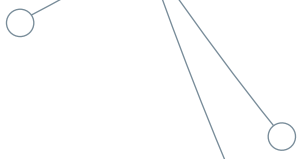
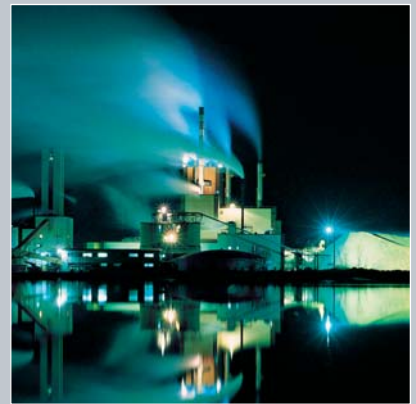


**Sabre Vacuum Circuit Breaker Ring Main Unit up to 24kV**  
with automation and remote control options

ENGINEERING BRILLIANT SOLUTIONS





Sabre is Small, Smart, Safe and Environmentally Friendly



## Contents

- 2 Sabre - at the cutting edge of Ring Main Unit technology
- 3 a is for advanced - a new addition to the Sabre range
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## Sabre - at the cutting edge of Ring Main Unit technology

Lucy Switchgear has over 100 years experience within the power distribution industry. Today the company is at the cutting edge of Ring Main Unit design and innovation, engineering medium and low voltage switchgear and providing retrofit and automation solutions to customers throughout the world.

## Sabre - total flexibility in design

The Sabre range is fully extensible and highly flexible. It is suitable for use in a wide range of applications including distribution switchboards, transformer substations, ring distribution networks and HV connections to industrial and commercial sites.

The units are skillfully designed and developed to suit customer requirements for connection, supply, protection and sectionalising with remote control.

Combining the most advanced vacuum switching technology, the units are compact, flexible and easy to operate and install. Characterised by their reliability and operational safety, they are suitable for applications up to 24kV. The Sabre range is fully weatherproof for outdoor use, has a long service life, and requires virtually zero maintenance in the most extreme conditions.

A wide selection of product derivatives, including extensible ring switches, circuit breakers and air insulated metering units can be directly coupled to form multiple panel switchboards without the need for additional cabling or access to gas insulated chambers.

### Sabre Range

Designation	Description
Vacuum Ring Main Units - (all with 630A Fault Make, Load Break Ring Switches)	
VRN2a	Non Extensible with 250A Tee-off. Free Standing or Transformer Mounted
VRN6a	Non Extensible with 630A Tee-off. Free Standing
VRN24	24kV Non Extensible with 400A Tee-off. Free Standing
VRE2a	Extensible with 250A Tee-off. Free Standing
VRE6a	Extensible with 630A Tee-off. Free Standing
Vacuum Circuit Breakers	
VCE2a	Extensible with 250A Tee-off. Free Standing or Transformer Mounted
VCE6a	Extensible with 630A Tee-off. Free Standing
Switches - 630A Load Break, Fault Make	
SSE6a	Single Switch Extensible. Free Standing
DSE6a	Double Switch Extensible. Free Standing
DSN6a	Double Switch for Bus Section Isolation and Busbar Earthing



VRN6a

## a is for advanced

The Sabre ring main unit range is one of the most compact and ergonomically designed on the world market. The housing, stand and cable boxes save weight, and the compact transformer mounted units reduce civil engineering costs. The units have a user friendly front fascia and clear indicator positions as well as a detailed mimic diagram to facilitate ease of operation.

The ring switch integral cable test facility has been designed to provide easier access for test equipment, and the VRN6a Sectionaliser RMU now benefits from an integral cable test facility on the Tee-off.

## Key Features

- Up to 24kV
- Indoor and outdoor
- Fully extensible units available
- Vacuum Tee-off circuit breaker
- Common switching chamber (metal enclosed)
- Isolation in clean SF6
- Fully rated at atmospheric pressure
- Enhanced duty, in excess of IEC requirements
- Interlocked for safe operation
- Internal arc protection to IEC and ENA TS standards
- Padlocking facilities
- Side and rear cable access for maximum operator protection
- Integral ring cable testing
- Integral Tee-off testing on 630A models
- IP54 rated sheet steel housing
- Stainless steel SF6 enclosure sealed for life
- Variety of protection options including Relay and TLF
- 3 mounting heights as standard on 12kV units



VRN2a



Ring switch earth and test



Tee-off earth and test

# Options

- Remote operation



Ring Switch Motor

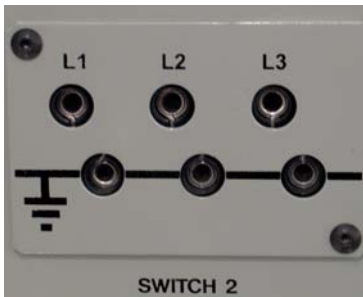


Circuit Breaker Motor

- Fault passage indicators



- VPIS (Voltage Presence Indication System)



Sockets only



Push Button Neon Indicators

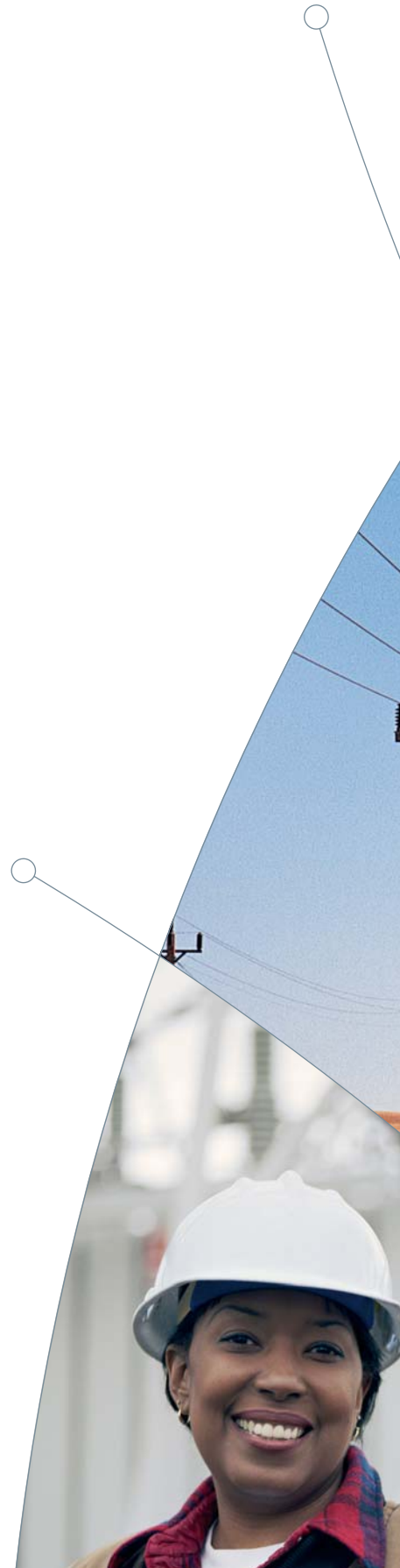
- Top entry and angled cable boxes. Note: Top entry can be assigned on-site using the standard bottom entry boxes



Angled Cable Box with Internal Arc Relief



Top Entry Cable Box



## Options

- Transformer mounting or free-standing achieved simply by using the universal e-flange with or without a cable box



- Castell interlocks for safety interlocking with other connected equipment on Tee-off and Ring Switches
- Tripped on fault indicator – flag drops if the circuit breaker has been tripped via a protection operation
- Gland plate variants – for single core and 3-core cable up to 500mm<sup>2</sup>
- Pre-wired or fully automated for motor actuation
- Internal arc tested cable boxes



## Sabre - Maximising Protection and Operator Safety

Having a reliable and continuous supply of energy is becoming more and more important. This means that the distribution network has to meet ever more stringent demands.

It goes without saying that safety and operational reliability play a major role.

### Protection to Suit Every Application

All Sabre units offer a high degree of safety, with customers benefiting from our experience in independent protection systems. All options provide transformer over current protection for phase to phase faults. Earth fault protection covering phase to earth faults is also available if required.

Time limit fuse (TLF) protection or self-powered and auxiliary powered relays, both with remote trip and fault trip/alarm trip (auxiliary only) facilities are available, depending on customer requirement.

#### System Voltage 11kV

Transformer rating	kVA	315	500	800	1000	1250	1500	1600	2000
Current	A	16	26	42	52	65	78	84	105
Protection	TLF	•	•	•	•	•	•	•	•
	Relay	•	•	•	•	•	•	•	•

#### System Voltage 13.8kV

Transformer rating	kVA	500	800	1000	1250	1500	1600	2000	2500
Current	A	21	33	42	52	62	67	84	105
Protection	TLF	•	•	•	•	•	•	•	•
	Relay	•	•	•	•	•	•	•	•

#### System Voltage 22kV

Transformer rating	kVA	800	1000	1250	1500	1600	2000	2500	3150
Current	A	21	26	33	39	42	52	66	83
Protection	TLF	•	•	•	•	•	•	•	•
	Relay	•	•	•	•	•	•	•	•

### Safety to Personnel

- Switching parts are contained within an earthed stainless steel enclosure
- A single line diagram forms a mimic on the front of the unit incorporating positively driven mechanical position indicators
- Positive safety interlocks on all switch positions prevent incorrect operation
- Padlocking facilities for all switch and selector positions
- Internal arc tests are carried out in accordance with IEC and ENA specifications - internal arc tests are also completed for cable boxes
- Interlocked cable boxes as an option

Note: System Voltage 24kV is available for cable feeders for over 10MVA.

## Preserving the Environment

Sustainability and environmental considerations are becoming more and more important in the choice of switch materials. Lucy Switchgear is committed to providing products that minimise adverse environmental impacts and contribute positively to customers' own environmental objectives.

The Sabre range is designed using vacuum technology that offers high performance whilst lowering the impact on the environment. The use of vacuum as a fault interrupting medium, eliminates the production of any toxic and harmful by-products making the Sabre safe and environmentally friendly. SF6 can be safely recovered at the end of the units lifespan and re-used after treatment.

This forms part of our contribution towards a greener and sustainable future.

## Quality Assurance

### Certified Standards: BSEN, ISO 9001:2000

Lucy Switchgear is committed to operating a Quality Management System which conforms to and exceeds the requirements of the highest international and customer demands ensuring world class performance and provide total customer satisfaction.

All new products are designed to ensure that, as a minimum, they meet all the essential requirements of stringent international standards. During the manufacture of a Sabre unit, each one undergoes a number of routine quality checks. Each product is registered using a 'birth certificate' scheme, so that it can be tracked and monitored for the duration of its lifespan providing traceability throughout its service life.

# Automation Solutions - Smarter Distribution Networks

Deregulation, privatisation and fierce competition... all these factors highlight the need for greater reliability of the supply, enhanced system performance and improved customer service. The solution lies in systems and software providing real-time representation of the network to managers, operators and decision-makers.

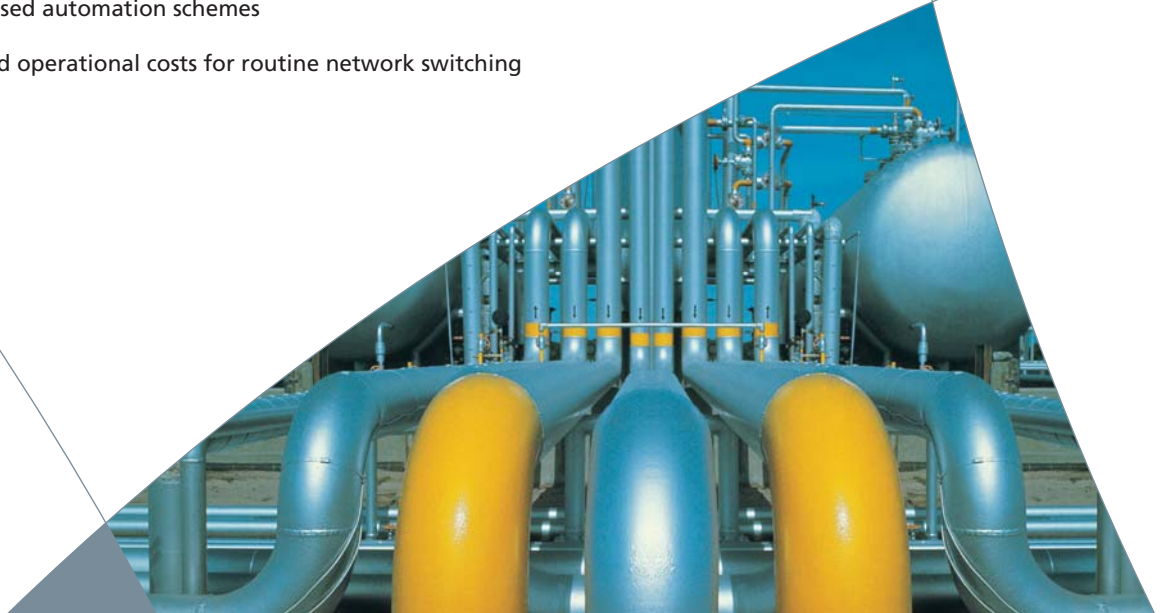
To address these needs and respond to the challenge, Lucy Switchgear has developed the Gemini family of RTUs, Data Concentrators and SCADA systems together with a suite of software applications for switchgear automation and remote control.

## Sabre with Automation

The Sabre range can be made “automation ready” by pre-wiring the actuator circuits and auxiliary indications such as Open, Closed and Earth on the ring switches and circuit breaker functions. This allows the purchaser to upgrade these ring main units to allow remote control or full automation at a later date to meet evolving operational needs and help reduce operating costs.

The enhanced system performance that follows the application of automation to your secondary distribution networks improves quality and reliability of supply. Other benefits include:

- Increased operator safety
- Reduced time to diagnose, locate and isolate the faulty section of the network
- Faster response time and network reconfiguration resulting in reduced number of customer minutes lost and supply interruptions (SAIDI and SAIFI performance statistics)
- Optimisation of asset management through implementation of customised automation schemes
- Reduced operational costs for routine network switching



## Retrofit Actuator Solutions

To address customers' requirements for remote monitoring and control, Lucy Switchgear has developed a compact, simple retrofit actuator for the Sabre range ring switches (for pre-wired units). This actuator design is also utilised for the Tee-off circuit breakers when required.

The PCB driven rotary actuator is designed for non-intrusive installation. Single or double actuators can be easily and rapidly fitted to the ring switches on site while the unit is in service. No access is required to the internal workings of the RMU thereby ensuring the integrity of electricity supply.



### Gemini-RTU 2

The Gemini-RTU (G2-RTU) has been specifically designed to control and monitor switchgear equipment. The G2-RTU supports different protocols and integrates a multitude of functionality including current monitoring, voltage sensing, network sectionalising and diagnostics to meet our customers' evolving automation needs.

The Gemini-RTU can control up to a maximum of four switches via four sets of open and close push buttons and indications.



### Gemini-SCADA

We offer cost effective software solutions to assist with the day-to-day management of distribution systems. Based on a high level SCADA programming language and field-proven technology, the Gemini software architecture combines flexibility and scalability.

Lucy Switchgear can integrate with most existing SCADA systems or provide a stand alone secondary SCADA system as part of a turnkey automation solution. Full technical support and training services are also available.

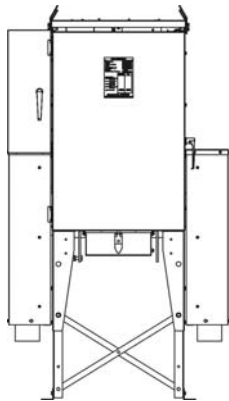
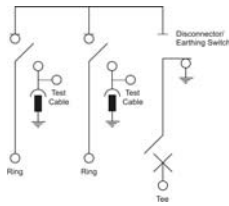
# Sabre Range

	VRN2a	VRN6a	VRN24	VRE2a	VRE6a
<b>Rated Voltage</b>	12kV (15.5kV)	12kV (15.5kV)	24kV	12kV (15.5kV)	12kV (15.5kV)
<b>Impulse Withstand Voltage (kV Peak)</b>	75kV (95kV)	75kV (95kV)	125kV (145kV)	75kV (95kV)	75kV (95kV)
<b>Normal Current</b>					
<b>Ring Switches</b>	630A	630A	630A	630A	630A
<b>Circuit Breaker</b>	250A	630A	400A	250A	630A
<b>Busbar</b>	630A	630A	630A	630A	630A
<b>Short Circuit Peak Making Current</b>					
<b>Ring Switches</b>	50kA	50kA	40kA	50kA	50kA
<b>Tee-off Circuit Breaker</b>	50kA	50kA	40kA	50kA	50kA
<b>Short Circuit Breaking Current</b>					
<b>Tee-off Circuit Breaker</b>	20kA RMS	20kA RMS	16kA RMS	20kA RMS	20kA RMS
<b>3 Second Short Time Current</b>					
<b>Ring Switches</b>	20kA	20kA	16kA	20kA	20kA
<b>Tee-off Circuit Breaker</b>	20kA	20kA	16kA	20kA	20kA
<b>Earth Switch Peak Making Current</b>					
<b>Ring Switches</b>	50kA	50kA	40kA	50kA	50kA
<b>Tee-off Circuit Breaker</b>	7.9kA	50kA	40kA	7.9kA	50kA
<b>Internal Arc Rating</b>					
<b>Freestanding</b>	20kA 1 sec	20kA 1 sec	16kA 1 sec	20kA 1 sec	20kA 1 sec
<b>Transformer Mounted</b>	20kA 1 sec in ENA Housing	20kA 1 sec in ENA Housing	n/a	n/a	n/a
<b>Gas Pressure</b>					
<b>MOP</b>	zero bar (G)	zero bar (G)	0.3 bar (G)	zero bar (G)	zero bar (G)
<b>IP Rating</b>					
<b>Up to IP54W</b>	Up to IP54W	Up to IP54W	Up to IP54W	Up to IP54W	Up to IP54W
<b>Dimensions</b>					
<b>Height (mm)</b>	1715, 1635 or 1415	1775, 1690 or 1470	1590	1715	1715
<b>Width (mm)</b>	950	950	950	950	950
<b>Depth (mm)</b>	1080	1080	1130	1080	1080
<b>Weight (kg)</b>	350	360	425	375	385
<b>Weight of SF6 (kg)</b>	1.46	1.46	1.56	1.78	1.91
<b>Protection</b>					
<b>TLF – Time Limit Fuse</b>	•		•	•	•
<b>Auxiliary Powered Relay</b>	•	•	•	•	•
<b>Self Powered Relay</b>	•	•	•	•	•
<b>Testing Standards Applicable</b>					
<b>IEC 62271-103</b>	•	•	•	•	•
<b>IEC 62271-100</b>			•	•	•
<b>IEC 62271-102</b>	•	•	•	•	•
<b>IEC 60056</b>	•	•	•	•	•
<b>IEC 60265-1</b>	•	•	•	•	•
<b>IEC 60129</b>	•	•	•	•	•
<b>IEC 60694</b>	•	•	•	•	•
<b>IEC 60298</b>	•	•	•	•	•
<b>ENA TS 41-36</b>	•	•	•	•	•
<b>IEC 62271-200</b>	•	•	•	•	•

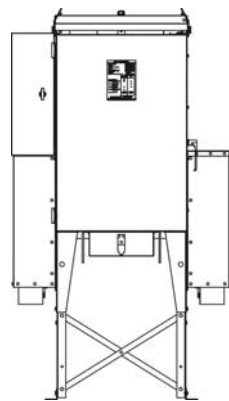
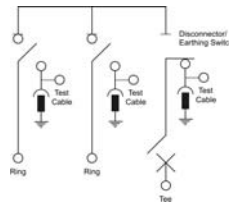
	VCE2a	VCE6a	SSE6a	DSE6a	DSN6a
Rated Voltage	12kV (15.5kV)	12kV (15.5kV)	12kV (15.5kV)	12kV (15.5kV)	12kV (15.5kV)
Impulse Withstand Voltage (kV Peak)	75kV (95kV)	75kV (95kV)	75kV (95kV)	75kV (95kV)	75kV (95kV)
Normal Current					
Ring Switches	n/a	n/a	630A	630A	630A
Circuit Breaker	250A	630A	n/a	n/a	n/a
Busbar	630A	630A	630A	630A	630A
Short Circuit Peak Making Current					
Ring Switches	n/a	n/a	50kA	50kA	50kA
Tee-off Circuit Breaker	50kA	50kA	n/a	n/a	n/a
Short Circuit Breaking Current					
Tee-off Circuit Breaker	20kA RMS	20kA RMS	n/a	n/a	n/a
3 Second Short Time Current					
Ring Switches	n/a	n/a	20kA	20kA	20kA
Tee-off Circuit Breaker	20kA	20kA	n/a	n/a	n/a
Earth Switch Peak Making Current					
Ring Switches	n/a	n/a	50kA	50kA	50kA
Tee-off Circuit Breaker	7.9kA	50kA	n/a	n/a	n/a
Internal Arc Rating					
Freestanding	20kA 1 sec	20kA 1 sec	20kA 1 sec	20kA 1 sec	20kA 1 sec
Transformer Mounted	20kA 1 sec in ENA Housing	n/a	n/a	n/a	n/a
Gas Pressure					
MOP	zero bar (G)	zero bar (G)	zero bar (G)	zero bar (G)	zero bar (G)
IP Rating					
Up to IP54W	Up to IP54W	Up to IP54W	Up to IP54W	Up to IP54W	Up to IP54W
Dimensions					
Height (mm)	1715	1715	1360	1260	1260
Width (mm)	565 + busbar	565 + busbar	515 + busbar	565 + busbar	565 + busbar
Depth (mm)	1080	1080	1065	825	825
Weight (kg)	290	300	230	270	260
Weight of SF6 (kg)	1.05	1.05	0.78	0.98	0.98
Protection					
TLF – Time Limit Fuse	•				
Auxiliary Powered Relay	•	•			
Self Powered Relay	•	•			
Testing Standards Applicable					
IEC 62271-103	•	•	•	•	•
IEC 62271-100	•	•	•	•	•
IEC 62271-102	•	•	•	•	•
IEC 60056	•	•	•	•	•
IEC 60265-1	•	•	•	•	•
IEC 60129	•	•	•	•	•
IEC 60694	•	•	•	•	•
IEC 60298	•	•	•	•	•
ENA TS 41-36	•	•	•	•	•
IEC 62271-200	•	•	•	•	•

# Sabre Typical Arrangements

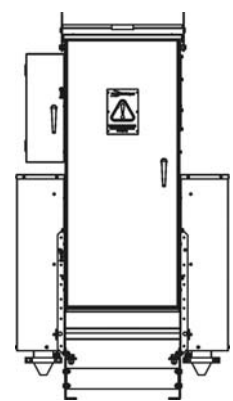
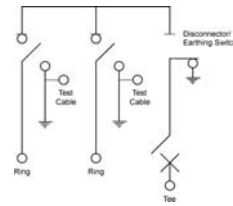
## Non-Extensible



VRN2a

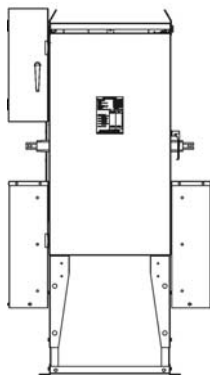
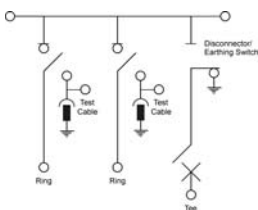


VRN6a

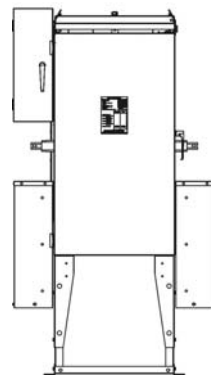
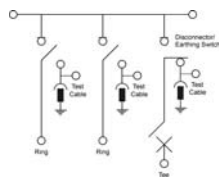


VRN24

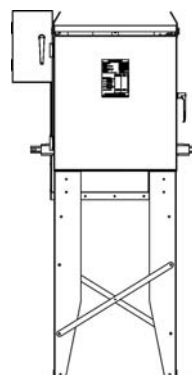
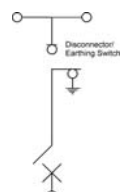
## Extensible Range



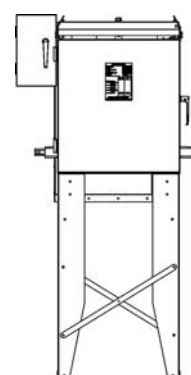
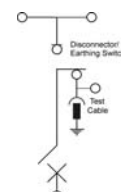
VRE2a



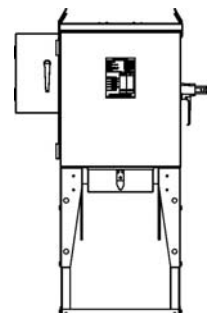
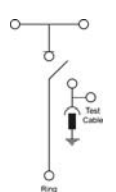
VRE6a



VCE2a

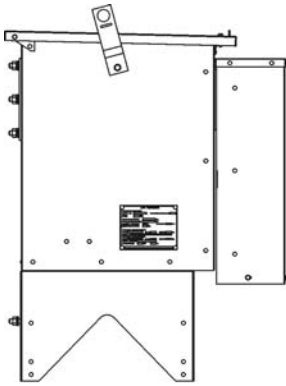


VCE6a

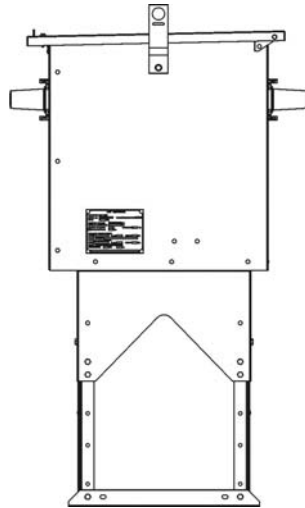


SSE6a

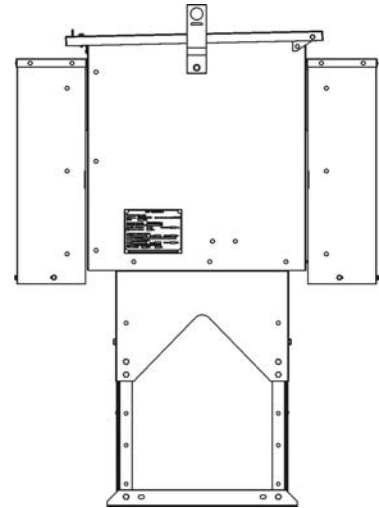
## Air Insulated Metering Unit (AMU)



AMU 2/4/6 - TC  
Tee-off Connected  
(Cantilevering on rear of RMU)



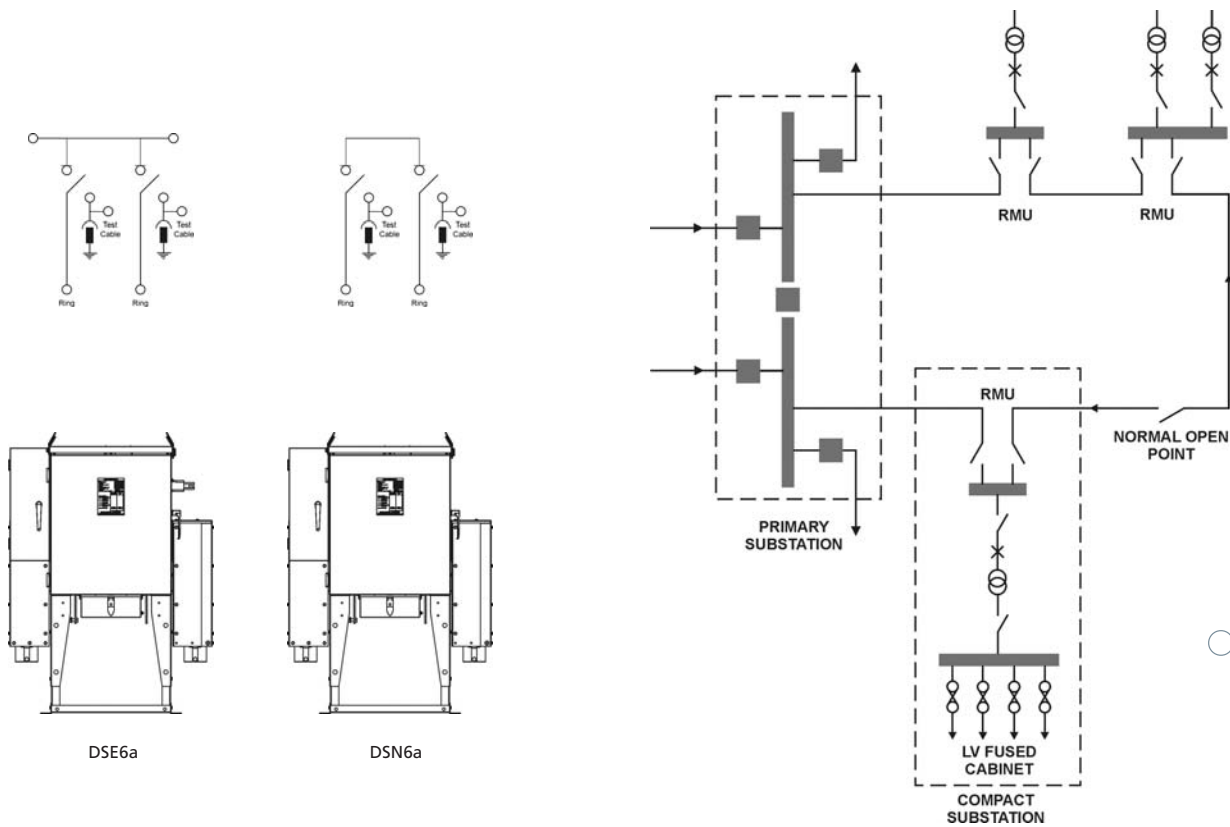
AMU 6 - BC  
Busbar Connected



AMU 2/4/6 - FS  
Freestanding

NB Please refer to HV Metering Unit brochure for more details on the AMU.

## Typical Distribution Schematic



## utilities uk

Our major customers include UK  
Distribution Network Operators (DNOs):

CE  
EDF ENERGY  
CENTRAL NETWORKS  
JERSEY ELECTRICITY  
MANX ELECTRICITY AUTHORITY  
NORTHERN IRELAND ELECTRICITY  
SCOTTISH POWER  
SCOTTISH & SOUTHERN ENERGY  
UNITED UTILITIES  
WESTERN POWER DISTRIBUTION

## industry uk

DATA CENTRES  
HEALTH AUTHORITIES  
LOCAL AUTHORITIES  
MINISTRY OF DEFENCE  
OIL & GAS  
SCHOOLS & UNIVERSITIES  
WATER AUTHORITIES

## export worldwide

Delivering Lucy Switchgear products worldwide:

ADWEA • ABU DHABI  
CLP • HONG KONG  
CODENSA • COLOMBIA  
DEWA • DUBAI  
ECG • GHANA  
ENERGY AUSTRALIA • AUSTRALIA  
KPLC • KENYA  
MEW • BAHRAIN  
MEW • KUWAIT  
NEPA • NIGERIA  
POWER GRID • SINGAPORE  
UMEME • UGANDA



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tel: +966 3 8823057 fax: +966 3 8822553  
email: info@saudilucy.com

[www.lucyswitchgear.com](http://www.lucyswitchgear.com)

## A global network

In association with industrial partners and contractors, Lucy Switchgear has established a global network operating in over 50 countries. Currently 50 agents, joint venture associates and trading partners represent Lucy Switchgear products all over the world from Europe, the Middle East, the Far East, Africa, Australasia, Central America, the Caribbean to South America thus strengthening the Lucy presence globally.

With headquarters in Oxfordshire, UK, and a main regional office in Dubai, servicing the Middle East, the Lucy group is constantly looking to develop further partnerships.