Switchgear Products
At the forefront of switchgear design

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Switchgear Products

BRUSH Switchgear (previously Hawker Siddeley Switchgear) is a leading manufacturer of highly reliable indoor and outdoor AC and DC medium voltage switchgear.

BRUSH Switchgear provides cutting-edge solutions and excellent customer service across a range of market sectors worldwide.

With over 130 years’ expertise, BRUSH Switchgear has a reputation for innovation, first class product performance and delivering high service standards to our customers in the major utilities, industrial, transport and infrastructure sectors across the world.

Our award-winning magnetic actuator technology and electromagnetic spring innovations are widely acclaimed developments which provide BRUSH with a leading edge in circuit breaker technology.

Our state-of-the art manufacturing facility, highly skilled workforce and innovative Technology Centre, all located on one site in South Wales, are the foundations upon which our success is based as we continue to drive innovation and growth in the future.
Switchgear Products

BRUSH Switchgear offer both AC and DC switchgear solutions to electrical distribution utilities and public & private sector end user organisations operating in a variety of settings.
AC Switchgear - Indoor

BRUSH offer a complete range of AC Switchgear Indoor solutions for use throughout the distribution network for both primary and secondary applications. The product range includes air insulated and gas insulated panels with a choice of gas or vacuum circuit breakers. The current voltage range is 3.3-15kV with ratings meeting IEC and ANSI requirements.

Eclipse
Quantum
BSR
SWR12
Appreciated throughout the distribution network and across every business sector, the Eclipse currently holds a leading market position for indoor 11kV switchgear.

**Key Features**

- Superior technology with minimal maintenance
- The fixed pattern design has the simplicity of air insulation and, with the low parts count (the total parts count has been reduced by a factor of x20 and the number of moving parts by a factor of x50), is more compact (500mm wide) than equivalent rated GIS equipment
- The Eclipse boasts of superior operator safety with a fully interlocked disconnector selector mechanism, animated front panel mimic and a front access cable test facility, eliminating the need for any intrusive access to high-voltage compartments
- The Eclipse is certified to IEC62271 and available as a pre-engineered solution in ratings up to 25kA, 2000A. Alternatively, it can be fully engineered to meet exact customers needs
- Endurance tested to 10,000 operations
- Environmentally friendly vacuum interrupters
- Internal arc containment
- Voltage Presence Indication System (VPIS) is fitted as standard to all panels (circuit)
- Award-winning magnetic actuator technology powered from substation battery via contactors
- Trip circuit supervision, self diagnostics & position indication contacts included as standard
- Customer’s choice of protection

**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.
Quantum expands the BRUSH Switchgear portfolio of medium-voltage indoor switchgear with its deserved reputation for great reliability and low maintenance and is the perfect solution where product diversity within electricity networks may be required.

Key Features
- Compact design offering reduced footprint
- Reliable technology with minimal maintenance requirements
- IAC - AFL internal arc protection* with rear venting
- Superior operating safety with fully interlocked front-access cable-test facility
- New design of integrated CT busbar bushing
- New design of top-mounted busbar earthing switch facility**
- Wide range of top and bottom entry cable connection options including separable 'C'-type connectors
- VPIS as standard on all circuits (mounted on fascia panel)
- Expandable LV top box for more complex solutions
- Resilient on-board electronics control module providing trip circuit supervision and self-diagnostics as standard

* Additional containment required
** Coming soon
BSR

The Retrofit Solution

The BSR is an OEM designed retrofit circuit breaker for both the BRUSH Switchgear VSI range of Oil Circuit Breakers and the VMV vacuum Circuit Breaker, to IEC 62271-100.

Key Features

- Superior, proven technology with minimal maintenance
- Remove the need for high capacity auxiliary supplies
- No civil works required and existing HV cabling remains undisturbed
- Improvement of Health & Safety by removal of oil
- Considerable life extension of the existing switchgear
- Lower owner costs through virtually no maintenance requirements and increased switchboard life expectancy
- Uses existing design of primary and automatic secondary contacts
- Improved panel interlocking to latest ENA requirements
- In addition to the retrofit of the circuit breaker BRUSH Switchgear can offer a more complete system solution to enhance the control and automation of the distribution network

BRUSH Switchgear is proud of its heritage in the VSI, VTD & VMV range of switchgear, which continue to work at the highest standards today. Technological advances have allowed us to improve further and offer our customers a circuit breaker that boasts the magnetic actuator.

The BSR circuit breaker, offers a new lease of life for existing switchgear, with this effective retrofit solution. Employing magnetic actuator technology with vacuum interrupters, the BSR is designed for 10,000 operations and a life expectancy of 30 years.

It is designed for retrofitting into existing switchboards without the need for panel modification.
BRUSH Switchgear is proud of its heritage in the C and D range of switchgear, which continue to work at the highest standards.

Technological advances have allowed us to improve further and offer our customers a circuit breaker that boasts the award winning magnetic actuator along with removing the need for SF6 gas.

The SWR12 circuit breaker, offers a new lease of life for existing switchgear, with this effective retrofit solution. Employing magnetic actuator technology with vacuum interrupters, the SWR12 is designed for 10,000 operations and a life expectancy of 30 years. It is designed for retrofitting into existing switchboards without the need for panel modification.

**Key Features**

- Superior, proven technology with minimal maintenance
- Removes the need for high capacity auxiliary supply
- No civil works required and existing HV cabling remains undisturbed
- Improvement of Health & Safety by removal of Oil or SF6 gas
- Considerable life extension of the existing switchgear
- Lower owner costs through virtually no maintenance requirements and increased switchboard life expectancy
- Uses existing design of primary and automatic secondary contacts
- Improved panel interlocking to latest ENA requirements
- In addition to the retrofit of the circuit breaker, BRUSH Switchgear can offer a more complete system solution to enhance the control and automation of the distribution network

**SWR12**

The Retrofit Solution

The SWR12 is an OEM designed retrofit circuit breaker for both the South Wales Switchgear C & D range Oil Circuit Breaker and the HG12 Gas Circuit Breaker, to IEC 62271-100.
AC Switchgear - Outdoor

BRUSH offer a range of AC Switchgear Outdoor solutions for use throughout the distribution network. The product range is designed to meet the need for outdoor, ground-mounted circuit breakers. The current voltage range is 15kV-38kV with ratings meeting IEC and ANSI requirements.

Horizon
Horizon Compact
GVR RECLOSER
V-Mag 25
Fault Thrower
Designed for a 38kV application, the Horizon can be used with other products from BRUSH Switchgear to provide cost-effective and compact substations or breathe new life into existing substations by replacing old and obsolete equipment.

HORIZON
38kV Outdoor Circuit Breaker

The Horizon fills the market need for outdoor, ground-mounted circuit breakers and features the award winning magnetic actuator.

**Key Features**

- Superior, proven technology with minimal maintenance
- Vacuum interruption in an SF6 filled, controlled environment (0.5 bar gauge)
- Dead tank construction suitable for live or dead tank applications
- Internal arc containment
- Generous accommodation for current transformers
- The lightweight aluminium tank makes the Horizon easier to transport and install
- The silicone rubber bushings are resistant to damage from vandalism or mishandling and have an extended creepage of 1550mm
- Cubicle with space for ancillary equipment and option for integrated control and protection relay
- Optional Adjustable Legs version
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 BRUSH Switchgear to provide cost-effective and compact substations or breathe new life into existing substations by replacing old and obsolete 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.

**Key Features**

- Superior, proven technology with minimal maintenance
- Uses a magnetic actuator driven vacuum circuit breaker without the need for electronic control
- EPDM Bushings
- Corrosion resistant, light weight Aluminium tank and cover
- Dead tank construction suitable for live or dead tank applications
- Internal arc certified
- Cubicle with space for ancillary equipment and option for integrated control and customer specified protection relay
- Substation frame, stand or pole-mounted, the Horizon Compact can be integrated into the most advanced distribution schemes or operate as a stand alone breaker
- Variety of mounting options provide compact solution where space is at premium
The GVR provides ‘intelligent control’ and protection on power distribution networks, whilst offering a lifetime of trouble-free service.

The GVR automatic recloser is now available as a tank only option for those customers who wish to connect their own protection and control cubicles. Alternatively, customers looking for a ground-mounted solution can select our epoxy separable bushings for cable connected networks.
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.

Key Features

- Weather-proof housing for protection of equipment from both weather and unauthorised access
- Self-contained room
- Robust construction
- Complete factory substation assembly
- Fully factory tested, resulting in minimum site commissioning and installation time
- Reinforced glass panels ensure it is possible to visually inspect components within the HV compartment without the need for personnel access into the compartment itself.
- V-Mag requires minimal maintenance due to a reduced number of moving mechanical parts
- Capable of Retrofitting into South Wales Switchgear & GEC housing
The need to operate the remote circuit breaker can be due to equipment faults, such as thermal protection or low level fault currents that cannot be detected by the remote protection.

A typical application is with transformer feeders to enable the remote feeder breaker to respond to the transformer local fault detecting relays, such as Buchholz protection, local earth fault protection etc.

**Key Features**

- Superior, proven technology using a single phase vacuum interrupter driven by a magnetic actuator for fault initiation
- The switch is housed in an aluminium tank, dielectric insulation is provided by SF6 gas
- Connection to the system is achieved by either a separable connector or open terminal bushing
- Manual release of the switch is available within the control cubicle housed under the tank
- The fault is ‘thrown’ through the aluminium tank, two earth points are provided for safely earthing the equipment steel work and to provide a fault path

**Fault Thrower**

**38kV 25kA Single Phase to Earth Fault Making Switch**

Part of our Horizon family of products, the Fault Thrower provides a means of deliberately introducing a phase to earth fault in order to ensure remote end tripping of a circuit breaker, assuming pilot wires are not available for intertripping.
DC Switchgear

BRUSH offer a range of DC Switchgear solutions for a variety of markets and applications.

Lightning DC

Safebond
Combining innovation with 50 years of DC circuit breaker design and manufacturing experience, the Lightning offers optimal safety, reliability and high speed performance – the ideal solution to your DC requirements.

**Key Features**

- Superior proven technology with minimal maintenance
- A long service life designed to exceed 30 years
- Superior compact design concept and operating mechanisms
- High speed operation, direct overload and electrical tripping
- Simple, reliable mechanism with no mechanical latch
- Ergonomic, intuitive truck isolation and interlocking
- Enhanced electrical and mechanical endurance
- Patented Arc transfer coil
- Fully bi-directional current interruption
- Hard wearing main contact material (silver tungsten carbide) ensuring long life
- Integrated operation with a wide range of protection relay options
Safebond
Integrated Track Feeder and Negative Shorting Panel

The BRUSH Switchgear SafeBond integrates the feeder circuit breaker function and the remote bonding function into one standard Lightning panel footprint, a big advantage in floor space saving, civil engineering, cabling and operational consistency and safety.

The SafeBond incorporates the NDC high speed, unidirectional circuit breaker to carry out the making and breaking of all load and fault currents, whilst an “off-load” motorised two position disconnector selects the circuit.

With the disconnector in the positive position and the NDC CB closed, the positive busbar is connected to the track feeder cable thereby functioning as a standard feeder circuit breaker.

With the disconnector in the negative position and the NDC CB closed the track feeder cable is bonded to the negative busbar, thereby functioning as a negative bonding device.

All operations are fully electrically interlocked and the control system can be operated remotely via SCADA or locally via the local control panel.

BRUSH Switchgear believe this product will contribute to improving safety and reducing lead times for track maintenance periods (possessions).

As with all BRUSH Switchgear products the SafeBond is designed, manufactured and assembled to the highest standard of quality, fulfilling the customers’ requirements and leading the market in innovative technology.
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