Product Selection Table And Dimensions (continued)

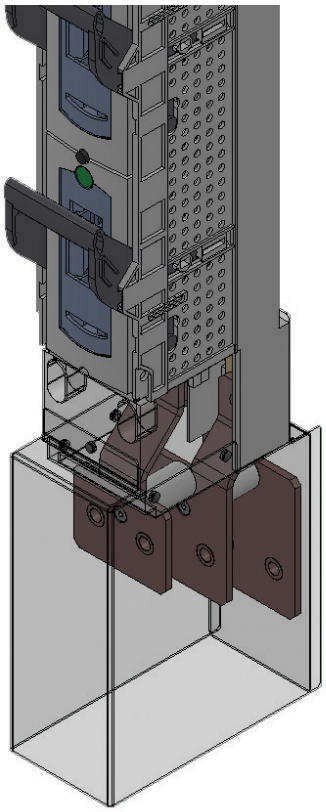
Din Size	Hiko Code	Function	Current Rating (A)	Busbar Pitch (mm)	Nominal Width (mm)	Cable Clamps	Cable Connection Adaptors		3-Phase	Low Profile	Removable Links	Busbar Connections			
						V-Clamps	Extended	Compact				Rear	Side (L)	Side (R)	Bus Coupler
3	EFV31000V	Switch Isolator	1000	185	100	V									
3	EFV31000Q	Switch Isolator	1000	185	100						Q				
3	EFV31000QC	Switch Isolator	1000	185	100			C			Q				
3	EFV31000QE	Switch Isolator	1000	185	100		E				Q				
3	EFV31000QL	Switch Isolator	1000	185	100					L	Q				
3	EFV31000QP	Switch Isolator	1000	185	100				P		Q				
3	EFV31000QR	Switch Isolator	1000	185	100						Q	R			
3	EFV31000QSL	Switch Isolator	1000	185	200						Q		SL		
3	EFV31000QSR	Switch Isolator	1000	185	200						Q				
3	EFV31000QV	Switch Isolator	1000	185	100	V					Q			SR	
2x3	EFV31250CD	Fuse Switch Disconnect	1250	185	200			C							
2x3	EFV31250CDP	Fuse Switch Disconnect	1250	185	200			C	P						
2x3	EFV31250ED	Fuse Switch Disconnect	1250	185	200	E									
2x3	EFV31250FD	Fuse Switch Disconnect	1250	185	200										
2x3	EFV32000CD	Switch Isolator	2000	185	200			C							
2x3	EFV32000ED	Switch Isolator	2000	185	200	E									
2x3	EFV32000FD	Switch Isolator	2000	185	200										
2x3	EFV32000QCD	Switch Isolator	2000	185	200			C			Q				
2x3	EFV32000QCDP	Switch Isolator	2000	185	200			C	P		Q				
2x3	EFV32000QED	Switch Isolator	2000	185	200	E					Q				
2x3	EFV32000QFD	Switch Isolator	2000	185	200						Q				
2x3	EFV32000QFDP	Switch Isolator	2000	185	200				P		Q				
2x3	EFV31820CD	Fuse Switch Disconnect	1820A	185	200			C							
2x3	EFV31820CDP	Fuse Switch Disconnect	1820A	185	200			C	P						
2x3	EFV31820FD	Fuse Switch Disconnect	1820A	185	200										
2x3	EFV31820FDP	Fuse Switch Disconnect	1820A	185	200				P						
2x3	EFV31250D	Fuse Switch Disconnect	1,250	185	200										
2x3	EFV31600D	Switch Disconnect[1]	2,000	185	200										
2x3	EFV31820D	Fuse Switch Disconnect	1,820	185	200										
2x3	EFV32000D	Switch Disconnect[1]	2,000	185	200										
4A	EFV41600	Fuse Switch Disconnect	1,600	185	150										
4A	EFV41250	Fuse Switch Disconnect	1,250	185	150										

Examples
EFV00160P 160A DIN 00/185 fuse-switch-disconnect with three phase handles
EFV32000QCD 2 x DIN3 Switch isolator with removable links and compact connection adaptors

Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Connections, Spare Covers, CTs and Other Accessories

For EFEN E3 vertical disconnects



Hiko provides a range of accessories to make the latest generation of EFEN E3 vertical fuse switch disconnectors even more versatile.

Connections

Connection plates have been specially designed to enable the connection of large cross section cables and multiple cables. These are typically ordered with the EFEN E3 disconnector as a complete assembly. The "compact single" connection is available as a retrofit kit.

Side entry tags are available for either the left or the right-hand side of the EFEN E3 disconnector.

Hiko also engineers bespoke connection solutions for individual customer requirements.

Spare Covers

Connection plates are provided complete with covers; spare covers are available if required.

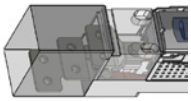
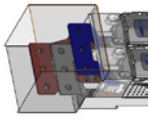
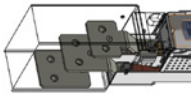
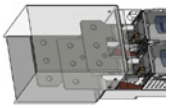
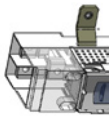
Current Transformers

The EFEN E3 disconnector product line includes a specially designed range of Class 1 CT's that fit neatly onto the busbar connection tags, without increasing external dimensions.

Other Accessories

The range of accessories available also includes: V-clamps, for cable connection without compression crimping; mounting brackets to provide attachment points on the side of the EFEN E3 disconnector; handle clips to identify a particular circuit such as the incomer; and CT cable covers, to protect the special CT wiring behind the disconnector.

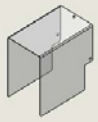
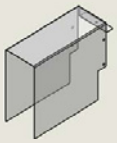
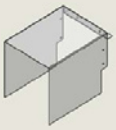
Disconnect Connection Variants (Compact Extension)

Connection Terminal Image	For Use With Disconnect Types	Hiko Product Suffix[1]	Description	Rating (A)	Max Conductor Size (mm²)	Extended length to bottom connection centre line (mm)
	EFV2400 EFV3630 EFV31000 EFV3910	C	Compact single Also available as an accessory Hiko code EFA0005	1000	2 x 300	103
	EFV31250 EFV31800 EFV32000	CD	Compact dual	2000	3 x 630	114
	EFV2400 EFV3630 EFV31000	E	Extended single	1000	1 x 630 or 2 x 300	158
	EFV31250 EFV32000	ED	Extended dual	2000	3 x 630	169
	EFV2400 EFV3630 EFV31000	SL	Side entry tags (left)	1000	-	-
		SR	Side entry tags (right)	1000	-	-

Disconnect Accessories

Hiko Code	For Use With Disconnect Types	Description	Accessory Image
EFA0014	EFV2400 EFV3630 EFV31000	V-clamp Connector set	
EFA0005		Compact connection kit (set of 3x brackets, bolts and modified cover	
EFA0013	EFV2400 EFV3630 EFV31000	Angle bracket (set of 4x for attachment points in the side of disconnects)	
EFA0006	EFV31250 EFV32000	Red handle clips (for identifying incomer)	
EFA0001		CT cable holder (clips on to the back of the disconnect)	

Spare Covers[3]

Hiko Code[2]	For Use with Disconnect Types	Description	Cover Images
EFA0007	EFV2400 EFV3630 EFV31000	Standard E3 terminal cover	
EFA0026		Front cover for compact single	
EFA0027	EFV31250 EFV3200	Front cover for compact dual	
PC021	EFV2400 EFV3630 EFV31000	Front cover for extended single	
PC024	EFV31250 EFV32000	Front cover for extended dual	

Current Transformers

Hiko Code[2]	For Use with Disconnect Types	Suffix[1]	Description	Rating[4,5]	Burden VA	Accuracy Class	CT Image
EFCT250	EFV2400 EFV3630 EFV31000 EFV31250 EFV32000	250	Current Transformer	250:5	5	1	
EFCT400		400		400:5			
EFCT600		600		600:5			
EFCT800		800		800:5			

Notes

1. When ordered as part of a disconnect assembly
2. When ordered separately as a component
3. Contact Hiko for installation guidelines
4. Rated continuous current 1.2x In; rated short-time thermal current Ith = 60x In (max 50 kA); rated dynamic current 2.5x Ith (max 120 kA)
5. Highest equipment voltage Um = 720 V; rated ac withstand voltage 3 kVrms

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

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EFEN LV Horizontal Fuse Switch Disconnects

The best of both worlds with EFEN SILAS and IN Series

Horizontal fuse switch disconnects provide an alternative mounting and connection method to vertical disconnects, for example for single circuit supplies and for the safe and cost effective upgrade or replacement of earlier generations of fuse switches.

The EFEN SILAS range has been used successfully in New Zealand for 30+ years and is now complemented by the EFEN IN series.

Both the SILAS and IN series use the widely available and economic DIN blade fuse cartridges, and offer an excellent level of operator safety thanks to their AC22B switching capacity.

Both may be used in AC or DC applications, as specified by their ratings.

The SILAS range is designed for independent mounting for single switch protection applications by virtue of its terminal covers. These features are ideally suited to solar applications or wherever battery protection is required in an internal installation.

SILAS is also suitable for multiple feeder mounting on busbars with ratings from 160 A to 630 A.

The EFEN IN series of switches is available from 160 to 1,600 A and is a more compact design. Cable covers are supplied: these can be removed for use in applications where a protective enclosure is used. Its compact size makes the IN ideal for network pillar applications.

Sizes 00, 1, 2 and 3 of the IN series and sizes 1, 2 and 3 of the SILAS series have the added advantage of phase protection barriers moulded into the base.

Characteristics and Ratings (According to IEC 60947-3)

IN series		DIN size	000/00	1	2	3	4A
Rated operational current, I_e	690 V	A	160	250	400	630	1,250 1.600
Conventional free-air thermal current I_{th}	690 V	A	160	250	400	630	1,250 1,600
Rated operational voltage, U_e		V	690	690	690	690	690
Rated insulation voltage, U_i		V	800	800	800	800	800
Rated impulse withstand voltage, U_{imp}		kVpk	8	8	8	8	8
Rated conditional short circuit current	400 V	kA	100	100	100[1]	100	50
(when protected with NH fuse-links)	690 V	kA	50	50	50	50	50
Utilisation category	400 V		AC-22B	AC-22B	AC-22B	AC-22B	AC-22B
	500 V		AC-22B	AC-22B	AC-22B	AC-22B	AC-22B
	690 V		AC-21B	AC-21B	AC-21B	AC-21B	AC-21B
	440 Vdc[2]		DC-21B	DC-21B	DC-21B	DC-21B	DC-21B
Mechanical service life		Cycles	1,600	1,600	1,000	1,000	600
Permissible ambient temperature		°C			25 to +55		
Degree of protection to IEC 60529					IP3X		
Maximum permissible power dissipation of the NH fuse-links		W	12	23	34	48	115 140
Weight without fuse links		kg	0.5	2.0	3.3	5.3	14.0

SILAS series		DIN size	000/00	1	2	3
Rated operational current, I_e	690 V	A	160	250	400	630
Conventional free-air thermal current I_{th}	690 V	A	160	250	400	630
Rated operational voltage, U_e		V	690	690	690	690
Rated insulation voltage, U_i		V	1,000	1,000	1,000	1,000
Rated impulse withstand voltage, U_{imp}		kVpk	8	8	8	8
Rated conditional short circuit current (when protected with NH fuse-links)	690 V	kA	80	80	50	80
Utilisation category	400 V		AC-23B	AC-23B	AC-23B	AC-23B
	500 V		AC-22B	AC-22B	AC-22B	AC-22B
	690 V		AC-21B	AC-21B	AC-21B	AC-21B
	220Vdc		DC-22B	DC-21B	DC-21B	DC-21B
	440 Vdc			DC-21B	DC-21B	DC-21B
Mechanical service life		Cycles	1,600	1,600	1,000	1,000
Permissible ambient temperature		°C	25 to +55			
Degree of protection to IEC 60529			IP3X			
Maximum permissible power dissipation of the NH fuse-links		W	12	23	34	48
Weight without fuse links		kg	0.8	2.2	3.6	4.1

Notes
1. With pilot tool
2. When equipped with L1 and L3 with two poles; 1-pole Ue = 220 Vdc

Tightening Torques for Terminals and Busbar Mounting

IN series	DIN size	000/00	1	2	3	4A
Multiple use screw terminal	Nm	14	32	32	32	32/56
Pressure plates with bolts / prism clamps		4	8	14	14	-
Busbar mounting		6	10	10	14	-

SILAS Series	DIN size	000/00	1	2	3
Multiple use screw terminal	Nm	12	20	20	20
Pressure plates with bolts / prism clamps		3	6	8	8
Busbar mounting		3	6	8	8
Box clamps		5	12	20	20

Conductor Application Ranges

IN series	Conductor type		Cross section	000/00	1	2	3	4A
Multiple use screw terminal	-	-	-	M8	M10	M10	M10	M12/M16
Pressure plates with bolts	CU	RE	mm²	1.5-16	1.5-16	-	-	-
		RM/SM		2-25	6-50	6-70	6-70	
Pressure plates with bolts and prism clamps	CU/AL	RE/RM/ SE/SM		2.5-70	70-150	70-240	70-240	-
Flat conductor (max W x H)	-	-	mm	10x6	16x15	21x15	21x15	-

SILAS series	Conductor type		Cross section	000/00	1	2	3
Multiple use screw terminal	-	-	-	M8	M10	M10	M10
Pressure plates with bolts	CU	RE	mm²	6-50	70-150	-	-
		RM/SM		6-25	6-50	6-70	6-70
Pressure plates with bolts and prism clamps	CU/AL	RE/RM/ SE/SM		6-70	70-150	120-240	150-300
Box clamps	CU	RE/RM		2.5-95	35-150	95-300	95-300
		RE/RM		-	50-150	120-300	120-300
	AL	RE/RM		-	35-150	95-300	95-300
		RE/RM		-	50-150	120-300	120-300
Flat conductor (max W x H)	-	-	mm	-	15x20	20 x 32	20 x 32

Product Selection Table and Dimensions

Hiko Code	Type	DIN Size	Current Rating (A)	Configuration	Mounting System	Optional V-Clamps[1]	Nominal Height (mm)	Nominal Width (mm)	Nominal Depth (mm)
WE160E	IN	00	160	Single Phase	Base plate	No	157	50	80
EFH00160		00	160	Three phase single throw		Yes	156	106	90
EFH1250		1	250				270	184	110
EFH2400		2	400				281	210	127
EFH3630		3	630				289	250	132
EFH41600		4A	1,600			No	330	378	233
EF00160S		00	160	Single phase		Yes	200	50	95
EF1250S		1	250				284	100	142
EF2400S		2	400				284	100	142
EF3630S		3	630				284	115	142
EF41600S		4A	1,600			No	330	126	233
EF2400SB		2	400		Busbar	Yes	284	100	142
EF3630SB		3	630				284	115	142
WE500	SILAS	00	160	Three phase single throw	Base plate	Yes	194	106	80
WE510		1	250				306	184	110
WE520		2	400				306	210	130
WE530		3	630				306	250	130

Notes

1. add “V” suffix to product code to specify V-clamps.

Also available

Fuse links
Solid copper (knife) links
LV switchgear assembly frames, cabinets and underground pits

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

EFEN NH Low Voltage High Rupturing Capacity Fuses and Solid Links

For horizontal and vertical disconnects

NH stands for "low voltage high rupturing capacity" (from the German: Niederspannungs Hochleistungs Sicherungen). NH fuses have a breaking capacity generally exceeding 100 kA, which covers virtually all the short-circuit currents expected to be encountered in low voltage systems.

The NH fuse system is used worldwide, and comprises fuses, solid links, fuse bases and fuse switch disconnects. NH fuses are designed to be used by authorised persons, and as such their design does not provide inherent protection against electric shock; instead, the fuse switch disconnect provides this protection. EFEN SILAS and IN series horizontal disconnects are fully compliant in this regard and EFEN E3 vertical disconnects deliver best practice, with fully shrouded source and load contacts, even in the open position.

NH fuses and links sizes 00, 1, 2, 3 and 4a for which fully standardised bases are available.

There is no minimum operating voltage that must be observed for NH fuses, and they are designed to operate with AC systems from 45-62 Hz.

For most distribution line and cable applications, NH fuses with utilisation category gG are specified. These have full-range breaking capacity for general application, and have a time-current characteristic aligned to meet the current carrying capacity of insulated conductors. Hiko stocks a range of the most commonly used sizes of gG fuses. Other specialised fuses with different operating characteristics are also available.

Product Selection Table: Fuse Links

Hiko Code	NH size	Rated Current (A)
WEF00006	00	6
WEF00010		10
WEF00016		16
WEF00020		20
WEF00025		25
WEF00035		35
WEF00040		40
WEF00050		50
WEF00063		63
WEF00080		80
WEF00100		100
WEF00125		125
WEF00160		160
WEF1025	1	25
WEF1035		35
WEF1050		50
WEF1063		63
WEF1080		80
WEF1100		100
WEF1125		125
WEF1160		160
WEF1200		200
WEF1250		250

Product Selection Table: Fuse Links

Hiko Code	NH size	Rated Current (A)
WEF2025	2	25
WEF2035		35
WEF2063		63
WEF2080		80
WEF2100		100
WEF2125		125
WEF2160		160
WEF2200		200
WEF2250		250
WEF2315		315
WEF2355		355
WEF2400		400
WEF3315	3	315
WEF3400		400
WEF3500		500
WEF3630		630
WEF4630		630
WEF4800	4a	800
WEF41000		1000
WEF41250		1250
WEF41600		1600

Product Selection Table: Solid Links

Hiko Code	NH size	Rated Current (A)
WEFS0	0	160
WEFS1	1	250
WEFS2	2	400
WEFS3	3	630
WEFS4	4a	1600

Notes
Fuse links are rated for use up to 500 Vac

Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

EFEN NH Fuse-Switches 80 V and 550 V DC, 1-pole switching

For baseplate and busbar mounting

33107-0602

TPS Fuse-Switch for Baseplate Mounting with Fuse-Monitoring

EFEN Part No.	Designation	Size	Amps	PU
33107-0252	Flat terminal M8	00	250	2
33107-0602	Flat terminal M12	00	600	2
33460-0010	Flat terminal M16	2	1200	1
33560-0010	Flat terminal 2 x M12	2	1600	1

33111-0252

TPS Fuse-Switch for Busbar Mounting with Fuse-Monitoring

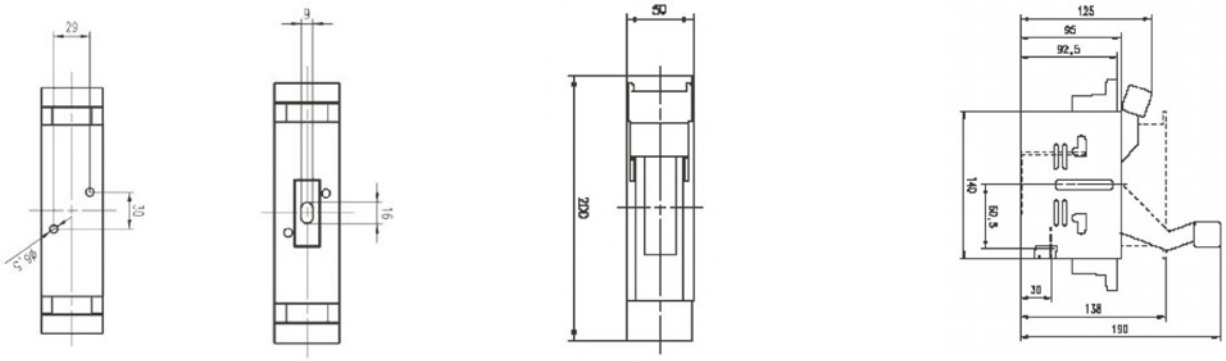
EFEN Part No.	Designation	Size	Amps	PU
33111-0252	Flat terminal M8	00	250	2
33111-0602	Flat terminal M12	00	600	2
33470-0010	Flat terminal M16	2	1200	1
33570-0010	Flat terminal 2 x M12	2	1600	1

Cover with Integrated Fuse-Monitoring for NH Fuse-Switch 550 V DC

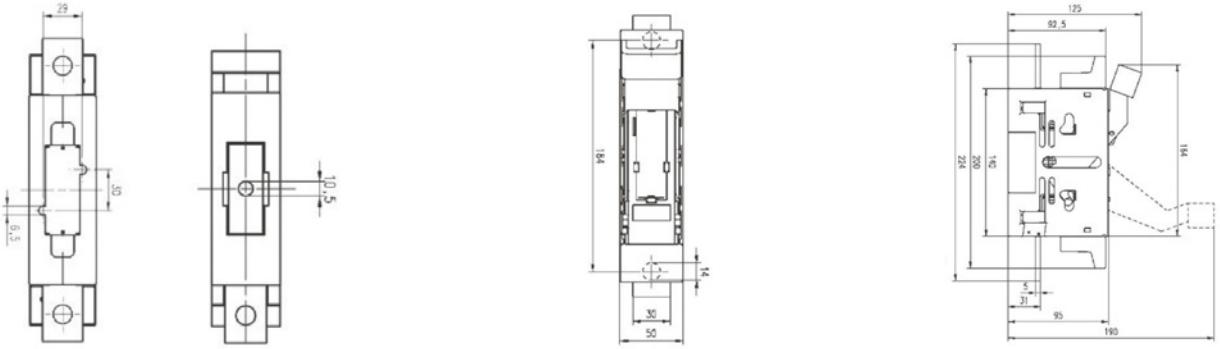
EFEN Part No.	Designation	Size	PU
83359-0100	Cover with fuse-monitoring	1	1
83360-0100	Cover with fuse-monitoring	2	1
83361-0100	Cover with fuse-monitoring	3	1

NH Fuse-Switches DC applications up to 80 V TPS series

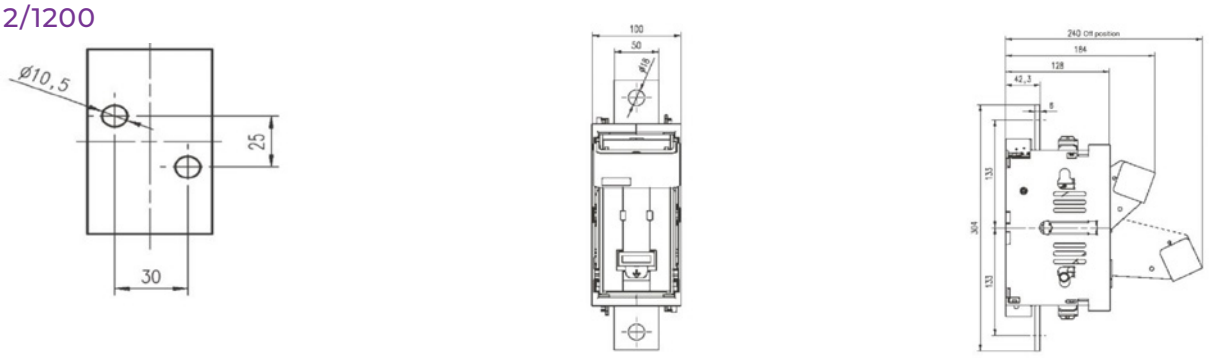
TPS 00/250



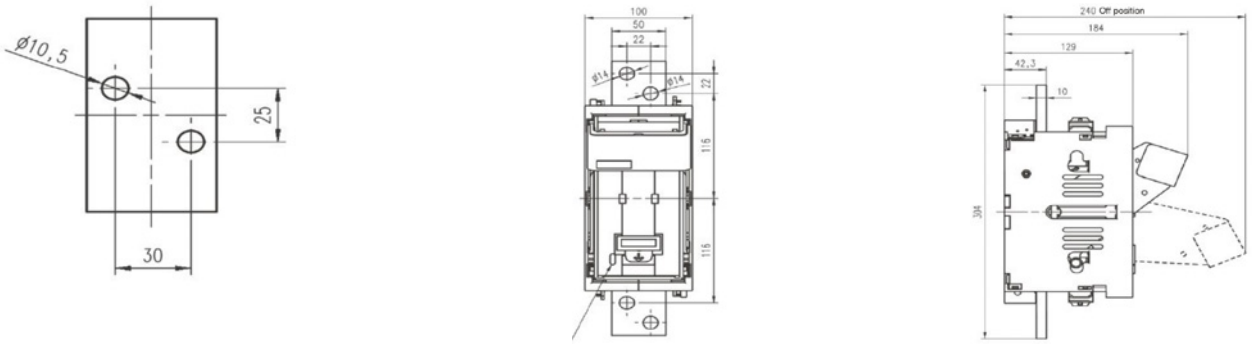
TPS 00/600



TPS 2/1200

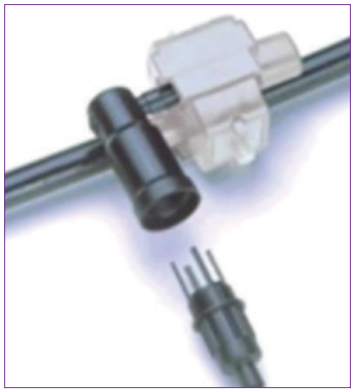


TPS 2/1600



Pfisterer Fuse Switch Disconnects for LV Overhead lines

For up to 160 A and 400 A in-line fused switching and for 16 A tap off connections



Pfisterer DIN standard fuse switch disconnects for Low Voltage are designed for bare wire or ABC overhead line sectionalising applications.

The fuse switch disconnect housings are manufactured from weatherproof UV and ageing resistant reinforced polymer.

Contacts are tin plated copper (DIN00) or silver plated copper (DIN1/2). Terminals are fully insulated and made from high grade aluminium alloy, suitable for use with either aluminium or copper conductors on either side.

Both the DIN00 and DIN1/2 size fuse switch disconnects can be mounted on poles, crossarms or other structures. Mounting brackets are available for single and triple pole plus neutral configuration. Brackets can be fabricated or modified to suit individual requirements.

The 16 A fuse protected tap-off is also fully insulated and can be used on ABC systems using an insulation piercing conductor and on bare overhead conductors, if the terminal bolt is stripped.

Fuse Switch Disconnects and Tap-Off Connectors

Hiko Code	Package Quantity	Description	Rated Operation Current	Fuse Size	Mounting Bolts	Dimensions (mm)		
						Length	Width	Height[2]
KP2207R	1	Single pole fuse switch disconnect	160 A[1]	DIN 00	1x M8	207	65	106
KP2209	1	Single pole fuse switch disconnect	400 A	DIN 1/2	2x M8[3]	345	100	140
KP2202	25	Tap-off fuse connector[4]	2-16 A	NEOZED D01	-	-	-	-

Fuse Switch Disconnect Technical Data

Hiko Code	In terminal		Out terminal		Rated Short Circuit Making Capacity kA	Rated Short Circuit Withstand Current kA	Protection Class	Utilisation Category
	Type	Conductor Size (mm^2)	Type	Conductor Size (mm^2)				
KP2207R	Single tunnel	6 - 95	Double tunnel	2 x 6 - 95	16	16	IP23	AC21B
KP2209		25 - 240		2 x 25 - 240				

Accessories

Hiko Code	Package Quantity	Description	Material	Mounting Holes	
				Size (mm)	Distance Between Centres (mm)
WEB002004	1	Slotted angle bracket for 1x KP2207R	2 mm stainless steel 304	9 x 20	-
WEB002014	1	Two-hole angle bracket for 1x KP2207R	6 mm hot dip galvanised steel	2x Ø14	55
KP2213	1	Angle bracket for 3x KP2209		2x Ø18	220

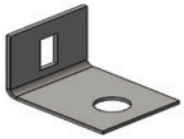


Figure 1 - Slotted angle bracket

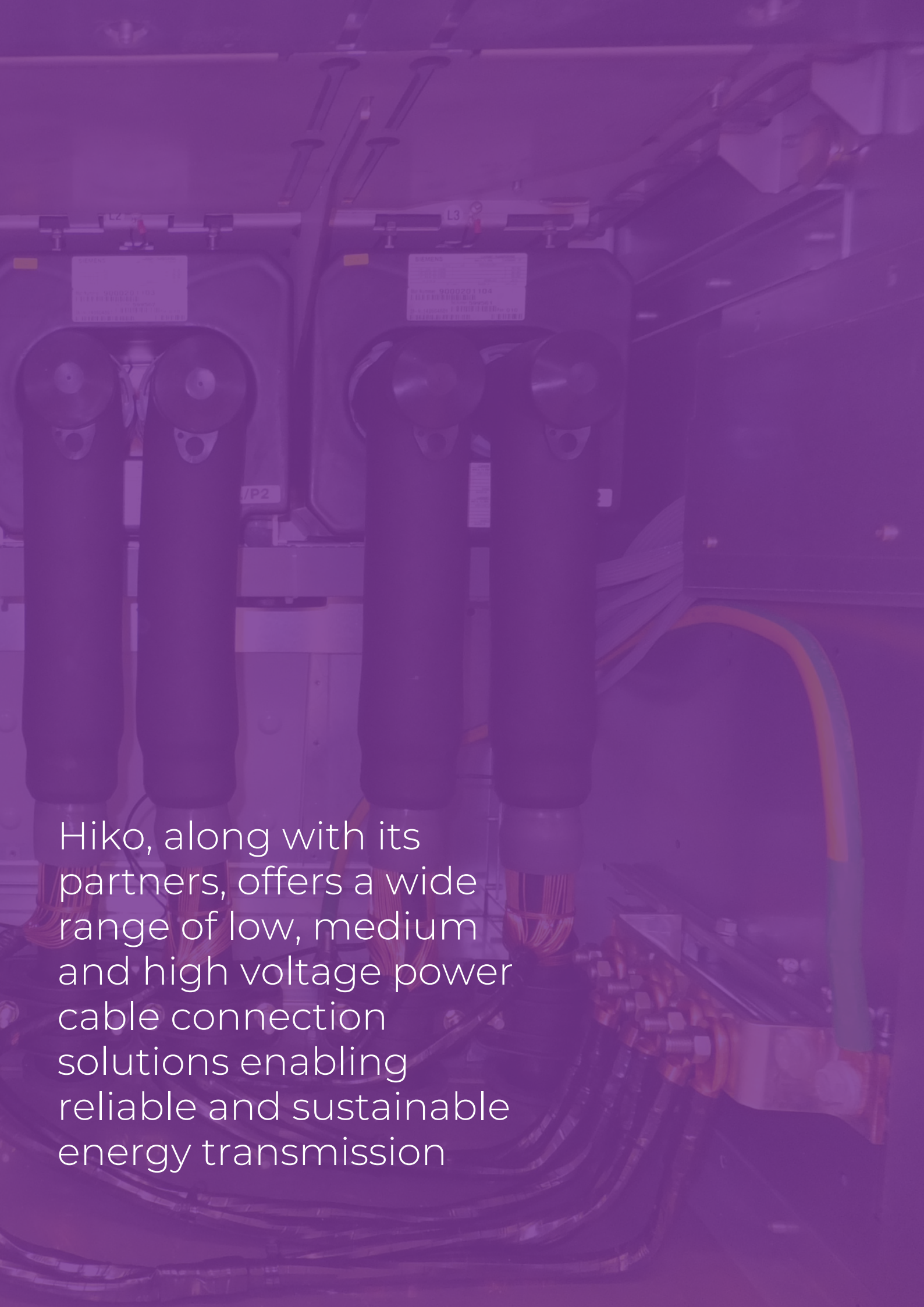
Figure 2 - Two-hole angle bracket

Figure 3 - Angle bracket

Notes
1. Current rating 245 A with solid links.
2. Nominal, excluding mounting bolts and pulling handle.
3. Distance between centre lines 60mm
4. For branch conductor 1.5-6mm^2

Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

PFISTERER

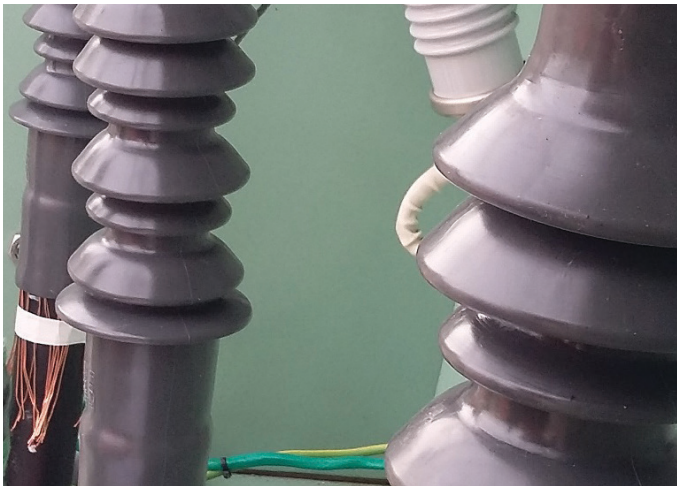


Hiko, along with its partners, offers a wide range of low, medium and high voltage power cable connection solutions enabling reliable and sustainable energy transmission

Med/High Voltage: Cable Joints & Terminations

NKT Cable Joints, Terminations and Connectors

Safe and easy connection of power cables with NKT cable accessories



Manufacturing and developing power cable accessories from 1kV to 550 kV is core business for NKT.

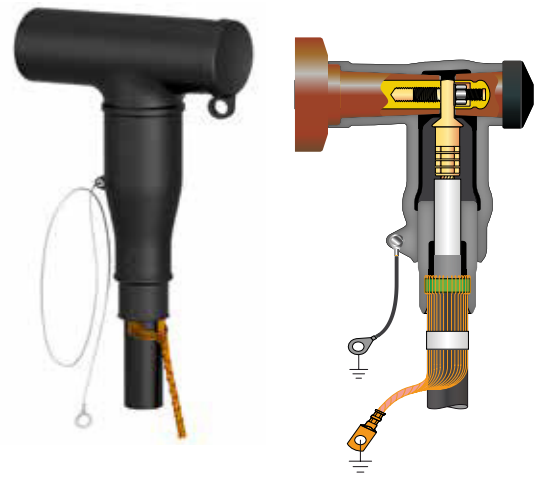
With the joined forces of Kabeldon and NKT cables under the new common brand NKT, we provide an even wider product range, long experience in design and manufacturing of accessories and excellent service.

The NKT range of cable joints, terminations and connectors continues to grow as a result of both acquisition and ongoing investment in manufacturing processes, materials and product development.

In addition, NKT offers a complete solution for transmission system applications, including push-on composite and porcelain dry-type and oil-filled terminations, cable joints and switchgear / transformer connectors up to 400 kV and above.

The design of NKT accessories is based on expertise in managing electrical, mechanical and thermal properties. NKT's extensive materials experience is backed up by the use of finite element modelling. Depending on the application, designs involve geometrical / capacitive, resistive and refractive field control.

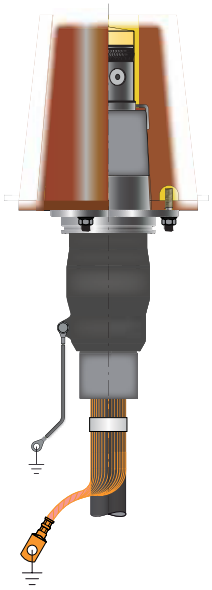
Cable Accessories for Power Distribution from 1 kV to 42 kV



Outer Cone Connectors

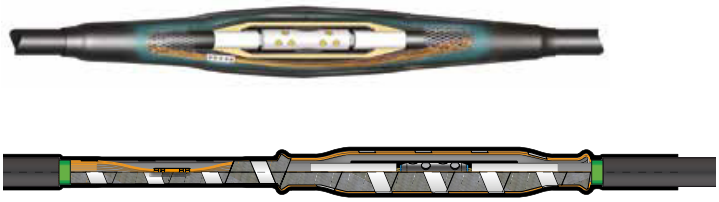
Connectors for GIS for interface A, B, C, E and F.

Suitable coupling connectors and surge arresters.



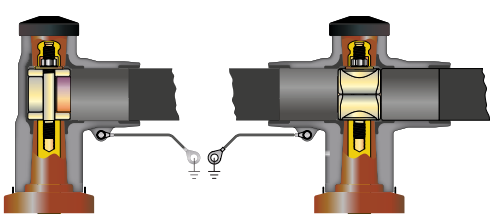
Inner Cone Connectors

Plug in connectors for bushing size 2 and 3 and suitable surge arresters.



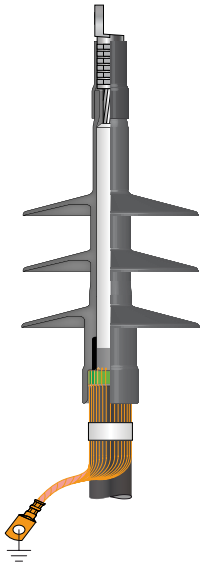
Joints

Push on and cold shrink straight joints, Branch joints. Transition joints for PILC cables.



OEM Busbar system from 24 kV to 72.5 kV

Adapter for interface C and F. Busbar connections up to 2500 A Customized interconnections.



Terminations

Push on and cold applied terminations for indoor and outdoor.

Cable Accessories for Power Distribution from 52 kV to 550 kV

GIS/Transformer Terminations

Dry plug-in cable terminations.

Oil filled plug-in cable terminations.

Outdoor Terminations

Flexible cable terminations.

Oil filled cable terminations.

Termination with porcelain or composite insulator.

Joints

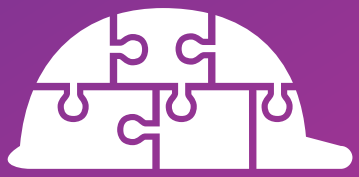
One or three pieces straight joints with or without cross bonding.

Low Pressure Oil filled Accessories

Joints and terminations.

Hiko®
Power Engineering

OUR VALUES | The Hiko Way



Think and Be Safe

We understand people come first through safety by design, compliance and good process, no shortcuts.

NKT Screened Elbow Connectors

For Type C Interfaces

NKT manufactures a wide range of cables and cable accessories and is the leading supplier of medium voltage screened connectors across much of Australasia.

NKT was the first to manufacture silicone rubber cable terminations and now has 50 years' experience, in applications up to 400 kV.

The CB range of screened T-connectors are made of silicone rubber for connecting to medium voltage switchgear, RMU's and transformers fitted with Type C bushings according to EN 50180/50181.

The silicone rubber grade used in CB connectors is durable, UV and ozone resistant, waterproof, non-flammable, self-extinguishing and heat resistant.

Together with its excellent mechanical and electrical properties, this makes it the preferred material for 11-33 kV screened connectors.

In addition to offering high quality electrical insulation and superior corona and tracking resistance, the elasticity of silicone rubber facilitates a wide application range for each CB size. So, one product can be used for many different conductor cross-sections.

The Type C bolted connection type is secure and safe and is very widely used, with sizes available up to 1000 mm2. Installation is straightforward and fast, requiring no special tools.

The outer screen is a fully bonded conductive layer specially developed by NKT for long term reliability. Operation is maintenance free.

Coupling Connectors (CC range) are available for each screened T-connector.

Screened connectors for interface Sizes A, B and F are also available.

NKT Screened Connectors for Type C Interface

Hiko Code	System Voltage			Application Range				Dimensions	
				Cross Section[1] (mm)		Insulation Diameter (mm)		Approx length[2] (mm)	Approx depth[3] (mm)
T-connector	11kV	22kV	33kV	Min	Max	Min	Max		
NKT2632142HNZ	✓			25	95	12.7		245	190
		✓			70		25.0		
NKT2632143HNZ	✓			95	300	17.0	32.6		
NKTCB12630N6	✓			400	500	28.9	40.0	385	
NKT2632145HNZ		✓		95	300	21.2	34.6	245	190
NKTCB241250P7	✓	✓		400	630	34.0	45.6	385	
NKT2633116HNZ			✓	25	35	17.0	24.3	245	190
NKT2633117HNZ			✓	50	150	21.2	33.6		
NKT2633120HNZ			✓	150	300	28.9	40.0		
NKT2633133HNZ			✓	300	400		44.0		
NKTCB361250N7			✓	400	500	34.0	45.6	385	190
NKTCB361250P8			✓	400	630	39.1	51.0		
NKTCB421250R8			✓	630	800			440	200
NKTCB421250S9			✓	630	1000	45.5	57.8		

Accessories for NKT Screened Connectors

Hiko Code	Description	Max System Voltage (kV)	Notes
NKTCBEAS630	End plug for C-type connectors	33	Fits into front of T-connector (in place of bushing)
NKTCBC40630MI2	End cover for C-type bushings, M12 thread		Fits onto bushing in place of T-connector
NKTCBC40630M16	End cover for C-type bushings, M16 thread		Fits onto bushing in place of T-connector
NKTCBE20M12	Earthing plug for NKTCB12/24/36630 connectors		Fits into back of T-connector to provide earthing point (20 mm dia)
NKTCBE20M16	Earthing plug for NKTCB36/421250 connectors		
NKTCBPAKM12	Test adaptor for NKTCB12/24/36630 connectors		Fits into back of T-connector to provide test point for AC, DC, VLF testing
NKTCBPAKM16	Test adaptor for NKTCB36/421250 connectors		
NKTPASTE	Assembly paste (60 g tube)	-	Always use the correct assembly paste
NKTTBOLT12	Threaded bolt for NKTCC12/24/36630 coupling connectors	33	Single piece
NKTTBOLT16	Threaded bolt for NKTCC36/421250 coupling connectors	33	Single piece
NKTCBBPLUG24M12	NKT M12 insulating plug for CB24-630	22	Set of three
NKTCBBPLUG36M12	NKT M12 insulating plug for CB36-630	33	Set of three
NKTCBBPLUG36M16	NKT M16 insulating plug for CB36/42-630(1250)	33	Set of three

Notes

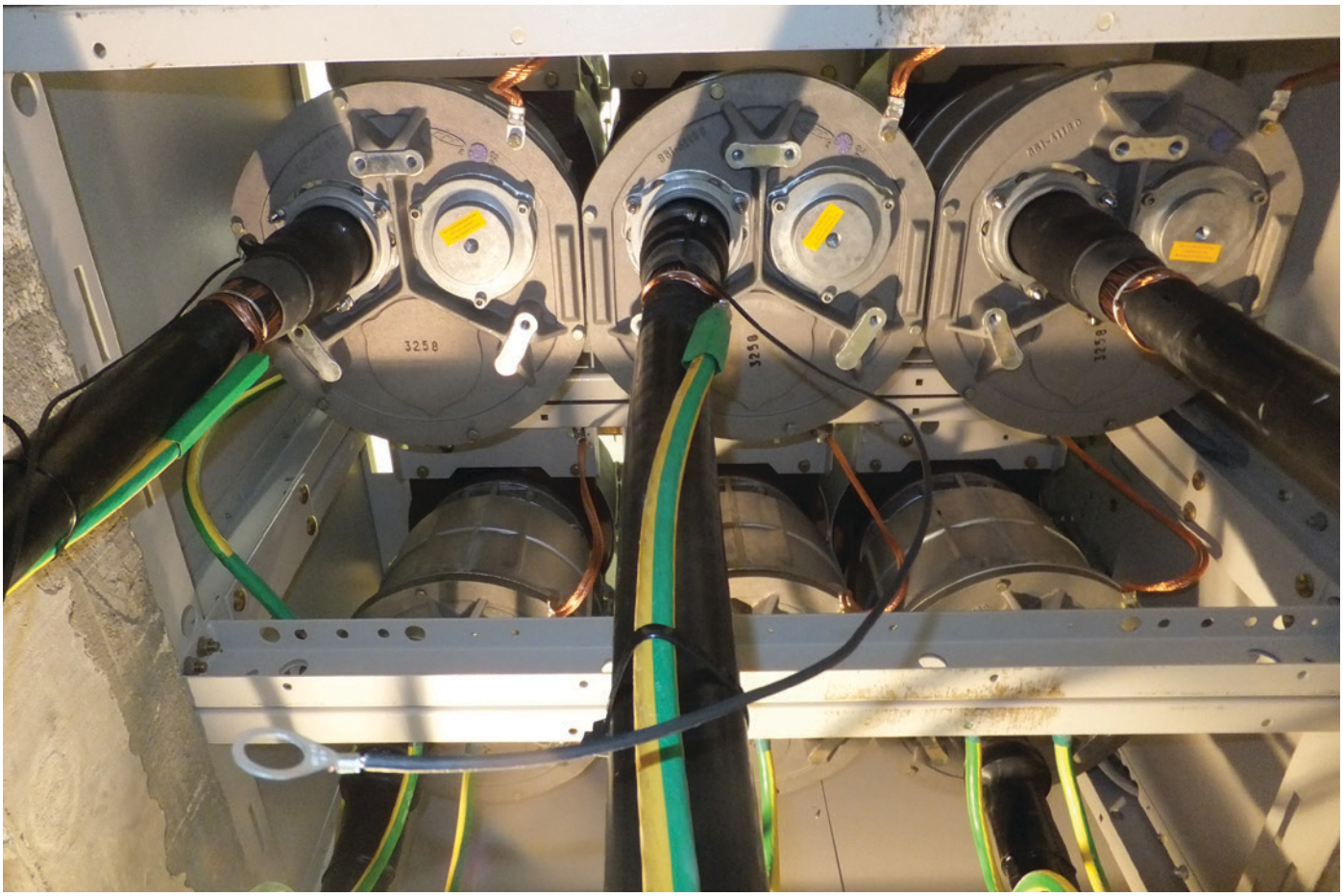
1. Maximum size is for AL or CU RMV conductor
2. From bushing centre line to end of stress cone
3. From mounting face to back plug cover

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

NKT CPI Inner Cone Connectors

Easy to install, range-taking MV switchgear connections for EN 50180/50181 Sizes 2 and 3



NKT manufactures a wide range of cables and cable accessories and is the leading supplier of medium voltage screened connectors across much of Australasia.

NKT was the first to manufacture silicone rubber cable terminations and now has 50 years' experience, in applications up to 400 kV.

CPI is a screened inner cone cable connector made of silicone rubber for connecting to medium voltage switchgear, RMUs and transformers fitted with bushings Size 2 or 3 according to EN 50180/50181.

The silicone rubber grade used in the CPI is durable, UV and ozone resistant, waterproof, non-flammable, self-extinguishing and heat resistant. Together with its excellent mechanical and electrical properties, this makes silicone rubber a preferred material for 11-33 kV inner cone connectors.

In addition to offering high quality electrical insulation and superior corona and tracking resistance, the elasticity of silicone rubber facilitates a wide application range for each CPI. So, one product can be used for many different conductor cross-sections.

This connection type delivers a compact and reliable in-line interface with XLPE and EPR cables.

Installation is straightforward and fast thanks to the design of the CPI. The unique shear-bolt connector simplifies assembly and provides assurance of correct fit; the multi-range stress cone allows realistic cable preparation tolerances; the unique connector casing eliminates the requirement for special tools.

The outer screen is a fully bonded conductive layer. The cable screen can be tested without disassembly. Operation is maintenance free.

NKT Inner Cone Connectors for Size 2 and Size 3 Interfaces

Hiko Code	Interface Type	Continuous Nominal Current (A)	Application range							Dimensions
			11 kV	22kV	33kV	Cross Section[1] (mm²)		Insulation Diameter (mm)		Approx Length[2] (mm)
						Min	Max	Min	Max	
NKT2647151	2	800	✓			35	70	12.7	19.2	190
NKT2647152			✓	✓	✓	95	120	17.0	24.3	
NKT2647153			✓	-	-	120	185	17.0	24.3	
NKT2647154			-	✓	✓	50	120	21.2	33.6	
NKT2647155			✓	✓	✓	120	185	21.2	33.6	
NKT2647156			✓	✓	-	240	300	21.2	33.6	
NKT2647157			-	-	✓	150	185	28.9	40.0[3]	
NKT2647158			-	✓	✓	240	300	28.9	40.0[3]	
NKT2647251HNZ	3	1250	-	✓	✓	95	120	21.2	33.6	195
NKT2647252HNZ			✓	✓	✓	120	185	21.2	33.6	
NKT2647253HNZ			✓	✓	-	240	300	21.2	33.6	
NKT2647254HNZ			-	-	✓	150	185	28.9	37.8	
NKT2647255HNZ			-	✓	✓	240	300	28.9	37.8	
NKT2647256HNZ			✓	-	-	400	500	28.9	37.8	
NKT2647257HNZ			-	-	✓	300		34.0	45.6	
NKT2647258HNZ			✓	✓	✓	400	630	34.0	45.6	
NKT2647259HNZ			-	-	✓	630		39.1	51.0	
NKT2647260HNZ			✓	✓	✓	800[4]		39.1	51.0	300
NKT2643798			✓	✓	-	800		45.5	57.8	
NKT2643799			-	✓	✓	800[5]		45.5	57.8	

NKT Accessories for Inner Cone Connectors

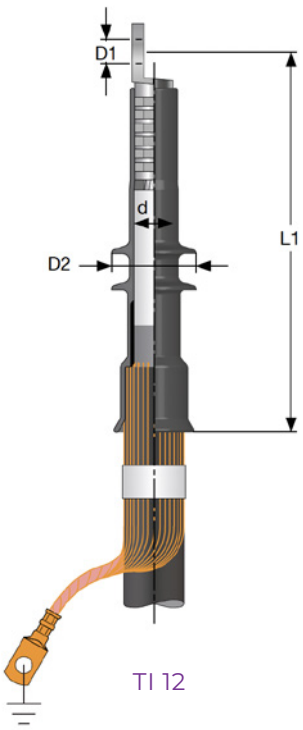
Hiko Code	Description	Max system voltage (kV)	Notes
NKTFPI2	Final plug for Size 2 (set of 3)	42	Insulating plug for equipment interface
NKTFPI3	Final plug for Size 3 (set of 3)	52	Insulating plug for equipment interface
NKTPASTE	Assembly paste (60 g tube)	-	Always use the correct assembly paste

Notes

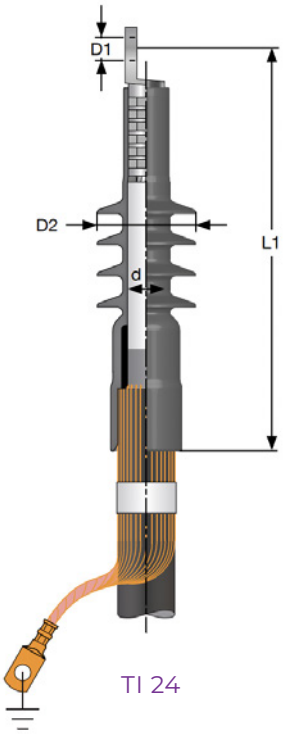
1. For round stranded conductors, designation RM
2. From mounting face to end of stress cone
3. Three core cables 44.0 mm
4. Fits 800 mm² round solid, designation RE
5. Max conductor diameter 36 mm (fits 1000 mm² round solid, designation RE)

NKT Indoor Terminations

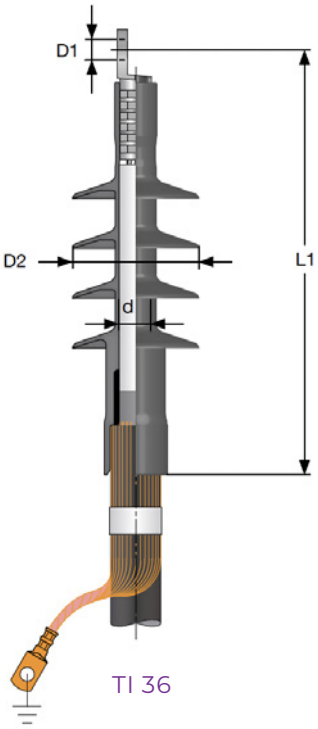
NKT CPI Inner Cone Connectors



TI 12



TI 24



TI 36

The NKT indoor termination range is made of silicone rubber for connection to air insulated switchgear and transformers up to 36kV.

Features for all indoor terms

- Quick and easy assembly
- One-piece design with capacitive stress control system
- Short body
- Long creepage distance by optimised shed arrangement
- Use of various cable lug types such as screw type and hexagonal pressing

TI 12 Technical Details for Order for 6/10(12) kV Cables

TI 12 incl. crimp type cable lugs for conductor and screening wires

Cross section (mm²)	Size of Termination	Ø of Core Insulation (mm)	L1 (mm)	D1 (mm)	D2 (mm)	Al	Cu
16	1	11.8 – 16.3	195	13	39	26 291 50	26 291 00
25	2	12.7 – 19.2	195	13	39	26 291 51	26 291 01
35	2	12.7 – 19.2	195	13	39	26 291 52	26 291 02
50	2	12.7 – 19.2	190	13	39	26 291 53	26 291 03
70	2	12.7 – 19.2	190	13	39	26 291 54	26 291 04
95	3	17.0 – 28.4	215	13	43	26 291 55	26 291 05
120	3	17.0 – 28.4	220	13	43	26 291 56	26 291 06
150	3	17.0 – 28.4	220	13	43	26 291 57	26 291 07
185	3	17.0 – 28.4	220	17	43	26 291 58	26 291 08
240	3	17.0 – 28.4	220	17	43	–	26 291 09

TI 24 Technical Details for Order for 12/20(24) kV Cables

TI 24 incl. crimp type cable lugs for conductor and screening wires

Cross section (mm²)	Size of Termination	Ø of Core Insulation (mm)	L1 (mm)	D1 (mm)	D2 (mm)	Al	Cu
25	3	17.0 – 25.0	250	13	55	26 302 51	26 302 01
35	3	17.0 – 25.0	250	13	55	26 302 52	26 302 02
50	3	17.0 – 25.0	250	13	55	26 302 53	26 302 03
70	3	17.0 – 25.0	250	13	55	26 302 54	26 302 04
95	5	21.2 – 34.6	250	13	60	26 563 55	26 302 05
120	5	21.2 – 34.6	255	13	60	26 563 56	26 302 06
150	5	21.2 – 34.6	260	13	60	26 563 57	26 563 07
185	5	21.2 – 34.6	260	17	60	26 563 58	26 563 08
240	5	21.2 – 34.6	260	17	60	26 563 59	26 563 09

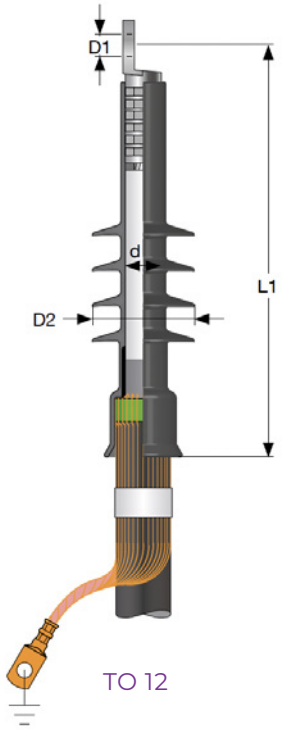
TI 36 Technical Details for Order for 18/30(36) kV Cables

TI 36 incl. crimp type cable lugs for conductor and screening wires

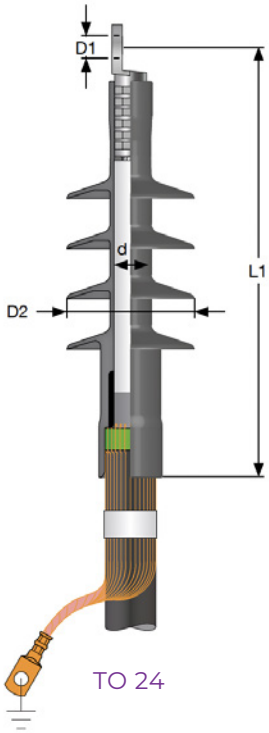
Cross section (mm²)	Size of Termination	Ø of Core Insulation (mm)	L1 (mm)	D1 (mm)	D2 (mm)	Al	Cu
95	5	21.2 – 34.6	310	13	90	26 392 55	26 392 05
120	5	21.2 – 34.6	315	13	90	26 392 56	26 392 06
150	27	28.9 – 43.0	370	13	90	26 392 67	26 392 17
185	27	28.9 – 43.0	370	17	90	26 392 68	26 392 18
240	27	28.9 – 43.0	370	17	90	26 392 69	26 392 19

NKT Outdoor Terminations

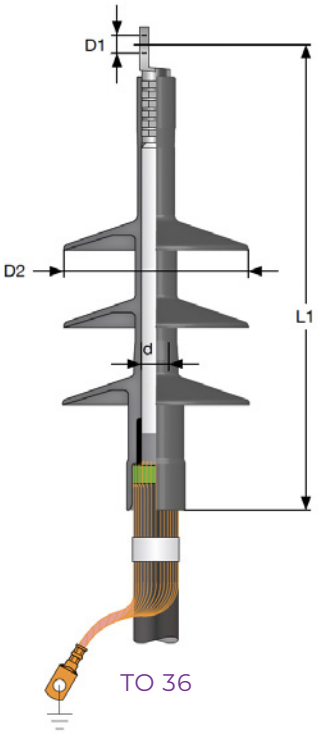
NKT CPI Outdoor Cone Connectors



TO 12



TO 24



TO 36

The NKT outdoor termination range is made of silicone rubber for overhead link and other outdoor applications up to 36kV.

Features

- Quick and easy assembly
- One-piece design with capacitive stress control system
- Short body
- Long creepage distance by optimised shed arrangement
- Use of various cable lug types such as screw type and hexagonal pressing

TO 12 Technical Details for Order for 6/10(12) kV Cables

TO 12 incl. crimp type cable lugs for conductor and screening wires

Cross Section (mm²)	Size of Termination	Ø of Core Insulation (mm)	L1 (mm)	D1 (mm)	D2 (mm)	Al	Cu
95	3	17.0 – 28.4	270	13	60	26 292 55	26 292 05
120	3	17.0 – 28.4	275	13	60	26 292 56	26 292 06
150	3	17.0 – 28.4	280	13	60	26 292 57	26 292 07
185	3	17.0 – 28.4	280	17	60	26 292 58	26 292 08
240	3	17.0 – 28.4	280	17	60	–	26 292 09

TO 24 Technical Details for Order for 12/20(24) kV Cables

TO 24 incl. crimp type cable lugs for conductor and screening wires

Cross Section (mm²)	Size of Termination	Ø of Core Insulation (mm)	L1 (mm)	D1 (mm)	D2 (mm)	Al	Cu
25	3	17.0 – 25.0	330	13	90	26 303 51	26 303 01
35	3	17.0 – 25.0	330	13	90	26 303 52	26 303 02
50	3	17.0 – 25.0	330	13	90	26 303 53	26 303 03
70	3	17.0 – 25.0	330	13	90	26 303 54	26 303 04
95	5	21.2 – 34.6	310	13	90	26 303 55	26 303 05
120	5	21.2 – 34.6	315	13	90	26 303 56	26 303 06
150	5	21.2 – 34.6	320	13	90	26 303 57	26 303 07
185	5	21.2 – 34.6	320	17	90	26 303 58	26 303 08
240	5	21.2 – 34.6	320	17	90	–	26 303 09

TO 36 Technical Details for Order for 18/30(36) kV Cables

TO 36 incl. crimp type cable lugs for conductor and screening wires

Cross Section (mm²)	Size of Termination	Ø of Core Insulation (mm)	L1 (mm)	D1 (mm)	D2 (mm)	Al	Cu
25	3	17.0 – 25.0	max. 430	13	90	26 446 61	26 446 11
35	3	17.0 – 25.0	max. 430	13	90	26 446 62	26 446 12
50	3	17.0 – 25.0	max. 430	13	90	26 446 63	26 446 13
50	20	21.2 – 34.6	380	13	156	26 446 53	26 446 03
70	20	21.2 – 34.6	380	13	156	26 446 54	26 446 04
95	20	21.2 – 34.6	380	13	156	26 446 55	26 446 05
120	20	21.2 – 34.6	380	13	156	–	–
150	27	28.9 – 43.0	390	17	156	26 446 57	26 446 07
185	27	28.9 – 43.0	390	17	156	26 446 58	26 446 08
240	27	28.9 – 43.0	390	17	156	26 446 59	26 446 09

NKT Fluid-filled MV/HV Cable Accessories

Joints and terminations for pressurised oil and gas cables up to 170 kV

NKT is a world leader in the specialised field of MV / HV fluid-filled cable accessories.

Through their own in-house expertise, supplemented over the years by acquisitions such as CCC and Ericsson Power Cables, NKT has built an unparalleled reputation in the design, manufacture and application engineering of joints and terminations for gas and oil-filled sub-transmission and transmission cables.

To support network asset managers, engineers and operators, NKT has developed unique expertise in the installation and servicing of fluid-filled cable accessories, as well as measuring and testing, training, on-site auditing, documentation and archiving.

In Australasia, NKT maintains a team of highly qualified and globally experienced cable jointers licenced up to 400kV on both fluid-filled and XLPE cable systems. Activities include:

- Installation of joints, terminations, optical fibres and oil pressure equipment
- Oil filling and pressurising
- Monitoring systems and leak detection
- Turnkey solutions.
- An extensive reference list is available on request.

Product Line Summary

Accessory Type	Maximum Voltage (kV)	Maximum Cable Size (mm²)
Outdoor terminations	145	1200
GIS and transformer terminations		800
Single core through joint	170	1200
Three core straight through joint	145	630
Single core stop joint	145	800
Three core transition joint	170	Oil: 1200 XLPE: 2500
Single core transition joint		
Trifurcating box	-	-

Installation of NKT 33kV Sub-Transmission Transition Joints in New Zealand:

XLPE cable end

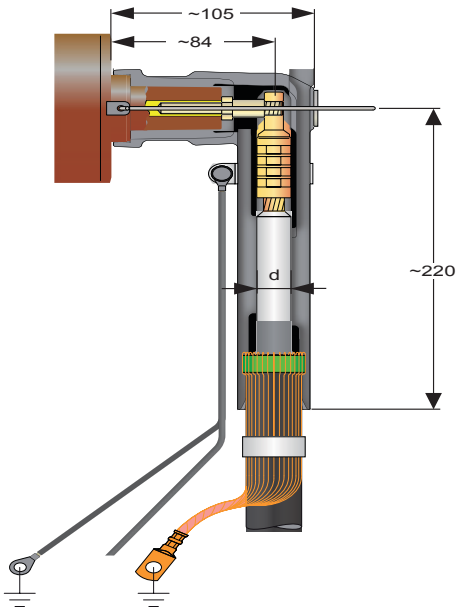
Oil cable end

Notes
Other cross sections may be available on request

Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

NKT Screened Connectors for Type A and Type B Interfaces

MV switchgear and transformer connections for up to 630 A and 1250 A



CE 24-250

NKT manufactures a wide range of cables and cable accessories and is the leading supplier of medium voltage screened connectors across much of Australasia.

NKT was the first to manufacture silicone rubber cable terminations and now has 50 years' experience, in applications up to 400 kV.

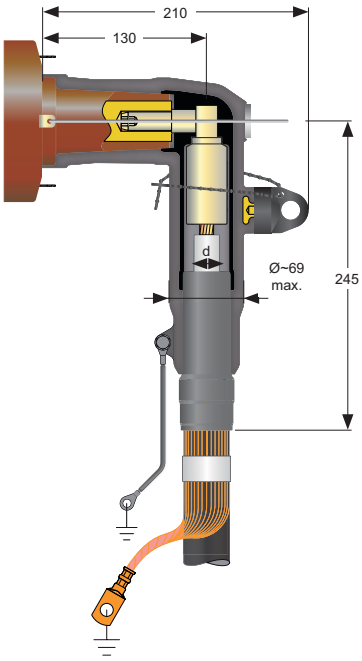
The range of screened connectors for Type A and Type B interfaces are made from silicone rubber and are quick and easy to assemble. Each connector has an outer conductive layer, and an integrated inner conductive layer and field control system. Cable sheath testing can be done without dismantling the connector.

The CE 24-250 elbow connector (illustrated) is typically used to provide a safe, screened connection up to 250A in 11/22 kV transformers, RMUs and distribution switchgear fitted with Type A bushings according to EN 50180/50181. One size covers the application range 25 – 95 mm2 / 22 kV. The CE 24-250 is widely used in electricity distribution applications in New Zealand.

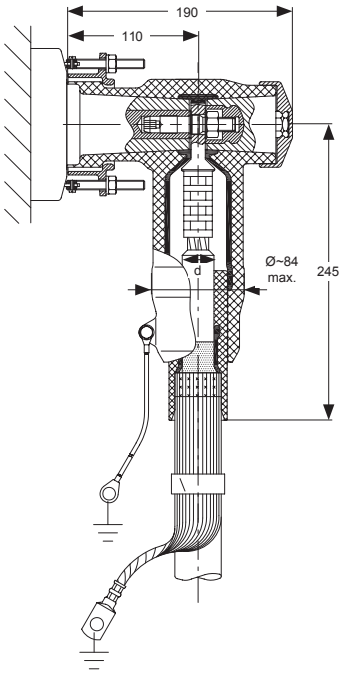
The CE 24-400 elbow connector and CB 36-400 T-connector provide safe, screened connections up to 400A in MV transformers, RMUs and distribution switchgear fitted with Type B bushings according to EN 50180/50181.

Product Selection Table

Hiko Code	Interface	Rating (A)	System Voltage			Application Range				Dimensions	
			11kV	22kV	33kV	Cross Section[1] (mm)		Insulation Diameter (mm)		Approx Length[2] (mm)	Approx Depth[3] (mm)
						Min	Max	Min	Max		
NKTCE2425095	A	250	✓	✓		25	95	16.9	25.0	220	105
NKTCE12400H3	B	400	✓			95	240	17.2	32.6	245	210
NKTCE12400L5			✓			185		21.1	34.6		
NKTCE24400C2			✓	✓		25	95	12.7	25.0		
NKTCE24400H5				✓		95	240	21.2	34.6		
NKTCE24400M5				✓			300				
NKTCB36400A1			✓[4]	✓	✓	25	35	17.0	24.3		190
NKTCB36400F4			✓[5]	✓	✓	50	120	21.2	33.6		
NKTCB36400K6					✓	150	240	28.9	40.0		
NKTCB36400M6			✓[6]	✓	✓	95	300				



CE 24-400



CB 36-400

Notes

1. Maximum size is for AL or CU RMV conductor
2. From bushing centre line to end of stress cone
3. From mounting face to back plug cover
4. Maximum application range at 11 kV: 70 mm²
5. Minimum application range at 11 kV: 95 mm²
6. Minimum application range at 11 kV: 185 mm²

NKT Cold Applied 11/22 kV Termination Shrouds

For 11kV in-line connections to ABB SafeLink and 11/22 kV in-line or right-angle connections

TBA

KAP

TBA is a cold applied in-line cable termination shroud for connecting XLPE and EPR cables in 11 kV cables in switchgear.

TBA has been designed specifically to fit the bushings in ABB Safelink but can also be used with other distribution switchgear with similar bushings.

The TBA comprises three two-piece boots, grease, cleaning cloth and installation instructions.

The smart installation method means the upper part of the two-piece boot sticks to the bushing; but the lower part of the boot can easily be pulled down to expose the palm of the bushing when required, for example for testing.

Meets the requirements of CENELEC HD 629.1

KAP is a rubber insulating boot with removable plastic plugs to allow testing on the conductor, and to allow easy installation in either in-line or right-angled connections.

Like the TBA, the KAP comprises three boots, grease and cleaning cloth.

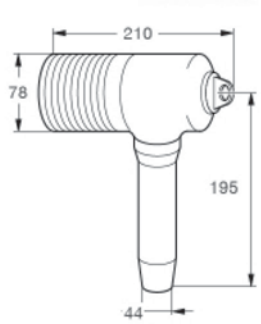
It is especially well suited for the renovation of oil-filled transformer boxes and other cable connections with non-standard bushings, for example when replacing paper-insulated cable with XLPE-insulated cable.

Meets the requirements of SEN 24 14 34 and SS 424 14 17 Edition 4.

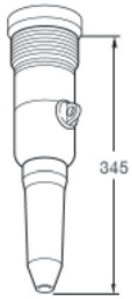
Both the TBA and KAP are designed to fit NKT cold applied indoor terminations type SOT241A, 241 and 242. Other cable terminations may also be used.

Product Selection Table

Hiko Code	System voltage		Cross section (mm²)	Nominal Length (mm)
	11kV	22kV		
NKTTBA12U	✓	-	16-300	400-450
NKTKPA300U	✓	✓	25-300	345[1]



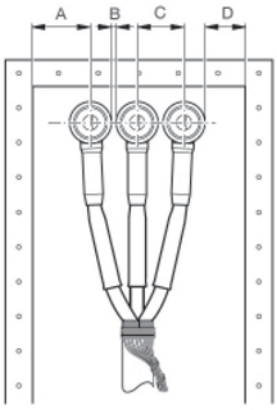
Elbow KAP 300 U.

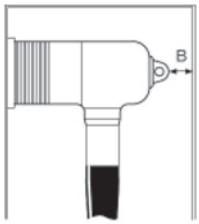


Straight KAP 300 U.

NKTKAP300U Recommended Minimum Clearances (in air)

System voltage (kV)	Insulation Level (kVpk)	A	B	C	D
11	75	50	10	90	10
22	125	110	50	130	50

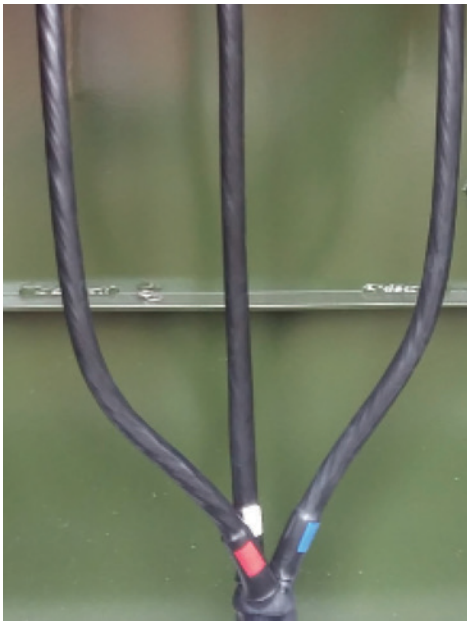




Notes
1. When assembled for right-angled connection: length 195 mm, depth 210 mm

NKT Heat-shrink Trifurcating Kits (HST)

For 11/22/33 kV cable terminations



NKT HST kits seal three-core cables at the breakout point, with heat-shrinkable insulating tubing and a heat-shrinkable break-out boot.

NKT HST kits are widely used and provide an economical and reliable solution. Hot-melt mastic is available as an option to provide additional sealing if required and is recommended for outdoor applications.

The HST is supplied in a standard length of 1.5 m. Other lengths are available on request, up to 5.0 m.

Product Selection Table

Hiko Code[1]	Cross Section (mm²)			Nominal Length (m)
	11 kV	22 kV	33 kV	
NKTHST1	35-120	35-120	-	1.5
NKTHST2R2[2]	150-185	150-185	50-185	1.5
NKTHST3	240-500	240-500	240-500	1.5

Notes

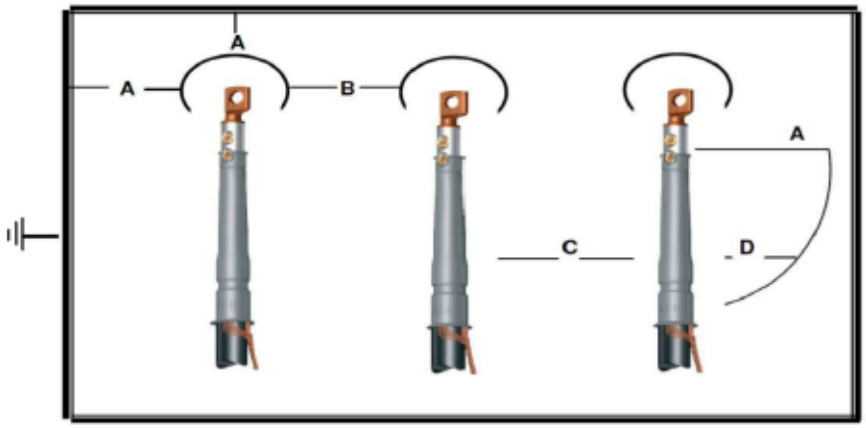
1. Add suffix SM if sealing mastic is required in the kit (recommended for outdoor applications).
2. Covers a different range of cable cross sections

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

NKT Pre-Moulded Cold Applied Slipover Cable Terminations

For XLPE- and EPR-insulated cables 1- or 3-core with Al or Cu conductors for 11-33 kV



Air Clearances to AS 2067

Dimensions in mm

Voltage	BIL		Ph/Ph (B)	(C)	(D)	PH/Grd (A)
6.6kV	60		104	10	10	90
11kV	95		184	10	15	160
22kV	150		320	20	25	280
33kV	200		440	30	35	380

NKT manufactures a wide range of cables and cable accessories and is the leading supplier of medium voltage screened connectors across much of Australasia.

NKT was the first to manufacture silicone rubber cable terminations and now has 50 years' experience, in applications up to 400 kV.

NKT pre-moulded cold applied slipover cable terminations are made of silicone rubber with integrated field control and top sealing.

The silicone rubber grade used in SOT terminations is durable, UV and ozone resistant, waterproof, nonflammable, self-extinguishing and heat resistant, and environmentally friendly.

Together with its excellent mechanical and electrical properties, this makes it the preferred material for 11-33kV terminations.

In addition to offering high quality electrical insulation and superior corona and tracking resistance, the elasticity of silicone rubber facilitates a wide application range. So, one product can be used for many different conductor cross-sections.

The single-piece design makes the termination quick and easy to install, saving you valuable time and money.

The outdoor types are provided with permanent sheds for extended creepage distance.

The terminations are supplied in indoor or outdoor kits for 1- or 3-core cables, with or without shear-bolt lugs.

Meets the requirements of:

- CENELEC, HD 629.1 S1
- IEEE 48 1996

Always select products by Insulation diameter.

3x Single Phase Kits Without Lugs

11/22 kV indoor terminations: 3x single phase kits without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range				Insulation Diameter (mm)	
	11kV		22kV			
	Cross Section (mm²)		Cross Section (mm²)			
	Min	Max	Min	Max	Min	Max
NKTSOT241A3	10	35	10	16	11.0	15.0
NKTSOT2413	50	185	35	120	15.0	28.0
NKTSOT2423	240	500	150	400	25.0	39.0
NKTSOT242B3	630	1000	500	800	38.0	54.0

11/22 kV outdoor terminations: 3x single phase kits without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range				Insulation Diameter (mm)	
	11kV		22kV			
	Cross Section (mm²)		Cross Section (mm²)			
	Min	Max	Min	Max	Min	Max
NKTSOT243A3	16	35	25		11.0	15.0
NKTSOT2433	50	120	35	75	15.0	24.0
NKTSOT2443	150	300	95	240	22.0	33.0
NKTSOT2453	400	500	300	500	31.0	40.0
NKTSOT2463	630	1000	630	800	38.0	54.0

33 kV indoor/outdoor terminations: 3x single phase kits without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range		Insulation Diameter (mm)	
	Cross Section (mm²)			
	Min	Max	Min	Max
NKTSOT3613	50	300	26.0	39.0
NKTSOT3623	400	800	38.0	54.0

3x Single Phase Kits With Shear-Bolt Lugs

11/22 kV indoor terminations: 3x single phase kits complete with shear-bolt lugs, includes silicon tape

Hiko Code	Application Range				Insulation Diameter (mm)		Lug Hole Diameter (mm)	Shear-Bolt # for Round Compacted Conductor
	11kV		22kV					
	Cross Section (mm²)		Cross Section (mm²)					
	Min	Max	Min	Max	Min	Max		
NKTSOT241A335	10	35	10	16	11.0	15.0	13	KP1225
NKTSOT2413150	50	150	35	120	15.0	28.0		KP1180
NKTSOT2413185		185	50					KP1190
NKTSOT2423300	240	300	150	300	25.0	39.0		KP1155
NKTSOT2423400		400	185	400				KP1231
NKTSOT2423500	300	500	300					KP1194
NKTSOT242B3630	630	630	500	630	38.0	54.0	16.5	KP1195

11/22 kV outdoor teminations: 3x single phase kits complete with shear-bolt lugs, includes silicon tape

Hiko Code	Application Range				Insulation Diameter (mm)		Lug Hole Diameter (mm)	Shear-bolt # for round compacted conductor
	11kV		22kV					
	Cross Section (mm²)		Cross Section (mm²)					
	Min	Max	Min	Max	Min	Max		
NKTSOT243A335	16	35	25		11.0	15.0	13	KP1225
NKTSOT243395	50	195	35	70	15.0	24.0		
NKTSOT2443300	150	300	95	240	22.0	33.0		KP1155
NKTSOT2453300	-		300		31.0	40.0		
NKTSOT2453500	400	500	300	500				KP1194
NKTSOT2463630	630		630		38.0	54.0	16.5	KP1195

33 kV indoor/outdoor teminations: 3x single phase kits without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range		Insulation Diameter (mm)		Lug Hole Diameter (mm)	Shear-Bolt # for Round Compacted Conductor
	Cross Section (mm²)					
	Min	Max	Min	Max		
NKTSOT3613185	50	185	26.0	39.0	13	KP1190
NKTSOT3613300	95	300				KP1155
NKTSOT3623630	400	630	38.0	54.0	16.5	KP1195
NKTSOT3623800	800				19	KP1198

3 Core Kits Without Lugs

(Including heat-shrink trifurcating kits, standard tail lengths, longer tails available on request)

11/22 kV three core indoor teminations, without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range				Insulation Diameter (mm)		Tail length (mm)
	11kV		22kV				
	Cross Section (mm²)		Cross Section (mm²)				
	Min	Max	Min	Max	Min	Max	
NKTSOT241A3C	10	35	10	16	11.0	15.0	700
NKTSOT2413C	50	185	35	120	15.0	28.0	
NKTSOT2423C	240	500	150	400	25.0	39.0	

11/22 kV three core outdoor teminations, without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range				Insulation Diameter (mm)		Tail length (mm)
	11kV		22kV				
	Cross Section (mm²)		Cross Section (mm²)				
	Min	Max	Min	Max	Min	Max	
NKTSOT243A3C	16	35	25		11.0	15.0	750
NKTSOT2433C	50	195	35	70	15.0	24.0	
NKTSOT2443C	150	300	95	240	22.0	33.0	
NKTSOT2453C	400	500	300	500	31.0	40.0	800

11/22 kV three core indoor/outdoor teminations, without shear-bolt lugs, includes silicone tape

Hiko Code	Application Range		Insulation Diameter (mm)		Lug Hole Diameter (mm)
	Cross Section (mm²)				
	Min	Max	Min	Max	
NKTSOT3613C	50	300	26.0	39.0	800
NKTSOT3623C	400	600	38.0	54.0	1000

3 Core Kits Complete With Shear-Bolt Lugs

(Including heat-shrink trifurcating kits, standard tail lengths, longer tails available on request)

11/22 kV three core indoor terminations, complete with shear-bolt lugs, includes silicone tape

Hiko Code	Application Range				Insulation Diameter (mm)		Tail Length (mm)	Lug Hole Diameter (mm)	Shear-bolt # for round compacted conductor
	11kV		22kV						
	Cross Section (mm²)		Cross Section (mm²)						
	Min	Max	Min	Max	Min	Max			
NKTSOT241A335C	10	35	10	16	11.0	15.0	700	13	KP1225
NKTSOT241395C	50	95	35	95	15.0	28.0			
NKTSOT2413150C		150		150					KP1180
NKTSOT2413185C	50	185		120					KP1190
NKTSOT2423300C	240	300	150	300	25.0	39.0			KP1155
NKTSOT2423500C	300	500	300	400					KP1194

11/22 kV three core indoor terminations, complete with shear-bolt lugs, includes silicone tape

Hiko Code	Application Range				Insulation Diameter (mm)		Tail Length (mm)	Lug Hole Diameter (mm)	Shear-Bolt # for Round Compacted Conductor
	11kV		22kV						
	Cross Section (mm²)		Cross Section (mm²)						
	Min	Max	Min	Max	Min	Max			
NKTSOT243A335C	10	35	25		11.0	15.0	700	13	KP1225
NKTSOT2433120C	50	120	35	95	15.0	24.0			KP1180
NKTSOT2443300C	150	300	95	150	22.0	33.0			KP1155
NKTSOT2453500C	400	500	300	120	31.0	40.0	800		KP1194

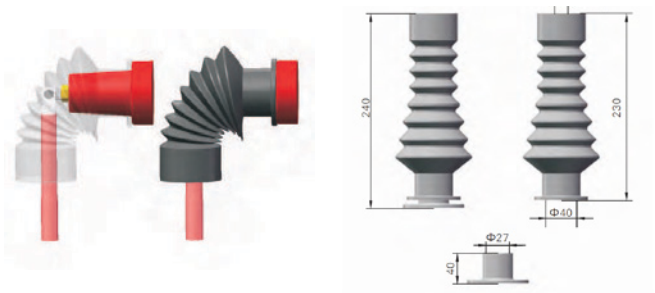
33 kV indoor/outdoor teminations, complete with shear-bolt lugs, includes silicone tape

Hiko Code	Application Range		Insulation Diameter (mm)		Lug Hole Diameter (mm)	Lug Hole Diameter (mm)	Shear-Bolt # for Round Compacted Conductor
	Cross Section (mm²)						
	Min	Max	Min	Max			
NKTSOT3613185C	50	185	26.0	39.0	800	13	KP1190
NKTSOT3613300C	95	300					KP1155
NKTSOT3623630C	400	630	38.0	54.0	1000	16.5	KP1195

Selection Table for SICON Shear Bolt Lugs

Hiko Code	Application Range (mm²)						Palm Bore Diameter (mm)	Number of Bolts
	Round Stranded (RM)		Sector Stranded (SM)		Round Compacted (RMV)			
	Min	Max	Min	Max	Min	Max		
KP1225	10	95	35	70	10	95	13	1
KP1180	16	150	35	120	16	150	13	2
KP1181	16	150	35	95	16	150	16.5	
KP1190	50	185	50	150	50	240	13	
KP1191	50	185	50	150	50	240	16.5	
KP1155	95	300	95	240	95	300	13	
KP1156	95	300	95	240	95	300	16.5	
KP1231	185	400	185	240	185	400	13	3
KP1233	185	400	185	240	185	400	16.5	
KP1194	300	630	300	400	300	630	13	
KP1195	300	630	300	400	300	630	16.5	

WCAB Cold Applied Insulation Boot



Woer elastomeric insulating boots are molded parts which fit over the connection between the cable lug and the inline or right-angled bushing to improve phase-to-phase and phase-to-ground insulation. They are used in switchgears and transformers where the clearances are insufficient for normal operation, or to protect against flashover rodents or high humidity.

Features

- Made of silicone rubber
- Collar is optional for use where the bushing size is smaller
- Offering tailor-made solutions against specific requirements (size, colour)
- Connection can be energized immediately after installation
- Excellent tracking and erosion resistance
- Removable and re-installable
- Fast and simple installation
- Unlimited shelf life

Technical Data

Components	Units
Maximum System Voltage	17.5kV
Basic Impulse Level	95kV
Collar Size	27mm
Bushing Diameter	31-45mm
Bushing Types	250A/630A
Cable Cross Section	35-400mm²

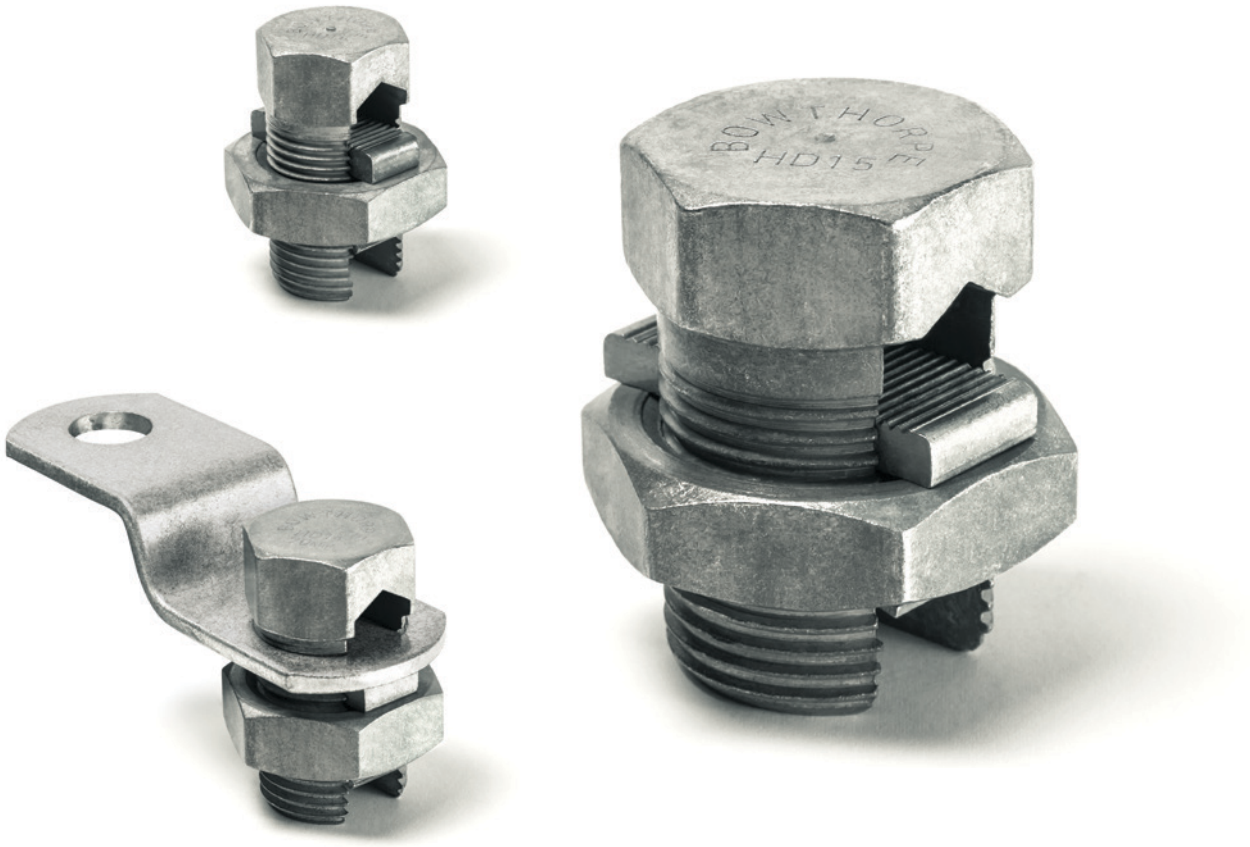
Other literature available on request
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

The Hiko LV Protective Cap provides a cost effective and convenient way to protect LV bushings and other live metalwork from accidental contact.

Med/High Voltage: Network Fittings & Accessories

BOWTHORPE HD Series Line Taps

The original New Zealand line tap tried and trusted by overhead lines engineers and line mechanics since 1952



The safe and reliable operation of electricity distribution lines depends on the quality of overhead line fittings.

Over the years, BOWTHORPE HD series line taps have earned an enviable record for robustness and reliability in New Zealand and overseas.

BOWTHORPE HD series line taps have been used extensively across New Zealand electricity distribution networks since 1952. They have a long-term trouble-free record in a wide variety of operating conditions.

They have also proven themselves to provide an inexpensive and lasting solution. They can be quickly and easily installed (and removed) without the need for special tools.

BOWTHORPE HD series line taps are made in New Zealand from a particular grade of brass extrusion also made in New Zealand. Every step of the manufacturing process, including the metallurgy, extrusion, machining, tinning and assembly, is critical to the performance of the product. Exacting quality control procedures are applied throughout to provide assurance that BOWTHORPE HD series line taps conform to specification and can be relied on during installation and in service.

This also allows relatively high torque settings to be specified to provide assurance of correct installation time after time without damaging the conductor.

Five sizes cover all conductors from 4 – 120 mm2.

BOWTHORPE HD line taps have been type tested for 1,000 hours of heat-cycling, to the latest version of BS 3288.1.

Note: all genuine BOWTHORPE HD series line taps are marked with the name “BOWTHORPE”

BOWTHORPE HD Series Line Taps

Type	Hiko Code	Pack Quantity	Cross Section (mm^2)		Application Range Diameter (mm)		Diameter (mm)		Recommended Torque Setting (Nm)	
			Min	Max	Min	Max	Min	Max	Min	Max
HD9	BL500	500	4	7	2.7	4.0	7 / 0.91	7 / 1.12	5	7
HD10	BL510	200	10	16	3.8	5.8	7 / 1.32	7 / 1.75	12	15
HD12	BL520	150	16	25	4.3	6.6	7 / 1.63	7 / 2.14	14	18
HD12A	BL530	100	16	35	5.3	8.1	7 / 1.70	19 / 1.63	25	30
HD13	BL540	50	25	50	6.6	10.1	7 / 2.11	19 / 1.83	40	45
HD14	BL550	50	35	70	7.3	11.1	19 / 1.53	19 / 2.14	60	65
HD15	BL565	25	50	95	8.8	13.4	19 / 1.75	37 / 1.83	100	110
HD18	BL575	25	70	120	10.5	16.1	19 / 2.11	37 / 2.11	100	110

Palms for HD Series Line Taps

Type	Hiko Code	Description
HD10P	BL760	For HD10 Line Tap
HD12P	BL765	For HD12 Line Tap
HD12AP	BL770	For HD12A Line Tap
HD14P	BL775	For HD14 Line Tap
HD12APTH	BL900	Braised palm for HD12A Line Tap
HD12A&P	BL920	Palm assembly with HD12A Line Tap

HD Series Line Taps Variants

Type	Hiko Code	Description	Thread Size
HD12TC	BL610	HD12 with drilled and tapped head	5/16" Whit
HD12ATC	BL620	HD12A with drilled and tapped head	3/8" Whit
HD12ATCS	BL680	HD12A with attached stud and nut	3/8" Whit

Pole-Mounted Earth and Neutral Bars for HD Series Line Taps

Type	Hiko Code	Description
ETB/3	BL740	Earth bar for 3x HD12A Line Taps
ETB/4	BL741	Earth bar for 4x HD14 Line Taps
ETB/312	BL742	Earth bar for 6x HD14 Line Taps
ETB/4WAY	BL743	Earth bar for 4x HD12A Line Taps
A6134	BL779	Neutral bar with 4x M8 bolts tapped

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Bowthorpe®

REBAr Earth Bonding Anchor

For retrofit earthing of hollow spun concrete pole reinforcing cage.

The REBAr provides a secure means of bonding the internal reinforcing cage of older hollow spun concrete poles to the external copper cable earthing system.

The REBAr is a stainless steel ferrule suitable for retrofitting onto poles that have external earthing leads fitted from the crossarms down to a driven earthing pin. It is fixed to the reinforcing cage under the pole cap and bonded via a bonding lead to the top crossarm earthing point.

Three grub screws are supplied for fixing to the reinforcing cage, and a stainless steel bolt and Belleville washer supplied for attaching the bonding lead.

A work procedure is available developed in conjunction with Linetech Consulting.

REBAr Earth Bonding Anchor

Short circuit current rating
10 kA x 0.5 s

Requirement
One anchor per pole

Product code
FECHR044458

Materials

Grub screws	M10 x 10 stainless steel
Attachment bolt	M12 x 40 stainless steel
Belleville washer	M12 stainless steel
Anchor body	Stainless steel 304

Other literature available on request
Installation instruction (Linetech Consulting work procedure LWM 542) Drawing

Pfisterer SICON Stepless Shear Bolt Connectors

The cable connector system for voltages up to 36 kV

Terminals, connectors and cable lugs using screw technology have been on the advance for years, and with good reason.

The special design feature of the SICON shear bolt connectors is that there are no predetermined break points in the thread. This provides for optimal load-bearing capacity for each range of cross sections. The bolt always breaks at the surface of the clamp body, so there are no protrusions and nothing has to be filed down to make the sleeve fit. Fitting requires a simple tool – literally with a flick of the wrist.

Offering a large clamping range, SICON shear bolt connectors feature a compact design with rounded edges and flat transitions suitable for slide-on and shrink sleeves.

They are contact technology type-tested to IEC 61238-1 and proven in joint tests to HD 629 and in 18-month endurance test.

The SICON system features aluminium alloy connectors, steel threaded studs, brass shear bolts and plastic centring sleeves and the family includes branch connectors, inline connectors and cable lugs.

An overview of SICON system benefits:

- Nothing protrudes, and nothing has to be filed down.
- Full utilisation of the thread loading for any size of conductor.
- No special tools needed.
- Smooth breakage of the shear bolt simplifies tightening.
- The remains of the bolt stay with the tool and can be disposed of safely.

Sicon Stepless Shear Bolt Connectors

Product Images	Hiko Code	Solid	Compressed	Sector 90°	Sector 120°	Stranded	Sector 90°	Sector 120°	Palm Bore Diameter (mm)	Wrench Size (mm)	Number Of Bolts	Length (mm)	Outer Diameter (mm)	Inner Diameter (Bore) (mm)
		(mm²)												
														
Branch Connector 	KP1165	50 - 240	50 - 240	50 - 185	50 - 150	50 - 185	50 -150	50 - 120	-	6	6	136	68 x 33	22
In-line Connectors 	KP1185	10 - 95	10 - 95	50 - 95	50 - 70	10 - 95	35 - 70	35 - 50	-	5	2	65	24	13
	KP1160	25 - 150	25 - 150	35 - 120	35 - 95	25 - 150	35 - 120	35 - 95	-			68	28	16.3
	KP1200	16 - 150	16 - 150	50 - 120	50 - 120	16 - 150	35 - 120	35 - 95	-		4	85	28	16.5
	KP1205	50 - 240	50 - 240	50 - 185	50 - 150	50 - 185	50 - 150	50 - 120	-	6		108	33	20
	KP1210	50 - 240	50 - 240	50 - 240	50 - 240	50 - 240	50 - 240	50 - 240	-			108	35	21
	KP1215	95 - 400	95 - 400	95 - 240	95 - 240	95 - 300	95 - 185	95 -185	-			128	38	24
	KP1240	185 - 500	185 - 500	185 - 240	185 - 240	185 - 400	185	185	-	8		165	42	26.4
	KP1220	300 - 800	300 - 630	-	-	300 - 630	300- 400	300	-			200	52	33.5
Lugs 	KP1225	10 - 95	10 - 95	50 - 95	50 - 70	10 - 95	35 - 50	35 - 50	13	5	1	68	24	13
	KP1180	16 - 150	16 - 150	50 - 120	50 - 120	16 - 150	35 - 120	35 - 95	13	5	2	89	28	16.5
	KP1181	16 - 150	16 - 150	50 - 120	50 - 120	16 - 150	35 - 120	35 - 95	16.5					
	KP1190	50 - 240	50 - 240	50 - 185	50 - 150	50 - 185	50 - 150	50 - 120	13	6		110	33	20
	KP1191	50 - 240	50 - 240	50 - 185	50 - 150	50 - 185	50 - 150	50 - 120	16.5					
	KP1155	95 - 400	95 - 300	95 - 240	95 - 240	95 - 300	95 - 185	95 - 185	13	8		120	38	24
	KP1156	95 - 400	95 - 300	95 - 240	95 - 240	95 - 300	95 - 185	95 - 185	16.5					
	KP1231	185 - 500	185 - 400	185 - 240	185 - 240	185 - 400	185 - 240	185	13		3	140.5	42	26.4
	KP1233	185 - 500	185 - 400	185 - 240	185 - 240	185 - 400	185 - 240	185	16.5					
	KP1194	300 - 800	300 - 630	-	-	300 - 630	300 - 400	300	13			168	52	33.5
	KP1195	300 - 800	300 - 630	-	-	300 - 630	300 - 400	300	16.5					

Notes

All SICON connectors listed have oil-stops
Cable sections in accordance with EN 60228 (VDE 0295)
Central screw-type cable lugs and other versions on request.

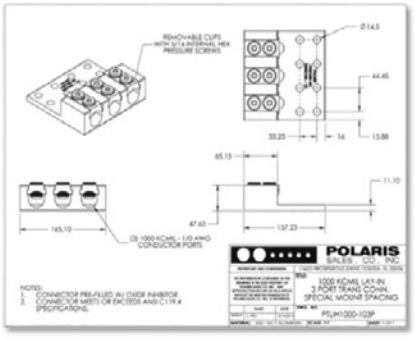
Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

PFISTERER

Polaris PTLIH Ground Mounted Transformer Connectors

Heavy duty connectors with bolted lay-in cable clamps



Polaris PTLIH transformer connectors are application engineered for the New Zealand market to provide a secure, reliable and cost-effective means of connection for ground mounted transformers.

Polaris PTLIH transformer connectors are manufactured from high-strength 6061-T6 aluminium alloy to provide premium electrical and mechanical performance. They are dual rated for copper and aluminium conductors.

No cable lugs are required, reducing tooling and installation costs and electrical losses.

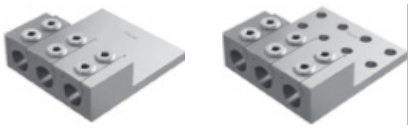
The lay-in cable cleats make connection quick and convenient, especially with large cable cross sections.

By using torque-setting set screws, Polaris PTLIH connectors are re-enterable, enabling the connection of additional cables, or different cable cross-sections.

The range-taking design minimises inventory requirements; three sizes cover transformer ratings from 200 – 1500 kVA.

Polaris PTLIH connectors meet or exceed ANSI C119.4 Class A, which specifies connectors for use between aluminium-aluminium or aluminium-copper conductors used in electricity distribution networks.

Polaris PTLIH Heavy-Duty Transformer Connectors with Lay-In Cable Clamps

Connector Images	Part No.*	Cable Ports	Mounting Holes	Rating A	Minimum Conductor (mm^2)	Maximum Conductor (mm^2)
	PTLIH 600PNZB	1	0	600	35	300
	PTLIH 600PNZ		2		35	300
	PTLIH 60052PB	2	0	1200	35	300
	PTLIH 1000102PB				70	500
	PTLIH 60052P		4		35	300
	PTLIH 1000103PB	3	0	2400	70	500
	PTLIH 1000103P		8			
	PTLIH 1000104PB	4	0			
	PTLIH 1000104P		8			

* Other sizes are available on request.

Connectors and Cover Kits

Part No.	Application	Colour
50750HK5	For connectors with 1—2 cable ports	Black (UV Stabilised)
50750HK9	For connectors with 3—4 cable ports	

Tightening Torques

Conductor Size (mm^2)	Set Screw Torque (Nm)	Palm Bolt Size	Bolt Torque (Nm)
35 – 120	28	M12	68
185	38		
300	41		
400 – 500	51		

Options

Oxide inhibitor provided as standard, can be omitted if required
Anodised set screws
Tin plated connectors
Other sizes available on request

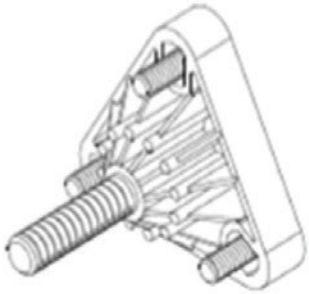
Other literature available on request

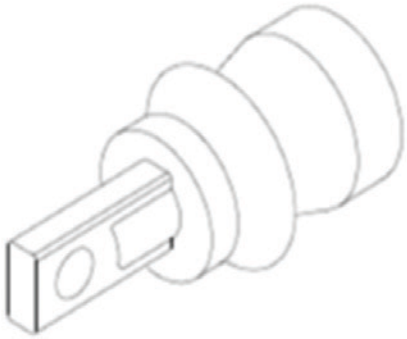
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

POLARIS®

Polaris PSMTL Transformer Connectors

Bolted connectors for ground mounted and pole mounted transformers





Polaris PSMTL transformer connectors are application engineered for the New Zealand market to provide a secure, reliable and cost-effective means of connection for pole-mounted and small ground-mounted transformers.

Polaris PSMTL transformer connectors are manufactured from high-strength 6061-T6 aluminium alloy to provide premium electrical and mechanical performance. They are dual rated for copper and aluminium conductors, and come complete with insulating cover.

Connection is either by slip-fit and set screw onto the transformer bushing stud or bolted directly to the bushing palm. No cable lugs are required, reducing tooling and installation costs and electrical losses.

By using torque-setting set screws to secure the conductors, Polaris PSMTL connectors are re-enterable, enabling the connection of additional conductors, or different conductor cross-sections.

Polaris PSMTL connectors meet or exceed ANSI C119.4 Class A, which specifies connectors for use between aluminium-aluminium or aluminium-copper conductors used in electricity distribution networks.

Polaris PSMTL Transformer Connectors

Connector Images	Part No.*	Cable Ports	Mounting Holes	Rating A	Minimum Conductor (mm^2)	Maximum Conductor (mm^2)
	POL82	2	2	200	16	120
	PSMTL 3504PH	4	4	400		
	PSMTL SC3504P					

* Other sizes are available on request

Tightening Torques

Conductor Size (mm^2)	Set Screw Torque (Nm)	Connection Type	Bolt Torque (Nm)
16—25	14	Threaded Stud (Slip-fit 5/8" 11)	42
35—120	28	Bushing Palm (M10 bolt)	35

Options

Oxide inhibitor provided as standard, can be omitted if required
Anodised set screws
Tin plated connectors
Transparent covers to facilitate inspection / audit (not UV-stabilised)
Other sizes available on request

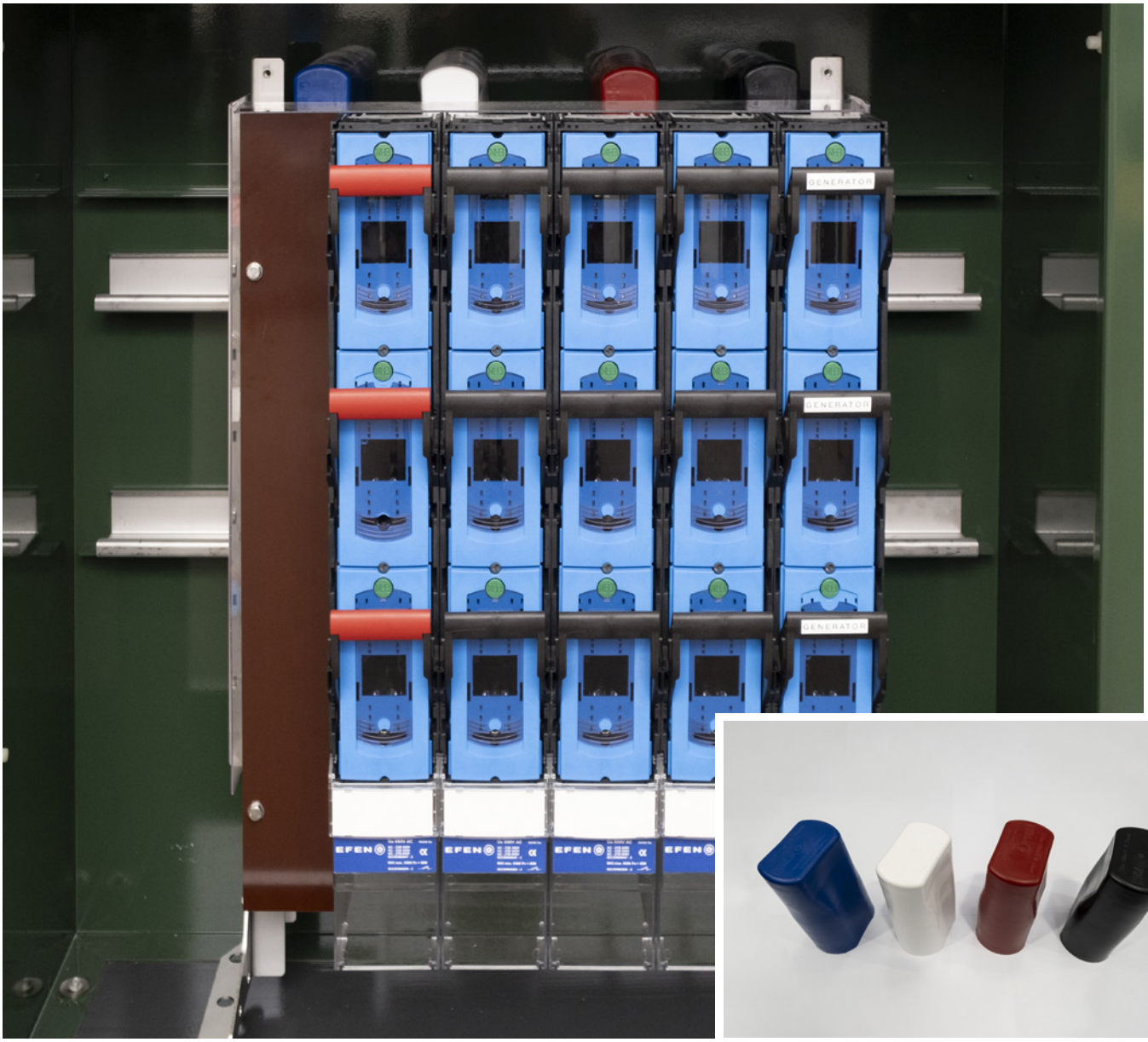
Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

POLARIS®

Hiko LV Protective Caps

For transformer bushings and other applications



The Hiko LV protective cap provides a cost effective and convenient way to protect LV bushings and other live metalwork from accidental contact.

LV protective caps are quick and simple to install, compared to other methods, such as using PVC tape. In addition, as a factory-made moulding, with defined wall thickness and materials characteristics, they provide greater assurance of safety than ad-hoc methods.

The caps are supplied as a set of four, in standard colours, to provide a clear visual indication to phase identification.

They are designed so that one size fits most New Zealand bushing types and sizes. LV protective caps can also be modified to fit different cable entry positions.

Product Selection Table

Hiko Code	External Length (mm)	Opening			Inner End		
		Width (mm)	Height (mm)	Length (mm)	Width (mm)	Height (mm)	Length (mm)
HL0004	170	86	73	80	74	47	40

Technical Data

Components	Description
Material	PVC
Operating temperature	-40 °C to +120 °C
Dielectric strength	20 kV/mm

Notes

Packaged as a set of four: red, white, blue, black.
This product is not intended for use on medium voltage or high voltage bushings.

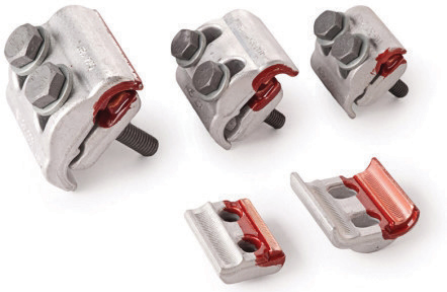
Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

IPCs, PG Clamps and Other Clamps for Overhead Lines

For aluminium and copper conductors

Insulation piercing connectors



Bimetallic parallel groove clamps

Bimetallic cover tap-off clamp

Parallel groove clamps

Bimetallic bow clamp

Hiko stocks a wide range of overhead line fittings. This data sheet lists commonly stocked items; other types are available on request.

Insulation Piercing Connectors (IPC's) are used to make tap off connections on low voltage insulated conductors. Hiko IPCs include shear bolts to ensure the correct tightening torque is applied during installation.

Parallel Groove (PG) Clamps are used to connect aluminium and ACSR conductors. Bimetallic PG Clamps connect aluminium or ACSR main conductors with copper tap-off conductors.

Hiko PG clamps and bimetallic PG clamps are manufactured from high strength corrosion resistant aluminium alloy (AlMgSi1/Al6082) and use hot-dip galvanised steel bolts and nuts and corrosion protected washers.

Bimetallic Cover Tap-Off Clamps connect aluminium or ACSR main conductors with copper tap-off conductors. Hiko cover tap-off clamps are manufactured from high strength corrosion resistant aluminium alloy, hot-forged metallic sheet and high strength copper alloy (CuNi2Si) and use hot-dip galvanised steel bolts and corrosion protected washers.

Bimetallic Bow Clamps connect aluminium or ACSR conductors with copper conductors. The body is made of high strength aluminium alloy with bimetallic sheet for copper tap-off; the U-bolt and nuts are hot-dip galvanised with corrosion protected washers.

Product Selection Table: Application Ranges

Hiko Code	Description	Main Conductor								
		AL	CU	ACSR	Cross Section (mm²)		Diameter (mm)		ACSR Size	
					Min	Max	Min	Max	Min	Max
BIZ1695	Insulation piercing connector	✓	✓		16	120 BARE				
KP2190					25					
KP2197					6 BARE					
BIZ2595					25					
BIZ50150					(35)50	150				
KP1928	Bimetallic parallel groove clamp (two bolts)	✓		✓	16	70	5.1	11.7	16/2.5	70/12
KP1930					25	150	7.5	14	35/6	95/15
KP1927					35	120	6.3	15.7	25/4	120/20
KP1926	Bimetallic parallel groove clamp (single bolt)	✓			35	120				
KP1935	Bimetallic cover tap-off clamp	✓		✓	25	70			25/4	70/12
KP1937					50	150			50/8	120/20
KP2111	Bimetallic bow clamp	✓		✓	95	240	12.5	21.9	95/15	240/40
KP1950	Parallel groove clamp	✓		✓	16	70	5.1	11.7	16/2.5	70/12
KP1942					25	150	6.3	15.7	25/4	120/20
KP1960				✓	50	150	9	16	50/8	120/20

Hiko Code	Description	Branch Conductor					
		AL	CU	Cross Section (mm²)		Diameter (mm)	
				Min	Max	Min	Max
BIZ1695	Insulation piercing connector	✓	✓	4	35(50)		
KP2190				6	50		
KP2197				6 INS	35 INS		
BIZ2595				25	95		
BIZ50150				(35)50	150		
KP1928	Bimetallic parallel groove clamp (two bolts)		✓	6	50	2.7	9
KP1930				10		3.5	9
KP1927						3.5	12.5
KP1926	Bimetallic parallel groove clamp (single bolt)		✓	10	50		
KP1935	Bimetallic cover tap-off clamp		✓	10	70		
KP1937				25	120		
KP2111	Bimetallic bow clamp	✓		95	240		
			✓[1]	70	185		
KP1950	Parallel groove clamp	✓		16	70		
KP1942				25	150		
KP1960				50	150		

Product Selection Table: Dimensions, Other Characteristics

Hiko Code	Description	Number of Bolts	Bolt Size	Tightening Torque (Nm)	End Caps	Weight (g)	Box Quantity
BIZ1695	Insulation piercing connector	1	M8	Shear	1	148	5
KP2190						TBC	50
KP2197						TBC	25
BIZ2595					0	172	10
BIZ50150						205	10
KP1928	Bimetallic parallel groove clamp	2	M8	23		107	50
KP1930						134	50
KP1927						155	20
KP1926		1				80	50
KP1935	Bimetallic cover tap-off clamp	2	M8	20		122	50
KP1937						178	30
KP2111	Bimetallic bow clamp	1x U-bolt	M12	80		490	18
KP1950	Parallel groove clamp	2	M8	23		91	50
KP1942			M10	46		212	50
KP1960						TBC	30

Notes
1. With insert (included)

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

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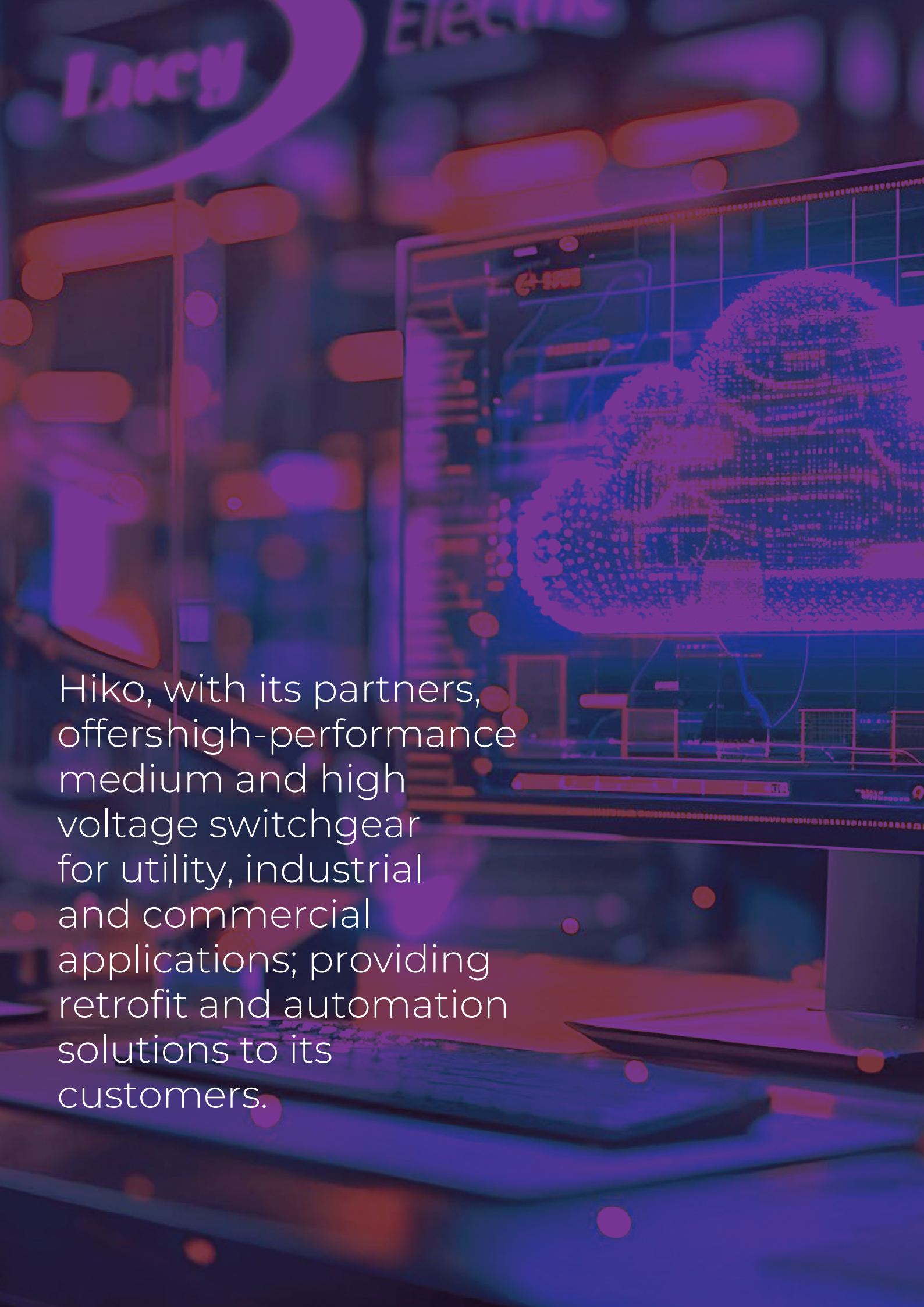

Hiko, with its partners, offershigh-performance medium and high voltage switchgear for utility, industrial and commercial applications; providing retrofit and automation solutions to its customers.

Med/High Voltage Switchgear & RMUs

Lucy Electric Aegis^{Plus} Ring Main Unit (RMU)

SF6 insulated with vacuum circuit breaker or fuse switch protection

Front cable termination, SF6 insulated RMU with up to 5 switching functions in a single stainless steel enclosure.

Characteristics

- 12, 17.5 and 24 kV with up to 630 A ratings
- Extensible and non extensible range with a wide choice of configurations
- Any combination of load break switches, vacuum circuit breakers or fuse switch available
- No on-site SF6 gas handling for installation AF, AFL and AFLR internal arc protection
- Intuitive single line mimic diagram
- Horizontal cable terminations with DIN 400 Type C bushings
- Front access earth and test facility
- Integrated motorisation for remote control operation
- Vacuum circuit breaker protection with relays or TLF and fuse switch protection for transformers
- Suitable for Indoor (IP41) and outdoor (IP54) applications
- Integrated Gemini 3 RTU for easy SCADA connection, with optional automatic transfer scheme (ATS)
- Fully interlocked, anti-reflex mechanisms with padlocks
- Maintenance free with 30 years life expectancy

Technical Specifications

Description	Unit	Size		
Rated voltage	kV	12	17.5	24
Rated current: ring switch	A	630	630	630
Rated current: vacuum circuit breaker	A	250 / 630	250 / 630	250 / 630
Fuse switch	A	200	200	200
Impulse withstand voltage	kV	75 / 85	95 / 110	125 / 145
Power frequency withstand voltage	kV	28 / 32	38 / 45	50 / 60
Short time withstand current	kA 3s	21	21	21
Short circuit making current	kA	52.5	54.6	52.5
Short circuit breaking current	kA	–	21	–
Internal arc rating	kA 1s	–	21	–

Range	Extensibility							
	Extensible					Non-Extensible		
Configuration	1 - Way	2 - Way	3 - Way	4 - Way	5 - Way	3 - Way	4 - Way	5 - Way
Load break switch and / or 250 A circuit breaker	✓	✓	✓	✓	✓	✓	✓	✓
Load break switch and / or 630 A circuit breaker	✓	✓	✓	✓	✓	✓	✓	✓

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Lucy Electric Aegis^{36} Ring Main Unit (RMU)

SF6 insulated with vacuum circuit breaker protection

Front cable termination, SF6 insulated RMU with up to 4 switching functions in a single stainless steel enclosure.

Characteristics

- 36 kV with up to 630 A ratings
- Extensible and non extensible range with a wide choice of configurations
- Any combination of load break switches and vacuum circuit breakers available
- No on-site SF6 gas handling for installation AF and AFLR internal arc protection
- Intuitive single line mimic diagram
- Horizontal cable terminations with DIN 400 Type C bushings
- Front access earth and test facility
- Integrated motorisation for remote control operation
- Vacuum circuit breaker protection with relays
- Suitable for Indoor (IP41) and outdoor (IP54) applications
- Integrated Gemini 3 RTU for easy SCADA connection, with optional automatic transfer scheme (ATS)
- Fully interlocked, anti-reflex mechanisms with padlocks
- Maintenance free with 30 years life expectancy

Technical Specifications

Description	Unit	Size
Rated voltage	kV	36
Rated current: ring switch	A	630
Rated current: vacuum circuit breaker	A	630
Impulse withstand voltage	kV	170 / 195
Power frequency withstand voltage	kV	200 / 220
Short time withstand current	kA 3s	50 / 62.5
Short circuit making current	kA	21 kA 3s / 25 kA 1s
Short circuit breaking current	kA	-
Internal arc rating	kA 1s	25

Range	Extensibility						
	Extensible				Non-Extensible		
Configuration	1 - Way	2 - Way	3 - Way	4 - Way	2 - Way	3 - Way	4 - Way
Load break switch and / or 250 A circuit breaker	✓	✓	✓	✓	✓	✓	✓
Load break switch and / or 630 A circuit breaker	✓	✓	✓	✓	✓	✓	✓

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Lucy Electric Aegis^{EcoTec} non-SF6 Ring Main Unit

A breath of fresh air for electrical distribution.

The Aegis^{EcoTec} non-SF6 Ring Main Unit (RMU) range is designed to be smaller and more efficient, while maintaining compatibility with standard installation requirements.

As a result, the EcoTec range provides the same set of solutions for substations as conventional equivalents, but in a more compact and optimised package.

Across the Aegis range, operator safety is paramount with integral interlocking at the forefront of its innovative mechanism design. With a clear, unambiguous mimic and 100% padlockable human-machine interface (HMI), this solution is straightforward and secure.

To ensure the high industrial and operational reliability NZ's networks need, Aegis^{EcoTec} non-SF6 12kV RMUs use the same core mechanism design as the hugely successful Aegis RMU range which is installed worldwide.

Aegis^{EcoTec} non-SF6 RMU uses synthetic air bringing environmental advantages for medium voltage (MV) switchgear. For load break switching, a new architecture is necessary.

Aegis^{EcoTec} non-SF6 RMU uses a small load break vacuum interrupter (VI) shunted across the main current-carrying contacts. This shunt VI breaks the load current, ensuring there is no arcing of the main current-carrying contacts.

Range

Aegis[EcoTec]	Width (mm)	Depth (mm)	Height (mm)
2-way	720	704	1669
3-way	1060	704	1669
4-way	1400	704	1669

Technical Data

Parameters		Specifications	12kV
Rated voltage		kV	12
Rated frequency		Hz	50
Rated impulse withstand voltage		kV	95
Rated power frequency withstand voltage		kV	38
Short time withstand current		kA	20
Rated duration of short circuit		Seconds	3
Short peak withstand current		kA	52.5
Internal arc classification		-	AF/AFL/AFLR
Internal arc rating:	Tank	kA 1 second	20
	Cable Box	kA 1 second	13.5 / 20
Ingress protection:	Outdoor	IP	54
	Indoor	IP	41
Temperature range		°C	-25 to +40
Maximum relative humidity		%	95

Circuit Breaker Function

Parameters		Specifications	12kV
Rated normal current:	T function	A	250
	V function	A	630
Mechanical endurance		Class	M1
Electrical endurance		Class	E2

Load Break Function

Parameters	Specifications	12kV
Rated normal current	A	630
Mechanical endurance	Class	M1
Electrical endurance	Class	E3

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Hiko supplies Insulect disconnectors which are designed to accommodate each network's needs and the layout of their substations.

Med/High Voltage: Crossbonding Link Boxes

Insulect Air Insulated Load Break Switches

Side break and vertical break 12kV, 24kV, 36kV

Insulect Air Break Switches (ABS) are designed, assembled and tested in Australia. Our range is widely installed throughout distribution networks for isolation or switching applications.

12, 24, 36kV Voltage Rating

We have two sizes: 12/24kV and 36kV with current ratings from 630A up to 1250A.

Vertical or Side Break

Each variant can be configured in a side break or vertical break arrangement.

Horizontal or Vertical Install

The switches can be mounted in horizontal or vertical (pole top or mid pole) configurations.

Local Design and Testing

Designed and tested in Australia in accordance with AS 62271.102 / IEC 62271.102.

Features

Modular Design

We readily provide custom design changes to suit individual customer requirements, as well as modular or unitised factory assembly for more rapid installation.

Manual or Motorised

Available with conventional operating rod and handle, with patented hook stick actuator. Able to be fitted with motorised operation as well as remote control facilities.

Insulators

Choose from porcelain, silicon or cycloaliphatic insulators.

Options

Associated earthing switch available.
Load interrupter to break up to 630 amps.

Ordering Information

- Side Break or Vertical Break
- 2/24 kV or 36 kV
- Current Rating
- Pole top or mid pole designs
- Unitised or Modular
- Operating Mechanism: manual handle, hook stick actuator, motor operation (local/remote or SCADA)
- Load Break option.

Technical Specifications

Break Type	Rated Voltage (kV, rms)	LIWV (BIL, kVp)	Power Frequency Withstand Voltage (kV)	Continuous Current (A)	Load Breaking Capacity (A)		Short Circuit Withstand
					Air Break Switch	Load Break Switch	
Side Break	12/24	150	50	Up to 1250	15	630	25 kA / 1s
	36	170	70	Up to 1250	15	630	25 kA / 1s
Vertical Break	12/24	150	50	Up to 1250	15	630	25 kA / 3s
	36	170	70	Up to 1250	15	630	25 kA / 3s

Technical Configurations

Pole Top, Side Break Switch with manual operating handle.

Pole Top, Side Break Switch with hook stick actuator.

Mid Pole, Side Break Switch with manual operating handle and associated Earth Switch.

Mid Pole, Vertical Break Switch with manual operating handle.

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

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Insulect Gas Insulated Load Break Switch

12kV, 24kV, 36kV

Our fully enclosed, pole mounted SF6 load break switches are used extensively throughout distribution networks and are designed to be maintenance free with a long service life.

12, 24, 36kV Voltage Rating

The switch can be supplied in 12, 24 & 36kV voltage ratings and up to 630A breaking current.

Safer, More Reliable Switching

Fully enclosed, SF6 insulation and interruption provides greater reliability.

Local or Remote Operation

Manually operated LBS can be fitted with a remotely controlled actuator.

Insulators and Leads

Choose from porcelain or polymer bushings, with factory fitted cable leads or bare terminal palms.

Features

- Stainless steel enclosure
- Easy handling and light weight
- Open/close indicator
- Maintenance free
- Low gas lockout feature
- High dielectric strength
- Superior endurance to adverse environments
- Mechanical latch holding in close position
- Pole mounting provisions
- Pressure relief vent.

Options

- IEC 61850 compatible automatic controller
- Manual mid-pole operation
- Fully dressed with cables and surge arrestors.

Ordering Information

- 12kV, 24kV or 36kV
- 400amp or 630amp
- With or without leads
- Manual or Automatic (SCADA)
- Manual with mid pole actuator
- Mid pole or pole top mounting arrangement
- Surge arrester mounting above or below bushings.

Technical Specifications

Parameter	Unit	12kV		24kV		36kV	
Rated Voltage	kV	12	12	24	24	36	36
Rated Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Normal Current	A	400	630	400	630	400	630
Rated Symmetrical Interrupting Current	A	400	630	400	630	400	630
Rated Short-Time Withstand Current, 1 sec	kA (rms)	16	16	16	16	16	16
Rated Short-Circuit Making Current	kA (peak)	41.6	41.6	41.6	41.6	41.6	41.6
Rated Power Frequency Withstand Voltage, 1 min	kA (rms)	70	70	70	70	70, 80	70, 80
Rated Impulse Withstand Voltage	kA (peak)	165	165	165	165	170, 195	170, 195
Number of Operations: Mechanical, Electrical (rated normal current)	times	5000	5000	5000	5000	5000	5000
Minimum Creepage Distance of Bushing or Supporting Insulator, from live part to ground	mm	min 600	min 600	min 600	min 600	min 900	min 900

Typical Configurations

Manual operation type

- Easy operation
- Open/Close indication
- Safety interlock
- Light weight
- Maintenance free

Remote operation type

- Local/Remote switch for local field control or remote from DAS master station and substation RTU
- Dry contacts provide the local/remote switch status to the DAS master station and substation RTU
- Auxiliary output contacts are mechanically linked with the switch main contact
- Metal connector (waterproof plug-in type) for connecting control cable
- Line switch control (open/close) and status indication

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Insulect Electronic Sectionaliser

Sectolink 12kV, 24kV, 36kV

Electronic Sectionalisers have been developed for usage on overhead distribution lines to eliminate transient faults They are typically used in conjunction with a recloser and replace the traditional dropout fuse protection.

12, 24, 36kV Voltage Rating

Available in two sizes of 12/24kV and 36kV with pickup current ratings from 8A up to 400A.

Simple Customisation

The sectionaliser performance settings can be manually adjusted with ease.

Various Mounting Options

Single, double or three pole ganged mounts available with hotstick operation.

One EDO Size Fits All

Fits standard single venting 150kV BIL and 170kV BIL EDO mounts.

Features

Low or High current
The sectionaliser suits installation in low and high current applications such as SWER lines or rural locations.

Reclaim time
With fully customised reclaim time, the sectionaliser can be programmed at time of manufacture to suit any network and recloser protection requirements.

Ganged operation
Our custom design two and three phase mounts include a fully ganged operation ensuring sectionaliser dropout of all 3 phases and reducing any ferro-resonance problems.

Technical Specifications

Paramater	Unit	High Current Model		Low Current Model	
Rated Voltage	kV	12/24	36	12/24	36
Lighting Impulse	kV BIL	125/150	170	125/150	170
Frequency	Hz	50/60	50/60	50/60	50/60
Max. continuous current rating	A	250	250	24	24
Pick up current rating	A	20-400	20-400	8-24	8-24
Short time current, 1 s (rms value)	kA	4	4	2	2
Programmable counts	#	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4
Reclaim time	#	25, 30, 60, 90, 120, or 180	25, 30, 60, 90, 120, or 180	25, 30, 60, 90, 120, or 180	25, 30, 60, 90, 120, or 180
Sensitivity of pick up current	%	+/- 10	+/- 10	+/- 10	+/- 10

Position of Switches: Selection Table

Sect No.			01	02	03	04	05	06	07	08	09	10	11	12
Position of Switches 1 2 3 4		# of Counts												
OFF ON	□ ■ □ ■ ■ □ ■ □	1	8	32	20	40	10	60	100	100	250	24	112	20
OFF ON	□ ■ ■ □ ■ □ □ ■	2	8	32	20	40	10	60	100	100	250	24	112	20
OFF ON	□ ■ □ □ ■ □ ■ ■	3	8	32	20	40	10	60	100	100	250	24	112	20
OFF ON	□ ■ ■ ■ ■ □ □ □	4	8	32	20	40	10	60	100	100	250	24	112	20
OFF ON	■ □ □ ■ □ ■ ■ □	1	16	40	40	56	12	80	120	150	300	40	160	25
OFF ON	■ □ ■ □ □ ■ □ ■	2	16	40	40	56	12	80	120	150	300	40	160	25
OFF ON	■ □ □ □ □ ■ ■ ■	**3**	**16**	**40**	**40**	**56**	**12**	**80**	**120**	**150**	**300**	**40**	**160**	**25**
OFF ON	■ □ ■ ■ □ ■ □ □	4	16	40	40	56	12	80	120	150	300	40	160	25
OFF ON	■ ■ □ ■ □ □ ■ □	1	20	50	50	80	16	100	140	200	350	56	224	30
OFF ON	■ ■ ■ □ □ □ □ ■	2	20	50	50	80	16	100	140	200	350	56	224	30
OFF ON	■ ■ □ □ □ □ ■ ■	3	20	50	50	80	16	100	140	200	350	56	224	30
OFF ON	■ ■ ■ ■ □ □ □ □	4	20	50	50	80	16	100	140	200	350	56	224	30
OFF ON	□ □ □ ■ ■ ■ ■ □	1	24	64	60	112	20	130	160	250	400	64	320	36
OFF ON	□ □ ■ □ ■ ■ □ ■	2	24	64	60	112	20	130	160	250	400	64	320	36
OFF ON	□ □ □ □ ■ ■ ■ ■	3	24	64	60	112	20	130	160	250	400	64	320	36
OFF ON	□ □ ■ ■ ■ ■ □ □	4	24	64	60	112	20	130	160	250	400	64	320	36

Number of count setting.

Current setting. Attention should be paid to the direction of the "ON" position.

Indicates the default factory settings.

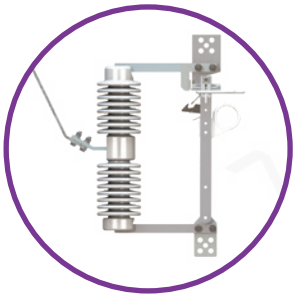
Other literature available on request

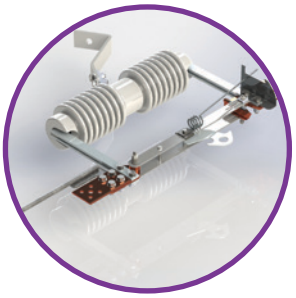
Reports, drawings, technical data sheets, installation instructions, O&M guidelines

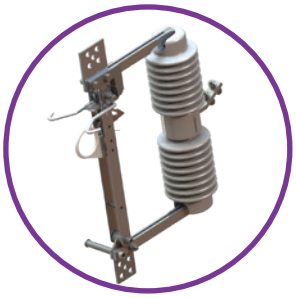
Insulect HV Isolating Links

Single phase 12kV to 72.5kV

Insulect HV Links are installed throughout distribution networks and in substations as isolation points between HV apparatus.







Wide voltage rating

The HV links range covers all voltage ratings between 12kV and 72.5kV, with current rating up to 1600A.

Three mounting configurations

The links can be mounted at 30 degrees, vertically or underslung orientations.

Load break capability

Isolating links can be fitted with Flicker blades or 630A load breaking devices.

Local design and testing

Designed and tested in Australia in accordance with AS 62271.102 / IEC 62271.102.

Features

Modular Design
We readily provide custom design changes to suit individual customer requirements and applications.

Insulators
Choose from porcelain, silicon or cycloaliphatic insulators.

Options

- Latching mechanism
- Load break plus fuse holder
- Flicker horns
- Earthing stirrup.

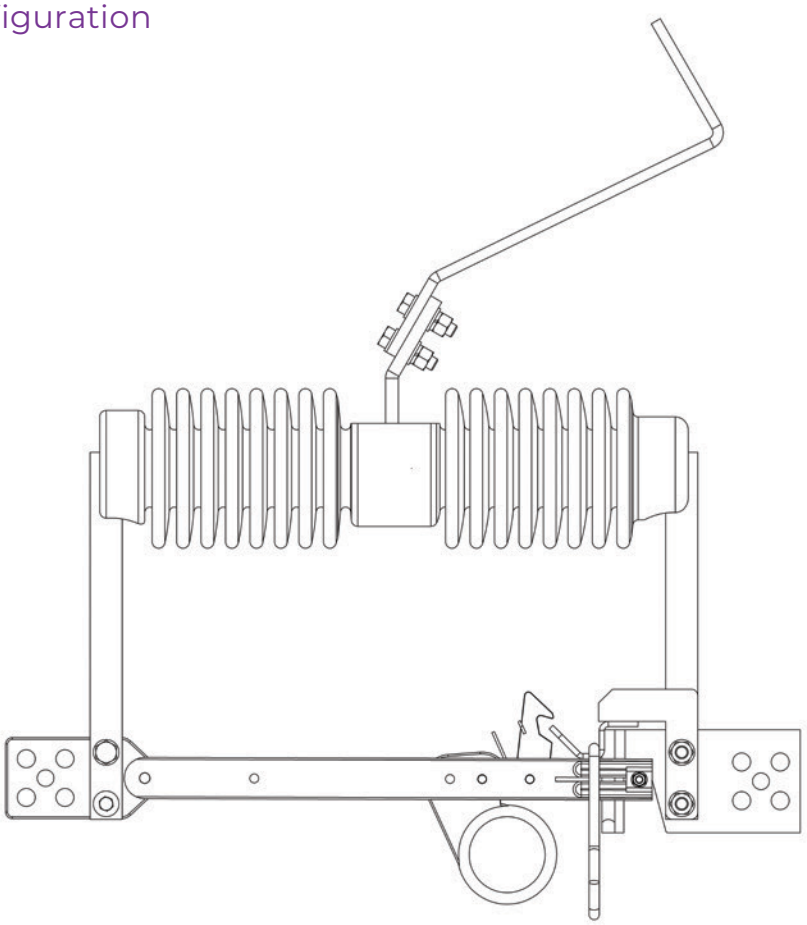
Ordering Information

- Vertical, horizontal or angled 30 degrees mounting configuration
- 12/24 kV, 36kV or 72.5 kV
- Porcelain, Cyclo or Polymer
- Current Rating
- With or without Earthing Stirrup
- Short Circuit withstand requirement.

Technical Specifications

Voltage (kV)	Rated Current (A)	BIL (kV)	STWC (kA)	Duration (s)
12 / 24	Up to 1250	150 / 170	20 / 25	3 / 1
24	Up to 1250	200	20	3
36	Up to 1250	200	20 / 25	3 / 1
72.5	Up to 1250	325	20 / 25	3 / 1

Typical Configuration



Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

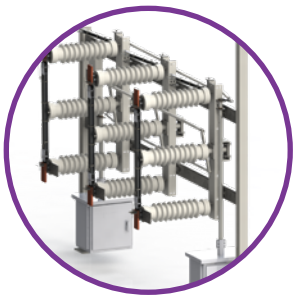
Insulect Substation Disconnectors and Earthing Switches

12kV to 145kV

Insulect Disconnectors are designed to accommodate each customer's needs and the layout of each substation. For over two decades, our disconnector and earthing switches have been 100% locally designed, built and serviced to ensure the best possible solution tailored to the needs of our customers.

Standard Design

Our disconnector range is based on a rotary double break design, with or without integrated earthing switch.



Horizontal or Vertical

Designed for horizontal or vertical applications and may be mounted on steel structures or pole mounted.

Manual or Motor Operated

Disconnectors are built for either manual operation or with a motor operated mechanism, for local or remote operation.

Earthing Switches

Independent single or double earthing switches can be supplied with the disconnectors.

Features & Options

Contacts

All contact surfaces are silver plated copper. Copper components other than the contact surfaces are tin plated as standard.

Flickers

The moving blades are supplied with a spring-loaded flicker to quickly extinguish residual current arcing when the switch is opened live.

Custom footprint

Insulect disconnectors can be customised to suit specific substation layouts, configurations and structure types.

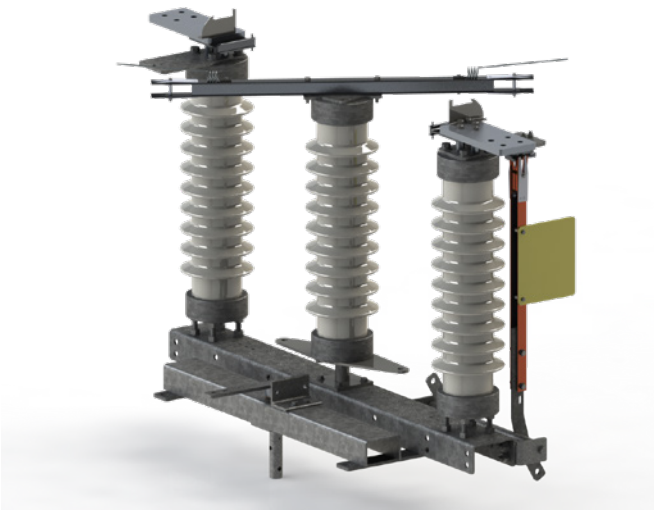
Insulators

A variety of insulator types can be accommodated for each voltage level, including electrical and mechanical ratings and pollution levels.

Earthing Switches

Each disconnector can be fitted with independent earth switches where required.

Earth switches can be supplied for one or both sides of the switch.

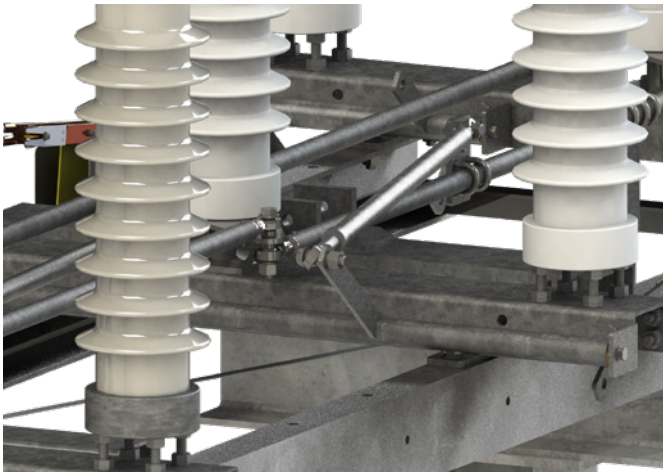


Interlocks

Mechanical or electrical interlocks can be provided for all disconnector models.

Mechanical interlocks prevent the earth switch operating when the disconnector is in the 'closed' position and vice-versa.

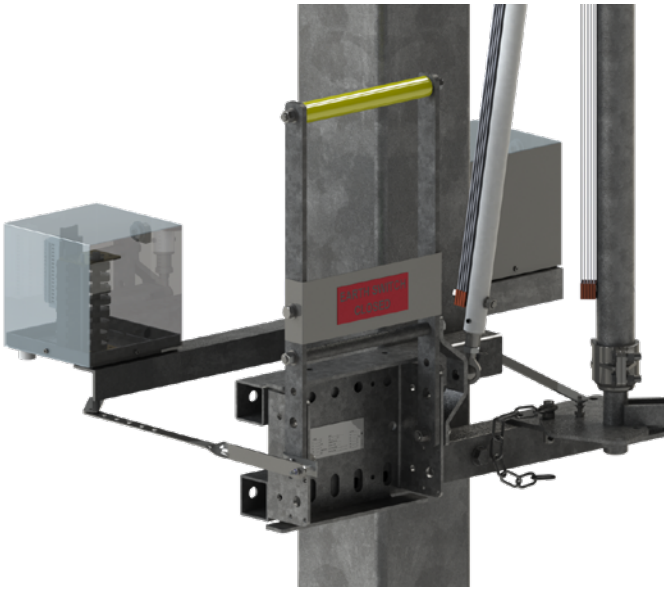
Electrical interlocks can be provided for disconnectors and earth switches that are fitted with a motor drive. It prevents the motor drive from engaging unless it is safe to do so.



Auxiliary Switches

The mechanism for each switch can be fitted with Auxiliary Switches to enable a substation control system to monitor the state of the disconnectors and earth switches.

Auxiliary switches can be supplied with more than 12 poles, depending on the control information required.

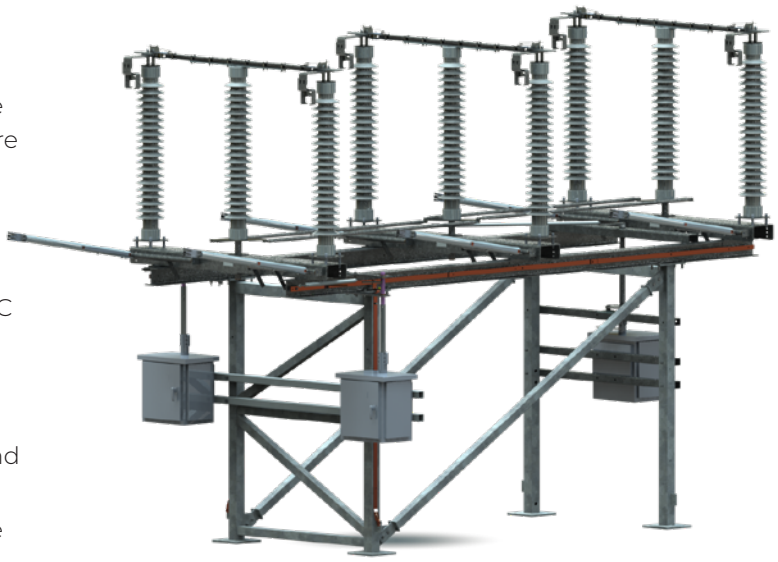


Motor Drive

For many applications it is desirable to operate switches remotely.

A motor drive eliminates the need for manual operation of disconnectors and earth switches and will enable operation when it is not safe to have a person in the switch yard. It also enables disconnectors and earth switches located at remote or unmanned sites to be operated from a remote control room when there are no local personnel available.

- IP65 rated stainless steel cabinet
- Variable speed DC motor
- The control voltage can be specified as AC or DC
- Limit switches coupled with mechanical stops prevent the output shaft over-rotating and damaging the contacts
- Protection is provided for the motor by fuses and thermal overload devices.
- An anti-condensation heater prevents moisture build-up inside the cabinet
- Positioning and mounting of motor drive components can be customised to suit user requirements.



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Installation Services

Insulect offers a complete service for new disconnectors to get them into your network and operational.

We can customise these services to suit your network requirements, including:

- Fully assembled or kit form
- Storage and delivery
- Switchyard install and test
- Staff operational training.

Contact our team for more information on how we can tailor a service package to your needs.

Refurbishment Services

Insulect's switchgear team provide support services for asset management of disconnectors.

We assist customers in maintaining their disconnector fleet with a range of services and expert advice, to keep their fleet performing optimally.

- Site assessments
- Customer site repair and refurbishment
- Insulect service centre refurbishment.

The refurbishment services return aged disconnectors to correct operating condition, replacing all corroded, worn or damaged components.

All services are covered by warranty. Available for Insulect and AKPS branded product, as well as other manufacturer brands.

Technical Specifications

Rating (according to IEC 60694)

Rated Voltage (Kv rms)	Rated Lightning Impulse Withstand Voltage kV (peak)		Rated 1 Min Power Frequency Withstand Voltage kV (rms)	
	To Earth and between Poles (Common Value)	Across the insulating distance	To Earth and between Poles (Common Value)	Across the insulating distance
12	75	85	28	32
24	125	145	50	60
36	170	195	70	80
72.5	325	375	140	160
145	650	750	275	315

Normal/Short Circuit Current Rating (according to AS62271-102 / IEC62271-102)

Rated Voltage (Kv rms)	Current rating Continuous (A)	Short Circuit Withstand Current and Duration (A/sec)	LIWV (kVp) BIL
12 / 24	600 - 2500	Up to 31.5 kA/3sec	125 kV
36	600 - 2500	Up to 31.5 kA/3sec	170 kV
72.5	600 - 2500	Up to 40.0 kA/3sec	325 kV
145	600 - 2500	Up to 50.0 kA/3sec	650 kV

Associated Earth Switch Ratings

Voltage	Short Circuit Withstand Current	LIWV (kVp) BIL
12 / 24	Up to 31.5 kA/3sec	125 kV
36	Up to 31.5 kA/3sec	170 kV
72.5	Up to 40.0 kA/3sec	325 kV
145	Up to 50.0 kA/3sec	650 kV

Mechanical Endurance Class

AKPS Disconnectors are built and tested to M1 class mechanical endurance suitable for operating cycles of 2000 operations, as per AS 62271.102-2005 & AS2650-2005.

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

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OUR VALUES | The Hiko Way

Quality by Design

We and our partners design and manufacture to meet customer need, to standards they trust and know.

Insulect Link Boxes

High Voltage Cable Systems & Cable Sheath Earthing

Insulect link box designs use various earthing practices to minimise sheath currents and provide sheath voltage protection.

- Direct Earthing or SVL Earthing through sheath voltage limiter surge arrester
- Cross Bonding with insulation withstand between phases
- Cable Sheath Protection using metal oxide sheath voltage surge limiters (SVL's).

Common Specifications

- Link Box Mounting - Structure or Pit
- DC Withstand - 25 kV/5mins
- Pressure Withstand - 250 kPa
- Engineering Compliance - C55/4.

Link Box Ultra

ULTRA is our original Link Box design, built for demanding conditions and highest performance.

- Material 316 Stainless Steel
- Short Circuit 63 kA/1s
- Enclosure rating IP68
- Internal power arc 40 kA/0.12s
- Pressure test meter 10M.

Link Box Lite

The LITE is designed for less arduous applications and where ease of handling and install is important.

- Material 304 Stainless Steel
- Short Circuit 40 kA/1s
- Enclosure rating IP68
- Internal power arc 20 kA/0.12s
- Pressure test meter 2M.

Insulect Link Boxes ensure a weather-proof environment for connecting links, whether for earthing or cross-bonding high voltage cables.

Comprehensive link box range

Link boxes of all types for single core and concentric bonding cables.

Up to IP68 rated stainless steel enclosures

Fully tested and fully sealed stainless steel enclosures, rated at a minimum of IP68.

For above or below ground applications

Universal design to suit indoor, outdoor and in-pit installation.

Australian design and manufacture

Our link boxes have been designed, manufactured and tested in Australia for over twenty years.

Key Component Materials

- Links - Extruded copper in hard drawn high conductivity 300 (mm^2) minimum
- Insulators - High tension porcelain, stainless steel hardware
- Stress cones - Polyurethane elastomer
- Plating - All conductors plated with ≥8µm of tin.

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

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Insulect Sheath Voltage Limiters

SVL's are an economic solution for safeguarding expensive cable installations.

They are highly reliable and effective at managing cable sheath voltage rises and the associated power flows that can result under fault conditions. Insulect manufacture an extensive range of quality 20kA zinc oxide sheath voltage limiters (SVL's). Voltages: 1.5kV to 9.0kV

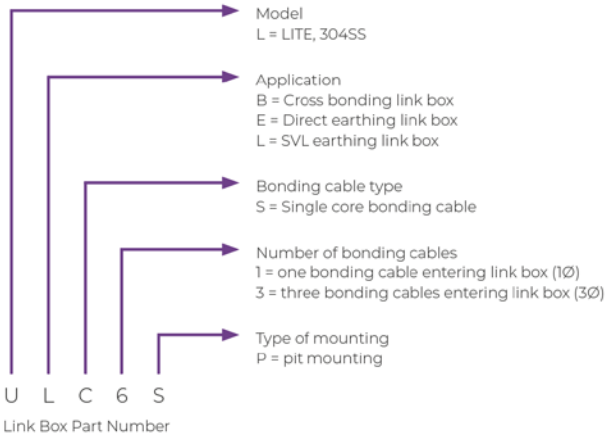
Ordering information

Use the table to build your specification and confirm your link box 5-digit Part Number. Use the diagram on the right as a guide or call us for assistance.

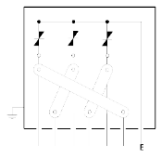
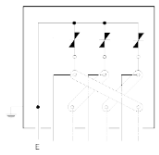
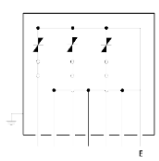
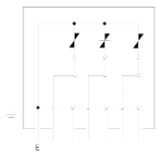
1. Select the model type - ULTRA or LITE
2. Choose the application
3. Choose single or concentric cables
4. And the number of cables
5. Choose the mounting type

Along with your 5-digit Part Number, you will need to confirm the following:

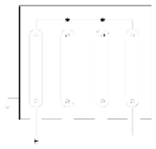
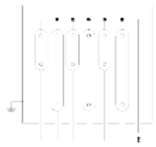
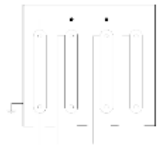
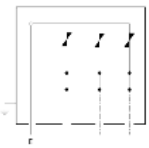
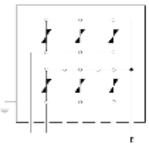
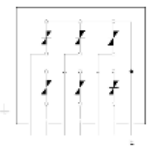
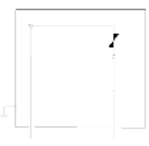
- Confirm the cable size of the bonding and earth cables
- Advise of any special requirements or modifications in detail.



Technical Specifications

					LINK BOX ULTRA 316 Stainless			LINK BOX LITE 304 Stainless		
Schematic	Application	Bonding Cable (cable diameter)	SVL (optional)	Impulse Level	Short Circuit	Dimensions (mm)	Weight (kg)	Short Circuit	Dimensions (mm)	Weight (kg)
	Cross Bonding	Single Core (95-500)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W770 D670 H560	140	40 kA/1s	W770 D670 H560	115
	Cross Bonding	Concentric (95-300)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W770 D670 H560	130	40 kA/1s	W770 D670 H560	107
	Combination SVL/Direct Earthing	Single Core (95-500)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W770 D670 H560	145	40 kA/1s	W770 D670 H560	119
	Combination SVL/Direct Earthing	Concentric (95-300)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W770 D670 H560	130	40 kA/1s	W770 D670 H560	107

Technical Specifications

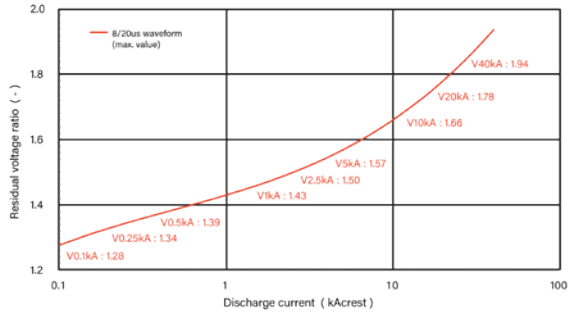
					LINK BOX ULTRA 316 Stainless			LINK BOX LITE 304 Stainless		
Schematic	Application	Bonding Cable (mm^2)	SVL (optional)	Impulse Level	Short Circuit	Dimensions (mm)	Weight (kg)	Short Circuit	Dimensions (mm)	Weight (kg)
	Direct Earthing	Single Core (95-500)	-	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W730 D560 H560	110	40 kA/1s	W730 D560 H560	90
	Direct Earthing	Single Core (95-500)	-	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W770 D670 H560	140	40 kA/1s	W770 D670 H560	115
	Direct Earthing	Concentric (95-300)	-	75 kVp Ph-Ph 40 kV Ph-E	63 kA/1s	W730 D560 H560	110	40 kA/1s	W730 D560 H560	90
	Direct Earthing	Single Core (95-500)	-	40kV Ph-E	63 kA/1s	W525 D410 H490	50	40 kA/1s	W525 D410 H490	41
	Direct Earthing	Concentric (95-300)	-	40kV Ph-E	63 kA/1s	W360 D645 H515	50	40 kA/1s	W360 D645 H515	41
	SVL Earthing	Single Core (95-500)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	-	W730 D560 H560	95	-	W730 D560 H560	78
	SVL Earthing	Single Core (95-500)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	-	W770 D670 H560	120	-	W770 D670 H560	98
	SVL Earthing	Concentric (95-300)	1.5kV to 9kV	75 kVp Ph-Ph 40 kV Ph-E	-	W770 D670 H560	125	-	W770 D670 H560	102
	SVL Earthing	Single Core (95-500)	1.5kV to 9kV	40kV Ph-E	-	W525 D410 H490	50	-	W525 D410 H490	41

Technical Specifications

SVL Type	Unit	TZS1.5	TZS3.0	TZS4.5	TZS6.0	TZS7.5	TZS9.0
Rated Voltage	kV rms	1.5	3.0	4.5	6.0	7.5	9.0
Maximum Continuous Operating Voltage	kV rms	1.3	2.5	3.8	5.1	6.4	7.7
Rated 8/20µs current	kA	20	20	20	20	20	20
20kA 8/20 20 shot duty cycle with power frequency voltage applied 1s/shot	kV rms	1.8	3.6	5.4	7.2	9.0	10.8
High current 4/10µs withstand	kA	100	100	100	100	100	100
Low current rectangular 2000µs duration withstand (20) shot	A	1000	1000	1000	1000	1000	1000
Energy absorption (on each of 20 shots)	kJ	5	10	15	20	25	30
Energy absorption on 2 shots before cooling	kJ	6.5	13	20	26	33	40
Maximum 8/20µs residual voltage at: 1.5kA 3kA 5kA 10kA 20kA 40kA 100kA (4/10µs)	 kV kV kV kV kV kV kV	 3.6 3.7 3.9 4.1 4.4 4.9 6.0	 7.1 7.4 7.7 8.2 8.8 9.7 12.0	 10.5 11.0 11.5 11.8 13.2 14.5 18.0	 14.1 14.7 15.4 16.3 17.6 19.3 24.0	 17.6 18.4 19.2 20.4 22.0 24.2 30.0	 21.1 22.1 23.0 24.5 26.4 29.0 36.0
Residual at 15kA 1µs current rise time	kV	4.7	9.3	14.0	18.6	23.3	28.0
Resistance at 2500Vdc	Ω	N/A	N/A	> 10^7	> 10^7	> 10^8	> 10^8
Resistance at 1500Vdc	Ω	> 10^7	> 10^7	> 10^7	> 10^7	> 10^8	> 10^8
Temporary over-voltage (TOV) 1s withstand: from no prior load after 7kJ/kVrms of rated voltage	 kV rms kV rms	 1.9 1.8	 3.9 3.7	 5.9 5.6	 7.8 7.4	 9.8 9.3	 11.8 11.2
TOV of 5kV dc withstand time	s	∞	2	∞	∞	∞	∞
TOV of 3.5kV dc withstand time	s	∞	50	∞	∞	∞	∞
TOV of 2.5kV dc withstand time	s	2	∞	∞	∞	∞	∞
Current at 5kV dc	A	∞	3	10-4	10-5	10-5	10-5
Reference Current	mA dc	1	1	1	1	1	1
Reference Voltage (minimum)	kV dc	2.1	4.18	6.28	8.36	10.46	12.54
Mechanical robustness	-	Dropped 1.5m without internal damage					

Residual Voltage Ratio

Discharge Current Characteristics of Block



Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

Hiko®
Power Engineering

Safely connecting communities to power the future.

Bowthorpe®
EFEN
GRIDKEY
NKT
Langmatz
PFISTERER
POLARIS
HellermannTyton
Lucy Electric
insulect
VERSATILITY VIA COLLABORATION

At Hiko, along with our partners, we are always thinking about the future and trends in the energy sector. We offer solutions today for the challenges tomorrow, as we have done for more than 85 years

Renewables: Connectors & Cable Management

Pfisterer CONNEX Separable Connector

Size 4, up to 72.5 kV

The dry pluggable CONNEX connection system connects the transformer, MV and HV GIS without timeconsuming SF6 gas work. CONNEX connection joints in cast resin technology up to 170 kV enable pluggable connections that can be seperated quickly if necessary. The longitudinal water barrier prevents water penetration as a result of cable faults. The solid-insulated CONNEX connections are maintenance-free and the only ones on the market with DNV - GL certification.

- No gas monitoring
- Fully submersible and salt water resistant.

Features:

- The separable connector is installed without any gas and oilwork at the transformer or GIS
- Considerably reduced installation time and safe installation
- Horizontal, vertical and angeled versions for connection to GIS and transformers
- Rapid separation and change of cable and equipment possible
- Touch proof, submersible and maintenance- free
- Routine-tested from factory

Application:

- Pluggable separable connector for all XLPE cables
- Available as factory-tested and preassembled field installation cable

Technical Specifications

Requirements	Unit	Rating
Max. system voltage	U_m (kV)	72.5
Size	-	4
Type designation	-	dry-type termination
Applicable standards	-	IEC 60840:2011
Working place	-	Outdoor and indoor offshore on request
Nominal voltage	U_n (kV)	60 - 69
Conductor residual voltage	U_o (kV)	36
Rated power frequency withstand voltage	1 min (kV)	140
Rated lightning impulse withstand voltage BIL	(kV)	325
Heating cycles	(kV)	72
Partial discharge test < 5pc at	(kV)	54
Rated power frequency withstand voltage - 30 min	(kV)	90
Partial discharge test <2pC at	(kV)	54
Nominal current*	I_n (A)	2500
Rated short-time withstand current	(kA)	50
Rated impulse current CALCULATED	(kA)	160
Conductor material	-	Copper or aluminium
Diameter of conductor	Ø (mm)	9.3 - 55.9
Conductor cross section area	(mm^2)	95 - 2000
Diameter of insulating	(mm)	33 - 78.5
Connection method	-	Compression connection
Length outside socket	(mm)	580

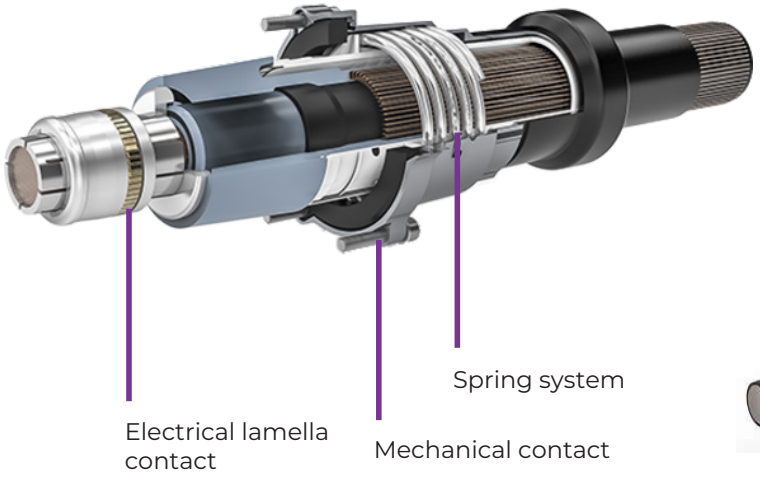
*Depending on conductor cross section and conductor material.

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

PFISTERER

Pfisterer SEANEX 66kV Inner Cone Connection



Connecting the transformer and the switching station.

Whether it is 33 kV or 66 kV, aluminium or copper cable: all connections are easy to connect. On the low voltage side with the PLUG, on the high voltage side with SEANEX. Installation is quick and easy, and maintenance times are significantly reduced. Due to our close cooperation with the transformer manufacturers, very compact device designs can be realised.

SEANEX is a dry pluggable inner cone connection and contact system specifically for offshore applications. It is based on the CONNEX system by Pfisterer for voltages up to 550 kV.

SEANEX components have been optimised for requirements at sea, are DNV GL certified and meet the new IEC 63026 offshore standard.

- Quick and easy installation
- No on-site oil work required
- Esters for insulation
- DNV GL offshore certification
- Pre-manufactured and tested cables possible
- For all highly flexible copper cables at all voltage levels
- According to the new standard EN 50673

Separate Electrical and Mechanical Contact.

Compared to other connection solutions, SEANEX is the much more robust system. Electrical and mechanical contacts are separate from one another. The proven lamella contact technology and spring system ensure reliable power transmission – even during sudden load changes.

For installation, the SEANEX connectors simply plug into the corresponding sockets and joints, and are secured with three screws. The rotatable bell flange enables 360° installation.

- Electricity flows in a line – no angles, corners or edges
- Transition box is eliminated
- Touch-safe thanks to metallic encapsulation
- No twisting of cables
- Connection can be separated without loss of quality

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

PFISTERER

Pfisterer HOCCA T72 T-Connector

HOCCA T72, dry-type, separable outer cone cable termination system for offshore wind turbines.

The safe supply of future power is based on reliable network infrastructure for offshore wind turbines with countless individual components. This depends above all on the sensitive interfaces in the cable network. In offshore wind turbines these are primarily the connections to transformers and switchgears.

Pfisterer's experience in contact technology is packed into every component. This means simple and safe installation, as well as durable, high-quality contacts.

High-quality contact materials and sophisticated contact technology in the SICON bolted connector ensures stable current flow and constant contact force. The silicone body is remarkably easy to fit and offers excellent resistance to environmental influences. All connectors conform to the international standards for cable accessories ie: IEC 60840 or IEC 63026.

Technical Data

Requirements	Rating
Rated voltage	66 - 69 kV
Max. system voltage	72.5 kV
Frequency	50 - 60 Hz
Rated current	1250 A
Max. operating temperature	-25 °C bis +50 °C
Degree of protection	IP X7 (DIN EN 60529)
Cable cross section	95 - 1200 mm²
Cable insulation media	XLPE, HEPR
Connection interface	Type F (EN 50673)
Conductor connection	SICON - Stepless Shear-Off Bolt Connector

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

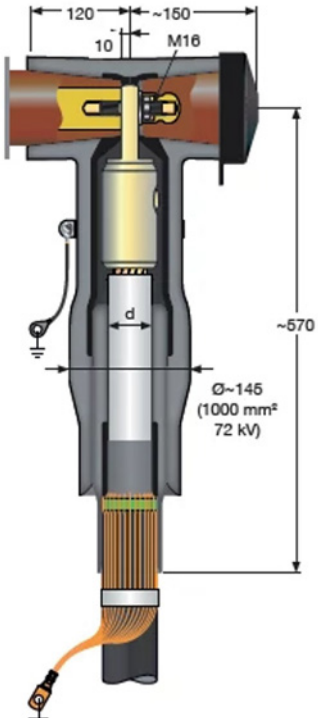
PFISTERER

NKT CB 72 Connector

The branch connector type CB 72 is applicable to the outer cone bushing type F of GIS and transformers and is suitable for XLPE- and EPR-insulated cables with Al or Cu conductors.

In cases where parallel cables for phases are needed, coupling connector type CC 72 could be linked directly to branch connector type CB 72. CSA-type surge arresters are available for coupling in order to protect electrical components against overvoltage and transients.

- The branch connector is made of silicone rubber and designed for a voltage of 72.5 kV level when connecting GIS and transformers.
- The complete connector consists of the connector body, a stress cone element, a cable lug, a covering (bolt) pin, an insulating plug and a covering cap.
- The pre-moulded geometric field control element is independent from system frequency and harmonic content.
- The branch connector can be provided with screw-type or crimp cable lugs. All components are routinely tested



Technical Specifications

Voltage (kV)	Type/Designation	Max. Cross Section (mm²)	Prepared Cable Insulation Diameter (mm)	Weight (approx.) (kg)
72.5	CB 72	1200	32.0 - 74.0	14

Optional kits

For on and offshore applications

Integrated capacitive measuring point

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

OUR VALUES | The Hiko Way

People Who Care

We care about each other, our customers, our partners, and the environment by listening and doing the right thing. Every time.

NKT Renewables Cable Accessories

NKT is dedicated to power cable technology and renewable energy transmission. As the electrification of society continues, NKT's cable technology and accessories plays an increasingly key role in powering modern life, global society and future generations with renewable energy.

Terminations

- Essential for connecting the cables to air-insulated switchgear, transformers, overhead lines or busbars
- Indoor and outdoor terminations for 12-36 kV
- Straight connectors APIT and APSEA for transformers for the feeding circuit

Ti

TO

APED

APSEA

APIT

Joints

Cold-shrink joint JC or premolded joint SOJ for connecting cables together to secure the generated wind power in the grid.

Cold-shrink joint JC

Premolded joint SOJ

Connectors

Screened elbow connector CSE-A or CB for connection of wind-tower, internal and external transformers

CB

CSE-A

Coupling Connectors

Coupling connectors to combine additional cable systems at the same bushing of switchgear

CC

CSEP-A

Surge Arresters

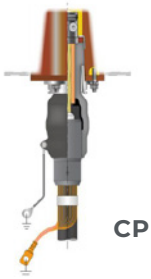
For the protection of electrical components against overvoltage or transients, surge arresters can be installed directly at the connectors

CSA/CSB

CSAP-A

Inner Cone Plugs

Pluggable connectors with their surge arresters for inner cone bushings to connect at switchgears of transformers



CPI 2

CPI 3

SPI 2 and 3

Cable Branch Cabinet

- Our cable branch cabinet serves as a branching point for cable systems at wind power networks
- For maintenance it provides a comfortable solution to sectionalise a test cable

Other literature available on request

Reports, drawings, technical data sheets, installation instructions, O&M guidelines

HellermannTyton Cable Management

HellermannTyton delivers exactly what solar installers need to do the job right:

When securing PV wires, never run cable ties through a module's razor-sharp mounting holes. This is one of the most common causes of premature failure on solar installations. In addition to being a problem on stationary panels, single-axis trackers will quickly sever a cable tie, regardless of material.

There is a "right" part for every job, including edge clips, fir trees and arrowhead fasteners, among others, designed for solar applications.

Solar Locking Clamp

This self-locking clamp with a living hinge is designed to hold cables in place while allowing for thermocycling and blowing winds.

Major considerations for correct module-level wire management:

- Home run routing
- Movement from wind and/or tracker rotation
- Lateral pulling from thermocycling
- Installation factors

Metal Clips

HellermannTyton metal edge clips are designed for the installer, with their unique, flat edge to ease installation and reduce repetitive injuries. Rounded edges will assure site owners that chaffing is next to impossible.

HellermannTyton

HellermannTyton Utility-Scale and Commercial Solar

When choosing components for supersized solar projects, driving down costs is often the highest priority. HellermannTyton makes it possible to do that while making the best decisions for the installation. Here are some of the considerations that go into making cost-effective components.

- Quicker installs – make parts easier to manipulate and attach.
- Superior design – engineer parts to withstand the factors working against them.
- Longer-lasting materials – formulate resins and UV tested label materials that stand up better to harsh elements and cost less to produce.
- Best practices – share our extensive knowledge base with site owners, distributors and installers.

Wire management and large-scale solar projects are a growing challenge. As voltages increase, so does the amount of weight and wiring. As trackers become more dominant in the market, installers must account for movement.

HellermannTyton take the time to advise you on the best product to route around the ballasts on a commercial rooftop system, or around a control system for every tracker design. Wire management isn't as easy as employing a single fastener, but we can take the mystery out of safe, long-term installations for any site and requirement.

HellermannTyton

HellermannTyton Large Bundle Applications

Among the many considerations for managing large wire bundles, weight and movement are key. Trackers move all day, shifting the weight of large bundles, which are further affected by wind. Care must be taken so products will last years instead of months.

The jumpers around tracker motors and at the ends of rows are especially prone to movement. Installing an arrest mechanism at these points is critical, because the weight of the row combined with the changing direction places great strain there.

Ratchet P-Clamp

HellermannTyton's revolutionary Ratchet P-Clamp delivers some of the most rugged, versatile wire management solutions in the solar market. The clamp can be attached easily with a self-tapping screw or using an existing bolt.

The Ratchet P-Clamp can be mounted before or after wires are added. With just four sizes, it closes and locks to perfectly fit bundle sizes from 1⁄4" to 2" wide. If changes need to be made in the future, the clamp opens without removing it from the mounting surface. Multiple mounting bases provide nearly endless configuration options

Large Solar Ties

HellermannTyton Heavy Duty and Wide Strap Solar Ties perform perfectly for large bundles and torque tubes. These ties feature many unique features that make wire management cost effective and easy. As you can see in the image, the HIRHSUV-formulated T250M in combination with another tie make an excellent solution for your cable routing needs.

Solar Ties

This common fastener will determine the future reliability of your PV system. Our Solar Ties are made specifically for solar applications, using proprietary, engineered plastics matched to the environment to deliver more years of dependable service no matter the weather.

HellermannTyton

HellermannTyton Solar E-Clips

Solar E-Clips

HellermannTyton Solar E-Clips include a wide selection of edge clips, clips and mounts to accommodate user preferences for bundling and routing applications. Made of materials that stand up to the harshest of environments, Solar E-Clips are designed for easy placement and removal for faster installations and reduced labor costs.

The E-Clip has proven itself in the field on over 5 GWs. Recently upgraded the Solar E-Clip with a new reinforced material blend to make it even stronger. It's the most universal and versatile wire management part in the solar industry.

Depending on wire routing needs, Solar E-Clip assemblies provide attachment on any edge of the solar module frame, to route cables parallel or perpendicular.

All Solar E-Clips products are made of UV stable material. HellermannTyton has the ability to customise these products for your specific preferences and applications.

Solar E-Clips Applications:

- Solar farms
- Commercial rooftops
- Municipal projects
- Residential systems

Edge clip assemblies can be used to secure PV cable bundles of varying widths.

Fits module holes and requires zero insertion force. Includes formula-matched Solar Tie to manage several cables.

Metal Edge Clips feature a large thumb surface to allow for quick and easy installation.

HellermannTyton

End-to-end service and technical support

For over 85 years Hiko Power Engineering has supplied the power industry with electrical equipment and components.

In 2020, our name Hiko Power Engineering Ltd was gifted to us by Ngāi Tūāhuriri when the wholesaling import/distribution arm of the business was sold, and the company rebranded. The names gifted included “Pou Hiko” and “Taura Hiko”. The Pou is the centre post in a meeting house and so Pou Hiko literally means the central heart of the Hiko Power Engineering business. In Taura Hiko we have a metaphor for the powerful electrical cable connecting power to people. This is particularly relevant to us as a company with a long history in Ōtāutahi, Christchurch safely connecting communities to power the future throughout Aotearoa, New Zealand and the world.

Today, Hiko Power’s key focus is on working closely with our customers to design, manufacture, and supply bespoke network connection solutions and quality products for quick, easy and safe installation into New Zealand’s electricity networks.

Our account managers work closely with you to design customised, high performance low voltage switchgear and distribution applications that deliver safety, reliability and added value to your network assets lifecycle. Collaborating together, with our team of specialised design engineers, we use your specifications to design equipment that meets your specific needs, including bespoke solutions for your individual network requirements that are easy to install, safe and reliable. We can also produce one-off designs for trial purposes, so you don’t have to. Our design methodology includes mechanical, electrical, and thermal modelling and testing before a design is released to production and is in line with the requirements of AS/NZS 61439.

Our technical team’s product expertise and engineering experience with all of our solutions allow us to provide you, with robust and responsive technical support. We have technical support, customer management and logistics specialists located in both Christchurch and Auckland who can meet with you either in person/onsite or remotely.

For further information on our products and services contact Hiko Power Engineering on **0800 473 999** or email **sales@hikopower.co.nz**

Hiko Power Engineering Limited

85a Falsgrave Street
Phillipstown
Christchurch 8011

Unit B5, 269A Mount Smart Road
Onehunga
Auckland 1061

hikopower.co.nz

CONTACT US

0800 473 999

sales@hikopower.co.nz

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