

# HAWKER SIDDELEY SWITCHGEAR

a **BRUSH** company

An aerial night photograph of a city skyline, likely Dubai, featuring several illuminated skyscrapers. The Burj Khalifa is prominent in the center, with its distinctive spire. Other buildings are lit up with various colors, including yellow, green, and blue. The foreground shows a road with traffic lights and some construction areas.

## Products and Services



## Building on tradition and integrity

The names of Whipp & Bourne, Brush and South Wales Switchgear are synonymous with circuit breaker technology around the globe.

All companies have histories which can be traced back over 125 years and it's a background which cannot be ignored even though the demands of today's industrial and power distribution sectors are vastly different and more complex.

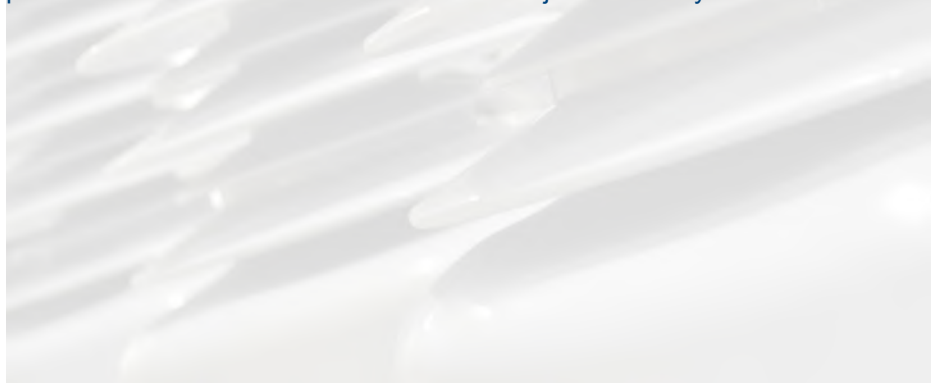
Today they form part of Hawker Siddeley Switchgear Ltd. – itself part of Melrose plc.

As a major national and international manufacturer of a range of distribution switchgear, Hawker Siddeley Switchgear Ltd. serves not only electrical utilities worldwide but also a vast array of industrial and transit sectors where the need for safe and reliable power supplies is paramount.

With a highly-skilled workforce and manufacturing facilities both in the UK and Australia, a technology centre based in the UK and sales offices around the globe, we have maintained a global reach – building on a clear and unrivalled reputation for innovation.

The success of the original companies was rooted in an ability to pioneer ground-breaking technologies, introducing state of the art developments which still lead the way in the switchgear sector.

Hawker Siddeley Switchgear Ltd. remains committed to innovation, striving to provide what our customers could have – not just what they want.



## Providing global switchgear solutions

Hawker Siddeley Switchgear Ltd. already serves thousands of customers around the world, offering both AC and DC switchgear solutions not only to electrical distribution utilities but also to individual public and private sector end user organisations operating in a variety of settings.

Although our customer base is wide-ranging, covering everything from the traction and maritime sectors through to building services, petrochemical and nuclear, there is a common requirement – the need for safe and reliable protection of electricity supplies.

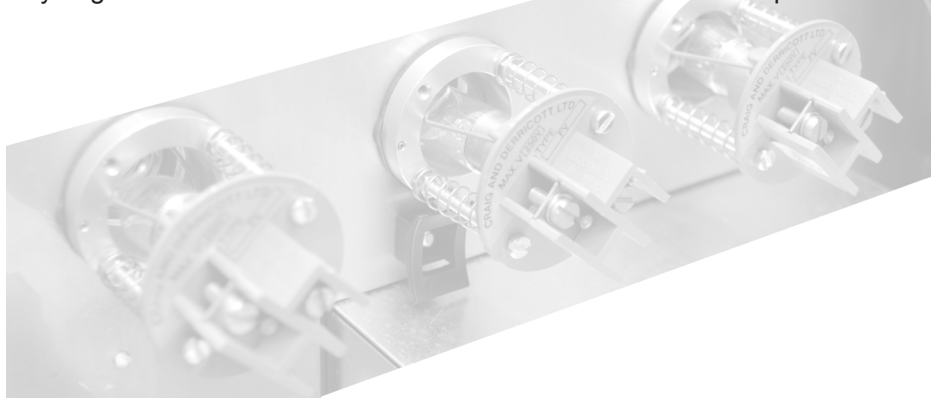
We're proud of our track record – using our skills and experience to produce solutions which have put us at the forefront of switchgear system design. For example, our magnetic actuator and electromagnetic spring innovations were widely acclaimed developments which still provide the company with a leading edge in circuit breaker technology. Our world renowned GVR Recloser was the first switchgear product that could claim to be maintenance free and was also the first in a range of equipment to be made available under the trademarked banner of:

### **Fit & Forget Technology.**

Increased functionality, reliability and space-saving attributes coupled with reduced environmental impacts and lifetime costs mean our impressive product portfolio can boast clear technical advantages.

Our products – independently recognised by the Royal Academy of Engineering and the Queen's Awards Committee, can be found operating in installations across the world in some of the most arduous of environments.

In addition, our flexible assembly facilities provide us with the scope to develop fully engineered solutions tailored to meet individual customer requirements.





## Proven products which customers can trust

Today, the company's key focus lies in four areas:

» **AC Switchgear** – supplied to world utilities and contractors for use with outdoor overhead lines and both indoor and outdoor sub-stations.

**Eclipse** – used throughout the distribution network, this AC product has been developed as an indoor demountable breaker using the most advanced operating mechanism available on the market. Compact and easy to install with superior operator safety, each panel is engineered to order and is configured to the customer's needs.

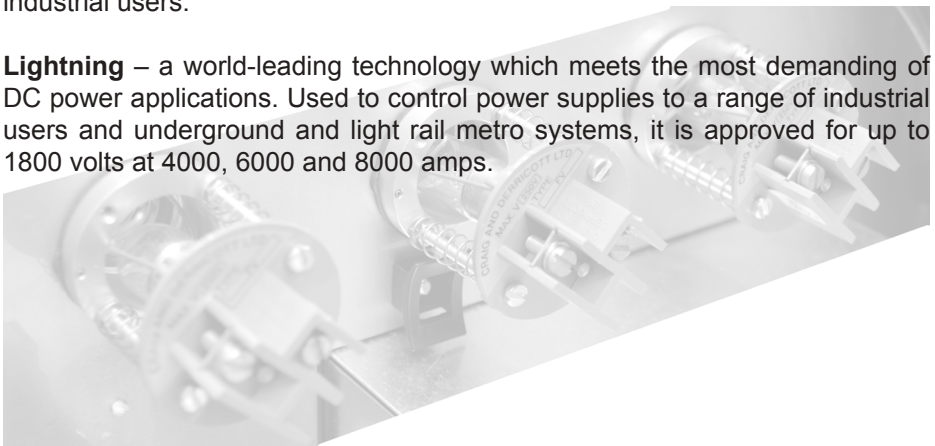
**GVR Recloser** – AC, pole or sub-station mounted switchgear which has been developed in many forms depending on customer requirements. It provides 'intelligent control' and protection on above-ground power distribution networks against transient faults and offers a lifetime of maintenance-free operation.

**Horizon** – filling the market need for outdoor, ground mounted circuit breakers, this AC product can be used with other switchgear and transformers to provide cost-effective and compact substations. Designed for 38kV applications it can be used to breathe new life into existing substations by replacing old and obsolete equipment.

**Horizon Compact** – the latest in our AC product family has been developed from the 38kV Horizon Circuit Breaker to complement our current range of outdoor circuit breakers.

» **DC Switchgear** – for controlling the power supplies to rail transit systems and industrial users.

**Lightning** – a world-leading technology which meets the most demanding of DC power applications. Used to control power supplies to a range of industrial users and underground and light rail metro systems, it is approved for up to 1800 volts at 4000, 6000 and 8000 amps.



» **Aftermarket** – a highly-important arm of the business, our fifth core product offering, developed as a result of the need to provide continuous support to a massive, global product installation base.

**Spares** - As an Original Equipment Manufacturer, Hawker Siddeley Switchgear Ltd can offer a complete range of spares, for both our current and discontinued ranges. This includes Hawker Siddeley Switchgear, Whipp & Bourne, Brush Switchgear and South Wales Switchgear. Component type consumable spares such as main contacts, springs, trip coils and closing solenoid assemblies, through to individual components such as batteries, relays, PCB's, etc. are available for most ranges of switchgear spanning up to 50 years of production.

**Service** - Hawker Siddeley Switchgear Ltd Site Engineers are fully factory trained at Hawker Siddeley Switchgear Ltd and fully conversant with all aspects of the equipment. Our world-wide comprehensive service package includes, routine maintenance (maintenance contracts and extended warranties also offered), repair, upgrades and modifications and extensions to existing installations (where supported), all with full engineering and project management support.

**Site Work** - Our team of site staff includes technicians and specialist engineers fully trained and skilled to carry out service work, modification work or commissioning to our complete range of products whether current production or heritage.

**Call Out** - No site service would be complete without an emergency call out. HSS offers just such a facility 24 hours a day 365 days a year anywhere in the world. Just one phone call puts you in touch and starts the process.

**Refurbishment** - HSSL offers partial or complete reconditioning of old OEM equipment which includes: Visual Inspection, Insulation Resistance Test's where applicable, Circuit breaker opening and closing tests, Main contact resistance checks, Test for proper operation of applicable circuit breaker trip followed by a detailed incoming inspection report documenting all test results, observations, findings and recommendations.



**Retrofit** - Sometimes new switchgear is not a viable proposition. One alternative is to replace the moving portion of old switchgear with a modern vacuum equivalent. In most cases this can be achieved quite simply, one circuit at a time with no disruption to the busbars or other circuits. This has the advantage of ensuring no re-cabling or expensive shutdowns for civil works. We can offer a full site survey to ascertain the viability of any retrofit and provide a quote for the upgrade as well as full implementation.

**Protection** - Change of use of a circuit can cause a re-appraisal of the protection of that circuit or just an upgrade from old electro-mechanical technology to more modern digital and programmable protection. Whatever the reason we can help by specifying the requirements to meet your needs exactly using a choice of protection types.

**Training** - Hawker Siddeley Switchgear Ltd offers bespoke, tailor-made specialist-training courses to help your staff operate and maintain your switchgear - safely, correctly and efficiently. These courses can vary widely on chosen topics, intensity of training and length.

**Engineering Upgrades** - We can prepare specifications from simple instructions to enhance the facilities of your switchgear. Specifications may include complete refurbishment because of a change of duty, upgrade to a higher fault level or specification of full interlocking and sequencing for complex starting arrangements. From the specification will flow a complete bill of materials to ensure that the project can be completed without delays.

» **Licensee Support** - Licensee Support – resulting from our strategy to utilise our existing strengths in world class circuit breaker technology by manufacturing our products under license with global OEM's partners.

In today's global market, customers are increasingly looking for suppliers to provide improved customer service, flexibility, shorter delivery cycles and knowledge of their local environment. In addition to our own high-quality facilities, we're unlocking greater international potential by offering local original equipment manufacturers the opportunity to manufacture our switchgear solutions under license whilst meeting our latest stringent design and quality standards. Indigenous manufacturers will now be able to offer their customers the very latest switchgear products that have been fully type tested - all backed by the highest levels of service and support.



# AC Indoor Equipment

## ECLIPSE

### 12kV Fixed Pattern Indoor Metalclad Vacuum Switchgear

The Eclipse is designed to provide a lifetime of unrivalled service, bringing together one of the most advanced operating mechanisms available on the market today – the award winning magnetic actuator technology, with vacuum interruption and the simplicity of air insulation in a compact, fixed pattern design. Appreciated throughout the distribution network and across every business sector, the Eclipse currently holds a dominant market position for 11kV indoor switchgear.

The Eclipse, which is newly certified to IEC62271, is also now available as a pre-engineered solution in ratings up to 25kA, 2000A. Alternatively, it can be fully engineered to meet exact customer's needs.



#### RATINGS

|                                      |             |         |         |         |
|--------------------------------------|-------------|---------|---------|---------|
| Rated Normal Current                 | A           | 630     | 1250    | 2000    |
| Rated Voltage                        | kV          | 12      | 12      | 12      |
| Rated Frequency                      | Hz          | 50      | 50      | 50      |
| Rated BIL                            | pk kV       | 75/95   | 75/95   | 75/95   |
| Rated Power Frequency Withstand      | kV 1min     | 28/38   | 28/38   | 28/38   |
| Rated Short-Time Withstand Current   | kArms 3secs | 20/25   | 20/25   | 20/25   |
| Rated Peak Making Current            | pk kA       | 50/62.5 | 50/62.5 | 50/62.5 |
| Internal Arc Compliance              | kA 1sec     | 25      | 25      | 25      |
| Rated Short Circuit Breaking Current | kA          | 20/25   | 20/25   | 20/25   |
| Degree of Protection*                |             | IP4X    | IP4X    | IP4X    |

\* Higher ratings available on request



# AC Outdoor Equipment

## GVR Recloser

For pole mounting and substation applications

The father of modern switchgear, Hawker Siddeley Switchgear's world renowned GVR Recloser was the first in a range of equipment utilising one of the most advanced operating mechanisms available on the market today – Hawker Siddeley Switchgear's 'Fit & Forget' Technology, featuring the award winning magnetic actuator.

The GVR provides 'intelligent control' and protection on power distribution networks, whilst offering a lifetime of trouble-free service.



### RATINGS

|                                          |                  | GVR 15      | GVR 27               | GVR 38          |
|------------------------------------------|------------------|-------------|----------------------|-----------------|
| Maximum System Voltage                   | kVrms            | 15.5        | 27                   | 38              |
| Continuous Current                       | A                | 630         | 630                  | 630             |
| Interrupting Current                     | kA               | 12.5/16     | 12.5                 | 10              |
| Impulse Voltage Withstand                | kV peak          | 110         | 125/150              | 150             |
| Power Frequency Withstand Dry            | kVrms for 60secs | 50          | 60                   | 70              |
| Power Frequency Withstand Wet            | kVrms for 60secs | 50          | 50                   | 60              |
| Rated Gas Pressure for above             |                  | Atmospheric | Atmospheric/0.3 bar* | 0.3 bar (gauge) |
| Number of Operations with no Maintenance |                  | 10,000      | 10,000               | 10,000          |
| Weight                                   | kg               | 145         | 145/155*             | 155             |

\* Ratings for 150kV impulse version

# AC Outdoor Equipment

## Horizon

### 38kV outdoor circuit breaker

Part of our Fit & Forget family of products, featuring the most advanced operating mechanism available on the market today – the award winning magnetic actuator technology, the Horizon fills the market need for outdoor, ground-mounted circuit breakers.

Designed for a 38kV application, the Horizon can be used with other products from Hawker Siddeley Switchgear to provide cost-effective and compact substations or breathe new life into existing substations by replacing old and obsolete equipment.



#### RATINGS

#### Horizon 38

|                                |           |                             |
|--------------------------------|-----------|-----------------------------|
| Maximum System Voltage         | kV        | 38                          |
| Continuous Current             | A         | 1250/2000                   |
| Interrupting Current           | kA        | 25/31.5                     |
| Impulse Voltage Withstand      | kV        | 170/200                     |
| Power Frequency Withstand Dry  | kV 1min   | 80                          |
| Power Frequency Withstand Wet  | kV 10secs | 80                          |
| Rated Gas Pressure for above   |           | Atmospheric                 |
| Control Voltage                | V dc      | 110/125 (48 & 220 Optional) |
| Rated Frequency                | Hz        | 50/60                       |
| Rated 3 sec Short-Time Current | kA        | 25/31.5                     |
| Rated Peak Making Current      | kA        | 65/82                       |
| Ambient Air Temperature        | °C        | -50 - +50                   |
| Degree of Protection           |           | IP45                        |
| Weight                         | kg        | 700                         |

# AC Outdoor Equipment

## Horizon Compact

15/27/kV Outdoor circuit breaker

A substation frame, stand or pole-mounted vacuum circuit breaker with SF6 insulation in a self-contained package, the Horizon Compact expands our Horizon family of products. Featuring the most advanced operating mechanism available on the market today – the award winning magnetic actuator technology, the Horizon Compact offers unrivalled reliability, protection and environmental endurance for outdoor circuit breakers. Designed for a 15kV or 27kV application, the Horizon Compact can be used with other products from Hawker Siddeley Switchgear to provide cost-effective and compact substations or breathe new life into existing substations by replacing old and obsolete equipment.



### RATINGS

|                           |    |            |            |
|---------------------------|----|------------|------------|
| Maximum System Voltage    | kV | 15.5       | 27         |
| Continuous Current        | A  | 1250       | 1250       |
| Interrupting Current      | kA | 25         | 25         |
| Impulse Voltage Withstand | kV | 110        | 125        |
| Ambient Air Temperature   | °C | -50 to +50 | -50 to +50 |
| Maximum Weight            | kg | 280        | 280        |

# DC Equipment

## Lightning DC

Incorporating the NDC circuit breaker

Hawker Siddeley Switchgear Ltd's Lightning product, incorporating the high speed NDC Circuit Breaker, is the latest addition to our 'Fit & Forget' range of switchgear products. Utilising our proven technologies with the award winning, patented magnetic actuator technology, the Lightning provides an innovative DC Switchgear solution for a variety of markets and demanding applications.

Combining innovation with 80 years of DC design and manufacturing experience, the Lightning offers optimal safety, reliability and high speed performance – the ideal solution to your DC requirements



### RATINGS

|                                       |        |                              |                              |
|---------------------------------------|--------|------------------------------|------------------------------|
| Rated Voltage                         | V dc   | 900                          | 1800                         |
| Rated Service Current                 | A      | 4000/6000/8000               | 4000/6000                    |
| Nominal Voltage                       | V dc   | 750                          | 1500                         |
| Power-Frequency Withstand Level       | kV     | 9                            | 9                            |
| Rated Short-Time Withstand Current    | kAp/kA | 100/71 250ms                 | 100/71 250ms                 |
| Rated Track Time-Constant             | ms     | 100                          | 100                          |
| Rated Short-Circuit Current           | kAp/kA | 180/125                      | 142/100                      |
| Bi-directional Critical Current **    | A      | 25                           | 26                           |
| Mechanical Endurance                  |        | 50,000 operations            | 50,000 operations            |
| Breaking Characteristic               |        | High Speed                   | High Speed                   |
| Rated Insulation Voltage              | kV     | 1.8                          | 3                            |
| Auxiliary Operating Supply Available) | V dc   | 50 (Other Options Available) | 50 (Other Options Available) |

\*\* As defined in BS EN50123-1: 2003, the critical current quoted is the current with the longest arcing time.

At 900V/25A the arcing time is approximately 330ms

# V-mag 25

## 25kV Single Phase Vacuum Switchgear for Railway Electrification

Our 25kV single phase vacuum switchgear is installed on many railway networks throughout the world for railway electrification, meeting the high fault levels and current ratings for international railway systems.

Based on 1100mm wide modular units, the V-Mag 25 is arranged with a high voltage compartment enclosing busbars, vacuum circuit breaker and potential transformer together with a control aisle and annexe to accommodate supervisory control equipment, battery and auxiliary equipment.

Each circuit breaker comprises a single vacuum interrupter mounted on a post insulator, which also supports the operating mechanism. The circuit breaker module is removable, complete with mechanism from its service location.



### RATINGS

| V-MAG 25                          |          |                 |
|-----------------------------------|----------|-----------------|
| System Nominal Voltage            | kV       | 25 Single Phase |
| Normal Current                    | A        | 1250            |
| Symmetrical Short Circuit Current | kA       | 20              |
| Power Frequency Test Voltage      | kV       | 105             |
| Impulse Withstand Voltage         | kVp      | 250             |
| Rated Short-Time Current          | kA 3secs | 20              |
| Rated Frequency                   | Hz       | 50              |



# HSS Transducer System

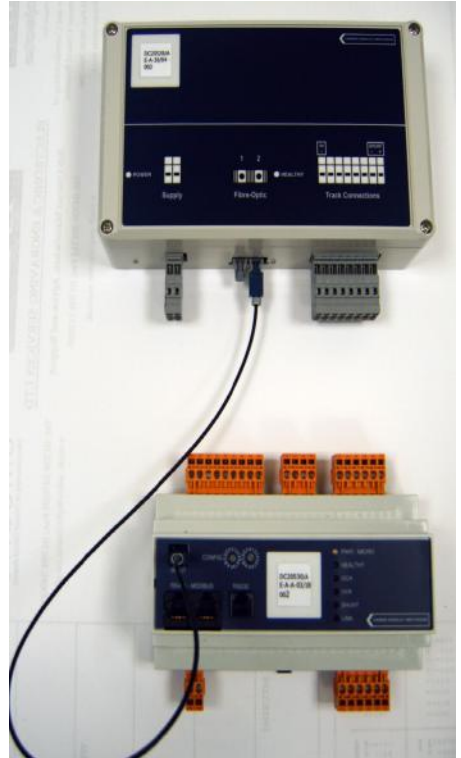
High isolation transducer system  
for rail traction systems

The Hawker Siddeley Switchgear (HSS) Transducer System is a two part isolated signalling unit. One unit is the transmitter unit, which is connected to the track feeder. The current is measured using a low impedance shunt. The voltage is measured directly by connection to the track and to the current shunt. These are all mounted in the high voltage compartment. The signal is transmitted digitally by fibre-optic cable to the receiver unit.

The receiver unit converts the digital voltage and current parameters into analogue current signals for connections to protection or monitoring devices. Alarm relays can be set to indicate Under-Voltage and Overcurrent. There is also a system healthy alarm relay output. This unit is DIN rail mountable.

Signals are transmitted using a proprietary transmission protocol. This protocol gives a very robust connection system. Both voltage and current parameters are digitised before transmission and then reconverted by the receiver into analogue signals.

Both units are powered by the system control voltage. Signalling relay outputs are provided to indicate system healthy, Under-Voltage and Overcurrent. These levels are preset but can be adjusted using an optional HMI unit.



## KEY FEATURES

- » High Isolation - 20kV RMS for 1 minute
- » Fibre Optic Interconnection
- » High Accuracy (Typically 0.1%, ignoring shunt accuracy limitations)
- » Under-Voltage relay output contact (configurable activation level)
- » Overcurrent relay output (configurable activation level)
- » Factory configurable analogue output ranges
- » Wide supply range (42V to 143V DC)
- » Optional HMI
- » Optional Modbus RTU protocol



## Retrofit Circuit Breakers

To enable you to safely extend the life of your existing VSI switchgear, Hawker Siddeley Switchgear can provide direct replacement retrofit vacuum circuit breakers.

Within the MV switchgear sector, there is now increasing interest in the options for the economic replacement of ageing oil based switchgear with a product that utilises Vacuum as the breaking medium. One such option is to retain the fixed portion of the switchgear and replace the oil circuit breaker with a modern technology circuit breaker.

Oil circuit breakers manufactured by Brush Switchgear since 1963 formed an integral part of the VSI (single busbar) and VTD (double busbar) range of switchgear. Many of these circuit breakers are approaching or have exceeded twenty five years operational service life.

We can supply a type tested vacuum circuit breaker as a direct retrofit for the oil circuit breakers in the VSI and VTD switchgear. This vacuum circuit breaker has more than two decades of reliable and proven operational service experience throughout the world in the Hawker Siddeley Switchgear Ltd VMV range. Only very minor modifications are required to the existing switchgear fixed portion.



### RATINGS

|                                  |         |            |                  |
|----------------------------------|---------|------------|------------------|
| Rated Normal Voltage             | kV      | 15         | 12               |
| Impulse withstand                | kVp     | 95         | 75 (95 optional) |
| Making Current (Peak)            | kA      | 50         | up to 120        |
| Symetrical Breaking Current      | kA      | 20         | up to 40         |
| Rated Short-Time Current (3 sec) | kA      | 20         | up to 40         |
| Frequency                        | Hz      | 50/60      | 50/60            |
| Busbar Ratings                   | A       | up to 2000 | up to 3150       |
| Current Ratings                  | A       | 630/1250   | up to 3150       |
| Specifications                   | IEC 298 | ENATS      |                  |

## Aftermarket

### Spares, service and repair

To move forward with its current core products, utilising its award winning magnetic actuator technology, Hawker Siddeley Switchgear Ltd still offers full customer support on a variety of discontinued switchgear - our legacy or “Heritage” products.

This covers spares, service and repair for an extensive range of products, supported either directly by ourselves or indirectly through an approved third party.

As an Original Equipment Manufacturer, Hawker Siddeley Switchgear Ltd have a dedicated Spares, Service & Repairs team offering a complete range of component and engineering spares, for both our current and discontinued ranges. This includes **Hawker Siddeley Switchgear, Whipp & Bourne, Brush Switchgear and South Wales Switchgear.**

Component type consumable spares such as main contacts, springs, trip coils and closing solenoid assemblies, through to individual components such as batteries, relays, PCB's, etc. are available for most ranges of switchgear spanning upto 50 years of production.

Hawker Siddeley Switchgear Ltd places great store in providing our valued customers with a professional aftermarket service, meeting their requirements in a timely and efficient manner.

Customer service and support remain at the heart of Hawker Siddeley Switchgear Ltd's approach. With an extensive base of installed equipment worldwide, we have developed a specialised division to maintain a total after-sales support capability.





Our highly-trained and experienced customer support team offers a comprehensive on-site service package embracing refurbishment and repair facilities for older product ranges, the capability to retrofit new technology circuit breakers into both HSS and non-HSS products, engineering and project management support through to full on site installation and commissioning.

ISO9001:2008 accredited, we offer unparalleled servicing expertise covering 415V – 33kV AC and DC switchgear and transformers, generation, offshore and land-based equipment as well as overhead line installations to 400kV – all backed by a commitment to provide 24/7 peace of mind.

Every switchboard or extension panel is fully assembled and tested before delivery but as customer requirements change, our service team is available to undertake modifications on site from the simplest duty upgrades to the most complex of scheme alterations.

Our dedicated in-house engineering support facility offers not only a complete range of components and spares for both current and discontinued HSS ranges but also a complete advice service to tailor solutions to meet individual system requirements.

We have a 20-year track record of successfully retrofitting oil and air circuit breakers, enabling customers to safely extend the life of their existing switchgear.

In addition, we offer a range of specialist services – all developed in order to further support our customer requirements, including a variety of bespoke, on-site or in-house, operation and maintenance training courses ensuring our customers' staff operate switchgear safely and efficiently.

## Operation and Maintenance Training

Believing that training needs to be as individual as you are, Hawker Siddeley Switchgear Ltd offers bespoke, tailor-made specialist-training courses to help your staff operate and maintain your switchgear - safely, correctly and efficiently.

These specialist courses can vary widely on chosen topics, intensity of training and length. Programmes and courses are developed according to the level of competence of trainees and the type of switchgear or protection systems being trained on.

Hawker Siddeley Switchgear Ltd offers training either at your premises, or in purpose-built training rooms / demonstration rooms at our production factories. The former is preferable when training is required on non-production switchgear types.

Certificates as a proof of training can be issued if requested. To request a quote please visit [www.hss-ltd.com](http://www.hss-ltd.com) and follow the online instructions.





## Servicing and Maintenance

All our engineers are fully factory trained at Hawker Siddeley Switchgear Ltd and fully conversant with all aspects of the equipment. Our world-wide comprehensive service package includes, routine maintenance (maintenance contracts and extended warranties also offered), repair, upgrades and modifications and extensions to existing installations (where supported), a full equipment/ substation condition monitoring service is supported.

We offer Method Statements and Risk Assessments in accordance with our ISO9001 accreditation. Dedicated Site Quality Plans are compiled for every site contract. Hawker Siddeley Switchgear Limited comply with the latest F Gas Regulations.

To request a quote please visit [www.hss-ltd.com](http://www.hss-ltd.com) and follow the online instructions.

## Customer Returns for Investigation and Repair

If you need to return a product for repair, our Customer Return Process is designed to provide a simple and efficient service. The customer simply needs to complete a Return Report Form online, before submitting it back to Hawker Siddeley Switchgear Ltd.

Please refer to our website, [www.hss-ltd.com](http://www.hss-ltd.com) and follow the online instructions.



**Whipp & Bourne**



## Notes

## Notes

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# HAWKER SIDDELEY SWITCHGEAR

a **BRUSH** company



THORNE &  
**DERRICK**  
INTERNATIONAL

Thorne & Derrick  
+44 (0) 191 410 4292  
[www.powerandcables.com](http://www.powerandcables.com)

## **Hawker Siddeley Switchgear Ltd**

Unit 3 Blackwood Business Park, Newport Road, Blackwood, South Wales,  
NP12 2XH. UK

Tel: +44 (0) 1495 223001

00800 42426666 (24hr)

Fax: +44 (0) 1495 225674

[sales@hss-ltd.com](mailto:sales@hss-ltd.com)

## **Hawker Siddeley Switchgear Pty Australia**

PO Box 36, Kallangur, QLD 4503, Australia

Tel: +61 (0) 7 3888 2333

Fax: +61 (0) 7 3888 3241

[hssaus@hss-ltd.com](mailto:hssaus@hss-ltd.com)

## **Hawker Siddeley Switchgear South America**

Carrera 21 No 86A-31 of 101, Bogota, Colombia

Tel: +57 (0) 1 256 4617

Fax: +57 (0) 1 655 8915

[sales@hss-ltd.com](mailto:sales@hss-ltd.com)

## **Hawker Siddeley Switchgear Technology Centre**

Falcon Works, Loughborough,  
Leicestershire. LE11 1EX.  
United Kingdom.

Tel : +44 (0)1509 611511

Fax : +44 (0)1509 612009

[sales@hss-ltd.com](mailto:sales@hss-ltd.com)

**[www.hss-ltd.com](http://www.hss-ltd.com)**