TE Energy
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TE ENERGY

AIR-INSULATED COMPACT SWITCHGEAR UP TO 24 kV FOR RMU APPLICATIONS AND PRIMARY DISTRIBUTION

SCELL_MONO | 24 kV, 630 A, 20 kA
24 kV, 1250 A, 25 kA

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Co-funded by the European Union
Investing in your future

ISO 9001:2015
ISO 14001:2015
ISO 45001:2018

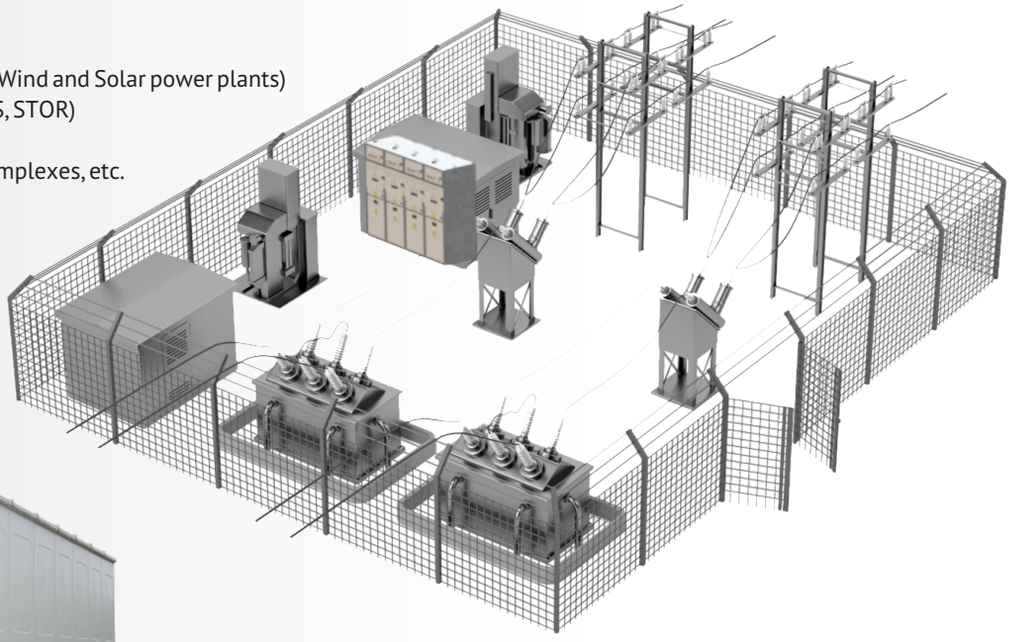
VERSATILE RMU SOLUTIONS

Introduction

The SCELL_Mono switchgear is designed to meet both current and future environmental regulations, fully adhering to EU Regulation No. 517/2014, which reduces the use of fluorinated gases in industrial applications. It also aligns with the European Commission's April 2022 proposal, part of the EU's Green Deal, aiming to phase out the use of F-gases in new switchgear by 2030, where alternative technologies are available. SCELL_Mono thus not only meets present standards but is also prepared for upcoming regulatory changes, helping equipment owners maintain low operating costs in a sustainable manner.

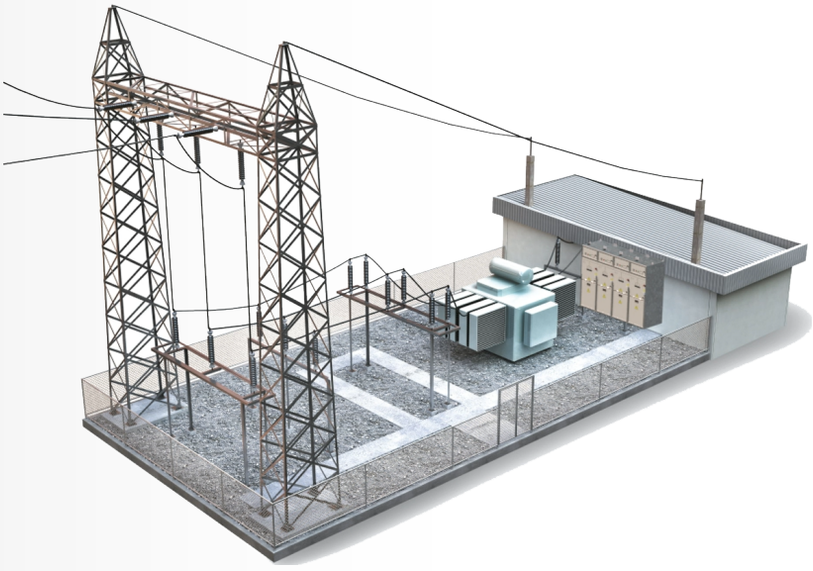
The SCELL_Mono switchgear, TE Energy's latest innovation, is specifically designed for use in ring main unit stations, providing essential control and protection for DNO cable networks. In addition to traditional substation use, it is also ideal for diverse sectors such as:

- Small Industries
- Renewable Energy Installations (Wind and Solar power plants)
- Energy Storage Installation (BESS, STOR)
- Hospitals and Health Facilities
- Data Centers and Commercial Complexes, etc.



Well-suited for primary distribution

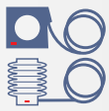
Besides its typical RMU applications, the SCELL_Mono's extensible design and robust accessories, with a 1250A current rating and 25kA short-circuit withstand capacity, allow it to be used in more demanding applications such as primary distribution. This versatility makes the SCELL_Mono suitable not only for secondary distribution networks but also for scenarios requiring higher power handling and more complex network configurations.



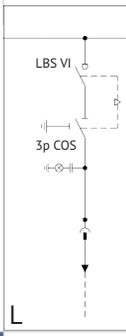
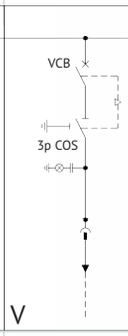
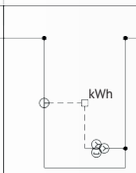
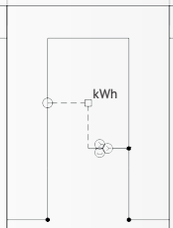
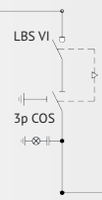
CONFIGURATIONS

Main switching devices

	LBS	Isc breaking capacity	Ir rated current	Operation	Auxiliary supply	Protection	Motorized operation
1		Isc=Load	Ir=630A Ir=1250A	Manual Remote	Not required	No	Upgrade accessory

	VCB	Isc breaking capacity	Ir rated current	Operation	Auxiliary supply	Protection	Remote control
2		Isc=20kA Isc=25kA	Ir=630A Ir=1250A	Manual Remote	Not required		Upgrade accessory

Selection

	LBS	VCB	Metering (uplink)	Metering (lowlink)	Busbar earthing	LBS Coupler LHS/RHS	VCB Coupler LHS/RHS
	24kV;20/25kA; 630A/1250A	24kV;20/25kA; 630A/1250A	24kV;20/25kA; 630A/1250A	24kV;20/25kA; 630A/1250A	24kV;20/25kA; 630A/1250A	24kV;20/25kA; 630A/1250A	24kV;20/25kA; 630A/1250A
							
Options	L	V	CMU	CML	BE	CLL/CLR	CVL/CVR
Cable VT	✔	✔					
Busbar VT	✔	✔			✔		
Cable CT/CS	✔	✔					
Busbar CT/CS	✔	✔			✔	✔	✔
Coupler CT/CS	✔	✔				✔	✔
2 cables per phase[1]	✔	✔					
Front attachment[2]	✔	✔					
Rear gas exhaust[3]	✔	✔	✔	✔	✔	✔	✔
Surge arresters[4]	✔	✔					

Accessories

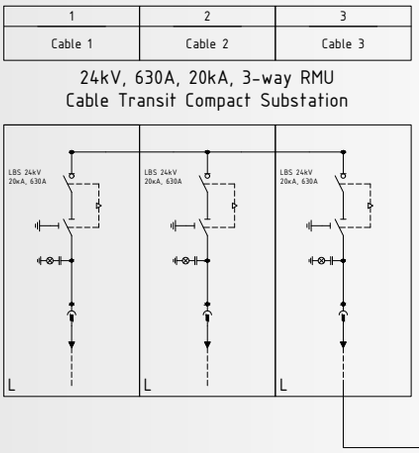
LBS/VCB motor	✔	✔				✔	✔
COS motor	✔	✔			✔	✔	✔
Self-powered IED		✔					✔
Time-Limit Fuse		✔					
SC indicator	✔	✔	✔	✔	✔	✔	✔
Remote trip	✔	✔				✔	✔

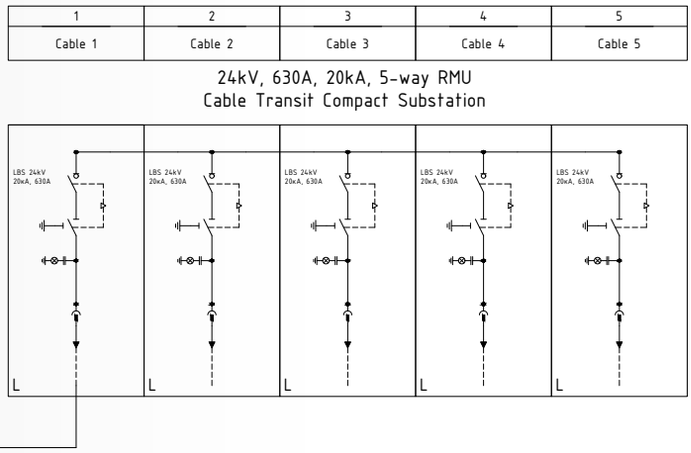
[1] Adding surge arresters requires a front attachment.
[2] The front attachment can house 2 more cables per phase or 1 cable plus surge arresters.
[3] This adds 150 mm in depth.
[4] One cable per phase and surge arresters can fit in the cable compartment.

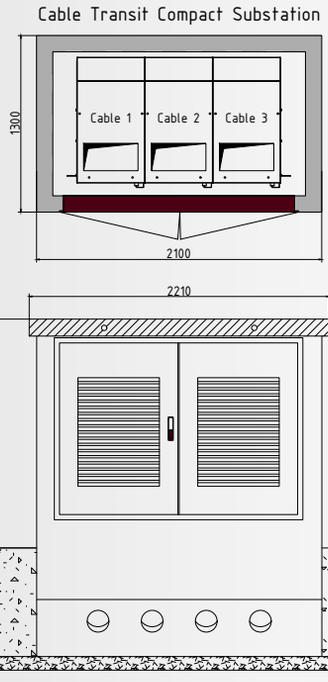
TYPICAL INSTALLATIONS

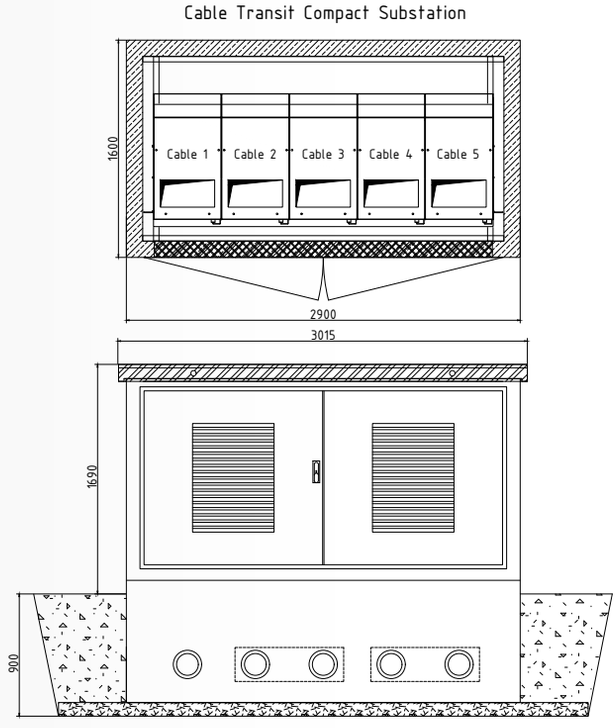
RMU for Cable Transit Compact Substations

The SCELL_Mono can be used as an RMU (Ring Main Unit) for secondary distribution networks. Its extendable and modular compact design offers complete solutions for compact secondary substations (concrete, metal, GRP) such as cable transit substations and transformer substations up to 4 MVA.



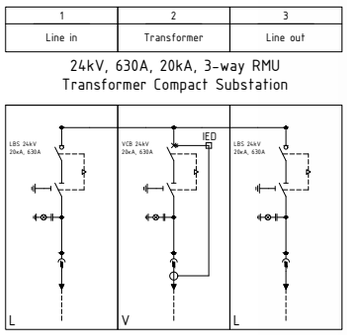


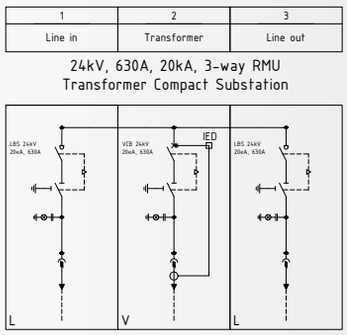


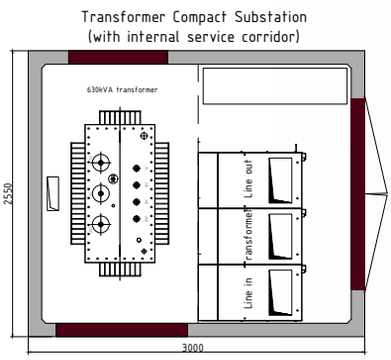


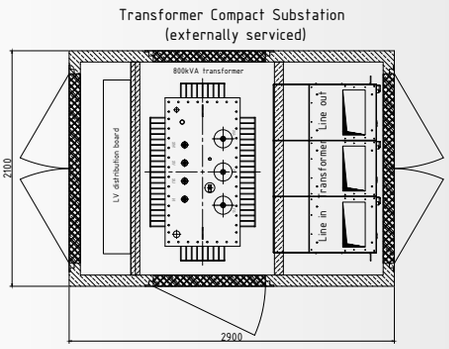
TYPICAL INSTALLATIONS

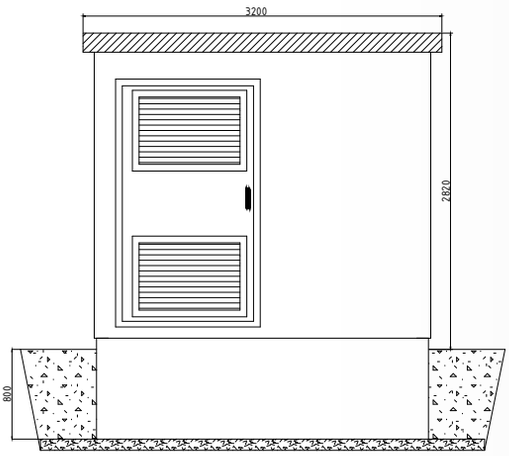
RMU for Transfomer Compact Substations

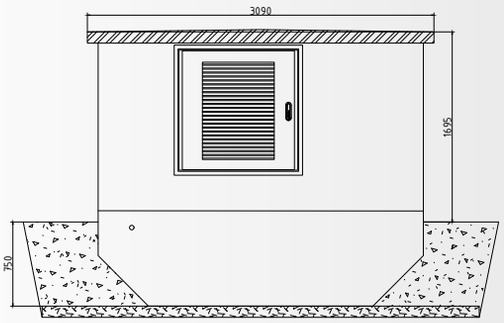










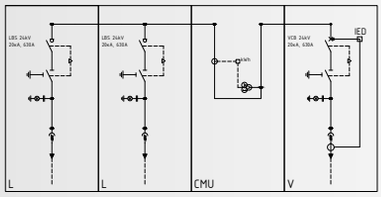


TYPICAL INSTALLATIONS

RMU for Transfomer Compact Substations with Metering
2-section RMU for 2x Transfomer Compact Substations

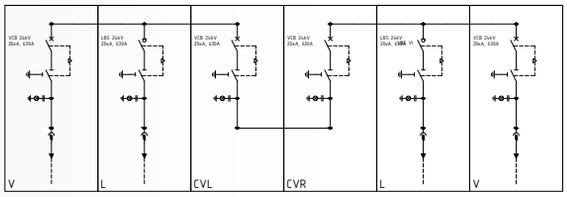
1	2	3	4
Line in 1	Line in 2	Metering	Transformer

24kV, 630A, 20kA, 4-way RMU
Transformer Compact Substation with Metering

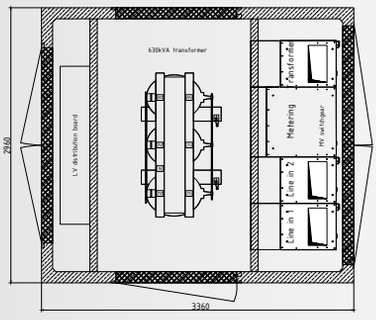


1	2	3	4	5	6
Transformer	Line in 1	LHS Coupler	RHS Coupler	Line in 2	Transformer

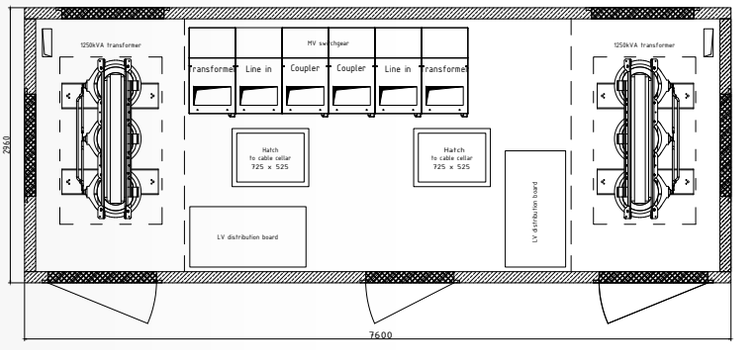
24kV, 630A, 20kA, 2-section RMU
2xTransformer Substation

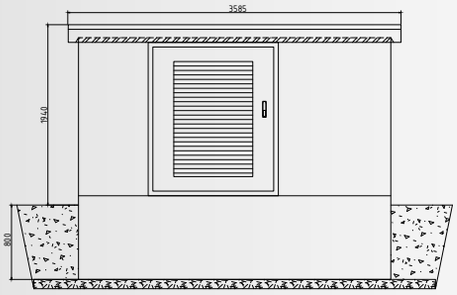


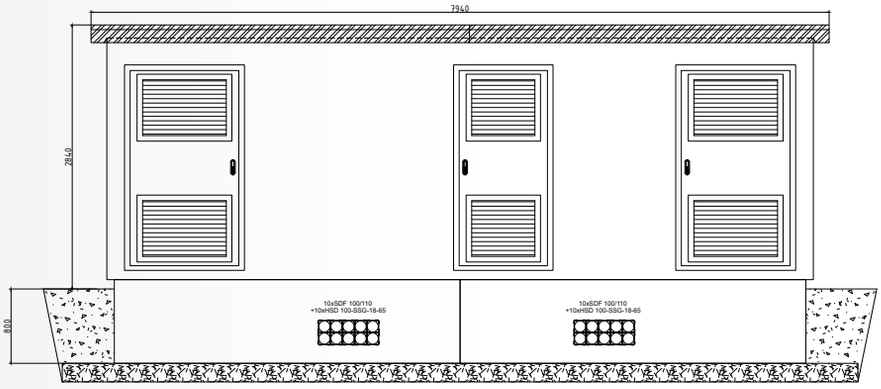
Transformer Compact Substation with Metering
(externally serviced)



2x1250kVA Transformer Substation
(with internal service corridor)



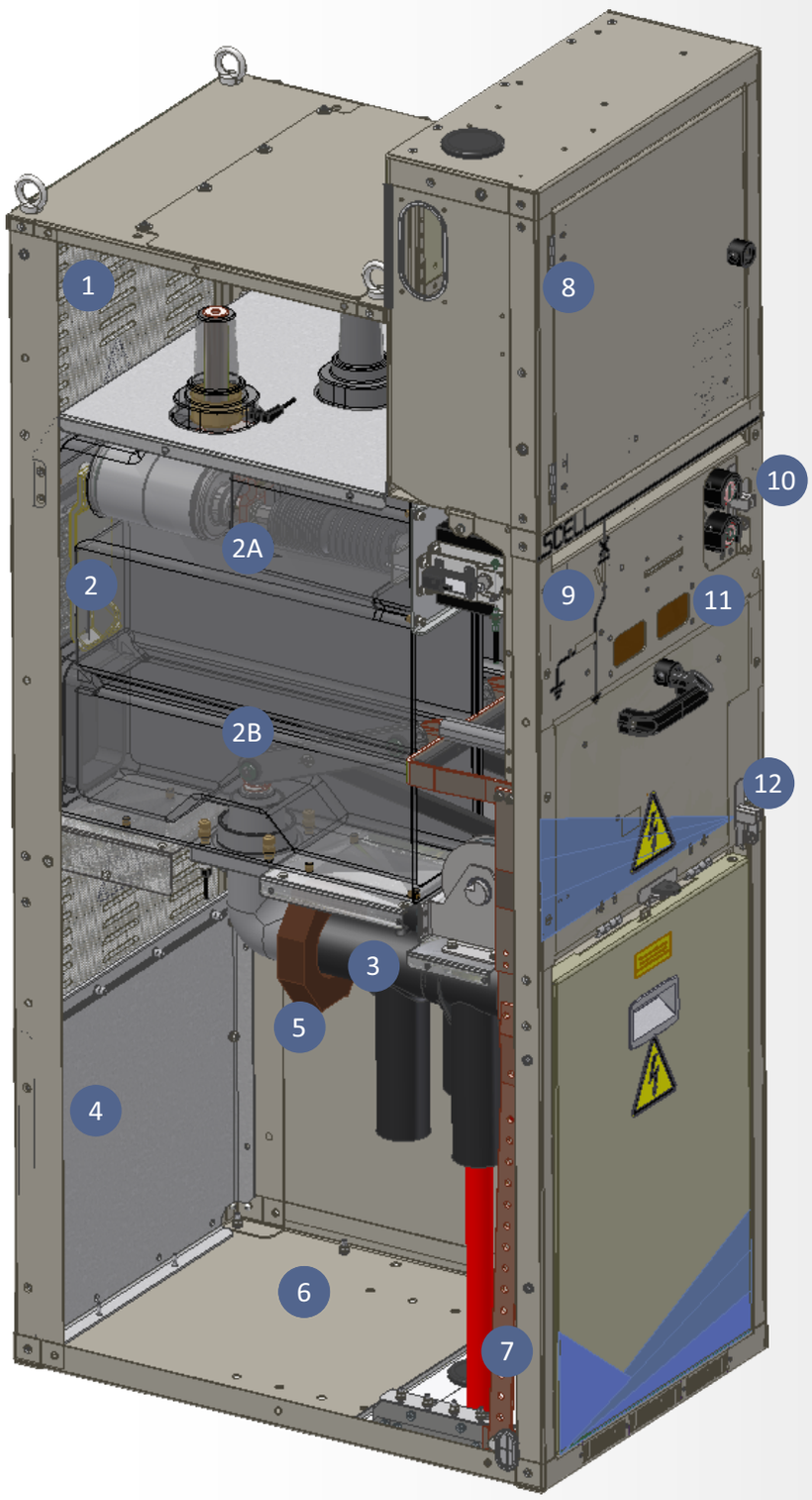




DESIGN

Overview

1 Busbar compartment
2 Monoblock insulated compartment:
2A: LBS or VCBlite switching devices
2B: Change-Over Switch (COS)
3 Type A or C bushings and MV terminations
4 Cable compartment
5 Ring-core current transformers
(can be installed on bushings or MV cables)
6 Plug-in voltage transformers facility
7 Main earthing busbar
8 LV compartment for TLF or self-powered protection IED
9 Facia mechanical indication mimics
10 LBS/VCBlite manual controls
11 Inspection windows
12 COS manual control slot



DESIGN

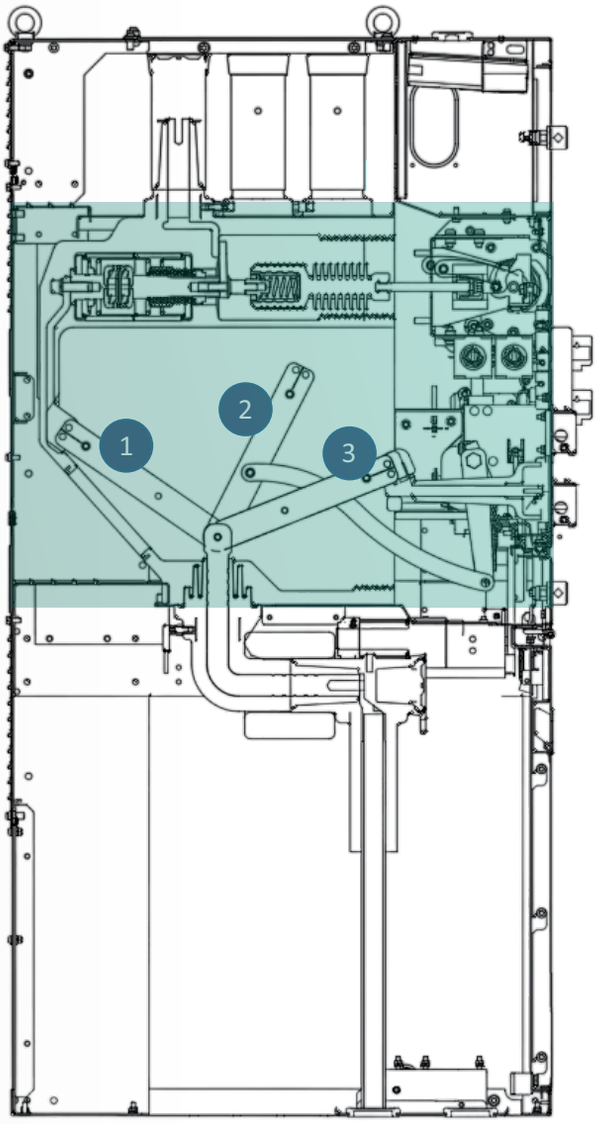
Switching devices

The SCELL_Mono offers a choice of either a vacuum circuit breaker (VCB) or load-break switch (LBS), paired with a versatile three-position Changeover Switch (COS) up to 24 kV, rated current up to 1250 A, and short-circuit withstand capability up to 25 kA. This design ensures flexible switching capabilities for various applications, allowing users to select the most suitable configuration based on specific operational needs.

The VCB, LBS, and COS feature a unique operating mechanism that uses flat spiral springs to store the energy required for operation.

The spiral springs offer an exceptionally efficient method for operating switching devices. Compared to the compression or extension springs commonly found in most other devices, the spiral spring design is more compact, making it particularly well-suited for space-constrained environments, such as SF6-free, air-insulated switchgear. Additionally, the spiral spring design enables faster opening and closing times, which are essential for protecting sensitive equipment.

The standard Changeover Switch (COS) has three distinct positions:
- SERVICE (1)
- ISOLATED (2)
- EARTHED (3)



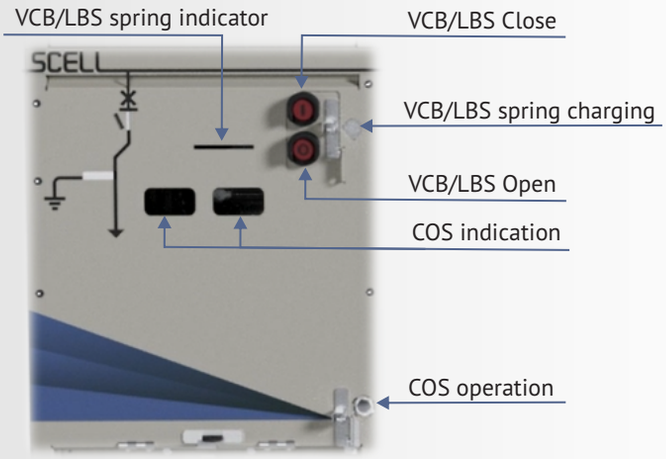
Operation principle

All switching devices can be operated manually without an auxiliary supply.

- To close the VCB or LBS , the spring mechanism must be charged before pressing the buttons on the front to operate the switches.
- The COS is operated by turning the operating handle.

A mechanical interlock between the VCB/LBS and the COS prevents incorrect operation.

Optionally, all switching devices can be equipped with an auxiliary-powered motor for remote control.



ACCESSORIES

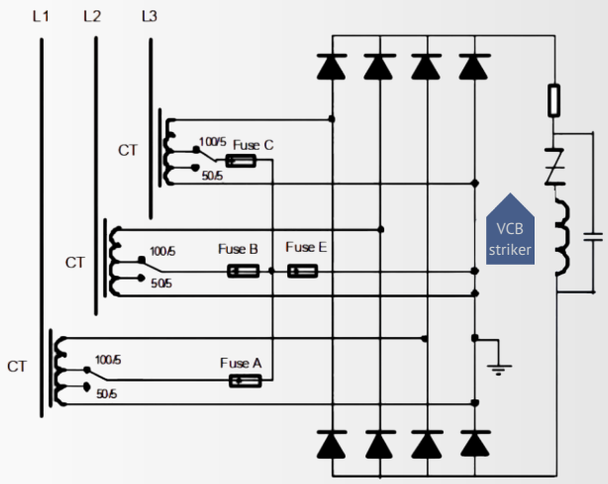
Optional features

The SCELL_Mono offers a range of options, including but not limited to:

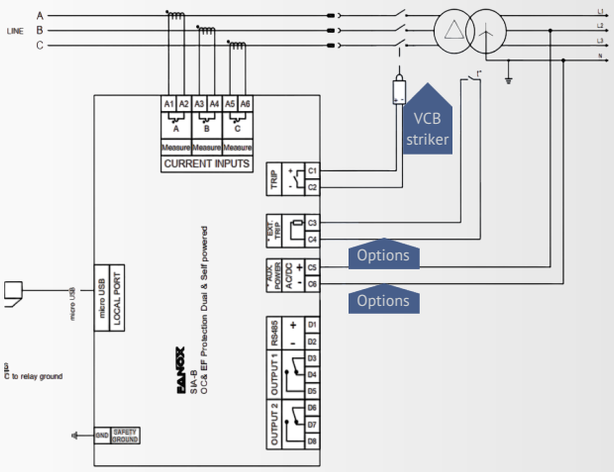
- Additional trip and close coils
- Motor-operated switching devices (VCB, LBS, COS)
- Cable-side voltage transformers
- Current and voltage sensors
- Self-powered relays; Time-Limited Fuse (TLF) for transformer protection; feeder protection relays; short-circuit indicators

Typical transformer protection schemes

Time-Limited Fuse (TLF) device installed in LV compartment and wired to cable CTs.



Self-powered relay with specific CTs or standard CTs.



TECHNICAL SPECIFICATIONS

Panel type	SG25_SCELL_Monoblock			
Rated voltage (Ur), kV	24			
Rated frequency, Hz	50/60			
Rated PF withstand voltage (Ud), kV	50/60 (across open contacts)			
Rated impulse withstand voltage (Up), kV	125/145 (across open contacts)			
IAC Classification	A-FL; A-FLR with rear attachment			
IA Isc, Duration kA, s	20/25, 1			
Loss of service continuity	LSC2B			
Partition type	PM			
Partial discharge level at 1.1 x Urated, pC	<20			
Degree of protection indoor	IP4X			
Temperature range	-25...+55°C			
Maximum relative humidity	95%			
Maximum altitude, m a.s.l.	1000			
Local operation	Manual or TLF or self-powered IED			
Remote operation Auxiliary voltage, V	24/110/220 DC or 100...230 AC			
Rated short-time withstand current (Ik), kA	20/25			
Rated peak withstand current (Ip), kA	52/64			
Rated duration of short circuit current (t), s	3			
Rated current, A	630/1250			
Equipment	VCBlite parameters IEC 62271-100			
Type of VI	TD-12/630-25	TD-12/1250-25	TD-24/630-20	TD-24/1250-25
Rated voltage (Ur), kV	12/17,5		24	
Rated frequency, Hz	50/60			
Rated PF withstand voltage (Ud), kV	28/38		50	
Rated impulse withstand voltage (Up), kV	75/95		125	
Rated current (I), A	630	1250	630	1250
Mechanical endurance Class	M1 (2,000 CO); M2 (10,000)			
Electrical endurance Class	E1; E2			
Capacitive currents switching Class	C1			
Autoreclosing cycle	0-3min-CO-3min-CO; 0-0.3s-CO-15s-CO			
Rated short circuit breaking current (Isc), kA	25		20	25
Rated making current (Ip), kA	64		52	64
Rated short-time withstand current (Ik), kA	25		20	25
Rated duration of short circuit current (t), s	3			

Equipment	LBS parameters IEC 62271-103	
Type of VI	TF-24/630-20	TF-24/1250-25
Rated voltage (Ur), kV	24	
Rated frequency, Hz	50/60	
Rated PF withstand voltage (Ud), kV	50	
Rated impulse withstand voltage (Up), kV	125	
Rated current (I), A	630	1250
Mechanical endurance Class	M2 (5,000 CO)	
Electrical endurance Class	E3	
Capacitive currents switching Class	C1	
Rated breaking current (In), A	630	1250
Rated making current (Ip), kA	52	64
Rated short-time withstand current (Ik), kA	20	25
Rated duration of short circuit current (t), s	3	
Equipment	COS parameters as Disconnector IEC 62271-102	
Rated Voltage, kV	24	
Rated Current, A	630/1250	
Rated peak withstand current (Ip), kA	52/64	
Rated short-time withstand current (Ik), kA	20/25	
Rated duration of short circuit current (t), s	3	
Mechanical endurance Class	M1	
Equipment	COS parameters as Earthing switch IEC 62271-102	
Rated Voltage, kV	24	
Rated peak withstand current (Ip), kA	52/64	
Rated short-time withstand current (Ik), kA	20/25	
Rated duration of short circuit current (t), s	3	
Mechanical endurance Class	M1	
Electrical endurance Class	E2	

Applicable standards

HV switchgear and control gear: common specifications	IEC 62271-1
AC metal enclosed switchgear and control gear	IEC 62271-200
Alternating current circuit breakers	IEC 62271-100
Alternating current disconnectors and earthing switches	IEC 62271-102
Alternating current switches	IEC 62271-103
Current transformers	IEC 61869-2
Voltage transformers	IEC 61869-3
Ingress protection	IEC 60529
VPIS systems for rated voltages between 1kV and 52kV	IEC 62271-206
EU LV directive	2014/35/EU
EU EMC directive	2014/30/EU

ON TIME WITH CONFIDENCE

In line with the growing focus on sustainability, we are fully committed to Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD). LCA is a method used to evaluate the environmental impact of a product throughout its entire life cycle, from raw material extraction to disposal. Building on this, an EPD is a detailed report that communicates the environmental performance of a product based on recognized standards. Together, these practices help us minimize our carbon footprint and reinforce our commitment to reducing environmental impact as part of our ongoing sustainability efforts.

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