

Sabre

Ring Main Unit



Sabre catalogue

Table of contents

Introduction to Lucy Electric	3
Product panorama	4
Introduction to Sabre	5
Installation and operating conditions	6
Safety features	6
Application example	9
Standards	9
The Sabre range	10
Non extensible range	10
Extensible range	12
Mounting style	17
Product characteristics	19
i. Product presentation	19
ii. User interface and interlocking mechanism	20
iii. Ring switch	21
iv. Vacuum circuit breaker	21
v. Circuit breaker protection	22
a. TLF	22
b. Protection relays	24
vi. Protection CTs for TLF and relays	27
vii. Bushings	27
Options and accessories	28
i. Secondary injection	28
ii. Actuators (motors)	28
iii. Cable boxes, glands and accessories	29
iv. Bus bar couplings	30
v. MV sensors	30
vi. Watchdog for relays	30
vii. Operation counter	30
viii. Castell locks	30
ix. Protection trip remote indicator	30
x. Shunt trip coils	31
xi. Earth fault indicators (EFI)	31
Cable terminations	32
Remote terminal unit (RTU)	33
Smart grid ready	34
Technical data sheet	35
Dimensions	37
Models, options and accessories	47
Sabre models and options order form	53
Air metering unit (AMU)	57
i. Characteristics	57
ii. Mounting style	57
iii. Dimensions	58
iv. Options and Accessories	60
Air metering unit (AMU) order form	66
Sabre accessories order form	68

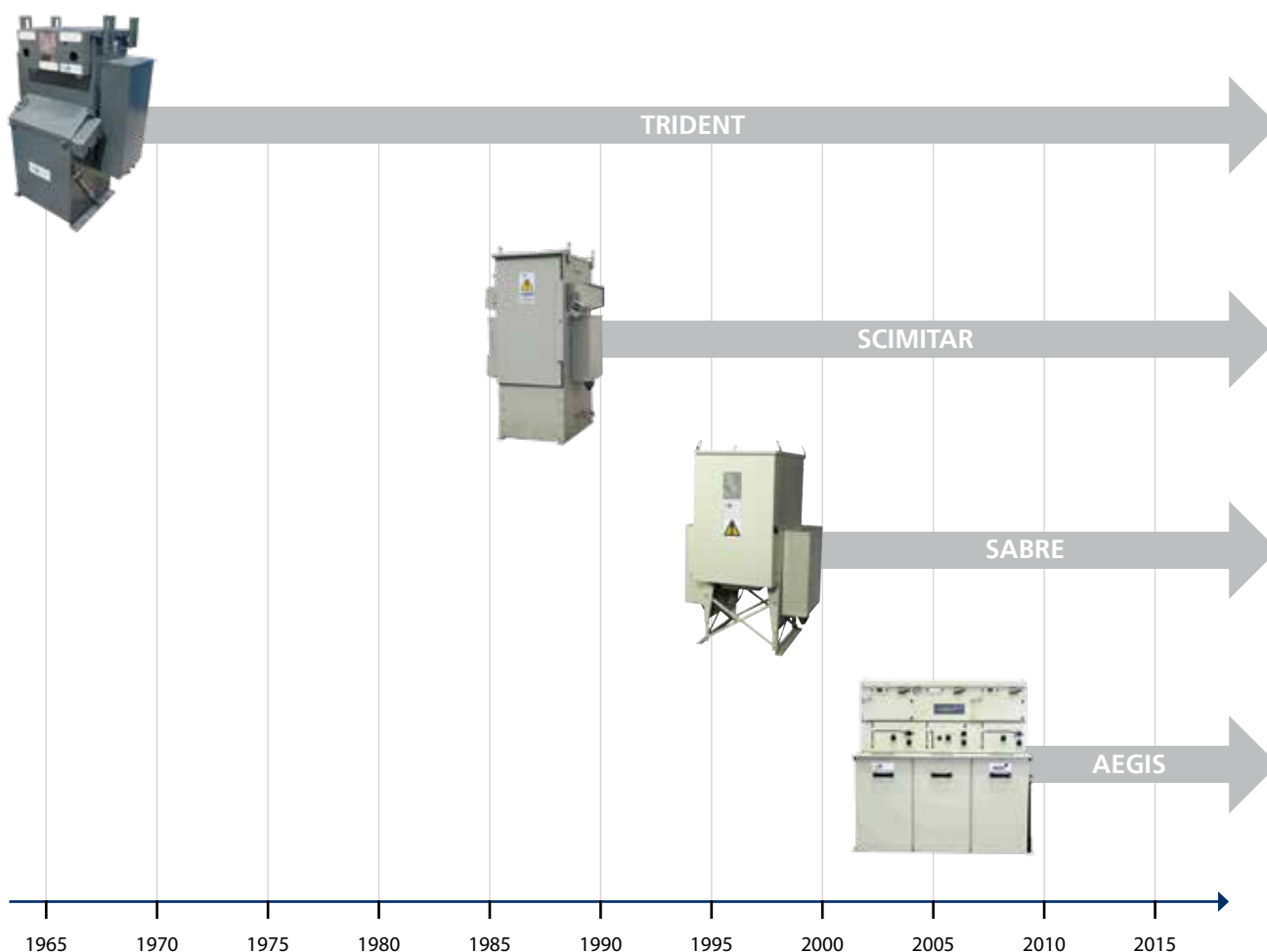
Introduction to Lucy Electric

Lucy Electric is a global leader in switching, protection and automation solutions for electrical distribution systems with over 100 years' industry experience. From its modest beginnings in street lighting, the company today is a specialist in secondary power distribution, engineering high-performance medium voltage switchgear for utility, industrial and commercial applications with a broad product portfolio that includes overhead line equipment and retrofit and automation solutions.

Engineering excellence coupled with state of the art technology make Lucy Electric one of the few companies that can offer truly bespoke solutions. With

the capability to manufacture equipment to suit almost any location, climate or situation, Lucy Electric can also offer maintenance packages and dedicated after sales support throughout the product lifecycle. A specialist UK based research and development facility ensures that Lucy Electric's products are always at the cutting edge of technology enabling rapid response to evolving technical and market demands of customers. All of our purpose built, state of the art manufacturing facilities espouse the latest international Quality and Environmental standards. The global profile of Lucy Electric is emphasised through manufacturing facilities in the United Arab Emirates, Saudi Arabia and India, offices in China, Dubai, Malaysia and South Africa and an established global network of industrial partners and contractors operating in over 50 countries worldwide.

Ring main unit range evolution



Product panorama

Lucy Electric medium voltage and high voltage range

Range name	 Trident	 Scimitar	 Sabre	 Aegis	 Rapier GX	 Rapier AX	 Rapier DSB
Type	Ring main unit				Switch disconnector		
Rated voltage (up to)	15.5kV	17.5kV	24kV	24kV	38kV	36kV	145kV
Mode of fault current interruption	Fuse	Fuse	Vacuum	Vacuum	-	-	-
Insulation medium	Oil	SF6				Air	Air
Rated current (up to)	630A					800A	2500A
Mounting	Ground / Transformer			Ground	Pole	Pole	Structure
Installation	Indoor / Outdoor				Outdoor		
Operation					Local / Remote		

Introduction to Sabre

Sabre ring main units are designed for secondary distribution networks up to 24kV. The range is an ideal solution for indoor/outdoor compact substations and is available in non-extensible, extensible and modular formats to suit various application requirements. All of the switching functions are insulated with SF6 gas and sealed in a stainless steel tank with a leakage rate of less than 0.1% per year.

The structural tank welding is performed by a robotic welding process ensuring high reliability with a product life expectancy of more than 30 years. The housing is fully treated using zinc coated steel and electrostatically applied oven cured paint to resist degradation from pollution and harsh climatic conditions.

The transformer protection is by vacuum circuit breaker. On request, the units can be supplied with integrated automation for remote monitoring and control functions.

Characteristics:

- Up to 24kV and 630Amps ratings
- Non extensible, extensible and modular range
- Switching functions enclosed in a SF6 gas insulated steel tank, sealed for life
- Intuitive single line mimic diagram for simple and safe operation
- Integrated earth and test facility for easy and safe cable test without removing cable connections
- Choice of TLF (time limit fuses) or self/auxiliary powered relay protection
- Anti-reflex mechanism to prevent load break switch opening under fault conditions
- Fully interlocked operation with padlocking facility for maximum operator protection
- Freestanding and transformer mounted units
- Actuators (motorised) for ring switches and circuit breakers
- Seamless integration with SCADA network for remote operation and control
- Maintenance free with 30 years life expectancy

Installation and operating conditions

- IP54 outdoor installation (kiosk not necessary)
- Ambient temperature for operation: -25°C to 60°C
- Average temperature over 24 hours: 40°C
- Maximum altitude for operation without derating: 1000m
- Insulation medium: SF6 Gas
- Interruption medium: Vacuum

Safety features

Operation mechanism

The operating mechanism of the ring switches and circuit breaker incorporates mechanical interlocks and padlocking facilities which make it impossible to simultaneously close the ring switch/circuit breaker and the earth switch.

Anti-reflex mechanism

Anti-reflex mechanisms on ring switches ensure a time delay between switching operations.

Internal arc withstand

Sabre gas tanks are fully internal arc rated and this feature is also available on the cable boxes (optional) to ensure maximum operator safety in the event of internal faults. The gas tanks are available in AF (front), AFL (front and lateral) and AFLR (front, lateral and rear) ratings.

For more details on internal arc classification (IAC) ratings, please refer to the technical data sheet.

Cable earth and test facility (E&T)

E&T feature is used for testing cable insulation and to locate faults in the circuit without the need to remove the main cables from the cable box.

The cable test access cover is fully interlocked and cannot be opened until the ring switch or circuit breaker switch is in the Earth ON position. The test bushings are earthed with a star bar which has to be removed for cable tests.

Ring switches: E&T is a standard feature located at the bottom of the unit.



Vacuum circuit breakers: E&T is an optional feature only on 630A VCB and is located at the top of the unit



Cable boxes

The cable boxes are located laterally or at the rear of the ring main unit. Factory mounted protection CTs are provided on the circuit breaker cable bushings for ease of installation and to avoid any potential damage to the CT during transit and connection. For additional operator safety, the cable boxes are earthed and can be interlocked to allow access to the operator only if the function is in the Earth ON position. There is an option to supply these cable boxes with internal arc rating as per IEC standards (for further information, please refer to the cable box, gland and accessories section).

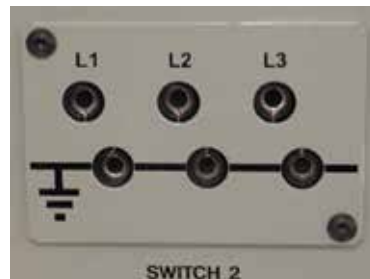
Safety features

VPIS

VPIS (Voltage Presence Indication System) is an optional feature in the Sabre range. The VPIS receives a voltage signal through the voltage divider built into the cable bushings. They can also be fitted with neon lights and momentary latching push buttons to show voltage presence without needing external testing probes.

Two types of voltage presence indication devices are offered:

- Pfisterer sockets
- Neon indicators with push-to-test buttons and phase comparator sockets



Pfisterer sockets



Neon indicator with push-to-test buttons

Gas pressure indicator

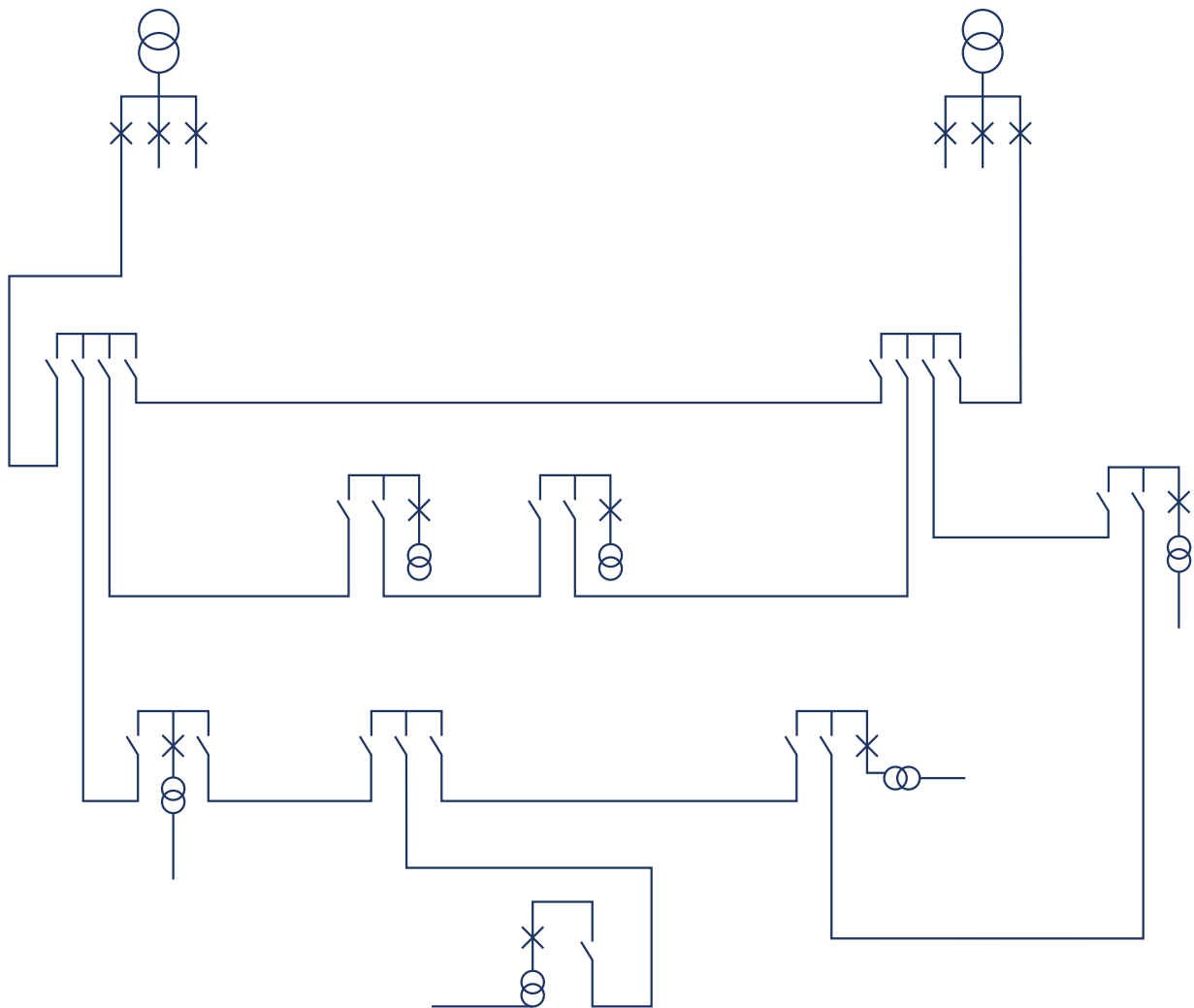
- A gas pressure indicator is fitted to the tank which has green and red sectors to indicate the minimum permissible pressure for safe operation
- An optional remote gas pressure alarm (1N/O) can be specified to alert the operator in the event of gas pressure falling below the permissible operable limit



Application examples

The key areas of application are

- Energy
 - i. Generation: wind power, solar power
 - ii. Distribution: compact substations
- Infrastructure: tunnels, airports, ports, underground railway stations
- Commercial buildings: hospitals, shopping centres, hotels, office buildings, data centres
- Industries: water and waste water, mining, minerals, automotive, iron and steel, paper and pulp, cement and petroleum



Standards

International Standards

IEC 62271-1

IEC 62271-100

IEC 62271-102

IEC 62271-103

IEC 62271-200

ENA TS 41-36

The Sabre range

Non extensible range

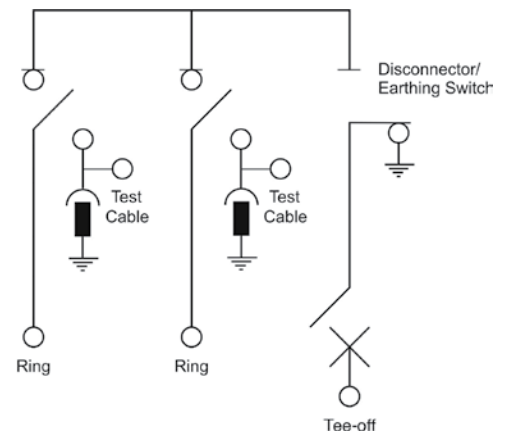
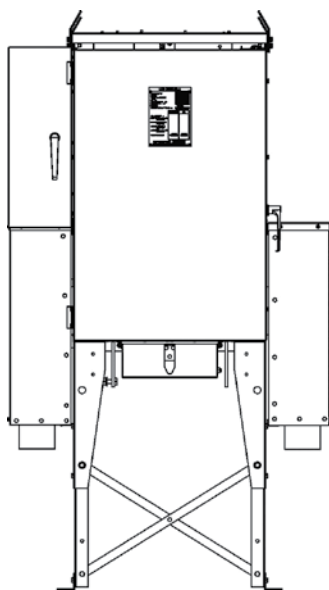
Non extensible ring main units are an ideal solution for compact outdoor substations. Along with low voltage distribution cabinets, these units can be easily coupled to the distribution transformer, forming a compact outdoor package substation.

Modular non-extensible ring switches are an ideal solution for making a switching point in the network.

- **Ring main units**

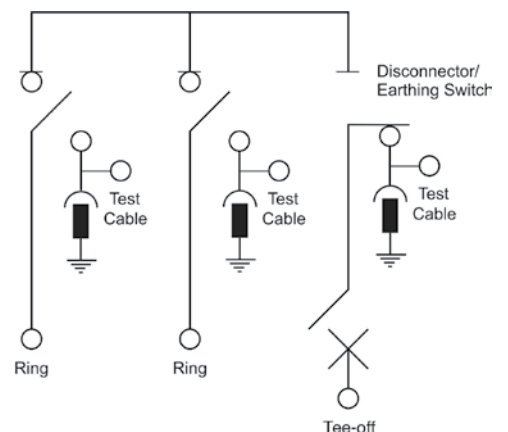
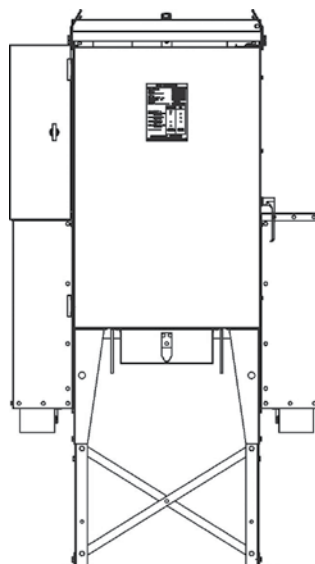
VRN2a

12/15.5kV, 2 ring switches 630A + 1 VCB 250A



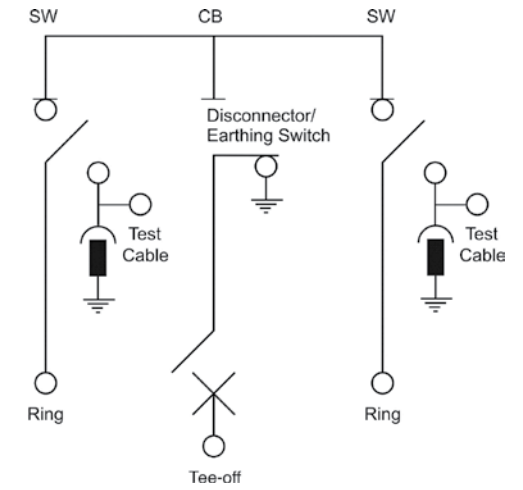
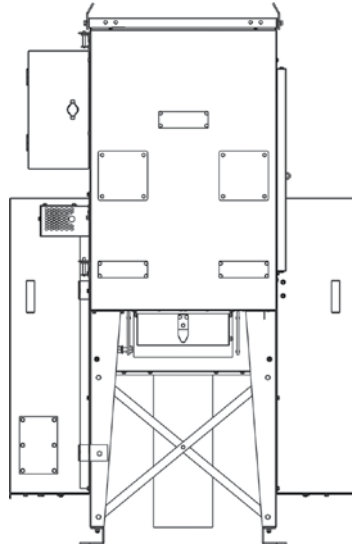
VRN6a:

12/15.5kV, 2 ring switches 630A + 1 VCB 250/630A



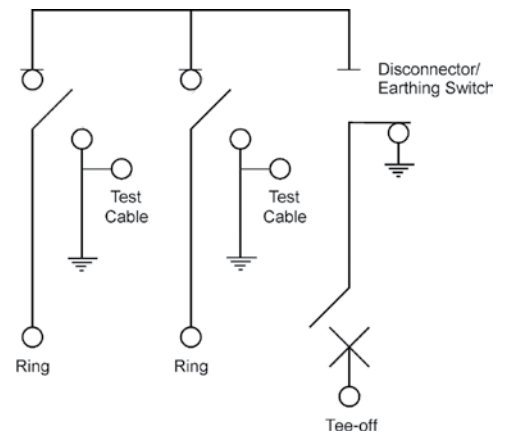
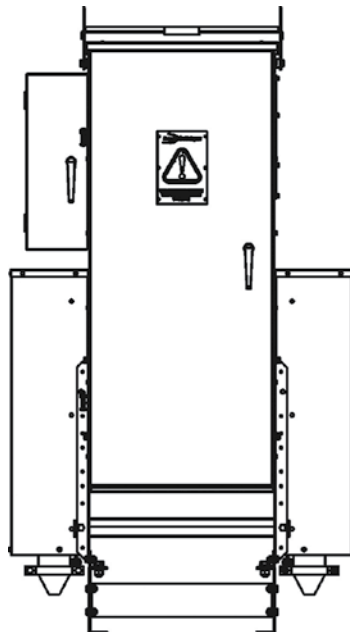
VRNFS

17.5KV, 2 ring switches 630A + 1VCB 400A



VRN24

24kV, 2 ring switches 630A + 1 VCB 400A

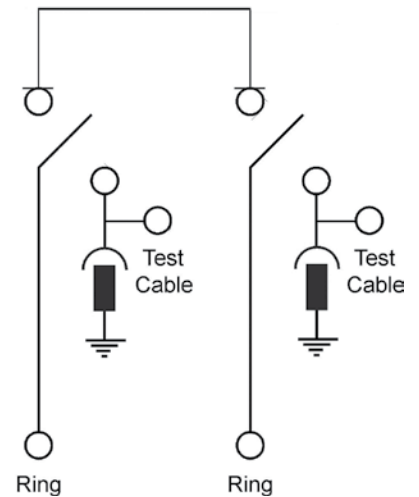
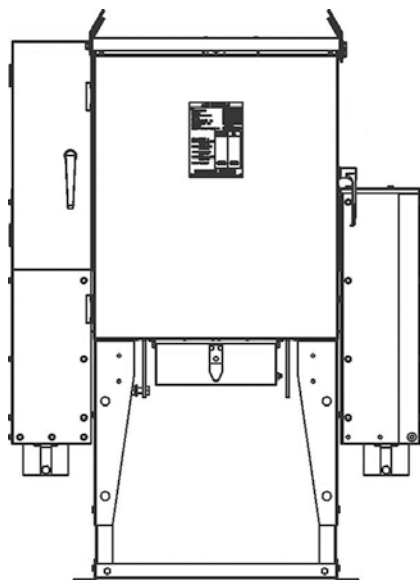


The Sabre range

- **Modular ring switch**

DSN6a

12/15.5kV, 2 ring switches 630A



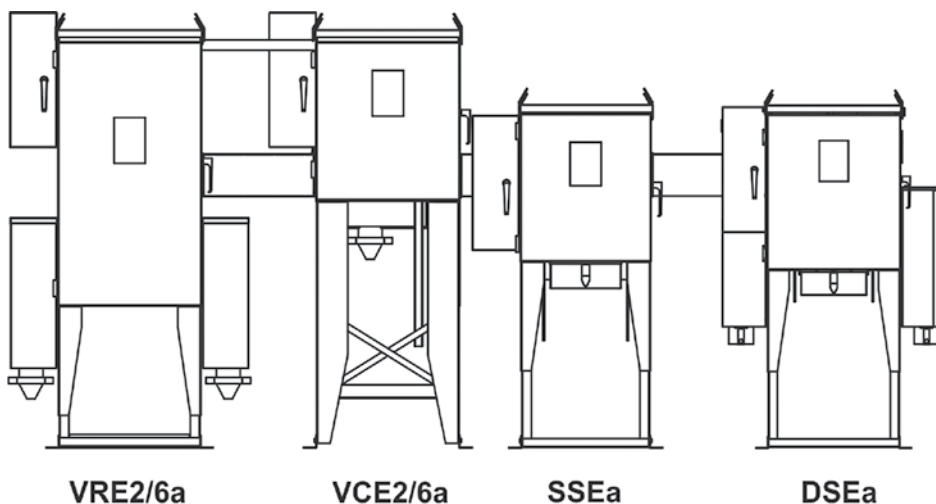
Extensible range

The extensible range is used to add another function on the left, right or both sides of switchgear installed in secondary networks. This is an ideal solution to allow future upgrades to systems when extra capacity is required. The units can be easily extended in any combination on site without specific tooling or floor preparation and without the need to transfer SF6 gas. The extensible range is designed to be mounted outdoors without needing a kiosk.

The units are extended as shown in the diagram below:

All the extensible units are available in the following configurations:

- Left hand
- Right hand
- Both sides



VRE2/6a

VCE2/6a

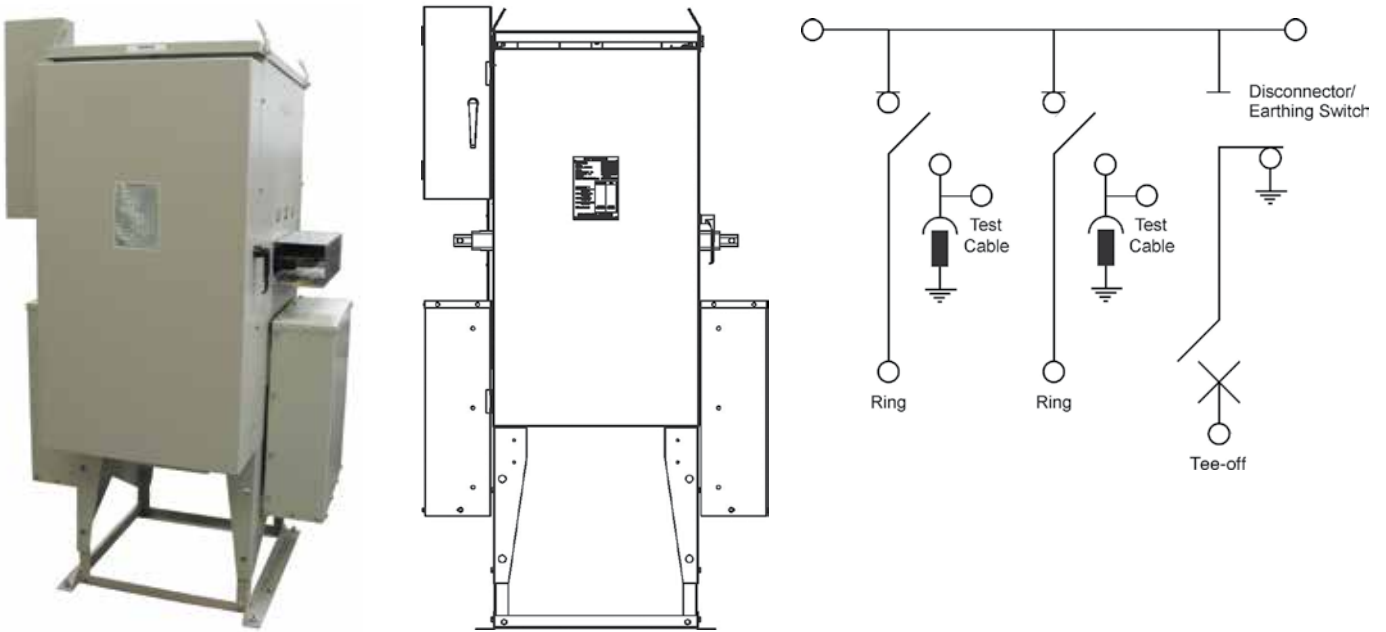
SSEa

DSEa

• Ring main units

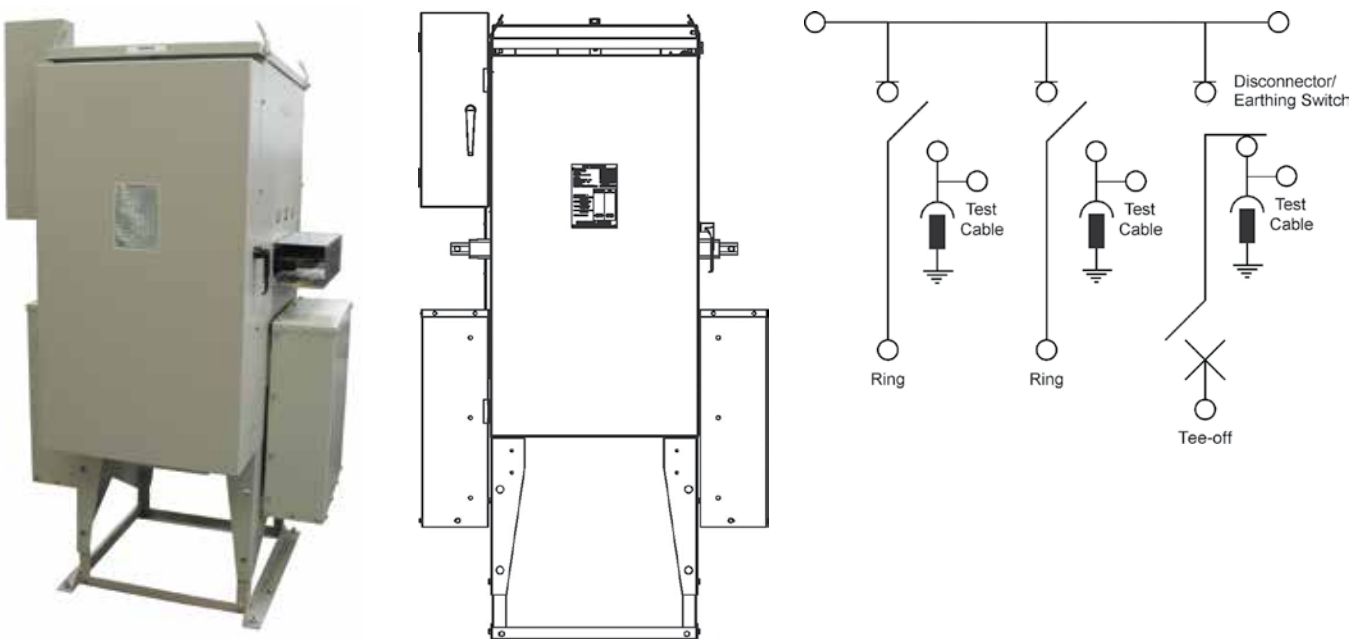
VRE2a

12/15.5kV, 2 ring switches 630A + 1 VCB 250A



VRE6a

12/15.5kV, 2 ring switches 630A + 1 VCB 250/630A

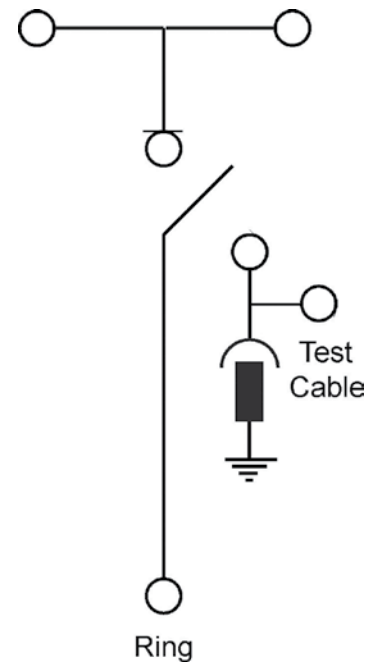
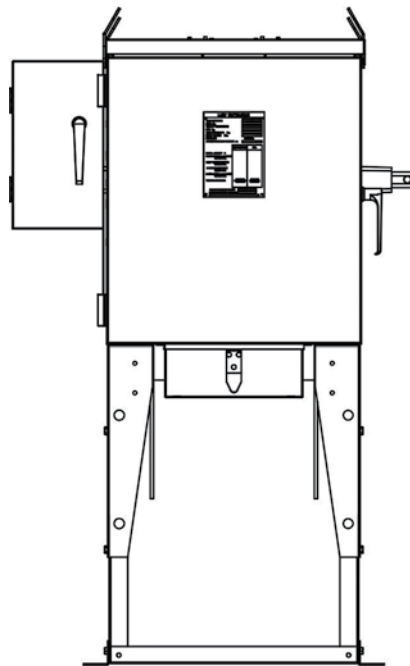


The Sabre range

- **Modular ring switch**

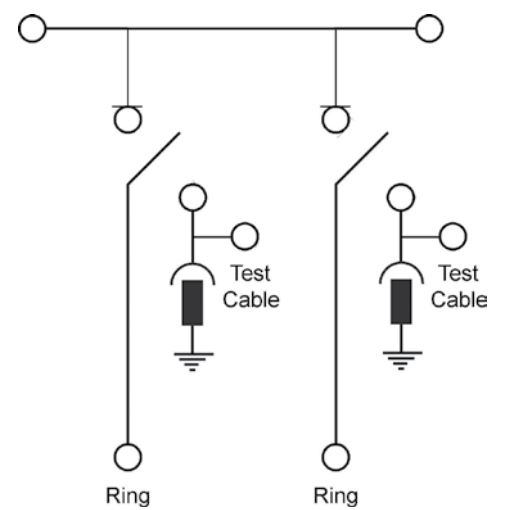
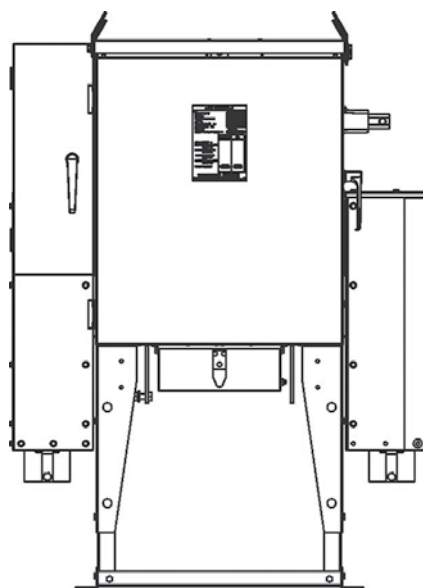
SSE6a

12/15.5kV, 1 ring switch 630A



DSE6a

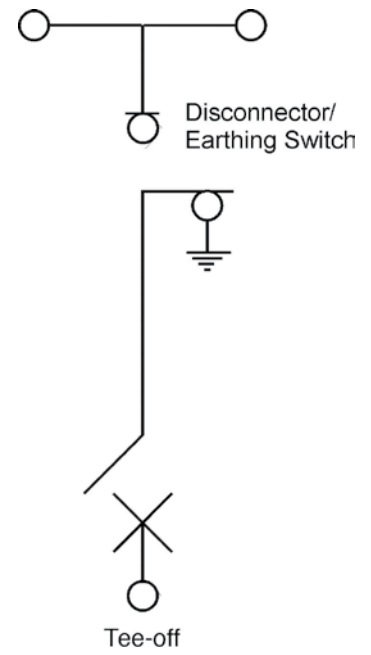
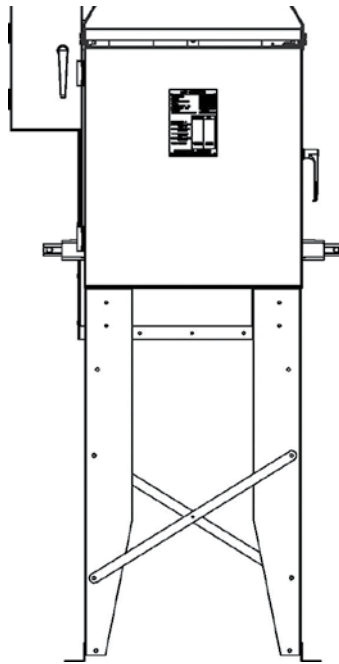
12/15.5kV, 2 ring switches 630A



• **Modular circuit breakers**

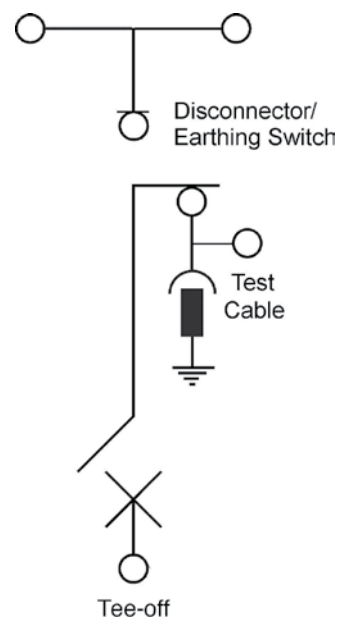
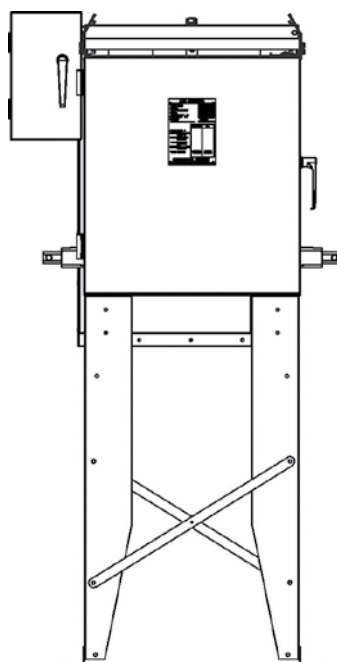
VCE2a

12/15.5kV, 1 VCB 250A



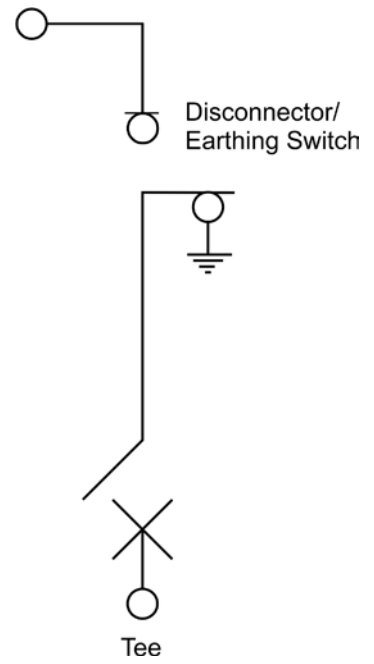
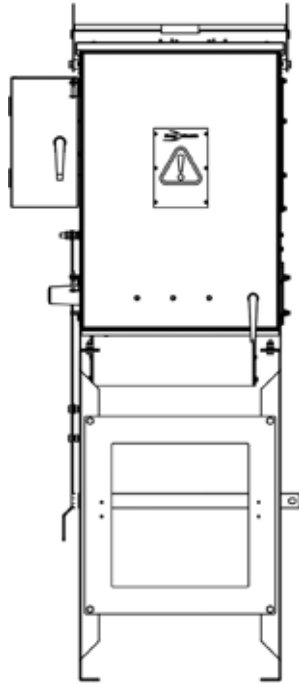
VCE6a

12/15.5kV, 1 VCB 630A



- **Modular circuit breakers**

VCE24
24kV, 1 VCB 400A



Mounting style

- Freestanding units



**Outdoor free standing with
bottom entry cable box**



**Indoor free standing with
top entry cable box**

- **Transformer mounted unit**



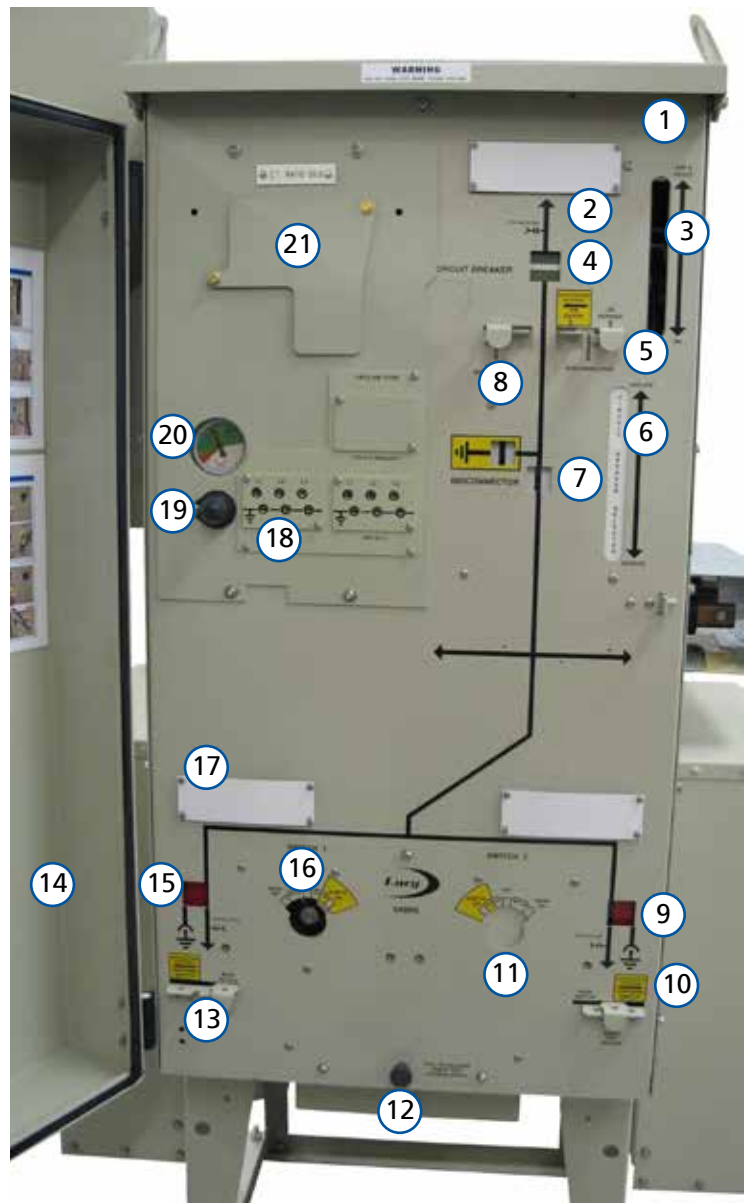
The Sabre ring main unit along with the low voltage distribution cabinet is mounted on the distribution transformer to form a low cost outdoor package substation to be used in distribution networks.

Product characteristics

i. Product presentation

VRE6a RMU parts labeled. For other products please refer to their respective IOM.

- ① Fascia / front panel
- ② Optional 'pull to trip' knob & 'tripped on fault' indicator blanks
- ③ Circuit breaker/Tee-off operation slot
- ④ Circuit breaker/Tee-off indicator
- ⑤ Circuit breaker/Tee-off selector
- ⑥ Disconnecter operation slot
- ⑦ Disconnecter indicator (service/earth)
- ⑧ Disconnecter padlock flap
- ⑨ Ring switch 2 indicator
- ⑩ Ring switch 2 selector
- ⑪ Ring switch 2 motor pack
- ⑫ Ring switch cable test access cover
- ⑬ Ring switch 1 selector
- ⑭ Door
- ⑮ Ring switch 1 indicator
- ⑯ Ring switch 1 operating aperture
- ⑰ Circuit label - customer customization
- ⑱ Optional VPIS plates for LH/RH Ring switches & CB/Tee-off
- ⑲ SF6 top up valve - Hansen coupling
- ⑳ Pressure indicator
- ㉑ TLF



ii. User interface and interlocking mechanism

Safety interlocking

Ring switch and circuit breaker mechanisms are fitted with safety interlocks to protect the operator and equipment from unintentional operation

Position		Interlock status	
Ring switch	Selector	Cable box (optional)	Earth & test interlock
ON	Main	ON	Locked
OFF	Main	ON	Locked
OFF	Earth	ON	Locked
Earth ON	Earth	OFF	Unlocked



Ring switch mechanism

Position		Interlock status	
Circuit breaker	Selector	Cable compartment interlock (optional)	Earth & test interlock (optional)
ON	Main	Locked	Locked
OFF (Tripped)	Main	Locked	Locked
OFF (Reset)	Earth	Locked	Locked
Earth ON	Earth	Unlocked	Unlocked
Earth ON	Earth	Locked	Locked
OFF (Tripped)	Earth	Locked	Locked



Circuit breaker mechanism

iii. Ring switch

Standard features

- Three function ON, OFF & Earth spring loaded mechanism, independent manual operation
- Single mechanism with rotary moving shaft for switching ON/OFF/Earth positions
- Interlocked selector with padlocking facility for selecting Mains or Earth ON position
- Single line intuitive mimic diagram with clear indication of switch status (ON, OFF or Earth position)
- Fully interlocked cable earth and test (E&T) facility
- Gas pressure indicator
- Lateral cable terminations with DIN 400 type C bushings
- Padlock facility (8mm diameter hole) for all the operating positions

Optional features, factory fitted

- Remote low gas pressure alarm, 1N/O
- VPIS - voltage presence indication system
- Remote switch position indicator (1N/O, 1N/C and 2N/O, 2NC)
- Short circuit and earth fault current indicators (EFI)
- Actuator (motor) wiring
- Castell locks

Optional features also available as retrofit

- Actuator (motor) for ring switch (only if unit is pre wired for motorisation)
- Internal arc rated cable box
- Wide range of cable glands and accessories to accommodate 1 and 3 core cables (refer to cable box section for further information)

iv. Vacuum circuit breaker

- 250A rated vacuum circuit breaker for transformer protection
- 400A rated vacuum circuit breaker for transformer/downstream network protection
- 630A rated vacuum circuit breaker for transformer/downstream network protection

Standard features

- Three functions (ON, OFF & Earth), two position spring loaded mechanism, independent manual operation

- Single mechanism with two independent operating

shafts, one for circuit breaker ON/OFF position and another for selecting disconnecter in Mains or Earth (isolation)

- Interlocked disconnecter selector, locked from operation when circuit breaker is in ON position
- Trip coil for receiving tripping signal from relay or TLF devices
- Protection function TLF or relay (customer specific)
- Single line intuitive mimic diagram with clear indication of switch status (ON, OFF or Earth position)
- Gas pressure indicator
- Horizontal cable terminations at the rear of the unit with parallel bushings (except for VRNFS and VRN24 which have DIN 400 type C bushings as standard)
- Protection CTs (current transformers) mounted on cable bushings (customer specific ratios)
- Padlock facility (8mm diameter hole) for all the operating positions

Optional features, factory fitted

- Remote low gas pressure alarm, 1N/O
- Mechanical (manual) pull-to-trip button for local operation
- VPIS (voltage presence indication system - refer to VPIS section for more details)
- Remote circuit breaker position indicator (1N/O, 1N/C and 2N/O, 2NC)
- Fully interlocked cable earth and test facility (only on 630A VCB)
- Self-powered relay for protection (customer specific)
- TLF (time limit fuses) for alternative protection
- Wide range of CTs for TLF and relay protection
- Remote protection trip output status signal (for TLF or relay trip status) 1N/O
- Shunt trip coils for external tripping
- Tripped on fault indication
- Watchdog for relays (only available with selective relays)
- Circuit breaker actuator enabled indication
- Actuators (motor) wiring

Optional features also available as retrofit

- Actuator (motor) for CB (only if unit is pre wired for motorisation)
- Internal arc rated cable box
- Wide range of cable glands and accessories to accommodate 1 and 3 core cables (refer to cable box section for further information)

v. Circuit breaker protection

Two types of protection devices are offered to protect the circuit breaker

- TLF : Time limit fuses
- Protection relays

a. TLF

When utilised in conjunction with circuit breaker type ring main units, time limit fuses (TLF) are a cost effective method of providing fault protection for overcurrent and earth faults (optional) to a transformer of 2MVA or less.

It is a recognised method of protection and was developed to comply with EA 41-26 (now superseded by ENA TS 41-36) with fuse links in accordance with ENA TS 12-6.

It should be noted that the TLF protection system is not a device for limiting overload levels of individual transformers. It should be used for fault protection only.

The TLF system provides protection for overcurrent and earth faults between the MV circuit breaker and the LV protection device.

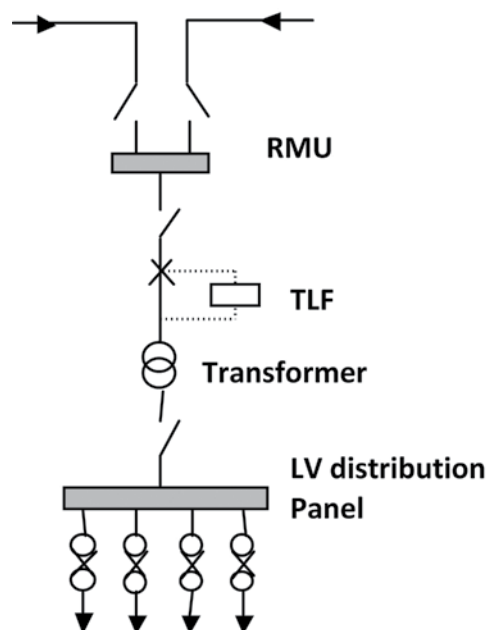
The selected TLF rating should be such that it allows for discrimination between the MV & LV devices. This will ensure that the circuit breaker does not open for faults beyond the LV distributor protection device.

When fitted with TLF, the Lucy RMU can also be configured to enable tripping of the circuit breaker from remote devices (Bukholtz, LV CB etc).

Lucy Electric customers in Europe, the Middle East, Africa and Asia are currently using TLF protection system within their distribution networks.



Fuse dimensions: Length 57mm x Diameter 13mm



Recommended TLF settings

		Transformer ratings (kVA)							
		200	315	500	800	1000	1250	1600	2000
		Rated voltage (kV)	TFL fuse rating (A)						
ct ratio 50/5 Earth fault setting = 25A (instantaneous trip)	3.3	10A							
	6.6	5A	10A	15A					
	11	3A	5A	10A	15A				
	13.8	3A	5A	10A	15A				
	24			3A	5A	7.5A			
ct ratio 100/5 Earth fault setting = 30A (instantaneous trip)	3.3	5A	10A	15A					
	6.6		5A	7.5A	12.5A	15A			
	11			5A	7.5A	10A	12.5A	15A	
	13.8			5A	7.5A	10A	12.5A	15A	
	24						5A	5A	7.5A

Advantage of vacuum circuit breaker with TLF compared to HV fuses

Feature	VCB with TLF	Fuse switch
Overall cost of units	Similar	
Approximate fuse replacement cost	\$5	\$50
Maximum rating of transformer, can be protected	2MVA*	1MVA
Maximum rated normal current	630A	200A
Physical size of fuses	Small	Large
Possibility of some pollution while changing fuses causing PD and flashover issues	No	Yes
Fuse location inside the unit	LV side	HV side
Range of fuses required for different rated transformers	Very small with multi ratio CT	Large

(* No issues with transfer current switching to IEC 62271-105, which minimizes the MVA rating)

Advantage of vacuum circuit breaker with TLF compared to protection relays

Feature	TLF	Protection relay
Installation cost of function	Low	High
Auxiliary power source for operation	Not required	As required
Delay in activation of trip function due to capacitor charging time lag	No delay	Delay
Employee training on setting tripping curves	Not required	Required
Additional training on different manufacturer setting up procedure	Not required	Required
Maintenance and repair cost	Low	High
Operating temperature limitations	None	Up to 70 °C
Upstream and downstream discrimination protection of circuit	Yes	Yes
Overcurrent and Earth fault protection	Yes	Yes

b. Protection relays



The Sabre range can be fitted with self-powered relays for protecting the transformer or downstream network from fault currents by tripping the circuit breaker. These relays incorporate many advanced features and have a variety of settings to provide discrimination protection in networks. The self-powered feature eliminates reliance on external power sources and increases the performance and reliability of the protection function.

Below are the technical characteristics of Woodward WIP1 and Fanox SIAC range. Other manufacturers' relays can also be incorporated into the units on request.

Woodward WIP 1

Manufacturer	Woodward
Range	WIP1
Functions	
Phase overcurrent	•
Short circuit protection	•
Number of overcurrent elements	2
Earth overcurrent	•
Number of earth overcurrent elements	2
Characteristics	
Display (measuring values and parameters)	•
Setting via buttons	•
Standard CT (1A/5A)	1A
LED pickup	•
LED trip indicator	•
Flag indication output	•
Fault memory	•
Clock	•
Password protection	•
Electro impulse and relay contact output	•
Number of output relays	3 C/O
Input remote tripping	•
Interface	O
RS 485 interface with pro open data protocol	O
RS-485 interface with Modbus protocol	O
Additional power supply	O

Key • Standard O Option

Fanox



Manufacturer	Fanox	Fanox	Fanox
Range	SIAC*****D	SIAC*****B	SIAC*****FA
Functions			
Phase overcurrent	•	•	•
Short circuit protection	•	•	•
Number of overcurrent elements	2 50P: Tap:0.1...30xIn Time:0,02...300 s 51P: Tap:0.1...7xIn	2 50P: Tap:0.1...30xIn Time:0,02...300 s 51P: Tap:0.1...7xIn	3 (2) 50P: Tap:0.1...30xIn Time:0,02...300 s 51P: Tap:0.1...7xIn
Earth overcurrent	•	•	•
Number of earth overcurrent elements	2 50N: Tap:0.1...30xIn Time:0,02...300 s 51N: Tap:0.1...7xIn	2 50N: Tap:0.1...30xIn Time:0,02...300 s 51N: Tap:0.1...7xIn	3 (2) 50N: Tap:0.1...30xIn Time:0,02...300 s 51N: Tap:0.1...7xIn
Pickup level	0,2xIn(single phase) 0,1xIn (three phase)	0,2xIn(single phase) 0,1xIn (three phase)	0,2xIn(single phase) 0,1xIn (three phase)
Startup time (Trip time after fault. Single phase)	130 ms	130 ms	70 ms
Characteristics			
Display (measuring values and parameters)	• (Display 20x2)	• (Display 20x2)	• (Display 20x2)
Setting via buttons	•	•	•
Test menu	• The test menu can be used to check the operation of the signaling components (LEDs and magnetic indicators), along with the trip output and the signaling outputs	• The test menu can be used to check the operation of the signaling components (LEDs and magnetic indicators), along with the trip output and the signaling outputs	• The test menu can be used to check the operation of the signaling components (LEDs and magnetic indicators), along with the trip output and the signaling outputs
Settings groups	1	1	3
Standard CT (1A/5A)	1A or 5A (depending on model)	1A or 5A (depending on model)	1A or 5A (depending on model)
LED pickup	The pickup message is shown at the display. Besides, the SIA-C front panel has three LED pilot lights to show the type of power being used: self-power, battery or auxiliary power	The pickup message is shown at the display. Besides, the SIA-C front panel has three LED pilot lights to show the type of power being used: self-power, battery or auxiliary power	The pickup message is shown at the display. Besides, the SIA-C front panel has two LED pilot lights to show the type of power being used: self-power or battery
LED trip indicator	To signal the trip, the front panel is equipped with 1 bistable magnetic indicator which indicates a trip has occurred	To signal the trip, the front panel is equipped with 1 bistable magnetic indicator which indicates a trip has occurred	To signal the trip, the front panel is equipped with 2 bistable magnetic indicators which indicates a trip has occurred

Manufacturer	Fanox	Fanox	Fanox
Range	SIAC*****D	SIAC*****B	SIAC*****FA
Flag indication output	Flags are included in the relay, no need of external modules	Flags are included in the relay, no need of external modules	Flags are included in the relay, no need of external modules
Fault memory	20 fault reports (64 events each)	20 fault reports (64 events each)	20 fault reports (64 events each)
Events	500 events in non-volatile RAM memory	500 events in non-volatile RAM memory	500 events in non-volatile RAM memory
Characteristics			
Clock	•	•	•
Password protection	•	•	•
Electro impulse and relay contact output	• Trip contact for striker or coil	• Trip contact for striker or coil	• Trip contact for striker or coil
Number of output relays	2 NO/NC	2 NO/NC	3 NO
Watchdog contact	-	-	-
Input remote tripping	•	•	•
Interface	○	○	○
RS 485 interface with pro open data protocol	-	-	-
RS-485 interface with Modbus protocol	○ Option included in the relay, no need for an external module MODBUS	○ Option included in the relay, no need for an external module MODBUS	○ Option included in the relay, no need for an external module MODBUS
Additional power supply	○ Option included in the relay, no need for an external module	○ Option included in the relay, no need for an external module	○ Option included in the relay, no need for an external module
Battery	No need for an internal battery to keep events and faults due to FRAM memory	No need for an internal battery to keep events and faults due to FRAM memory	No need for an internal battery to keep events and faults due to FRAM memory

Other manufacturers' relays are also available on request, please contact our local Sales Office for more information.

vi. Protection CTs for TLF and relays

The protection CT is used in conjunction with relays or TLF protection to protect a wide range of distribution transformers.

These CTs are mounted on the circuit breaker tee-off bushings inside the cable box to guard them from damage in transportation, installation and adverse weather conditions.

A comprehensive range of CTs* is available to suit varied application requirements

Dual ratio CT 100/50/-

Dual ratio CT 200:100/-

Triple ratio CT 150:100:50/-

*Please contact our local Sales Office for more information

vii. Bushings

i. Cable bushings

- a. **Ring switch:** DIN 400 type C
(125mm phase centre distance)
- b. **Vacuum circuit breaker tee-off:**
 - Parallel bushings (105mm phase centre distance)
Optional adaptor for converting parallel bushings connection to DIN 400 type C (125mm phase centre distance)
 - DIN 400 type C (125mm phase centre distance)
- c. **Metering unit:** DIN 400 type C
(125mm phase centre distance)

ii. Bus bar extension bushings:

(Obround 125mm phase centre distance)

iii. Test bushings



DIN 400 type C



Parallel bushings



Obround bushings



Test bushings

Options and accessories

i. Secondary injection

Secondary injection is used to test the relays or TLF operation without switching on the high voltage supply to the unit. A low voltage is applied to the secondary side of the CT connection (located in terminal box) to test the operation of the protection devices at the time of commissioning and routine tests.



Marshalling box

ii. Actuators (motors)

Sabre units are fitted with 24V DC motors, which can be powered from the Gemini remote terminal unit (RTU) 24V DC battery in the event of mains AC supply failure.



Ring switch actuator



Vacuum circuit breaker actuator

iii. Cable boxes, glands and accessories

Cable box

Cable boxes are available for the following:

- o Ring switches cable bushings
- o Circuit breakers tee-off bushings
- o Metering units bushings
- o Extensible bus bar bushings
- Safety interlocks: The cable boxes can be interlocked with a ring switch or circuit breaker mechanism. Interlocked cable boxes can only be removed when the circuit is in the 'Earth ON' position
- Internal arc rating
 - o Non internal arc rated cable box as standard
 - o Internal arc rated cable boxes 12.5kA 1sec and 20kA 1 sec as optional
- Cable box lengths
 - o 450mm
 - o 610mm
- Cable entry
 - o Top entry with
 - IP50 standard (indoor only)
 - IP54 optional
 - o Bottom entry with IP54 as standard
 - Straight
 - Angled

Cable gland and gland plates

- Cable gland and gland plates
 - o 1 x 3 core cable
 - X size
 - Gland plates
 - o X size gland plate with earth stud
 - Glands
 - o X tube glands
 - o X brass wiping gland
 - Y size
 - Gland plates
 - o Y size gland with earth stud
 - Glands
 - o Y tube glands
 - o Y brass wiping gland
 - o 3 x 1 core cable
 - Gland plates
 - 3 hole split steel with earth stud
 - 3 hole split steel with earth bar
 - 3 hole solid brass with earth stud
 - 3 hole solid brass with earth bar
 - Glands
 - Single core compression gland
 - Single core heat shrink glands



Bottom entry



Top entry cable box



Angled cable box

For further information refer to the accessories table.

iv. Bus bar couplings

Bus bar couplings are used to connect two extensible units.

Bus bar coupling lengths

- 453mm
- 500mm
- 750mm

Bus bar insulation types

- Heat shrink (manufactured by SPS)
- Heat shrink (manufactured by Raychem)
- Heat shrink (manufactured by REPL)
- Cold fit rubber boot (manufactured by Pirelli)

v. MV sensors

MV sensors are used to detect the medium voltage in the cable and send a signal to the remote control device for auto changeover.

vi. Watchdog for relays

They are used to check the healthy operation of relays.

vii. Operation counter

They are used to count the number of mechanical operations of the ring switch and circuit breaker mechanisms.

viii. Castell locks

Ring switch: Castell locks are used to prevent closing of the open point in the ring network.

Circuit breaker: Key free Earth ON: They are typically used for preventing transformer cubicle access until the circuit breaker is in the Earth ON position.

ix. Protection trip remote indicator

They are used to send a signal to a remote terminal unit if a protection device relay or TLF has tripped (operated).



Castell lock

x. Shunt trip coils

Shunt trips are magnetic coils that are used to trip circuit breakers through local push buttons, RTUs or additional transformer protection devices.

Shunt trips are available in the following voltages:

- DC voltage: 12V, 24V, 48V and 110V
- AC voltages: 110V, 240V
- Multiple voltage range: 24VAC/DC – 240VAC/DC.



Shunt trip

xi. Earth Fault Indicators (EFI)

Earth fault indicators (EFI) are used for rapid location and isolation of faults on medium voltage networks in open loop ring main networks. When the unit detects asymmetrical currents in the 3 phase cable, an earth fault is indicated by means of a flashing LED or mechanical flag.

Below is the list of EFIs available for the Sabre range

Manufacturer Model:
Suparule Sensorform



Features						
Power source	3.6V lithium ½ AA 850mAH battery		110-240V a.c.		CT on current carrying phase	
Voltage range	1 – 38kV					
Trip current	50A					
Primary indication	LED	Mech-flag (RED)		LED	Mech-flag	LED
Flashing duration	>1000 hrs	-	-	10 hrs	-	10 hrs
Minimum fault duration	2.5 cycles					
Manual reset	Push button					
Automatic timer reset	4 or 8 hrs selectable		10 secs after mains restore			
Manual trip test	Push button					
Operating temperature	-40°C to +80°C					
Operating humidity	0-100% RH					
Ingress protection	IP65					
Current sensor diameter:	CT100: 100mm	•	•	•	•	•
	CT150: 150mm	O	O	O	O	O
	CT300: 300mm	O	O	O	O	O
Remote flashing LED indicator	O	O	O	O	O	O
Auxiliary relay, 1N/O latching	O	O	O	O	O	O

Key • Standard O Option Other manufacturers' EFIs are also available on request, please contact our local sales office for more information.

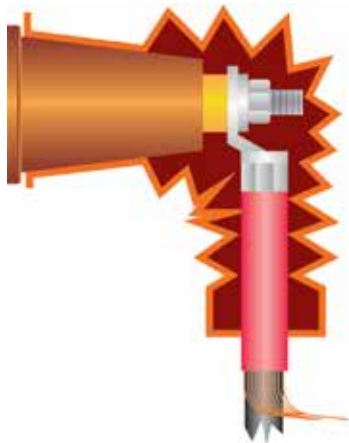
Cable terminations

The bushings are accessible by removing the cable box covers at the lateral and rear of the unit.

The maximum cable sizes that can be used are:

- 300mm² 3 - core
- 500mm² single - core.

The following types of terminations can be used with the Sabre range:



Insulating bushing boot



Profile "C" bolted separable



Heat shrink insulating bushing boot

DIN type C bushings (cable boxes)

- Insulating bushing boot
- Heat shrink insulating bushing boot
- Profile "C" bolted separable

Obround bushings (bus bar extension)

The following cable connections could be used if direct cable connection is required on the bus bar bushings

- Insulating bushing boot
- Heat shrink insulating bushing boot

Parallel bushings (tee-off)

The following connectors could be used if cable tee-off direct cable connection is required

- Insulating bushing boot
- Heat shrink insulating bushing boot

Remote terminal unit (RTU)

The Sabre range can be configured with the next- generation Gemini 3 RTU. This is an all new, highly flexible, general-purpose Remote Terminal Unit designed to remotely monitor and control medium and high voltage switchgear.

The Gemini 3 has a modular design such that it can be configured from a simple monitoring only device to a fully functional automated switch controller. It has the ability to transition from a basic to an advanced RTU by plugging in additional modules. These modules are rugged, making the device field serviceable and future proof.

The Gemini 3 modules available are:

Master Control Module (MCM) – This contains the main processor and supervises all modules. The MCM handles the protocol communications.

Single Switch Module (SSM) – This provides the inputs and outputs to perform secure interlocked control of a single gas enclosed switch.

Dual Switch Module (DSM) – This provides the inputs and outputs to perform secure interlocked control of two MV ring switches.

Power Supply Module (PSM) – This module works with the switch control modules to provide secure switching operations. The PSM generates regulated power to all other modules and external communication equipment. The PSM also provides the intelligent battery charging function to maintain a secure supply.

Input Output Module (IOM) – This is a general purpose module that covers digital and analogue inputs and relay outputs.

Fault Passage Module (FPM) – This is a dual fault passage indicator module which detects and alarms for Overcurrent and Earth Faults.

Human to Machine Interface (HMI) – This is an optional module that allows local control and monitoring without the need for a Computer. It allows local controls to be issued by an authorised Engineer (security enabled) or just provide data to be viewed locally.

Characteristics

- Fault detection (Earth and Phase)
- LED status indicators
- Real time clock (SCADA synchronised)
- Dual isolated Ethernet and RS232 ports
- Isolated RS485 port
- Supervisory selection and indication
- Event memory – 7000 events in non-volatile memory
- Communication protocol
 - DNP 3.0 TCP/IP or Serial
 - IEC 60870-5-101
 - IEC 60870-5-104
 - Modbus TCP or RTU
- Maintenance free



Smart-grid ready

Gemini 3 RTU integration

Key features of Gemini 3

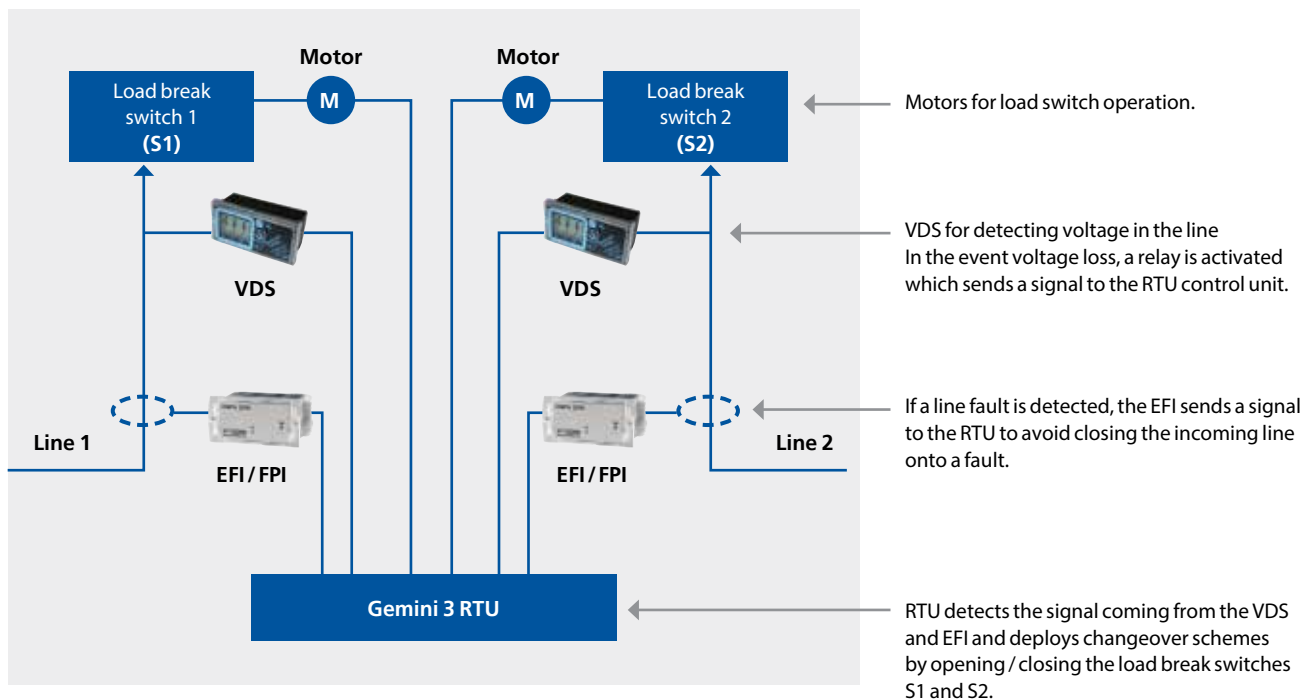
- Embedded auto change over and auto sectionalising functions
- Real time network condition monitoring of voltage, current, power, power factor and frequency
- Flexible communication through radio, RS232, RS485, packet data network, GSM, GPRS, PSTN, ethernet TCP / IP and optical fibre.
- Advanced battery pack to operate under mains AC input failure
- Fully tested to ENATS (Energy Network Association Technical Standards), EMC and environmental standards

Benefits of Automation

- Reduced time in diagnosing system anomalies as well as locating and isolating faulty sections of the network
- Faster response time and quick network reconfiguration
- Optimisation of asset management through the implementation of customised automation schemes
- Reduced operational cost associated with routine network switching
- Increased operator safety

Automatic transfer scheme

Sabre units coupled with Gemini 3 offers full Automatic Transfer Scheme support. This provides the rapid and reliable transfer of the system from one power source to another, in the event of normal source failure. The result is an added layer of reliability in the power supply.



Technical Data Sheet

	Ring main unit						Modular circuit breaker			Modular ring switch			
	Non Extensible				Extensible					Non Extensible			
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a	
Models													
Description		2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	1 VCB	1 VCB	1VB	1 RSW	2 RSW	2 RSW
General													
Rated voltage	kV	12 (15.5)	12 (15.5)	17.5	24	12 (15.5)	12 (15.5)	12 (15.5)	12 (15.5)	24	12 (15.5)	12 (15.5)	12 (15.5)
Rated frequency	Hz	50/60							50	50/60			
Rated lightning impulse withstand voltage													
Directly earthed	kV	75 (95)		95	125	75 (95)			125	75 (95)			
Across disconnector	kV	85 (110)		110	145	85 (110)			145	85 (110)			
Rated power frequency withstand voltage													
Directly earthed	kV	28 (38)		38	50	28 (38)			50	28 (38)			
Across disconnector	kV	38 (45)		45	60	38 (45)			60	38 (45)			
Protection													
Overall unit	IP							IP54					
Tank with HV parts	IP							IP67					
LV control box	IP							IP54					
Front face + mechanism	IP							IP2x					
Cable box	IP							IP54					
Mechanical impact protection	IK	IK07 (2J) Indoor, IK08 (5J) Outdoor											
Internal arc protection													
Unit	kA 1 sec	20		21	16	20			16	20			
cable box (optional)	kA 1 sec	12.5/20		21	12.5	12.5/20			12.5	12.5/20			
Gas tank internal arc ratings													
AF		Standard											
AFL		Optional											
AFLR		-	Optional	-	-	Optional			-	Optional			
SF6 gas													
Filled pressure	Bar (G)	0.4		0.5	0.4			0.5	0.4				
Minimum operating pressure	Bar (G)	0		0.3	0			0.3	0				
Annual leakage rate		≤0.1% per annum											
Weight	Kg	1.46		1.56	1.78	1.05	1.56	0.78	0.98				
Installation conditions													
Ambient air temperature	°C	40 / 50											
Maximum altitude (without derating)*	M	1000											
Relative humidity (max) - over period of 24hrs (IEC 62271-1, sub-clause 2.1)		100%											

	Ring main unit						Modular circuit breaker			Modular ring switch			
	Non Extensible				Extensible					Non Extensible			
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a	
Models													
Description		2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	1 VCB	1 VCB	1 VB	1 RSW	2 RSW	2 RSW
Bus bars													
Rated normal current	A	630		400/630	630								
Rated short time withstand current		20 kA 3s		21kA 1s	16kA 3s	20kA 3s			16kA 3s	20kA 3s			
Rated peak withstand current	kA	50		54.6	40	50			40	50			

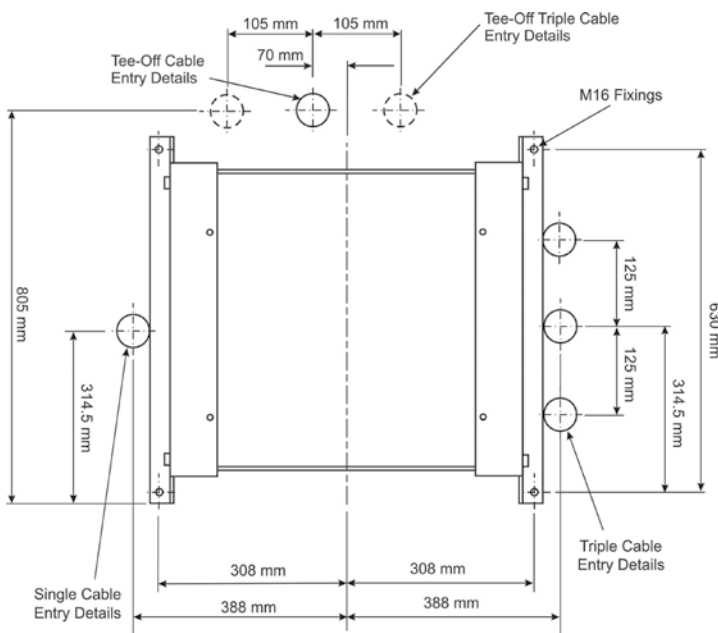
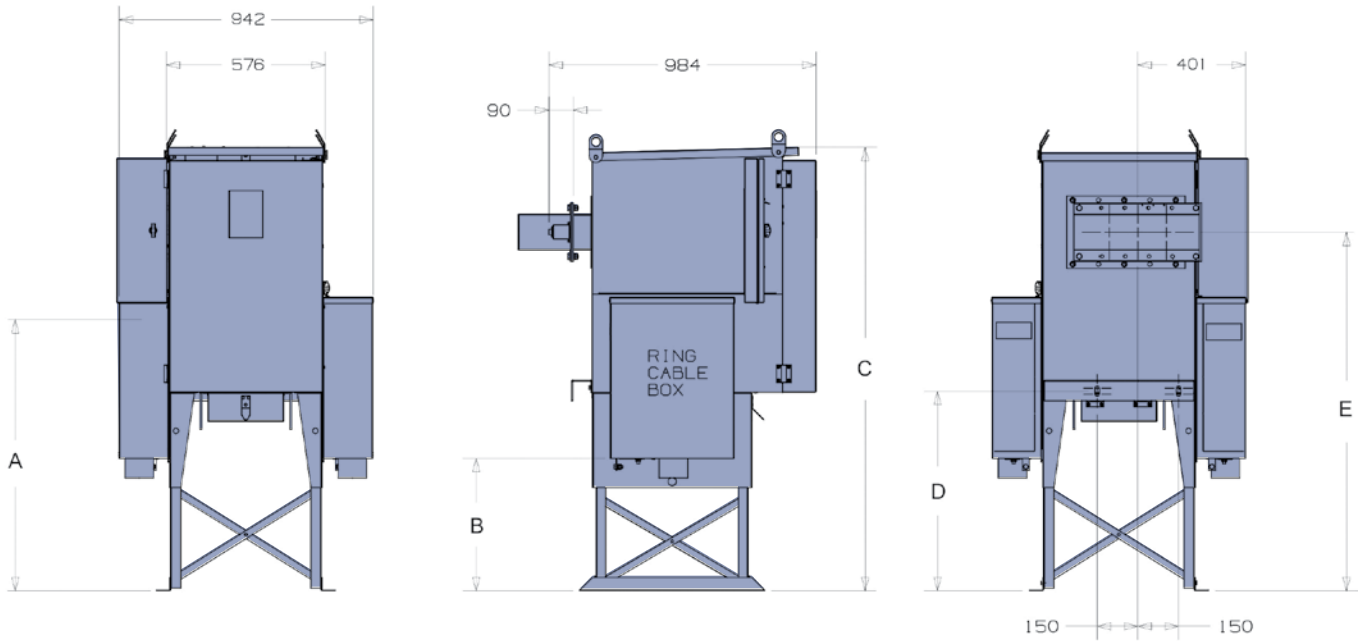
* for higher altitude applications please contact our local Lucy Electric sales office

	Ring main unit						Modular circuit breaker			Modular ring switch				
	Non Extensible				Extensible					Non Extensible				
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a		
Models														
Description		2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	1 VCB	1 VCB	1 VCB	1 RSW	2 RSW	2 RSW	
Ring switch														
Rated normal current	A	630	400/630	630	630						630			
Rated active load breaking current	A	630	400/630	630	630						630			
Rated short circuit making current														
Ring switch	kA	50	54.6	40	50						50			
Earth switch	kA	50	54.6	40	50						50			
Rated cable charging breaking current	A	25										25		
Rated short time withstand current														
Ring switch		20 kA 3s	21kA 1s	16kA 3s	20kA 3s						20kA 3s			
Earth switch		20 kA 3s	21kA 1s	16kA 3s	20kA 3s						20kA 3s			
Mechanical endurance class														
Ring switch		M2 (5000)										M2 (5000)		
Earth switch		M1 (1000)										M1 (1000)		
Electrical endurance class short circuit making														
Ring switch		E3 (5 times)		E1 (2 times)	E3 (5 times)						E3 (5 times)			
Earth switch		E2 (3 times)		E1 (2 times)	E2 (3 times)						E2 (3 times)			
Operating mechanism														
Local: close/open		Handle										Handle		
Remote: close/open		Actuator (Motor)										Actuator (Motor)		

	Ring main unit						Modular circuit breaker			Modular ring switch			
	Non Extensible				Extensible					Non Extensible			
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a	
Models													
Description		2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	1 VCB	1 VCB	1 VCB	1 RSW	2 RSW	2 RSW
Vacuum circuit breaker													
Rated normal current	A	250	630	400	400	250	630	250	630	400			
Rated active load breaking current	A	250	630	400	400	250	630	250	630	400			
Rated short circuit breaking current	kA	20		21	16	20			16				
Rated short circuit making current													
Circuit breaker	kA	50		54.6	40	50			40				
Earth switch	kA	7.9	50	54.6	40	7.9	50	50	50	40			
Rated cable charging breaking current	A	25									25		
Rated short time withstand current													
Main electrical circuit		20 kA 3s		21kA 1s	16kA 3s	20kA 3s			16kA 3s				
Earthing circuit		3.15kA	20kA 3s	21kA 1s	16kA 3s	3.15kA 3s	20kA 3s	3.15kA 3s	20kA 3s	16kA 3s			
Mechanical endurance class													
Circuit breaker		M1 (2000)											
Earth switch		M1 (1000)											
Electrical endurance class													
Circuit breaker		E2											
Earth switch		E2											
Operating mechanism													
Tripping time	ms	<80ms											
Operating sequence for mechanism		0-3min-CO-3min-CO											
Local: close/open		Handle											
Remote: close/open		Actuator (Motor)											

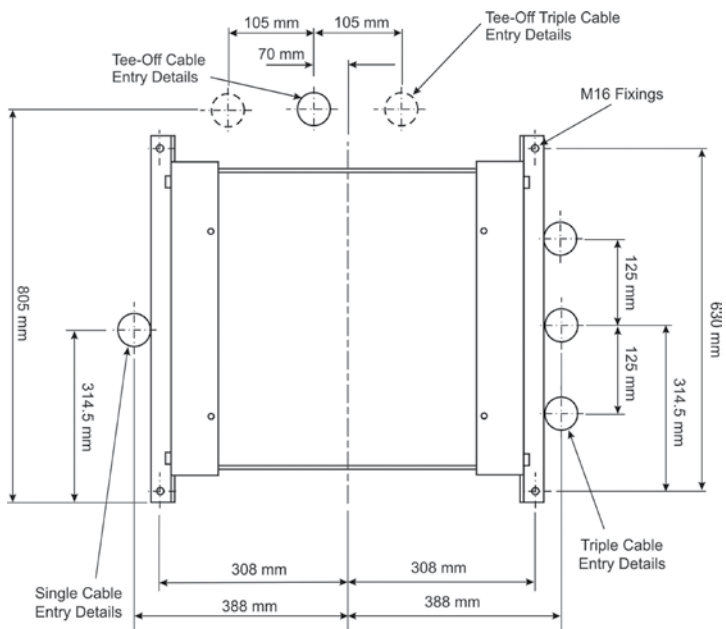
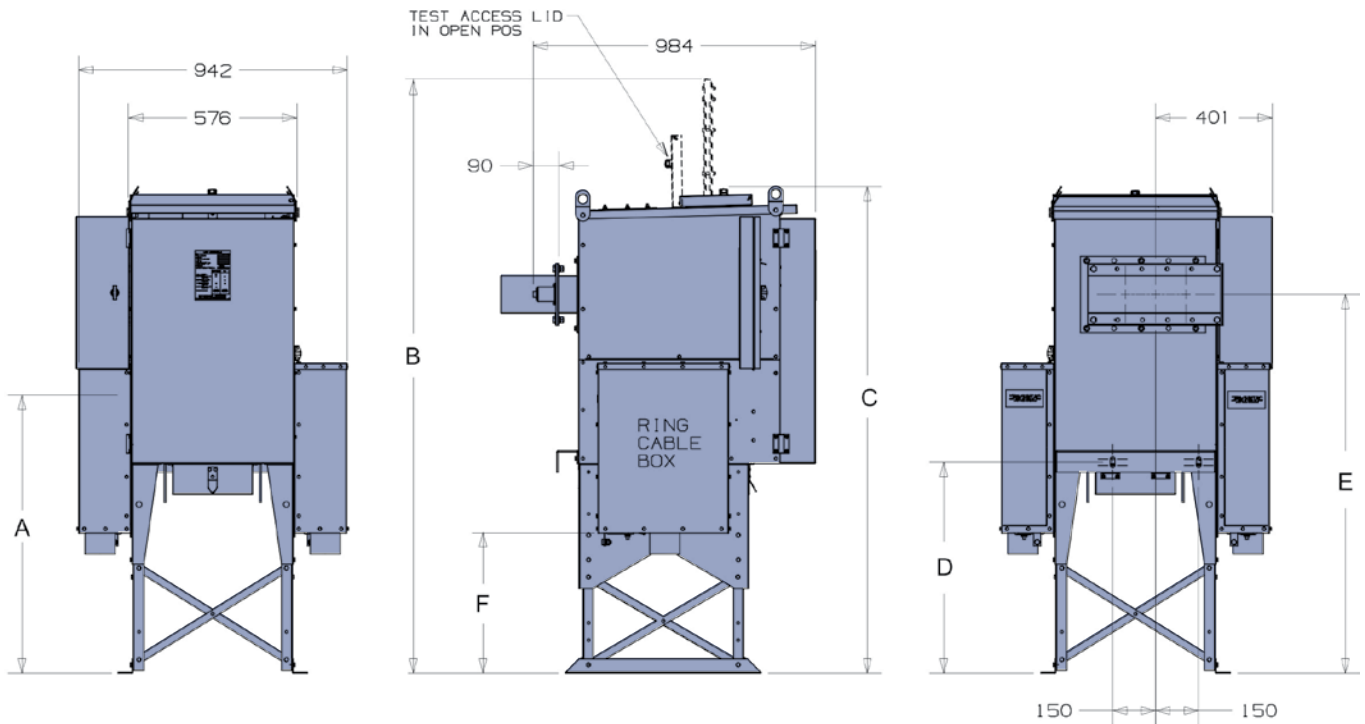
Dimensions

Dimensions & floor: VRN2A



Dim A (Ringbushing height in mm)	Dim B (450mm Tail length cable box in mm)	Dim B (570mm Tail length cable box in mm)	Dim C (mm)	Dim D (mm)	Dim E (Tee-offbushing height in mm)
1052	600	480	1715	817	1402
970	518	398	1633	735	1320
750	298	178	1413	515	1100

Dimensions & floor:
VRN6A

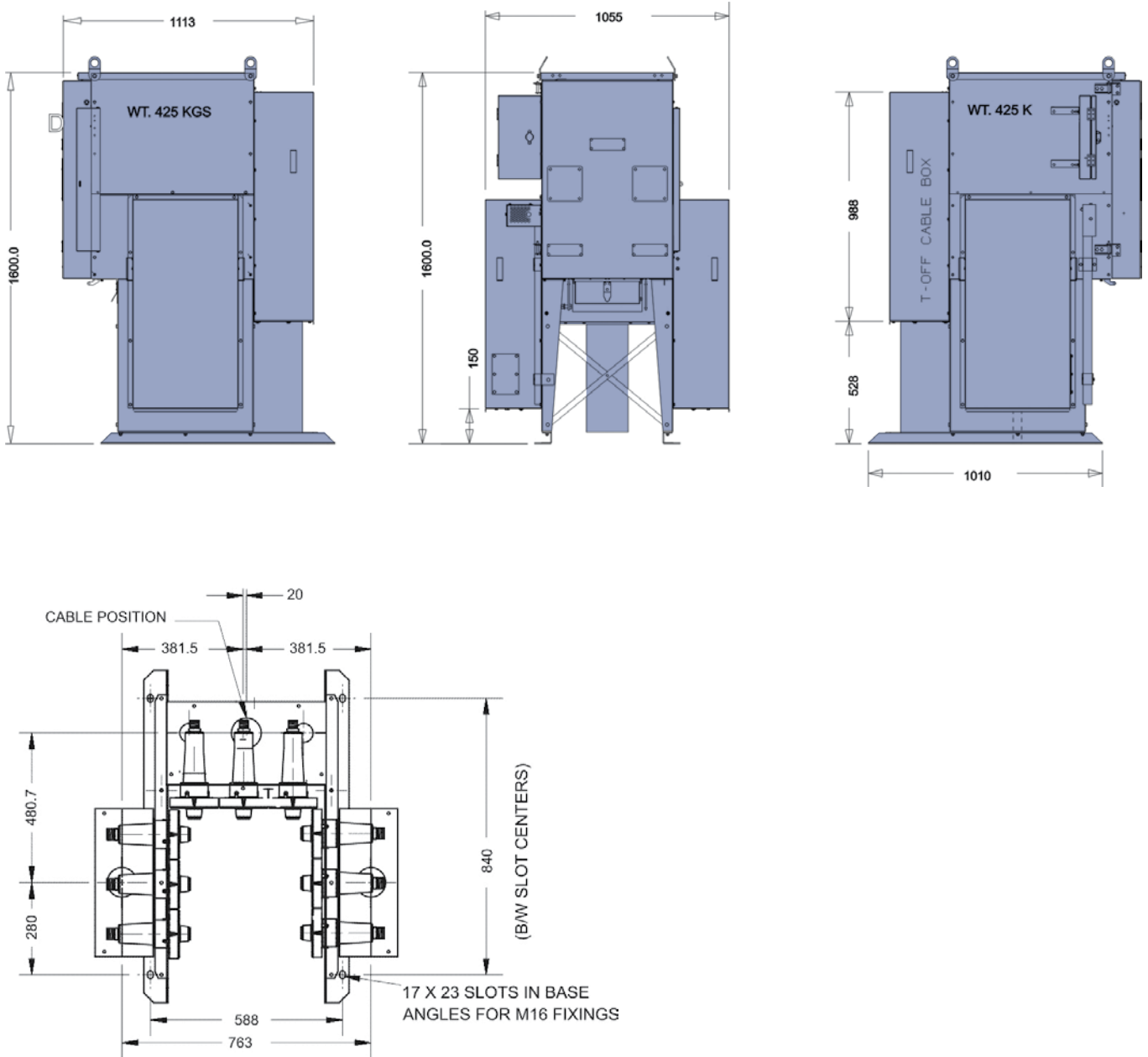


Dim A (Ringbushing height in mm)	Dim B (mm)	Dim C (mm)	Dim D (mm)	Dim E (Tee-offbushing height in mm)	Dim F (450mm Tail length cable box in mm)	Dim F (570mm Tail length cable box in mm)
1052	2163	1773	817	1402	600	480
970	2081	1691	735	1320	518	398
750	1861	1471	515	1100	298	178

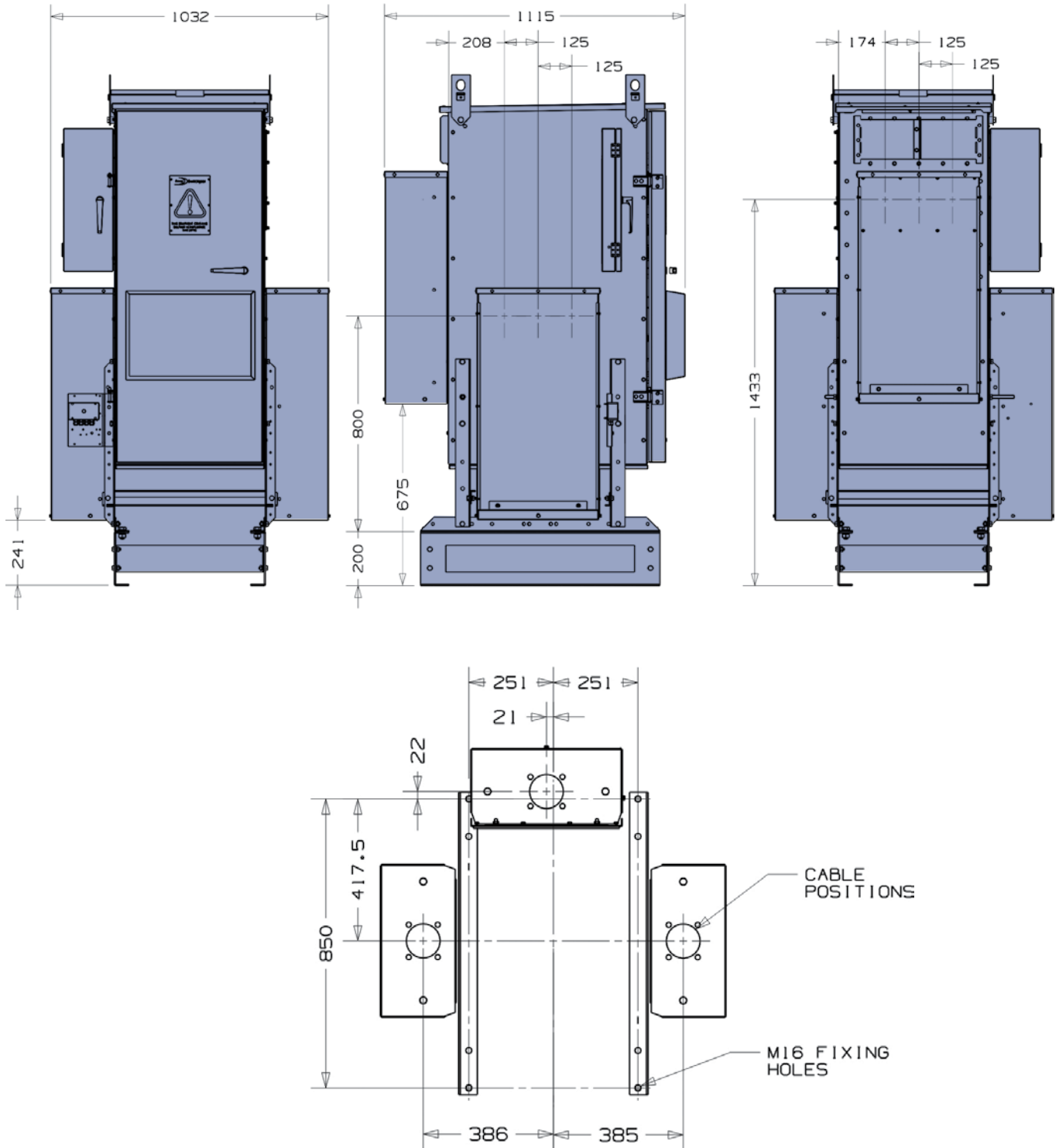
NOTE: All dimensions are in mm

Dimensions - continued

Dimensions & floor: VRNFS



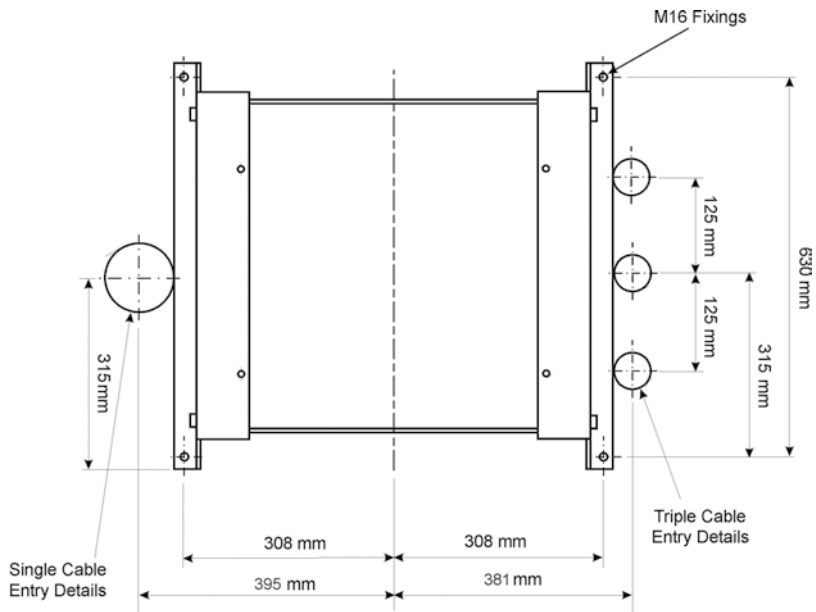
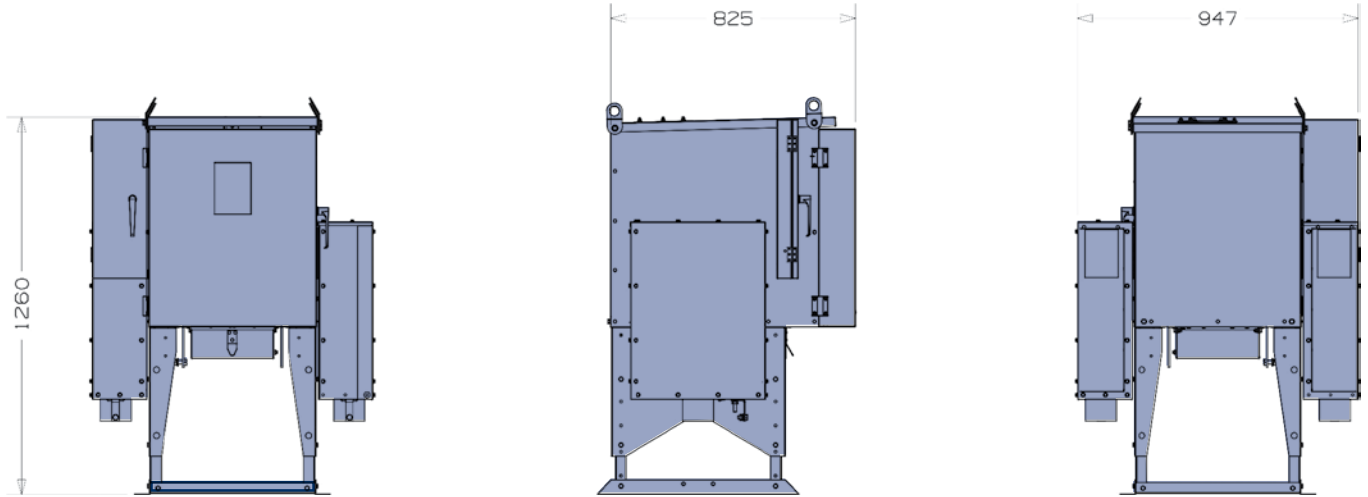
Dimensions & floor:
VRN24



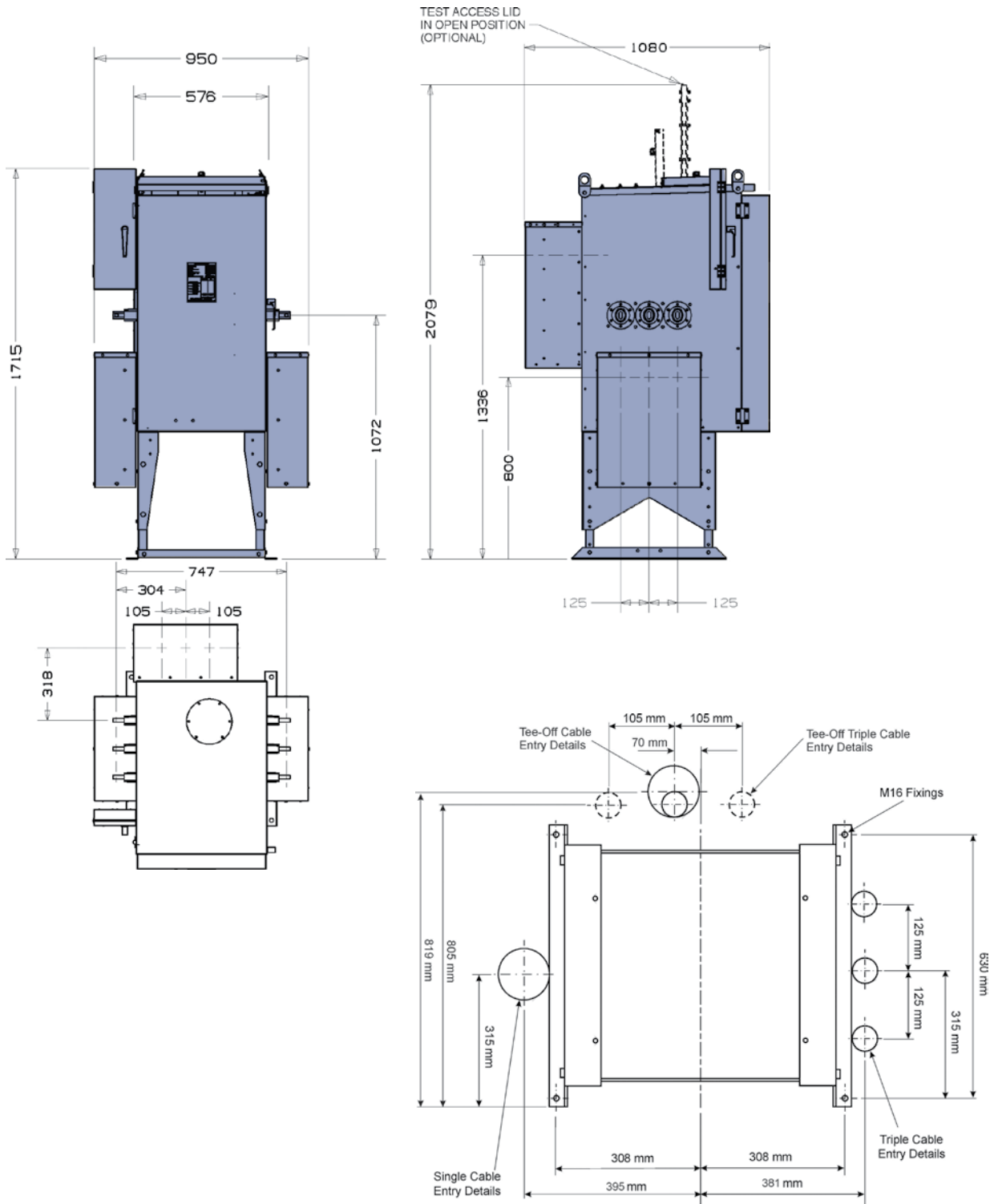
NOTE: All dimensions are in mm

Dimensions - continued

Dimensions & floor: DSN6A



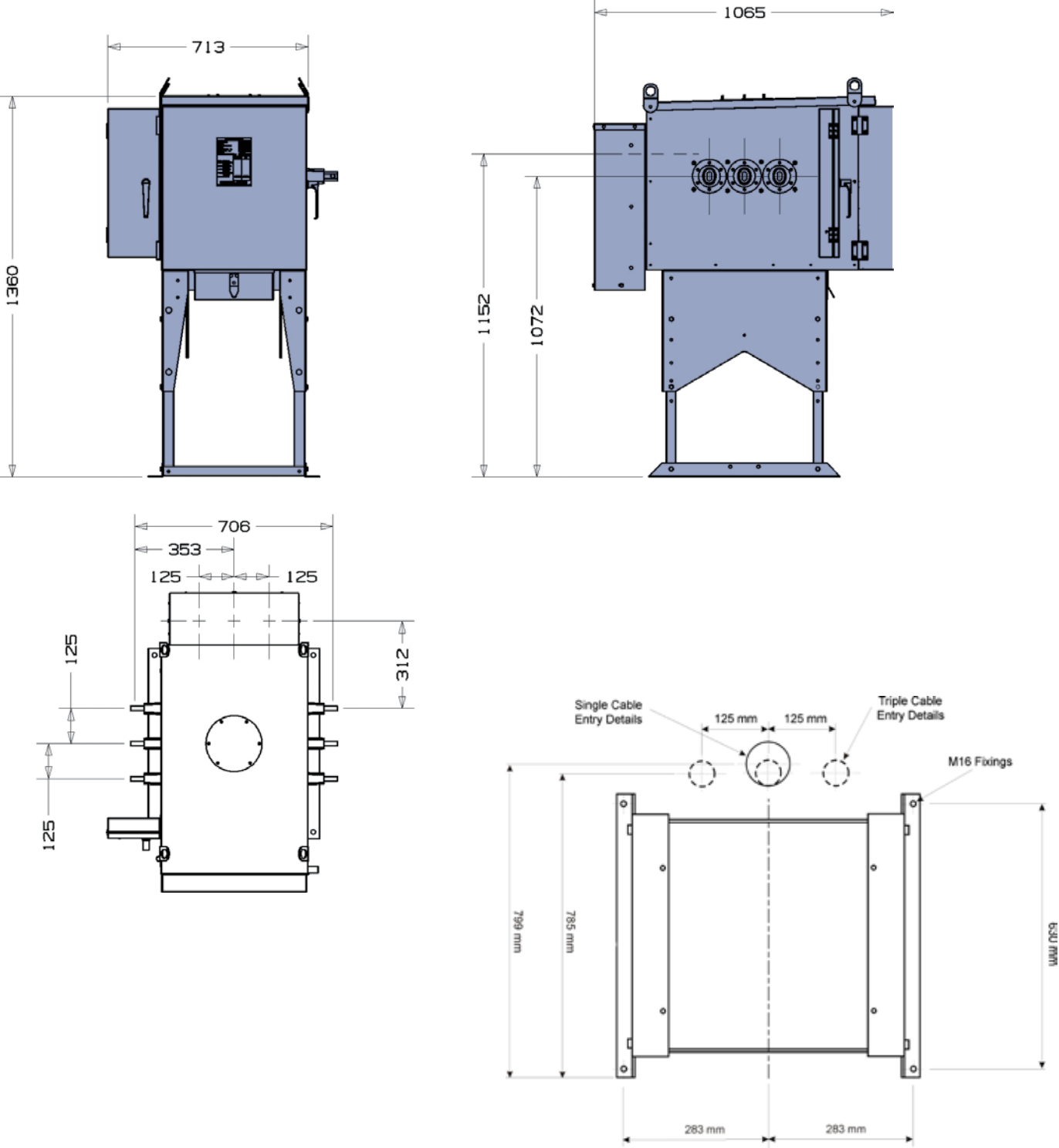
Dimensions & floor:
VRE2A / VRE6A



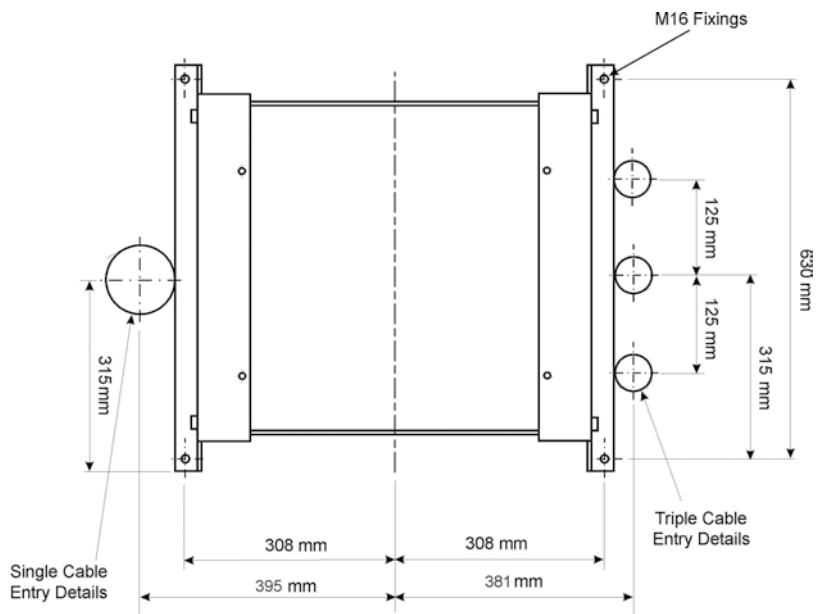
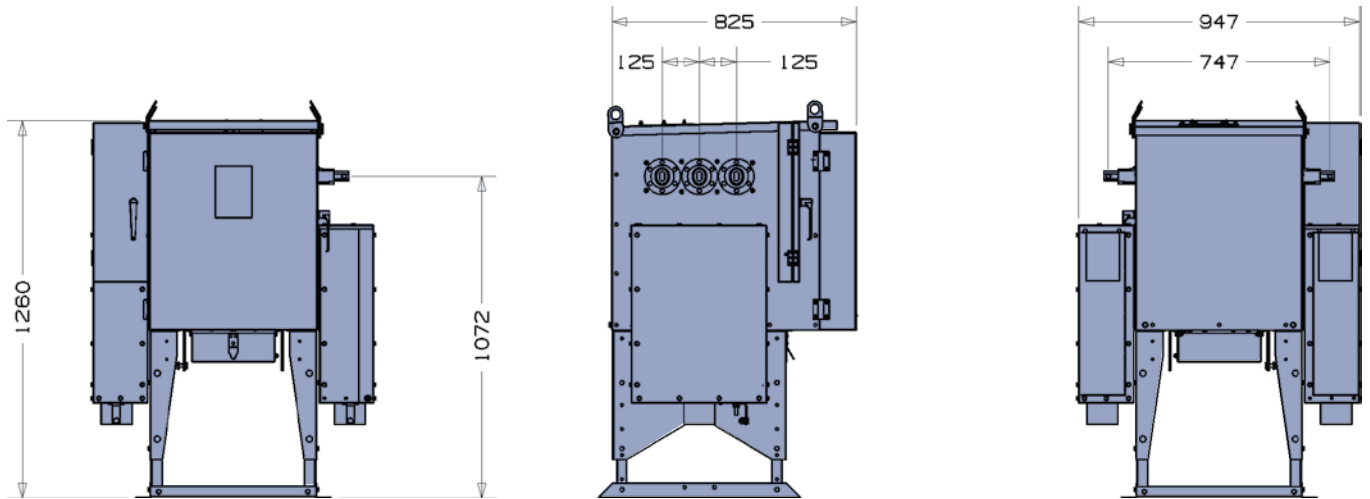
NOTE: All dimensions are in mm

Dimensions - continued

Dimensions & floor:
SSE6A

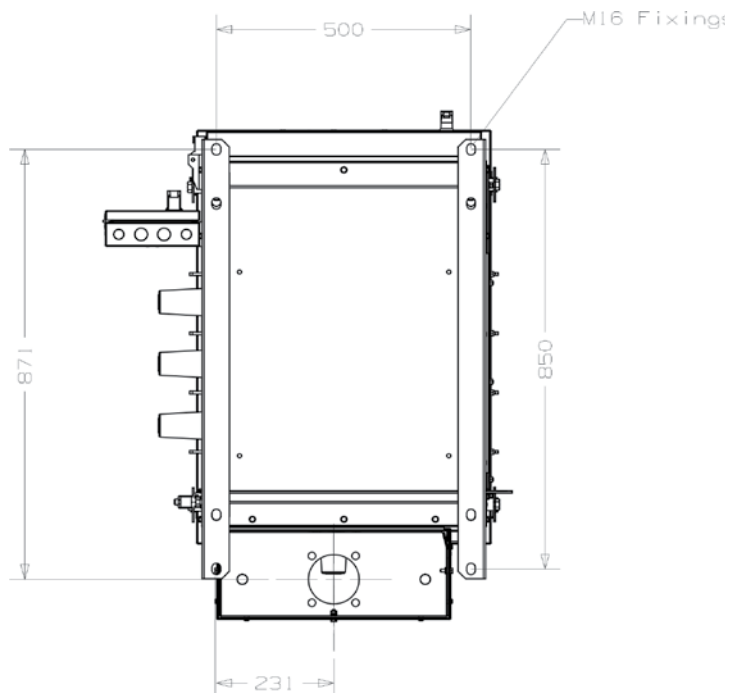
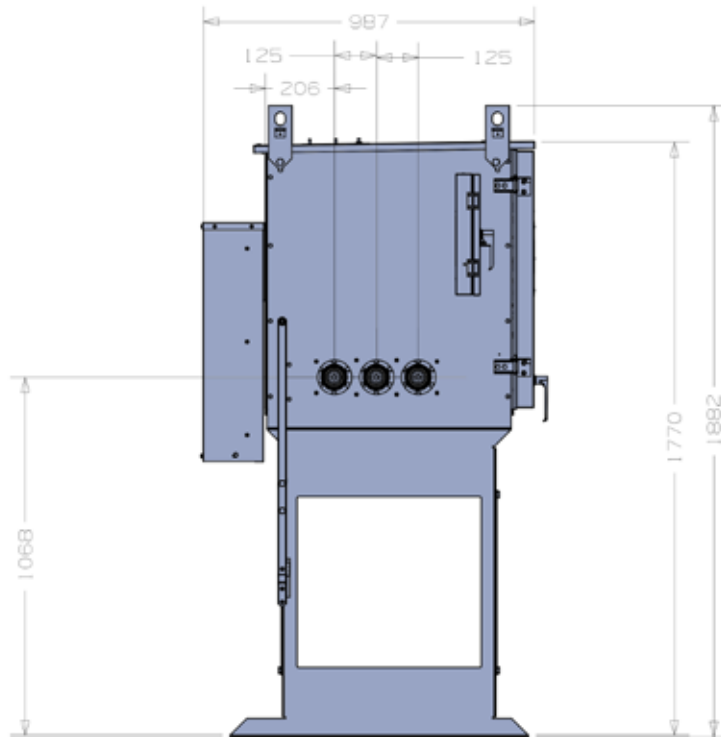
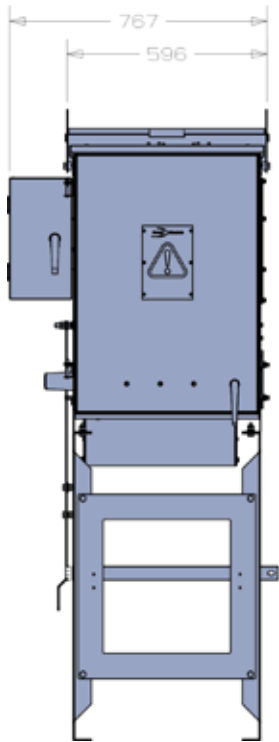


Dimensions & floor:
DSE6A



NOTE: All dimensions are in mm

Dimensions & floor:
VCE24



Sabre models and options

Range	Ring main units						Modular units					
							Modular circuit breaker			Modular ring switches		
Extensibility	Non extensible				Extensible		Extensible					Non extensible
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
General												
Extensibility												
Non extensible	•	•	•	•	-	-	-	-	-	-	-	•
LH extensible	-	-	-	-	○	○	○	○	○	○	○	-
RH extensible	-	-	-	-	○	○	○	○	-	○	○	-
Both sides extensible	-	-	-	-	○	○	○	○	-	○	○	-
Impulse withstand voltage (BIL) kVP (choose one from below)												
12kV at 75KVP BIL	○	○	-	-	○	○	○	○	-	○	○	○
15.5kV at 95KVP BIL	○	○	-	-	○	○	○	○	-	○	○	○
17.5kV at 95KVP BIL	-	-	○	-	-	-	-	-	-	-	-	-
24kV at 125kVP BIL	-	-	-	○	-	-	-	-	○	-	-	-
24kV at 145kVP BIL	-	-	-	○	-	-	-	-	○	-	-	-
Low gas pressure alarm auxiliary contact 1NO	○	○	○	○	○	○	○	○	○	○	○	○
Pressure indicator gauge with Hanson coupling	•	•	•	•	•	•	•	•	•	•	•	•
Mounting style												
Transformer mounted unit (fitted with ESI flange)	○	-	-	-	-	-	○	-	-	-	-	-
Freestanding unit	○	•	•	•	•	•	○	•	•	•	•	•
No ESI flange (with cable box) ¹	○	○	○	○	○	○	○	○	•	-	-	-
ESI Transformer flange fitted (with/without cable box) ¹	○	○	○	○	○	○	○	○	○	-	-	-
Height of tee-off bushing from floor (applicable to freestanding units)												
1100mm	○	-	-	○	-	-	-	-	-	-	-	-
1320mm	○	○	-	○	-	-	-	-	-	-	-	-
1348mm	-	-	•	-	-	-	-	-	-	-	-	-
1402mm	○	○	-	○	-	-	-	-	-	-	-	-
Height of extension bushings from floor (applicable to free standing units)												
1072 mm	-	-	-	-	•	•	•	•	•	•	•	•
Any other (available on request)	-	-	-	-	○	○	○	○	○	○	○	○
Internal arc protection for gas chamber (tank)												
AF	•	•	•	•	•	•	•	•	•	•	•	•
AFL	○	○	○	○	○	○	○	○	○	○	○	○
AFLR	○	○	-	○	○	○	○	○	-	○	○	○
Tank exhaust at top	•	•	-	-	•	•	•	•	-	•	•	•
Tank exhaust at rear	-	-	•	•	-	-	-	-	-	-	-	-
Extensible bus bar bushings: Obround (Hysol)	-	-	-	-	•	•	•	•	-	•	•	-
Vacuum circuit breaker												
Short circuit breaking current												
16kA RMS	-	-	-	•	-	-	-	-	•	-	-	-
20kA RMS	•	•	-	-	•	•	•	•	-	-	-	-
21kA RMS	-	-	•	-	-	-	-	-	-	-	-	-
25KA RMS ²	-	○	○	-	-	○	-	○	-	-	-	-

NOTE: All dimensions are in mm

Sabre models and options - continued

Extensibility	Non extensible				Extensible		Extensible					Non extensible
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
Vacuum circuit breaker												
Bushings type												
Parallel bushings	•	•	-	-	•	•	•	•	-	-	-	-
Adaptor to convert parallel bushings to DIN 400 type C bushing	○	○	-	-	○	○	○	○	-	-	-	-
DIN 400 type C	-	-	•	•	-	-	-	-	•	-	-	-
Rated normal current												
250A	•	○	-	-	•	○	•	-	-	-	-	-
400A	-	-	•	•	-	-	-	-	•	-	-	-
630A	-	•	○	-	-	•	-	•	-	-	-	-
Earth & test facility	-	○	-	-	-	○	-	○	○	-	-	-
Circuit breaker protection												
TLF	○	○	-	○	○	○	○	○	○	-	-	-
Relay (choose one from below)												
WIP1 relay	○	○	○	○	○	○	○	○	○	-	-	-
Fanox relay	○	○	○	○	○	○	○	○	○	-	-	-
Any other*	○	○	○	○	○	○	○	○	○	-	-	-
Protection (CT) current transformers												
Dual (Primary) ratio CT 100/50/-	○	○	○	○	○	○	○	○	○	-	-	-
Dual (Primary) ratio CT 200/100/-	○	○	○	○	○	○	○	○	○	-	-	-
Triple (Primary) ratio CT 150/100/50/-	○	○	○	○	○	○	○	○	○	-	-	-
Dual (Primary) ratio CT 400/200/-	-	○	○	○	-	○	-	○	○	-	-	-
Dual (Primary) ratio CT 150/100/-	○	○	○	○	○	○	○	○	○	-	-	-
Dual (Primary) ratio CT 600/200/-	-	○	○	-	-	○	-	○	-	-	-	-
Manual "Pull to trip"	○	○	•	•	○	○	○	○	•	-	-	-
Remote shunt trip												
12V DC	○	○	○	○	○	○	○	○	○	-	-	-
24V DC	○	○	○	○	○	○	○	○	○	-	-	-
48V DC	○	○	○	○	○	○	○	○	○	-	-	-
110V DC	○	○	○	○	○	○	○	○	○	-	-	-
110V AC	○	○	○	○	○	○	○	○	○	-	-	-
240V AC	○	○	○	○	○	○	○	○	○	-	-	-
Multi voltage (24V AC/DC- 240V AC/DC)	○	○	○	○	○	○	○	○	○	-	-	-
Indication / auxiliary switches												
Remote protection trip output signal (for TLF or relay trip status) 1N/O	○	○	○	○	○	○	○	○	○	-	-	-
Watchdog for relays (only available with selective relays)	○	○	○	○	○	○	○	○	○	-	-	-
Tripped on fault indication	○	○	○	○	○	○	○	○	○	-	-	-
Circuit breaker actuator enabled indication	○	○	○	○	○	○	○	○	○	-	-	-
Circuit breaker service indication												
1NO, 1NC	○	○	○	○	○	○	○	○	○	-	-	-
2NO, 2NC	○	○	○	○	○	○	○	○	○	-	-	-
Circuit breaker earth indication												
1NO, 1NC	○	○	○	○	○	○	○	○	○	-	-	-
2NO, 2NC	○	○	○	○	○	○	○	○	○	-	-	-

Key • Standard
○ Optional
- Not applicable

1: Refer to cable box, cable gland and gland plate table for more information
2: Available soon

Extensibility	Non extensible				Extensible		Extensible					Non extensible
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
Vacuum circuit breaker												
VPIS												
Neon indication push button	o	o	o	o	o	o	o	o	•	-	-	-
Neon indication pfisterer socket	o	o	o	o	o	o	o	o	o	-	-	-
Operation counter	o	o	o	-	o	o	o	o	-	-	-	-
Castell locks												
Key free earth on	o	o	o	o	o	o	o	o	o	-	-	-
Key trapped disconnecter service CB ON	o	o	o	o	o	o	o	o	o	-	-	-
Actuators (motors)												
Actuators wiring only	o	o	o	o	o	o	o	o	o	-	-	-
Actuators (24V DC motor) for remote control	o	o	o	o	o	o	o	o	o	-	-	-
Ring switch 1 (Left hand side)												
Rated current												
400A	-	-	•	-	-	-	-	-	-	-	-	-
630A	•	•	o	•	•	•	-	-	-	•	•	•
Earth & test facility	•	•	•	•	•	•	-	-	-	•	•	•
Bushings type												
DIN 400 type C	•	•	•	•	•	•	-	-	-	•	•	•
Operation counter	o	o	o	-	o	o	-	-	-	o	o	o
Actuators (motors)												
Actuators wiring only	o	o	o	o	o	o	-	-	-	o	o	o
Actuators (24V DC motor) for remote control	o	o	o	o	o	o	-	-	-	o	o	o
VPIS												
Neon indication push button	o	o	o	o	o	o	-	-	-	o	o	o
Neon indication pfisterer socket	o	o	o	o	o	o	-	-	-	o	o	o
MV sensor	o	o	o	o	o	o	-	-	-	o	o	o
Auxiliary switches												
1NO, 1NC	o	o	o	o	o	o	-	-	-	o	o	o
2NO, 2NC	o	o	o	o	o	o	-	-	-	o	o	o
Castell locks												
Key free in off position	o	o	o	o	o	o	-	-	-	o	o	o
Earth fault indication												
BFZ-50	o	o	o	o	o	o	-	-	-	o	o	o
MFZ-50	o	o	o	o	o	o	-	-	-	o	o	o
MLZ-50	o	o	o	o	o	o	-	-	-	o	o	o
CFZ-50	o	o	o	o	o	o	-	-	-	o	o	o
CLZ-50	o	o	o	o	o	o	-	-	-	o	o	o
BLZ-50	o	o	o	o	o	o	-	-	-	o	o	o
Any other(*)	o	o	o	o	o	o	-	-	-	o	o	o
Ring switch 2 (Right hand side)												
Rated current												
400A	-	-	•	-	-	-	-	-	-	-	-	-
630A	•	•	o	•	•	•	-	-	-	-	•	•
Earth & test facility	•	•	•	•	•	•	-	-	-	-	•	•
Bushings type												
DIN 400 type C	•	•	•	•	•	•	-	-	-	-	•	•
Operation counter	o	o	o	-	o	o	-	-	-	-	o	o

Extensibility	Non extensible				Extensible		Extensible					Non extensible
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
Ring switch 2 (Right hand side)												
Actuators (motors)												
Actuators wiring only	○	○	○	○	○	○	-	-	-	-	○	○
Actuators (24V DC motor) for remote control	○	○	○	○	○	○	-	-	-	-	○	○
VPIS												
Neon indication push button	○	○	○	○	○	○	-	-	-	-	○	○
Neon indication pfisterer socket	○	○	○	○	○	○	-	-	-	-	○	○
MV sensor	○	○	○	○	○	○	-	-	-	-	○	○
Auxiliary switches												
1NO, 1NC	○	○	○	○	○	○	-	-	-	-	○	○
2NO, 2NC	○	○	○	○	○	○	-	-	-	-	○	○
Castell locks												
Key free in off position	○	○	○	○	○	○	-	-	-	-	○	○
Earth fault indication												
BFZ-50	○	○	○	○	○	○	-	-	-	-	○	○
MFZ-50	○	○	○	○	○	○	-	-	-	-	○	○
MLZ-50	○	○	○	○	○	○	-	-	-	-	○	○
CFZ-50	○	○	○	○	○	○	-	-	-	-	○	○
CLZ-50	○	○	○	○	○	○	-	-	-	-	○	○
BLZ-50	○	○	○	○	○	○	-	-	-	-	○	○
Any other(*)	○	○	○	○	○	○	-	-	-	-	○	○

Key • Standard
○ Optional
- Not applicable

1: Refer to cable box, cable gland and gland plate table for more information
2: Available soon

Accessories

Cable box, cable gland and gland plate selection table				
	Ring switch 1	Ring switch 2	Circuit breaker tee-off	Extensible bus bars
				(Not to be used with VRE and DSE)
Interlocked cable box	0	0	0	-
Cable box internal arc rated (AFL)				
Top entry				
IP50 (standard)	•	•	•	•
IP54 (optional)	0	0	0	0
450mm bushings to gland height, 12.5KA IAC	0	0	0	0
610 mm bushings to gland height, 12.5KA IAC	0	0	0	0
Bottom entry (IP54)				
450mm bushings to gland height, 12.5 kA IAC	0	0	0	0
610mm bushings to gland height, 12.5 kA IAC	0	0	0	0
450mm bushings to gland height, 20KA IAC	0	0	0	0
610mm bushings to gland height, 20KA IAC	0	0	0	0
Bottom entry angled, 12.5KA IAC	0	0	0	0
Bottom entry deep, 12.5KA IAC	0	0	0	0
Cable box non IAC rated				
Top entry				
IP50 (standard)	•	•	•	•
IP54 (optional)	0	0	0	0
450mm bushings to gland height	0	0	0	0
610mm bushings to gland height	0	0	0	0
Bottom entry (IP54)				
450mm bushings to gland height	0	0	0	0
610mm bushings to gland height	0	0	0	0
Bottom entry angled	0	0	0	0
Bottom entry deep	0	0	0	0
1 X 3C cable gland and gland plates				
X size				
Gland plates				
X size gland plate with earth stud	0	0	0	0
Glands				
X tube glands	0	0	0	0
X brass wiping gland	0	0	0	0
Y size				
Gland plates				
Y size gland with earth stud	0	0	0	0
Glands				
Y tube glands	0	0	0	0
Y brass wiping gland	0	0	0	0

Cable box, cable gland and gland plate selection table

	Ring Switch 1	Ring Switch 2	Circuit breaker tee-off	Extensible bus bars (Not to be used with VRE and DSE)
3 x 1C cable gland and gland plates				
Gland plates				
3 hole split steel with earth stud	O	O	O	O
3 hole split steel with earth bar	O	O	O	O
3 hole solid brass with earth stud	O	O	O	O
3 hole solid brass with earth bar	O	O	O	O
Glands				
Single core compression gland	O	O	O	O
Single core heat shrink glands	O	O	O	O

Bus bar coupling selection table

Bus bar coupling kits (length mm)	241	378	453
Insulation for bus bar coupling			
Heat shrink manufactured by SPS	O	-	O
Heat shrink manufactured by Raychem	O	-	O
Heat shrink manufactured by REPL	•	-	•
Cold fit rubber boot manufactured by Pirelli	-	•	-

Other accessories	Quantity
Padlocks	
TLF fuses (specify quantity and Amp rating)	
Foundation bolts (not required for transformer mounting)	
Adaptor for converting parallel bushings to DIN 400 type C connection	

Key • Standard O Optional - Not applicable

Sabre models and options order form

To use this form, please photocopy and return the completed form to your nearest Lucy Electric office
Tick the boxes with your required order (addresses can be found on the back cover)

Name: _____	Company: _____
Address: _____	Tel No: _____
_____	Email: _____
_____	Order number: _____

Order quantity / number of units (please fill separate form for each type)

Range	Ring main units						Modular units					
							Modular circuit breaker			Modular ring switches		
	Non extensible				Extensible		Extensible					Non extensible
Extensibility	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Models												
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
General												
Extensibility												
Non extensible	•	•	•	•	-	-	-	-	-	-	-	•
LH extensible	-	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
RH extensible	-	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-
Both sides extensible	-	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-
Impulse withstand voltage (BIL) kVP (choose one from below)												
12kV at 75KVP BIL	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.5kV at 95KVP BIL	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.5kV at 95KVP BIL	-	-	<input type="checkbox"/>	-	-	-	-	-	-	-	-	-
24kV at 125kVP BIL	-	-	-	<input type="checkbox"/>	-	-	-	-	-	-	-	-
24kV at 145kVP BIL	-	-	-	<input type="checkbox"/>	-	-	-	-	<input type="checkbox"/>	-	-	-
Low gas pressure alarm auxillary contact 1NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressure indicator gauge with Hanson coupling	•	•	•	•	•	•	•	•	•	•	•	•
Mounting style												
Transformer mounted unit (fitted with ESI flange)	<input type="checkbox"/>	-	-	-	-	-	<input type="checkbox"/>	-	-	-	-	-
Freestanding unit	<input type="checkbox"/>	•	•	•	•	•	<input type="checkbox"/>	•	•	•	•	•
No ESI flange (with cable box)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•	-	-	-
ESI transformer flange fitted (with/without cable box)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Height of tee-off bushing from floor (applicable to freestanding units)												
1100mm	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-	-	-	-	-
1320mm	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-	-	-	-	-	-
1348mm	-	-	•	-	-	-	-	-	-	-	-	-
1402mm	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-	-	-	-	-	-
Height of extension bushings from floor (applicable to free standing units)												
1072 mm	-	-	-	-	•	•	•	•	•	•	•	•
Any other (available on request)	-	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal arc protection for gas chamber (tank)												
AF	•	•	•	•	•	•	•	•	•	•	•	•
AFL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AFLR	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tank exhaust at top	•	•	-	-	•	•	•	•	-	•	•	•
Tank exhaust at rear	-	-	•	•	-	-	-	-	-	-	-	-
Extensible bus bar bushings: Obround (Hysol)	-	-	-	-	•	•	•	•	-	•	•	-

Sabre models and options order form - continued

Extensibility	Non extensible				Extensible		Extensible					Non extensible
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
Vacuum circuit breaker												
Short circuit breaking current												
16kA RMS	-	-	-	•	-	-	-	-	•	-	-	-
20kA RMS	•	•	-	-	•	•	•	•	-	-	-	-
21kA RMS	-	-	•	-	-	-	-	-	-	-	-	-
25KA RMS	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-	-
Bushings type												
Parallel bushings												
•	•	-	-	•	•	•	•	-	-	-	-	-
Adaptor to convert parallel bushings to DIN 400 type C bushing												
<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	-
DIN 400 type C												
-	-	•	•	-	-	-	-	•	-	-	-	-
Rated normal current												
250A	•	<input type="checkbox"/>	-	-	•	<input type="checkbox"/>	•	-	-	-	-	-
400A	-	-	•	•	-	-	-	-	•	-	-	-
630A	-	•	<input type="checkbox"/>	-	-	•	-	•	-	-	-	-
Earth & test facility												
-	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-
Circuit breaker protection												
TLF												
<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Relay (choose one from below)												
WIP1 relay												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Fanox realy												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Any other*												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Protection (CT) current transformers												
Dual (Primary) ratio CT 100/50/-												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Dual (Primary) ratio CT 200/100/-												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Triple (Primary) ratio CT 150/100/50/-												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Dual (Primary) ratio CT 400/200/-												
-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Dual (Primary) ratio CT 150/100/-												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Dual (Primary) ratio CT 600/200/-												
-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-
Manual "Pull to trip"												
<input type="checkbox"/>	<input type="checkbox"/>	•	•	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•	-	-	-
Remote shunt trip												
12V DC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
24V DC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
48V DC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
110V DC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
110V AC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
240V AC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Multi voltage (24V AC/DC- 240V AC/DC)												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Indication/ Auxilliary switches												
Remote protection trip output signal (for TLF or relay trip status) 1N/O												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Watchdog for relays (only available with selective relays)												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Tripped on fault indication												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Circuit breaker actuator enabled indication												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Circuit breaker service indication												
1NO, 1NC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
2NO, 2NC												
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-

Extensibility	Non extensible				Extensible		Extensible					Non extensible
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	2 RSW+1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
Circuit breaker earth indication												
1NO, 1NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
2NO, 2NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Secondary injection terminals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
VPIS												
Neon indication push button	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•	-	-
Neon indication pfisterer socket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•	-	-
Operation counter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Castell locks												
Key free earth on	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Key trapped disconnecter service CB ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Actuators (motors)												
Actuators wiring only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Actuators (24V DC motor) for remote control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Ring switch 1 (Left hand side)												
Rated current												
400A	-	-	•	-	-	-	-	-	-	-	-	-
630A	•	•	<input type="checkbox"/>	•	•	•	-	-	-	•	•	•
Earth & test facility	•	•	•	•	•	•	-	-	-	•	•	•
Bushings type												
DIN 400 type C	•	•	•	•	•	•	-	-	-	•	•	•
Operation counter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Actuators (motors)												
Actuators wiring only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Actuators (24V DC motor) for remote control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VPIS												
Neon indication push button	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neon indication pfisterer socket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MV sensor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auxilliary switches												
1NO, 1NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2NO, 2NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Castell locks												
Key free in off position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Earth fault indication												
BFZ-50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MFZ-50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MLZ-50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CFZ-50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CLZ-50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLZ-50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other(*)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ring switch 2 (Right hand side)												
Rated current												
400A	-	-	•	-	-	-	-	-	-	-	-	-
630A	•	•	<input type="checkbox"/>	•	•	•	-	-	-	-	•	•

Sabre models and options order form - continued

Extensibility	Non extensible				Extensible		Extensible					Non extensible
	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Models	VRN2a	VRN6a	VRNFS	VRN24	VRE2a	VRE6a	VCE2a	VCE6a	VCE24	SSE6a	DSE6a	DSN6a
Description	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	2 RSW+ 1VCB	1VCB	1VCB	1VCB	1 RSW	2 RSW	2 RSW
Ring switch 2 (Right hand side)												
Earth & test facility	•	•	•	•	•	•	-	-	-	-	•	•
Bushings type												
DIN 400 type C	•	•	•	•	•	•	-	-	-	-	•	•
Operation counter	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Actuators (motors)												
Actuators wiring only	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Actuators (24V DC motor) for remote control	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
VPIS												
Neon indication push button	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Neon indication pfisterer socket	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
MV sensor	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Auxilliary switches												
1NO, 1NC	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
2NO, 2NC	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Castell locks												
Key free in off position	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Earth fault indication												
BFZ-50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
MFZ-50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
MLZ-50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
CFZ-50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
CLZ-50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
BLZ-50	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>
Any other(*)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	-	-	-	<input type="text"/>	<input type="text"/>

* Please fill the details in comments section below.

Comments

Air metering unit (AMU)

i. Characteristics

- Up to 15.5kV and 630A rating
- Freestanding and RMU mounted version
- Voltage transformer (VT) isolation for HV testing
- Bus bar metering and tee-off metering options
- Trip lock out relay for RMU/AMU combinations for emergency tripping
- Wide range of CT and VT options to suit various application needs
- IP54 for outdoor installation without needing a kiosk



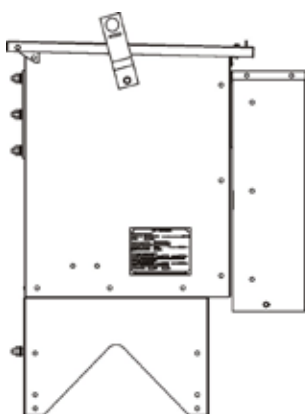
Tee-off metering
RMU mounted

ii. Mounting style

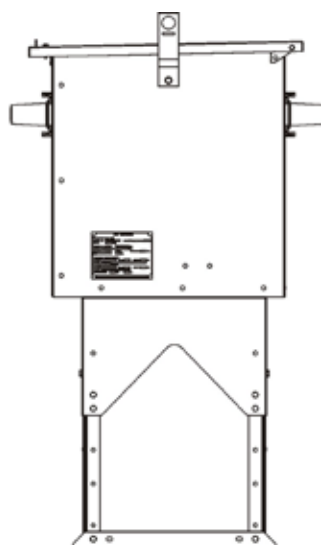
- a. Tee-off metering
- b. BC: Bus bar connected
- c. FS: Free standing metering



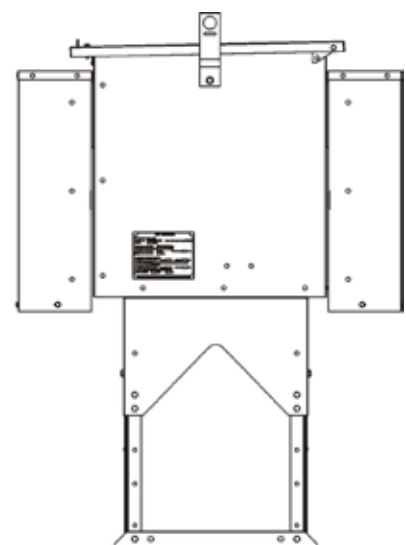
Free standing
metering unit



Tee-off metering



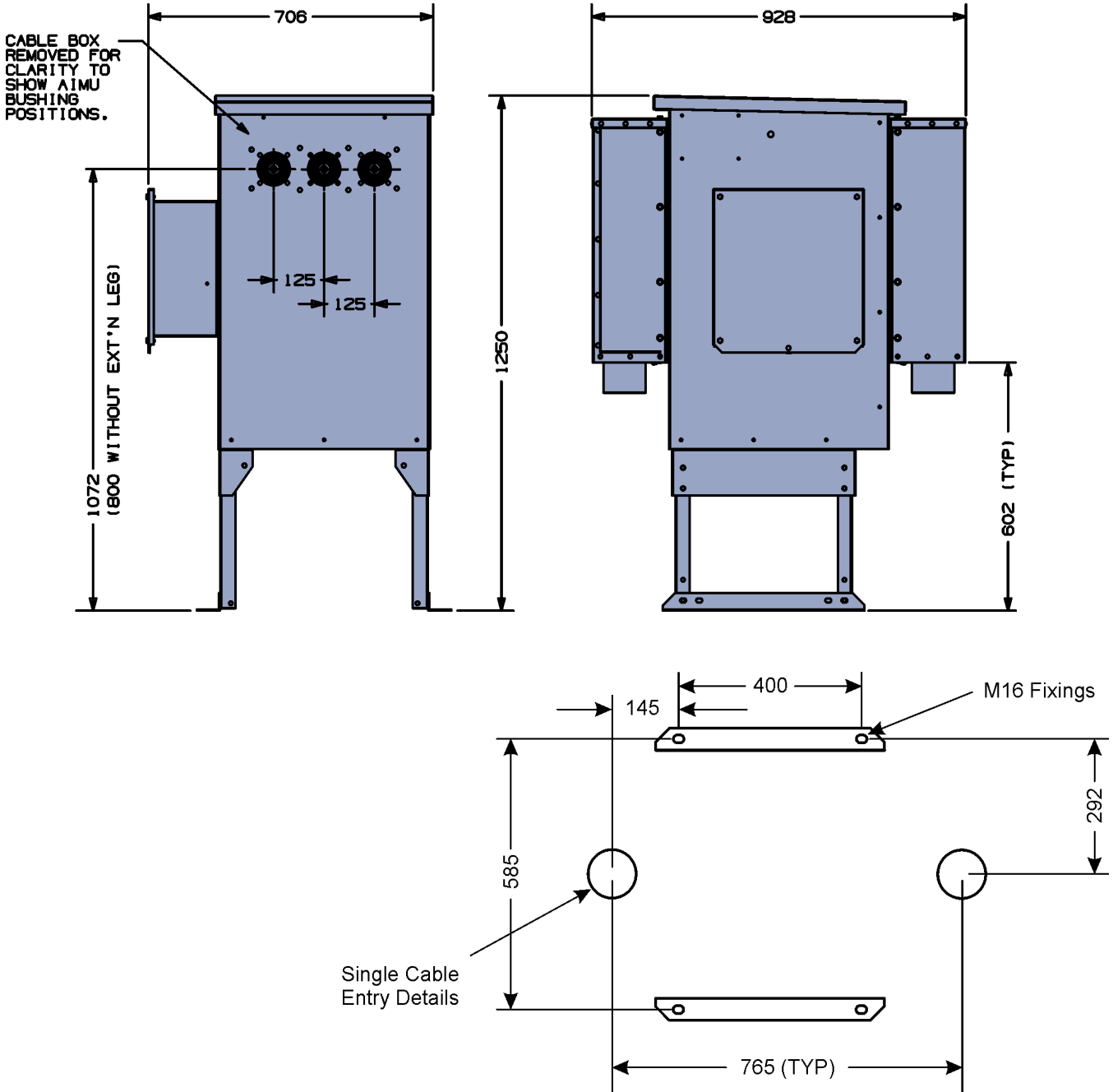
Bus bars connected metering



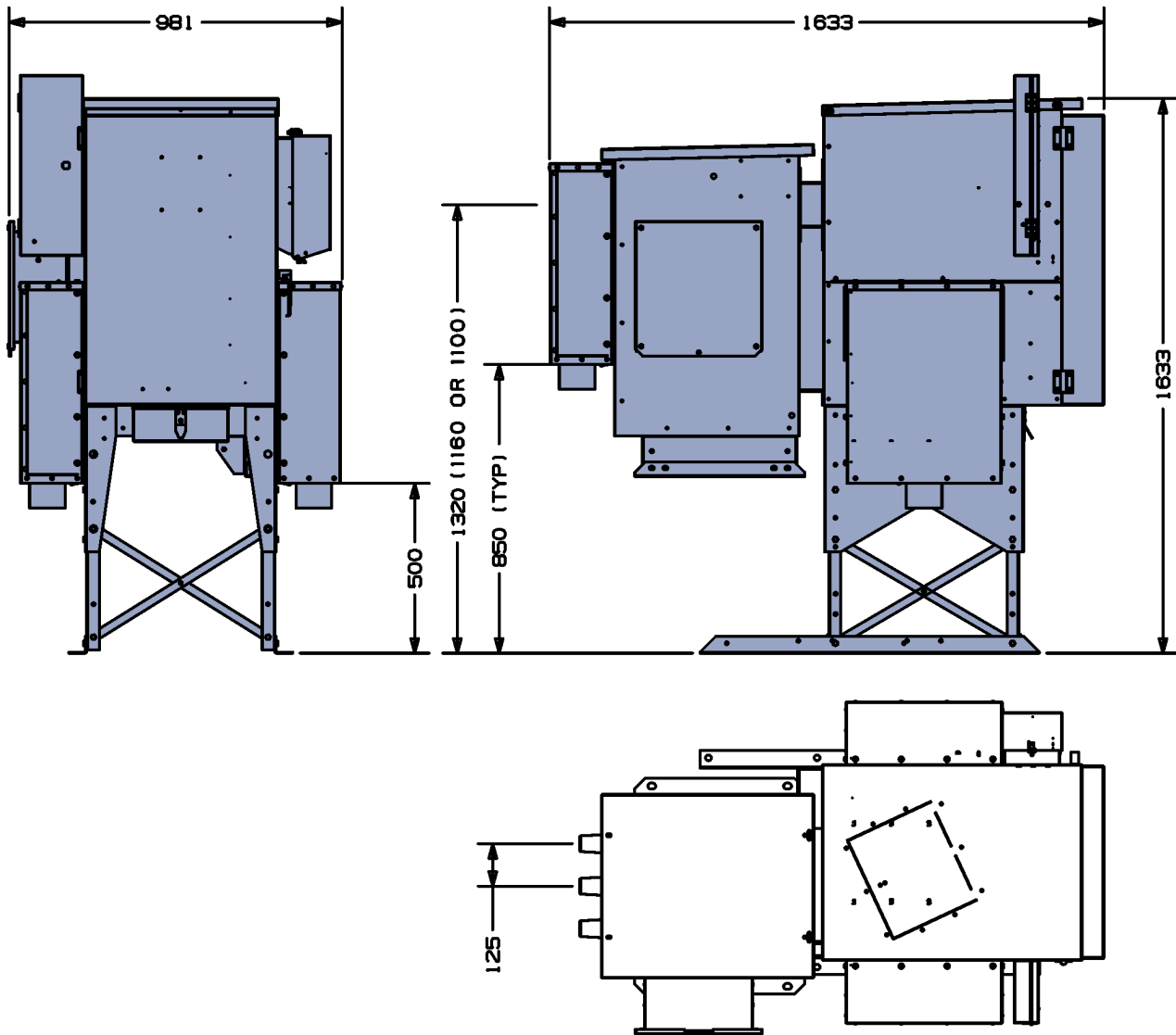
Free standing metering

iii. Dimensions

Dimensions & floor:
AMU Free standing



Dimensions:
Tee-off AMU (RMU mounted)



NOTE: All dimensions are in mm

iv. Options and Accessories

Metering units

General

Impulse withstand voltage (BIL) kVP (choose one from below)

12kV at 75KVP BIL		<input type="radio"/>
15.5kV at 95KVP BIL		<input type="radio"/>
Rated current		
250A		<input type="radio"/>
630A		<input type="radio"/>
Mounting style		
FS: Freestanding		<input type="radio"/>
BC: Bus bar connected		<input type="radio"/>
TC: Ring main unit (tee-off) mounted		<input type="radio"/>
Bushings type		
FS: Freestanding		
Incoming DIN type C		<input type="checkbox"/>
Outgoing DIN type C		<input type="checkbox"/>
BC: Bus bar connected		
Incoming DIN type C		<input type="checkbox"/>
Outgoing DIN type C		<input type="checkbox"/>
TC: Ring main unit (tee-off) mounted		
Incoming direct connection to RMU		<input type="checkbox"/>
Outgoing DIN type C		<input type="checkbox"/>

VT - Voltage transformer

VT primary fused protection

Unfused primary VT with tool free bus bar isolation for VT testing (only for 630A)		<input type="radio"/>
Fused primary VT		<input type="radio"/>
VT type	Number of VT	
Dual ratio (Primary) 3 Phase - 3 limb 11000/6600/110V, class 1, 50VA/PH	1	<input type="radio"/>
Single ratio (Primary) 3 Phase - 3 limb 11000/110V, class 1, 50VA/PH	1	<input type="radio"/>
Single ratio (Primary) 3 Phase - 3 limb 6600/110V, class 1, 50VA/PH	1	<input type="radio"/>
Single ratio (Primary) 1 Phase - 1 limb 13800/110V, class 0.5, 50VA/PH	2	<input type="radio"/>
	3	<input type="radio"/>
Dual ratio (Primary) 1 Phase - 1 limb 11000/6600/110V, class 0.2, 50VA/PH	2	<input type="radio"/>
	3	<input type="radio"/>
Dual ratio (Primary) 3 Phase - 5 limb, Ratio: 11000/6600/110v, Class 0.5, 50VA/PH	1	<input type="radio"/>
Dual ratio (Primary) 3 Phase - 5 Limb, Ratio: 11000/6600/110v, Class 0.5, 20VA/PH	1	<input type="radio"/>
Single ratio (Primary) 3 Phase - 5 Limb, Ratio: 11000/110v, Class 0.5, 50VA/PH	1	<input type="radio"/>
Dual ratio (Primary) 3 Phase - 5 Limb, Ratio: 11000/6600/110v, Class 0.5, 50VA/PH	1	<input type="radio"/>

CT - Current Transformer

CT Type	Reference Number	Number of CT's	
Single ratio (Primary), 30/5A, 7.5VA, Class 0.5, STC 20.1kA/1sec	SR1B2C4S13	2 / 3	o
Single ratio (Primary), 50/5A, 7.5VA, Class 1.0, STC 18.4kA/1sec	SR2B2C7S9	2 / 3	o
Single ratio (Primary), 100/1A, 15VA, Class 0.2s, STC 18.4kA/1sec	SR4B3C1S10	2 / 3	o
Single ratio (Primary), 100/5A, 10VA, Class 0.2, STC 18.4kA/3sec	SR5B4C2S10	2 / 3	o
Single ratio (Primary), 200/5A, 15VA, Class 0.2s, STC 18.4kA/3sec	SR5B4C4S10	2 / 3	o
Single ratio (Primary), 200/5A, 15VA, Class 0.5, STC 18.4kA/3sec	SR5B4C5S10	2 / 3	o
Single ratio (Primary), 200/5A, 15VA, Class 0.5s, STC 18.4kA/3sec	SR6B1C5S9	2 / 3	o
Single ratio (Primary), 300/5A, 5VA, Class 0.5s, STC 18.4kA/1sec	SR6B4C1S10	2 / 3	o
Single ratio (Primary), 300/5A, 15VA, Class 0.2, STC 18.4kA/3sec	SR7B4C5S10	2 / 3	o
Single ratio (Primary), 400/5A, 15VA, Class 0.5s, STC 18.4kA/3sec	SR8B4C4S9	2 / 3	o
Single ratio (Primary), 500/5A, 15VA, Class 0.5, STC 18.4kA/1sec	SR9B3C4S12	2 / 3	o
Single ratio (Primary), 630/5A, 10VA, Class 0.5, STC 20kA/3sec	SR9B3C5S11	2 / 3	o
Single ratio (Primary), 630/5A, 10VA, Class 0.5s, STC 20kA/1sec	DR10B2C5S11	2 / 3	o
Dual ratio (Primary), 50/25/5A, 7.5VA, Class 0.5s, STC 20kA/1sec	DR10B3C5S6	2 / 3	o
Dual ratio (Primary), 50/25/5A, 10VA, Class 0.5s, STC 16kA/1sec	DR10B3C5S6	2 / 3	o
Dual ratio (Primary), 50/25/5A, 10VA, Class 0.5s, STC 16kA/1sec	DR10B3C5S6	2 / 3	o
Dual ratio (Primary), 50/25/5A, 10VA, Class 0.5s, STC 8kA/0.5sec	DR10B3C5S2	2 / 3	o
Dual ratio (Primary), 100/50/5A, 7.5VA, Class 0.5, STC 13.1kA/0.5sec	DR12B2C4S4	2 / 3	o
Dual ratio (Primary), 100/50/5A, 7.5VA, Class 1.0s, STC 18.4kA/1sec	DR12B2C8S9	2 / 3	o
Dual ratio (Primary), 100/50/5A, 7.5VA, Class 1.0s, STC 18.4kA/1sec	DR12B2C8S9	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 12.5kA/1sec	DR12B3C5S3	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 16kA/1sec	DR12B3C5S6	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 8kA/0.5sec	DR12B3C5S2	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5,16kA/1sec	DR12B3C4S6	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 12.5kA/1sec	DR12B3C5S3	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 16kA/1sec	DR12B3C5S6	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR12B3C5S7	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR12B3C5S7	2 / 3	o
Dual ratio (Primary), 100/50/5A, 10VA, Class 0.5s, STC 20kA/1sec	DR12B3C5S11	2 / 3	o
Dual ratio (Primary), 100/50/5A, 15VA, Class 0.5, STC 18.4kA/3sec	DR12B4C4S10	2 / 3	o
Dual ratio (Primary), 100/50/5A, 15VA, Class 0.5, STC 16kA/1sec	DR12B4C4S6	2 / 3	o
Dual ratio (Primary), 100/50/5A, 15VA, Class 0.5, STC 20kA/1sec	DR12B4C4S11	2 / 3	o
Dual ratio (Primary), 100/50/5A, 15VA, Class 1.0, STC 13.1kA/1sec	DR12B4C7S5	2 / 3	o
Dual ratio (Primary), 120/60/5A, 15VA, Class 0.5, STC 18.4kA/1sec	DR13B4C4S9	2 / 3	o
Dual ratio (Primary), 120/60/5A, 15VA, Class 0.5s, STC 16kA/3sec	DR13B4C5S7	2 / 3	o
Dual ratio (Primary), 150/75/5A, 10VA, Class 0.5s, STC 20kA/3sec	DR14B3C5S12	2 / 3	o
Dual ratio (Primary), 150/75/5A, 10VA, Class 0.5s, STC 20kA/3sec	DR14B3C5S12	2 / 3	o
Dual ratio (Primary), 200/100/1A, 10VA, Class 0.2, STC 18.4kA/3sec	DR15B3C1S10	2 / 3	o
Dual ratio (Primary), 200/100/5A, 5VA, Class 0.5s, STC 18.4kA/1sec	DR16B1C5S9	2 / 3	o
Dual ratio (Primary), 200/100/5A, 5VA, Class 0.5, STC 18.4kA/1sec	DR16B1C4S9	2 / 3	o

CT - Current Transformer

CT Type	Reference Number	Number of CT's	
Dual ratio (Primary), 200/100/5A, 7.5VA, Class 1.0, STC 18.4kA/1sec	DR16B2C7S9	2 / 3	o
Dual ratio (Primary), 200/100/5A, 7.5VA, Class 1.0s, STC 18.4kA/1sec	DR16B2C8S9	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR16B3C5S7	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR16B3C5S7	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5, STC 12.5kA/1sec	DR16B3C4S3	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5, STC 16kA/1sec	DR16B3C4S6	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5s, STC 12.5kA/1sec	DR16B3C5S3	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR16B3C5S7	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR16B3C5S7	2 / 3	o
Dual ratio (Primary), 200/100/5A, 10VA, Class 0.5s, STC 20kA/1sec	DR16B3C5S11	2 / 3	o
Dual ratio (Primary), 200/100/5A, 15VA, Class 0.5s, STC 18.4kA/3sec	DR16B4C5S10	2 / 3	o
Dual ratio (Primary), 300/50/5A, 15VA, Class 0.5, STC 16kA/1sec	DR17B4C4S6	2 / 3	o
Dual ratio (Primary), 300/150/5A, 10VA, Class 0.5s, STC 20kA/3sec	DR18B3C5S12	2 / 3	o
Dual ratio (Primary), 300/150/5A, 15VA, Class 1.0s, STC 16kA/1sec	DR18B4C8S6	2 / 3	o
Dual ratio (Primary), 400/200/5A, 10VA, Class 0.5, STC 12.5kA/1sec	DR19B3C4S3	2 / 3	o
Dual ratio (Primary), 400/200/5A, 10VA, Class 0.5s, STC 12.5kA/1sec	DR19B3C5S3	2 / 3	o
Dual ratio (Primary), 400/200/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR19B3C5S7	2 / 3	o
Dual ratio (Primary), 400/200/5A, 10VA, Class 1.0, STC 20kA/3sec	DR19B3C7S12	2 / 3	o
Dual ratio (Primary), 400/200/5A, 15VA, Class 0.5, STC 18.4kA/1sec	DR19B4C4S9	2 / 3	o
Dual ratio (Primary), 400/200/5A, 15VA, Class 0.5s, STC 18.4kA/1sec	DR19B4C5S9	2 / 3	o
Dual ratio (Primary), 400/200/5A, 15VA, Class 0.5s, STC 20kA/1sec	DR19B4C5S11	2 / 3	o
Dual ratio (Primary), 400/200/5A, 20VA, Class 0.25s, STC 18.4kA/3sec	DR19B5C3S10	2 / 3	o
Dual ratio (Primary), 400/300/5A, 15VA, Class 0.2s, STC 16kA/1sec	DR20B4C2S6	2 / 3	o
Dual ratio (Primary), 600/200/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR21B3C5S7	2 / 3	o
Dual ratio (Primary), 600/300/5A, 7.5VA, Class 1.0, STC 18.4kA/1sec	DR22B2C7S9	2 / 3	o
Dual ratio (Primary), 600/300/5A, 10VA, Class 0.5s, STC 18.4kA/1sec	DR22B3C5S9	2 / 3	o
Dual ratio (Primary), 600/400/1A, 10VA, Class 0.5s, STC 16kA/3sec	DR23B3C5S7	2 / 3	o
Dual ratio (Primary), 600/400/5A, 10VA, Class 0.5s, STC 16kA/3sec	DR24B3C5S7	2 / 3	o
Dual ratio (Primary), 600/400/15A, 15VA, Class 0.5, STC 18kA/3sec	DR25B4C4S8	2 / 3	o
Triple ratio (Primary), 30/20/10/5A, 10VA, Class 0.5, STC 6.7kA/1sec	TR26B3C4S1	2 / 3	o
Triple ratio (Primary), 50/25/10/5A, 15VA, Class 0.5s, STC 6.7kA/1sec	TR27B4C5S1	2 / 3	o
Triple ratio (Primary), 200/100/50/5A, 10VA, Class 0.5s, STC 16kA/3sec	TR28B3C5S7	2 / 3	o
Triple ratio (Primary), 200/100/50/5A, 10VA, Class 0.5s, STC 16kA/1sec	TR28B3C5S6	2 / 3	o
Triple ratio (Primary), 200/100/50/5A, 10VA, Class 0.5s, STC 16kA/3sec	TR28B3C5S7	2 / 3	o
Triple ratio (Primary), 200/100/50/5A, 10VA, Class 0.5s, STC 18.4kA/1sec	TR28B3C5S9	2 / 3	o
Triple ratio (Primary), 200/100/50/5A, 15VA, Class 0.5s, STC 18.4kA/1sec	TR28B4C5S9	2 / 3	o
Triple ratio (Primary), 200/100/50/5A, 15VA, Class 0.5s, STC 18.4kA/1sec	TR28B4C5S9	2 / 3	o
Triple ratio (Primary), 400/200/100/5A, 10VA, Class 0.5s, STC 16kA/3sec	TR29B3C5S7	2 / 3	o
Triple ratio (Primary), 600/300/150/5A, 15VA, Class 0.5m, STC 32kA/1sec	TR30B4C6S14	2 / 3	o

Accessories

Shunt trip supply (110VAC to power shunt trip on RMU)		<input type="radio"/>
Trip lock out relay		<input type="radio"/>
Secondary wiring protection	MCB	<input type="radio"/>
	Fuses	<input type="radio"/>
Power meters		
Metering wiring	Wiring for single meter	<input checked="" type="radio"/>
	Wiring for 2 meters	<input type="radio"/>
Meter type	Circutor	<input type="radio"/>
	Actaris	<input type="radio"/>
	Any other (*)	<input type="radio"/>
Number of meters	1	<input type="radio"/>
	2	<input type="radio"/>
Meter mounting style	Door mounted	<input type="radio"/>
	DIN mounted (window on the door)	<input type="radio"/>
Marshalling box gland plates		
Blank gland plate		<input type="radio"/>
Gland plate with 1 hole (hole size)	20mm	<input type="radio"/>
	25mm	<input type="radio"/>
Gland plate with 2 holes (hole sizes)	20mm and 25mm	<input type="radio"/>
	16mm and 25mm	<input type="radio"/>
	20mm and 20mm	<input type="radio"/>
	25mm and 25mm	<input type="radio"/>
Any other hole sizes / combination(*)		<input type="radio"/>

iv. Options and Accessories - continued

Cable box, cable gland and gland plate selection table		
	Metering unit	
	Incoming side (for FS only)	Outgoing side (for FS and TC only)
Cable box internal arc rated (AFL)		
Top entry		
IP50 (standard)	•	•
IP54 (optional)	○	○
450mm bushings to gland height, 12.5KA IAC	○	○
610 mm bushings to gland height, 12.5KA IAC	○	○
Bottom entry (IP54)		
450mm bushings to gland height, 12.5 kA IAC	○	○
610mm bushings to gland height, 12.5 kA IAC	○	○
450mm bushings to gland height, 20KA IAC	○	○
610mm bushings to gland height, 20KA IAC	○	○
Cable box non IAC rated		
Top entry		
IP50 (standard)	•	•
IP54 (optional)	○	○
450mm bushings to gland height	○	○
610mm bushings to gland height	○	○
Bottom entry (IP54)		
450mm bushings to gland height	○	○
610mm bushings to gland height	○	○
1 X 3C cable gland and gland plates		
X size		
Gland plates		
X size gland plate with earth stud	○	○
Glands		
X tube glands	○	○
X brass wiping gland	○	○
Y size		
Gland plates		
Y size gland with earth stud	○	○
Glands		
Y tube glands	○	○
Y brass wiping gland	○	○

Cable box, cable gland and gland plat selection table		
	Metering unit	
	Incoming side (For FS only)	Outgoing side (for FS and TC only)
3 x 1C cable gland and gland plates		
Gland plates		
3 hole split steel with earth stud	o	o
3 hole solid brass with earth bar	o	o
Glands		
Single core compression gland	o	o
Single core heat shrink glands	o	o

Bus bar coupling selection table		
	Metering unit	
	Incoming side (for FS only)	Outgoing side (for FS and TC only)
Bus bar coupling kits (length mm)	500	750
Insulation for bus bar coupling		
Heat shrink manufactured by SPS	o	o
Heat shrink manufactured by Raychem	o	o
Heat shrink manufactured by REPL	•	•

Air metering unit (AMU) order form

To use this form, please photocopy and return the completed form to your nearest Lucy Electric office
Tick the boxes with your required order (addresses can be found on the back cover)

Name: _____	Company: _____
Address: _____	Tel No: _____
_____	Fax No: _____
_____	Email: _____
_____	Order number: _____

Order quantity / number of units (please fill separate form for each type)

Metering units

General

Impulse withstand voltage (BIL) kVP (choose one from below)

12kV at 75KVP BIL		<input type="checkbox"/>
15.5kV at 95KVP BIL		<input type="checkbox"/>

Rated current

250A		<input type="checkbox"/>
630A		<input type="checkbox"/>

Mounting style

FS: Freestanding		<input type="checkbox"/>
BC: Bus bar connected		<input type="checkbox"/>
TC: Ring main unit (tee-off) mounted		<input type="checkbox"/>

Bushings type

FS: Freestanding		
Incoming DIN type C		•
Outgoing DIN type C		•
BC: Bus bar connected		
Incoming DIN type C		•
Outgoing DIN type C		•
TC: Ring main unit (tee-off) mounted		
Incoming direct connection to RMU		•
Outgoing DIN type C		•

VT - Voltage transformer

VT Primary fused protection

Unfused primary VT with tool-free bus bar isolation for VT testing (only for 630A)		<input type="checkbox"/>
Fused primary VT		<input type="checkbox"/>

VT Type	Number of VT	
Dual ratio (Primary) 3 Phase - 3 limb 11000/6600/110V, class 1, 50VA/PH	1	<input type="checkbox"/>
Single ratio (Primary) 3 Phase - 3 limb 11000/110V, class 1, 50VA/PH	1	<input type="checkbox"/>
Single ratio (Primary) 3 Phase - 3 limb 6600/110V, class 1, 50VA/PH	1	<input type="checkbox"/>

Single ratio (Primary) 1 Phase - 1 limb 13800/110V, class 0.5, 50VA/PH	2	<input type="checkbox"/>
	3	<input type="checkbox"/>
Dual ratio (Primary) 1 Phase - 1 limb 11000/6600/110V, class 0.2, 50VA/PH	2	<input type="checkbox"/>
	3	<input type="checkbox"/>
Single ratio (Primary) 3 Phase - 5 Limb, Ratio: 11000/110v, Class 0.5, 50VA/PH	1	<input type="checkbox"/>
Dual ratio (Primary) 3 Phase - 5 limb, Ratio: 11000/6600/110v, Class 0.5, 50VA/PH	1	<input type="checkbox"/>
Dual ratio (Primary) 3 Phase - 5 Limb, Ratio: 11000/6600/110v, Class 0.5, 20VA/PH	1	<input type="checkbox"/>
Dual ratio (Primary) 3 Phase - 5 Limb, Ratio: 11000/6600/110v, Class 0.5, 50VA/PH	1	<input type="checkbox"/>

CT - Current transformer

CT Ratio change over link		<input type="checkbox"/>
CT Type	Number of CT	Reference Number (*)
Please insert the selected CT Reference Number	<input type="checkbox"/>	<input type="checkbox"/>

Accessories

Shunt trip supply (110VAC to power shunt trip on RMU)		<input type="checkbox"/>
Trip lock out relay		<input type="checkbox"/>
Secondary wiring protection	MCB	<input type="checkbox"/>
	Fuses	<input type="checkbox"/>
Power meters		
Metering wiring	Wiring for single meter	•
	Wiring for 2 meters	<input type="checkbox"/>
Meter type	Circutor	<input type="checkbox"/>
	Actaris	<input type="checkbox"/>
	Any other (#)	<input type="checkbox"/>
Number of meters	1	<input type="checkbox"/>
	2	<input type="checkbox"/>
Meter mounting style	Door mounted	<input type="checkbox"/>
	Din mounted (window on the door)	<input type="checkbox"/>
Marshalling box gland plates		
Blank gland plate		<input type="checkbox"/>
Gland plate with 1 hole (hole size)	20mm	<input type="checkbox"/>
	25mm	<input type="checkbox"/>
Gland plate with 2 holes (hole sizes)	20mm and 25mm	<input type="checkbox"/>
	16mm and 25mm	<input type="checkbox"/>
	20mm and 20mm	<input type="checkbox"/>
	25mm and 25mm	<input type="checkbox"/>
Any other hole sizes/ combination(#)		<input type="checkbox"/>

Please fill the details in comments section below.

Key • Standard Option select

*For CT Reference Numbers check pages 59-60

Sabre accessories order form

To use this form, please photocopy and return the completed form to your nearest Lucy Electric office
Tick the boxes with your required order (addresses can be found on the back cover)

Name: _____	Company: _____
Address: _____	Tel No: _____
_____	Fax No: _____
_____	Email: _____
_____	Order number: _____
Order quantity / number of units (please fill separate form for each type)	<input type="text"/>

Cable box, cable gland and gland plate selection table

	Ring switch 1	Ring switch 2	Circuit breaker tee-off	Extensible bus bars (Not to be used with VRE and DSE)	Metering unit	
					Incoming side (for FS only)	Outgoing side (for FS and TC only)
Interlocked cable box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
Cable box internal arc rated (AFL)						
Top entry						
IP50 (standard)	•	•	•	•	•	•
IP54 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
450mm bushings to gland height, 12.5KA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
610 mm bushings to gland height, 12.5KA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottom entry (IP54)						
450mm bushings to gland height, 12.5 kA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
610mm bushings to gland height, 12.5 kA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
450mm bushings to gland height, 20KA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
610mm bushings to gland height, 20KA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottom entry angled, 12.5KA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Bottom entry deep, 12.5KA IAC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Cable box non IAC rated						
Top entry						
IP50 (standard)	•	•	•	•	•	•
IP54 (optional)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
450mm bushings to gland height	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
610mm bushings to gland height	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottom entry (IP54)						
450mm bushings to gland height	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
610mm bushings to gland height	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bottom entry angled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Bottom entry deep	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
1 X 3C cable gland and gland plates						
X size						
Gland plates						
X size gland plate with earth stud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cable box, cable gland and gland plate selection table

	Ring switch 1	Ring switch 2	Circuit breaker tee-off	Extensible bus bars	Metering unit	
					Incoming side (for FS only)	Outgoing side (for FS and TC only)
				(Not to be used with VRE and DSE)		
1 X 3C cable gland and gland plates						
Glands						
X tube glands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
X brass wiping gland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Y size						
Gland plates						
Y size gland with earth stud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glands						
Y tube glands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Y brass wiping gland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 x 1C cable gland and gland plates						
Gland plates						
3 hole split steel with earth stud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 hole split steel with earth bar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 hole solid brass with earth stud	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 hole solid brass with earth bar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glands						
Single core compression gland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Single core heat shrink glands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Bus bar coupling selection table

Bus bar coupling kits (length mm)	453	500	750
Insulation for bus bar coupling			
Heat shrink manufactured by SPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heat shrink manufactured by Raychem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heat shrink manufactured by REPL	•	•	•
Cold fit rubber boot manufactured by Pirelli	-	-	-

Other accessories	Quantity
Padlocks	<input type="checkbox"/>
TLF fuses (specify quantity and amp rating)	<input type="checkbox"/>
Foundation bolts (not required for transformer mounting)	<input type="checkbox"/>
Adaptor for converting parallel bushings to DIN400 type C connection	<input type="checkbox"/>

Key • Standard Option select - Not applicable

Disclaimer

Lucy Electric has a policy of continuous research and development and accordingly reserves the right to change the design and specification of its products without prior notice or liability.

Lucy Electric worldwide offices

Lucy Electric UK Ltd

Howland Road, Thame, Oxfordshire,
OX9 3UJ, United Kingdom
Tel: +44 1844 267 267 General
Tel: +44 1844 267 222 Sales
Fax: +44 1844 267 223
Email: salesuk@lucyelectric.com

Lucy Middle East FZE

PO Box 17335, Jebel Ali, Dubai,
United Arab Emirates
Tel: +971 48 129 999
Fax: +971 48 129 900
Email: salesme@lucyelectric.com

Lucy Electric (Thailand) Ltd

388 Exchange Tower,
37th Flr Unit 3702,
Sukhumvit Road, Klongtoey Sub
district,
Klongtoey District, Bangkok,
10110, Thailand
Tel: +66 (02) 663 4290
Fax: +66 (02) 663 4293
Email: salesth@lucyelectric.com

Lucy Electric India Private Ltd

H21, MIDC
Ambad, Nasik 422010, India
Tel: +91 253 2381603
Fax: +91 253 2381247
Email: salesIndia@lucyelectric.com

Lucy Switchgear Arabia Co. Ltd

Novotel Business Centre,
P.O. Box 35340, Dammam 31488,
Saudi Arabia
Tel: +966 138 147 910
Fax: +966 138 147 914
Email: salessa@lucyelectric.com

Lucy Electric South Africa Pty. Ltd

Unit 12 & 13, Block C,
Honeydew Business Park,
1503 Street, Laser Park,
Honeydew, 2170, South Africa
Tel: +27 11 025 7490
Fax: +27 11 794 3277
Email: salesza@lucyelectric.com

Postal Address:
P.O. Box 1078, Honeydew, 2040

Lucy Asia Pacific Sdn Bhd

Unit 17-05-06, Level 17,
PJX-HM Shah Tower,
No.16 Persiaran Barat,
46050 Petaling Jaya,
Selangor, Malaysia
Tel: +603 74910700
Fax: +603 79316923
Email: salesmy@lucyelectric.com

Lucy Equipamentos Elétricos Ltda.

Av. das Araucárias 2558
Thomaz Coelho, CEP 83707-067,
Araucária Paraná State, Brazil
Tel: +55 (41) 2106 2801
Email: salesbrazil@lucyelectric.com

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www.lucyelectric.com