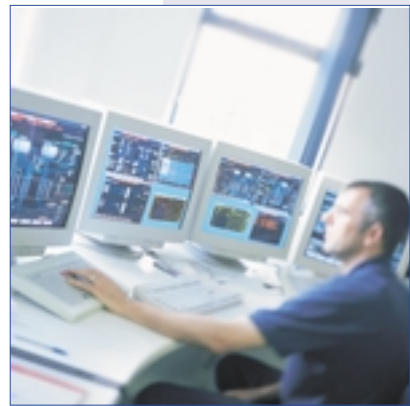


- MV ring main units
- HV metering units
- LV transformer cabinets
- Package substations
- LV distribution pillars
- LV substation fuseboards
- Multi service pillars
- Multi service distribution boards
- Heavy duty cutouts
- Domestic service cutouts
- Street lighting cutouts
- Pole mounting cutouts
- ABC service boxes
- Connector boxes
- Fuse links
- Weatherproof housings



○ SABRE Vacuum Circuit Breaker Ring Main Unit up to 15.5kV

○ with automation and remote control options



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- 4 SABRE - for maximum protection and operator safety
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- 6 SABRE with automation - a safe investment
- 7 SABRE and GEMINI - the powerful combination
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SABRE - at the cutting edge of Ring Main Unit technology

Key Features

- 12kV AND 15.5KV
- INDOOR AND OUTDOOR
- ISOLATION IN CLEAN SF6 GAS
- COMMON SWITCHING CHAMBER
- VACUUM TEE OFF CIRCUIT BREAKER
- FULL RATINGS WITH ZERO GAS PRESSURE
- ENHANCED DUTY, IN EXCESS OF IEC
- INTERLOCKED FOR SAFE OPERATION
- INTERNAL ARC PROTECTION
- PADLOCKING FACILITIES
- FULLY EXTENSIBLE
- TEE OFF PROTECTION OPTION: TLF
AUXILIARY OR SELF-POWERED RELAY
- SIDE AND REAR CABLE ACCESS FOR
MAXIMUM OPERATOR PROTECTION
- ROBUST SHEET STEEL HOUSING



The SABRE range of Ring Main Units combines the most advanced Vacuum and SF6 technologies to meet the requirements of UK Regional Electricity Companies, overseas utilities and industrial organisations. Compact, flexible, easy to operate and install, SABRE also ensures reliability and operator safety.

The SABRE range has been designed to be fully weatherproof for outdoor use, to have a long service life and to require minimum maintenance in the most extreme conditions.

SABRE Options

- REMOTE OPERATION OF RING SWITCH (MOTOR ACTUATORS)
- REMOTE OPERATION AND TRIPPING OF CIRCUIT BREAKER
- REMOTE POSITION INDICATION
- INTERTRIPPING
- NEON INDICATION
- CASTELL INTERLOCKS
- INTERLOCKED T OFF CABLE TEST FACILITY
- TOP ENTRY CABLE BOXES (INDOOR ONLY)

SABRE range - total flexibility in the design

The SABRE ring main unit is suitable for both indoor and outdoor applications. It can be used as a free standing unit or for transformer mounting to E.A.T.S. 35-1. The unit is fully extensible and highly flexible; suitable for use in a wide range of applications including distribution switchboards, transformer substations, ring distribution networks and for HV connections to industrial and commercial sites.

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 VRN
Free standing



SABRE SSE
Extensible Ring Switch

System Specification

Sabre Type	Description
VRN	Vacuum Ring Main Unit - Non Extensible
VRE	Vacuum Ring Main Unit - Extensible
VCE	Vacuum Circuit Breaker - Extensible
VCN	Vacuum Circuit Breaker - Non Extensible
SSE	Single Switch - Extensible
SSN	Single Switch - Non Extensible
DSE	Double Switch - Extensible



SABRE VRN TM
Transformer Mounted



SABRE VRE
Extensible



SABRE VCE
Extensible Circuit Breaker



SABRE VRE
Motorised for Automation and
Remote Control

SABRE - for maximum protection and operator safety



Safety

SABRE has been designed to ensure maximum operator safety.

LIVE PARTS ARE CONTAINED WITHIN AN EARTHED STAINLESS STEEL ENCLOSURE

A SINGLE LINE DIAGRAM ON THE FRONT OF THE UNIT INCORPORATES 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 IEC60298 AND EATS 41-26 FOR 1 SECOND

Protection

All options provide transformer overcurrent protection for phase to phase faults. Earth fault protection covering phase to earth faults is also available as required.

TLF (TIME LIMIT FUSES): SIMPLE DIRECT ACTING SYSTEM WITH A FIXED TIME/CURRENT CHARACTERISTIC

SELF POWERED RELAYS: DIRECT ACTING SYSTEM WITH ADJUSTABLE TIME /CURRENT CHARACTERISTICS

AUXILIARY POWERED RELAYS: SEPARATELY SUPPLIED CONTROL SYSTEM WITH ADJUSTABLE TIME/CURRENT CHARACTERISTICS

Application Guide

- TLF protection is generally utilised on smaller distribution transformers where the normal full load current is low and discrimination with the LV circuit can be achieved by fuse co-ordination.
- Relay protection provides a range of time/current operational settings that can be adjusted to suit the transformer circuit. The protection is more precisely set than with TLF. Therefore discrimination with the LV protection system is more readily achievable.
- Self-powered relays are particularly useful for outdoor substation equipment where no auxiliary power is available. A remote trip facility can be provided.
- Auxiliary powered relays provide operational security as they function independently from the circuit they are monitoring. Remote trip and fault trip/alarm facilities can be provided.

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		•	•	•	•	•	•	•

SABRE - for compact package substations

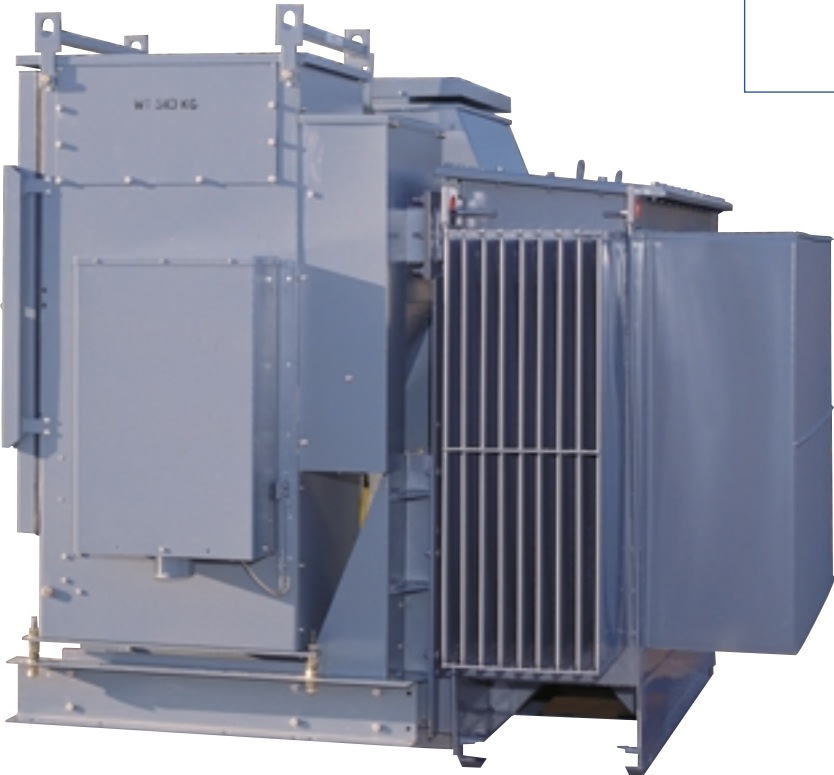
For single Ring Main Units or complete package substations with fully integrated communication systems, Lucy Switchgear offers you the ultimate solution for maximum customer benefits:

- SINGLE POINT OF CONTRACT HANDLING
- BETTER FOLLOW-UP AND IMPROVED CO-ORDINATION BETWEEN SUPPLIER AND CUSTOMER
- IMPROVED SUPPLY CHAIN MANAGEMENT
- MINIMUM TIME FOR INSTALLATION AND COMMISSIONING
- REDUCED PURCHASING AND LOGISTICS COSTS

LUCY Switchgear is a single source supplier providing high quality package substations and fully integrated automation systems tailored to your specifications.

Our SF6 insulated ring main units, circuit breakers or single switches can all be supplied for direct transformer mounting. In combination with the LUCY Switchgear's extensive range of distribution feeder pillars, we can offer complete indoor or outdoor package substations incorporating oil or dry type transformers, delivered fully assembled and direct to site.

- EXTENSIBLE AND NON EXTENSIBLE SABRE UP TO 15.5KV
- INDOOR AND OUTDOOR TRANSFORMERS UP TO 2500 KVA
- LOW VOLTAGE FEEDER PILLARS UP TO 2400A
- AUTOMATION AND REMOTE CONTROL SOLUTIONS



SABRE with automation - a safe investment

With today's increased focus on operational efficiencies and capital budget constraints, the level of interest in automation technology has significantly grown. Lucy Switchgear can provide you with effective integrated switchgear automation solutions yielding maximum benefits in terms of enhanced network management.

Our new generation SABRE responds to the changing customer demand for modern, fully automated and remote controlled switchgear. Our SABRE comes pre-wired for automation as standard. Both ring switches are supplied ready for motorised actuators with OPEN & CLOSE status indications. This allows you to retrofit and upgrade SABRE installed ring main units at a later date to meet your evolving operational needs.

Options

- REMOTE OPERATION OF RING SWITCH (PLUG-IN TYPE MOTOR ACTUATORS)
- REMOTE OPERATION AND TRIPPING OF CIRCUIT BREAKER
- REMOTE STATUS INDICATION
- LUCY SWITCHGEAR GEMINI-RTU (OR THIRD PARTY RTUS)
- FAULT PASSAGE INDICATORS
- INTERTRIPPING
- NEON PHASE INDICATION

Automated SABRE benefits:

- EXTENSION OF SABRE PRODUCT LIFE CYCLE
- IMPROVED QUALITY AND RELIABILITY
- ENHANCED SYSTEM PERFORMANCE
- REDUCED OPERATING COST



Retrofit actuator solutions

To address customers' requirements for remote monitoring and control, Lucy Switchgear has developed a reliable retrofit kit for the ring switches and circuit breaker of ring main equipment.

The microprocessor 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 maintaining the integrity of electricity supply.

SABRE and GEMINI - the powerful combination

GEMINI-RTU

For full automation and remote control functionality, SABRE can be equipped with our GEMINI-RTU controller. The GEMINI-RTU is fully expandable to meet future network requirements and compatible with existing systems. The control logic of the GEMINI-RTU can control up to a maximum of three switches via three sets of open/close push buttons and indications.

Automation sequences can also be embedded within the GEMINI-RTU to perform user defined automation functions such as Auto-Changeover or Auto-Open. The schemes can be initiated by loss of HV or LV voltage, fault current detection or by combination of both. The status, following the initiation of an automation sequence, then being reported to the Control Centre for diagnostics and analytical purposes.



GEMINI-SCADA

Based on our GEMINI range of automation products, we can offer either a cost effective stand alone secondary control system or integrate with most existing SCADA systems for remote reconfiguration and real-time data analysis.

Lucy Switchgear's bespoke systems, which are based on open software architecture and modular type GEMINI-RTU, can easily be upgraded and expanded as the customer adds secondary automated points to their Network Management System (NMS).

DNP3 PROTOCOL AS STANDARD – OTHERS ON REQUEST: IEC 870-5-101, WISP+

LOCAL OR REMOTE OPERATION

FLEXIBLE COMMUNICATIONS INTERFACE - RADIO, RS232, PAKNET, GSM, PSTN, PILOT OR LEASED WIRES AND FIBRE OPTIC

3 PHASE MONITORING OF VOLTAGES AND CURRENTS USING ANALOGUE INPUTS

ISOLATED DIGITAL INPUTS

DIGITAL CONTROL OUTPUTS

FAULT PASSAGE PROCESSING

EMBEDDED AUTOMATION SEQUENCING, IF REQUIRED (I.E. AUTO-CHANGEOVER, AUTO-OPEN)

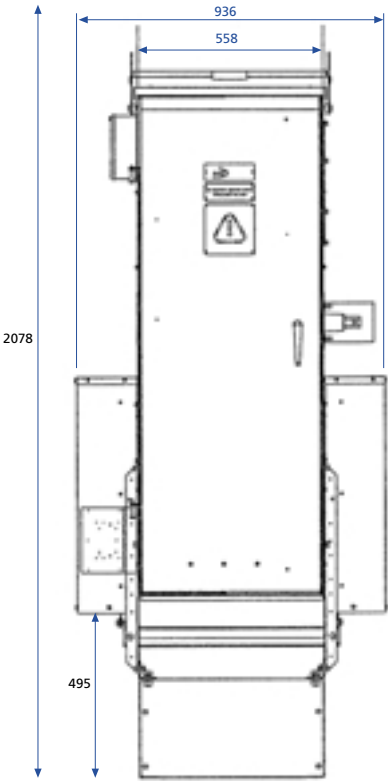
24V BATTERY FOR CONTINUED OPERATION UNDER POWER FAILURE CONDITIONS

BATTERY CONDITION MONITORING

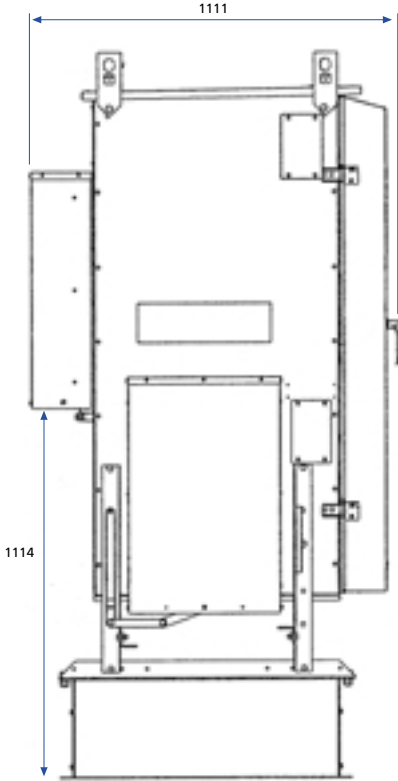
GEMINI-RTU SUPPLIED ON A FLOOR MOUNTED STAND OR WALL MOUNTED AS AN ALTERNATIVE



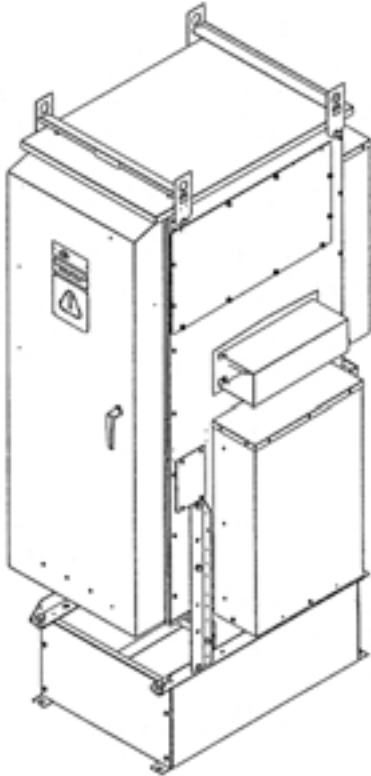
VRE typical arrangement



Front view



Left hand side view



VRN

Non Extensible



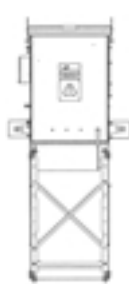
VRE

Extensible



VCN

Non Extensible



VCE

Extensible



SSE

Extensible



DSE

Extensible

	SABRE Transformer Feeder RMU	SABRE Sectionaliser RMU
Rated Voltage (kV)	12kV (15.5kV)	12kV (15.5kV)
Impulse Withstand Voltage (kV Peak)	75 kV (95kV)	75 kV (95kV)
Rated Current		
Ring Switches	630 A	630 A
Circuit Breaker	200A	400 A
Short Circuit Peak Making Current		
Ring Switches	50 kA	50 kA
Circuit Breaker	50 kA	50 kA
Short Circuit Breaking Current		
Circuit Breaker	20 kA RMS	20 kA RMS
3 Second Short Time Current		
Ring Switches	20 kA	20 kA
Tee to Circuit Breaker	20 kA	20 kA
Earth Switch Peak Making Current		
Ring Switches	50 kA	50 kA
Tee to Circuit Breaker	3.15 kA	50 kA
Internal Arc Rating		
Freestanding	20 kA 1 sec	20 kA 1 sec
Transformer Mounted	20 kA 1 sec	-
Gas Pressure		
Filling Pressure at 20° C	0.4 Bar G	0.4 Bar G
Minimum Operating Pressure	0.05 Bar G	0.05 Bar G
IP Rating	IP33 (IP54)	IP33D (IP54)
Dimensions		
Height (on standard support legs)	1658 mm	1658 mm
Width (with cable boxes)	936 mm	936 mm
Depth (with cable box)	1111 mm	1111 mm
Weight (approx)	410 Kg	410 Kg
Protection		
Time Limit Fuse	•	•
Auxiliary Powered Relay	•	•
Self Powered Relay	•	•
Testing Standards		
	BS EN 60265-1	BS EN 60265-1
	IEC 60056	IEC 60056
	BS EN 60129	BS EN 60129
	BS EN 60694	BS EN 60694
	BS EN 60298	BS EN 60298

(Ratings in brackets are optional)

utilities uk

Our major customers include:

AQUILA NETWORKS
24 SEVEN
EAST MIDLANDS ELECTRICITY
NORTHERN ELECTRIC
NORTHERN IRELAND ELECTRICITY
SCOTTISH POWER
SEEBOARD
SCOTTISH & SOUTHERN ENERGY
WPD

industry uk

CEGELEC
KVAERNER
MINISTRY OF DEFENCE
FORD MOTOR COMPANY
SEVERN TRENT WATER
ANGLIAN WATER

export worldwide

Delivering Lucy Switchgear products worldwide:

CLP • HONG KONG
ADWEA • ABU DHABI
MEW • KUWAIT
MEW • BAHRAIN
DEWA • DUBAI
JEPIC • JORDAN
ENERGEX • AUSTRALIA
NEPA • NIGERIA
UEB • UGANDA
ECG • GHANA
KPLC • KENYA
CODENSA • COLOMBIA

A global network

In association with industrial partners and contractors, Lucy Switchgear has established a global network operating in over 50 countries. Currently its 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 Oxford, UK, and a main regional office in Dubai, servicing the Middle East, the Lucy group is constantly looking to develop further partnerships.



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