TAVRIDA ELECTRIC
Excellence in Engineering

SmartCELL

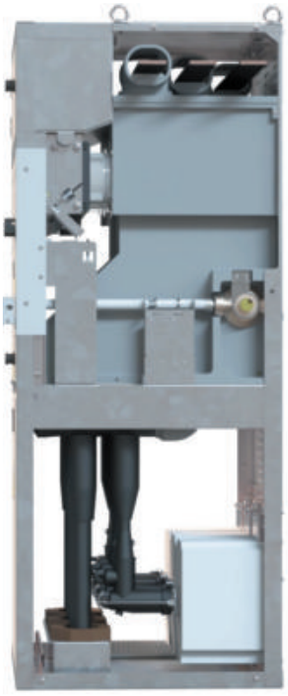
Compact, air insulated switchgear with instant digital network functionality

UK PAT. PEND. APPLICATION NO 1903461.0

BUILDING BLOCKS FOR NETWORK DIGITALIZATION

Distribution network operators all over the world produce high demands for the switchgear in their ownership in terms of digital network compatibility and variety of applications. High levels of Smart-Grid readiness, integration into SCADA and DMS for remote control, monitoring and data management, transferring data in digital format from protection devices and measuring instruments according to IEC 61850, fault detection and restoration with self-healing network algorithms; these represent a small percentage of the required functionality within modern digital networks.

SCELL panel is a universal building block to build up customer's sophisticated network of any configuration and functionality thanks to its instant digital network readiness, powerful electrical parameters, functional versatility and compact size.



SCELL intelligence is provided by a powerful Intelligent Electronic Device (IED) with digital current and voltage inputs, rich protection, automation and communication features.

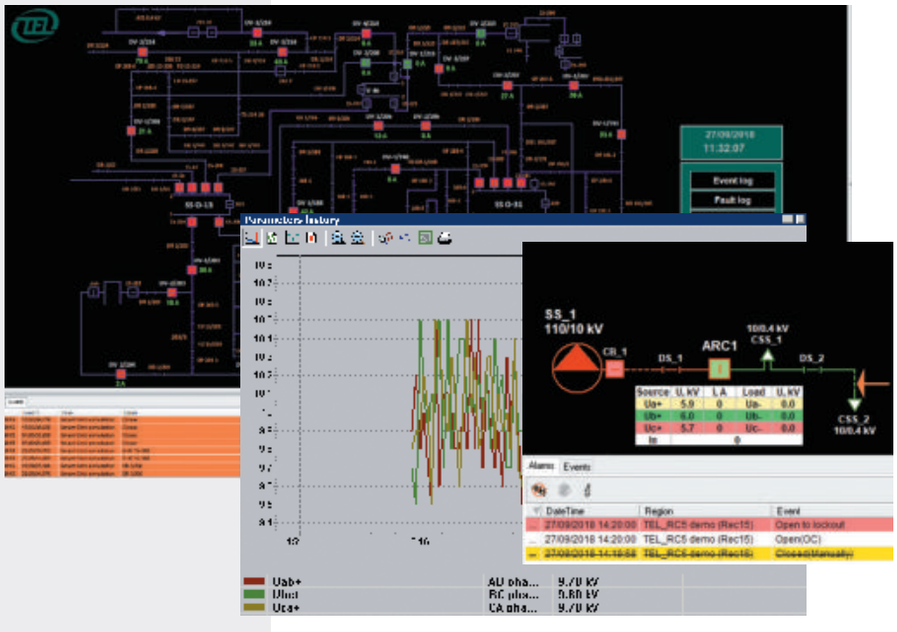
SCELL heart represents a standard combination of:

- 3 position (service, earthed, isolated) COS25 Change-Over switch with detachable earthing blades
- Fast vacuum circuit breaker ISM with an extremely long electrical and mechanical life

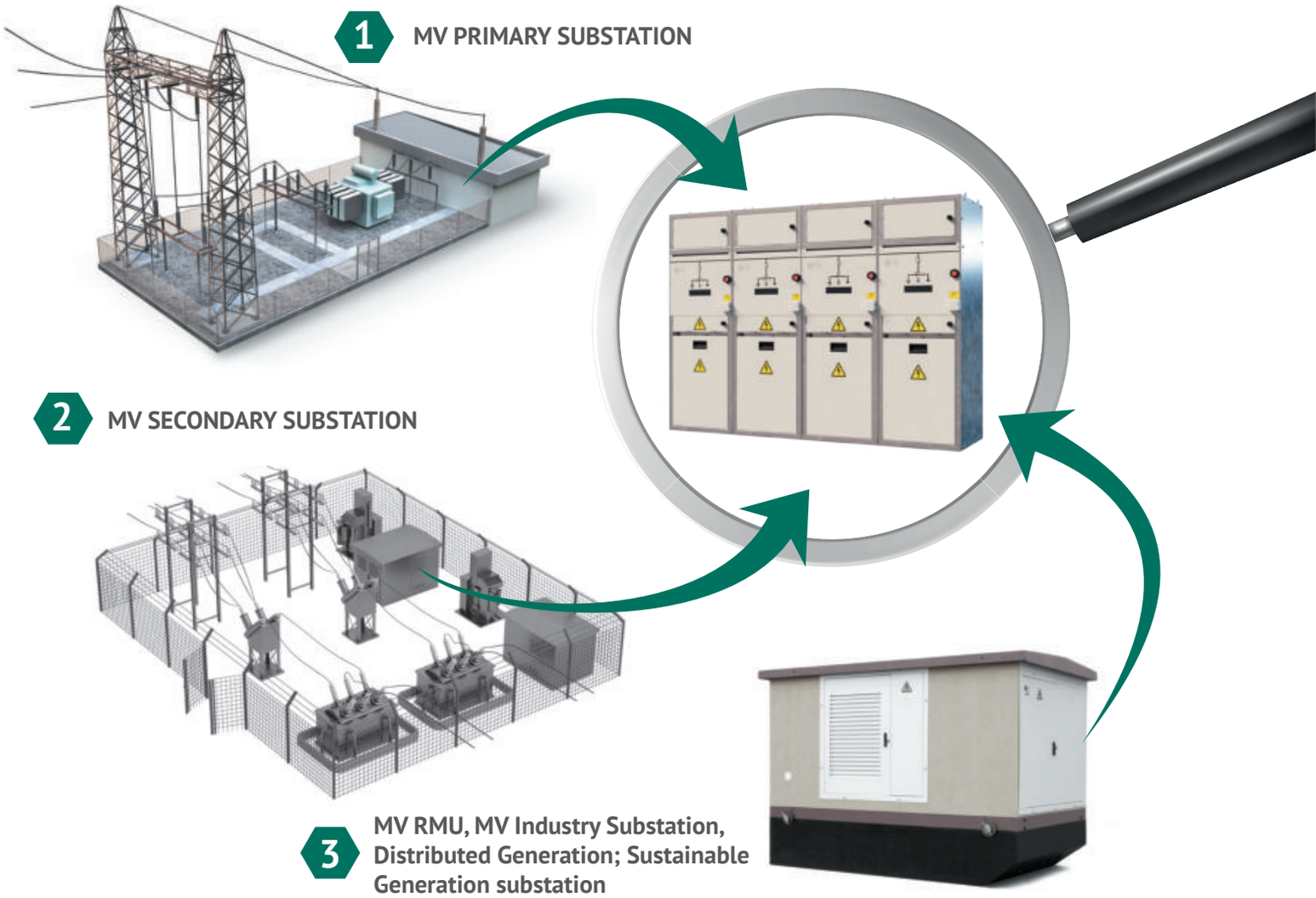
Both of switching devices are capable of performing as an "isolation device" as per IEC 61140.

SCELL sensing includes digital current and voltage sensors, temperature and PD sensors.

SCELL is a tool to either renovate existing networks or construct a new one. It can be easily integrated into any existing or newly expand SCADA system. As a grid automation ready solution, SCELL can be offered with TELSCADA – a perfect tool, allowing implementation of multi-scale grid automation projects, where other network assets (such as MILE panels or TEL reclosers) can be integrated.



SCELL IS DESIGNED FOR ALL LEVELS OF DISTRIBUTION NETWORK



MV PRIMARY SUBSTATION

	VCB	Isc rating	Ir rating	Protocol	Protection	Energy metering	IAC AFLR
1		Isc=25kA	Ir=1250A	IEC 61850			

MV SECONDARY DISTRIBUTION

	VCB	Isc rating	Ir rating	Protocol	Protection	Sensors	IAC AFLR
2		Isc=16kA	Ir=1250A	IEC 61850			

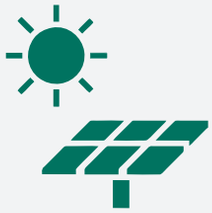
MV RMU, MV INDUSTRY SUBSTATION, DISTRIBUTED GENERATION; SUSTAINABLE GENERATION SUBSTATION

	VCB	Isc rating	Ir rating	RTU	Signaling&Trip	Sensors	IAC AFLR
3		Isc=16kA	Ir=630A				

SCELL APPLICATION

▶ Energy

Wind farms

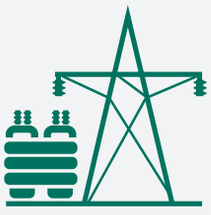


Photovoltaic parks

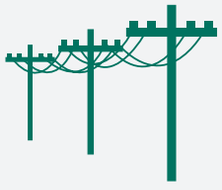
Hydro power substations

Power stations

Zone substations



Primary substations



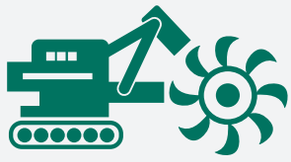
Compact rural substations

Secondary substations

City RMUs

Automotive production lines

▶ Industry



Mining and excavations

Oil and Gas

Water and waste water plants

Mineral production and transportation

Iron and steel production

▶ Infrastructure

Heat and water distribution

Airports

Seaports

City ground transport

Metro stations

Railways

▶ Marine

Ships

Shore supplies

Sea platforms

▶ Buildings

Stadiums and arenas

Hotels

Hospitals

Data Centres

Shopping centers

Office buildings

INSIDE SCELL

Compartments

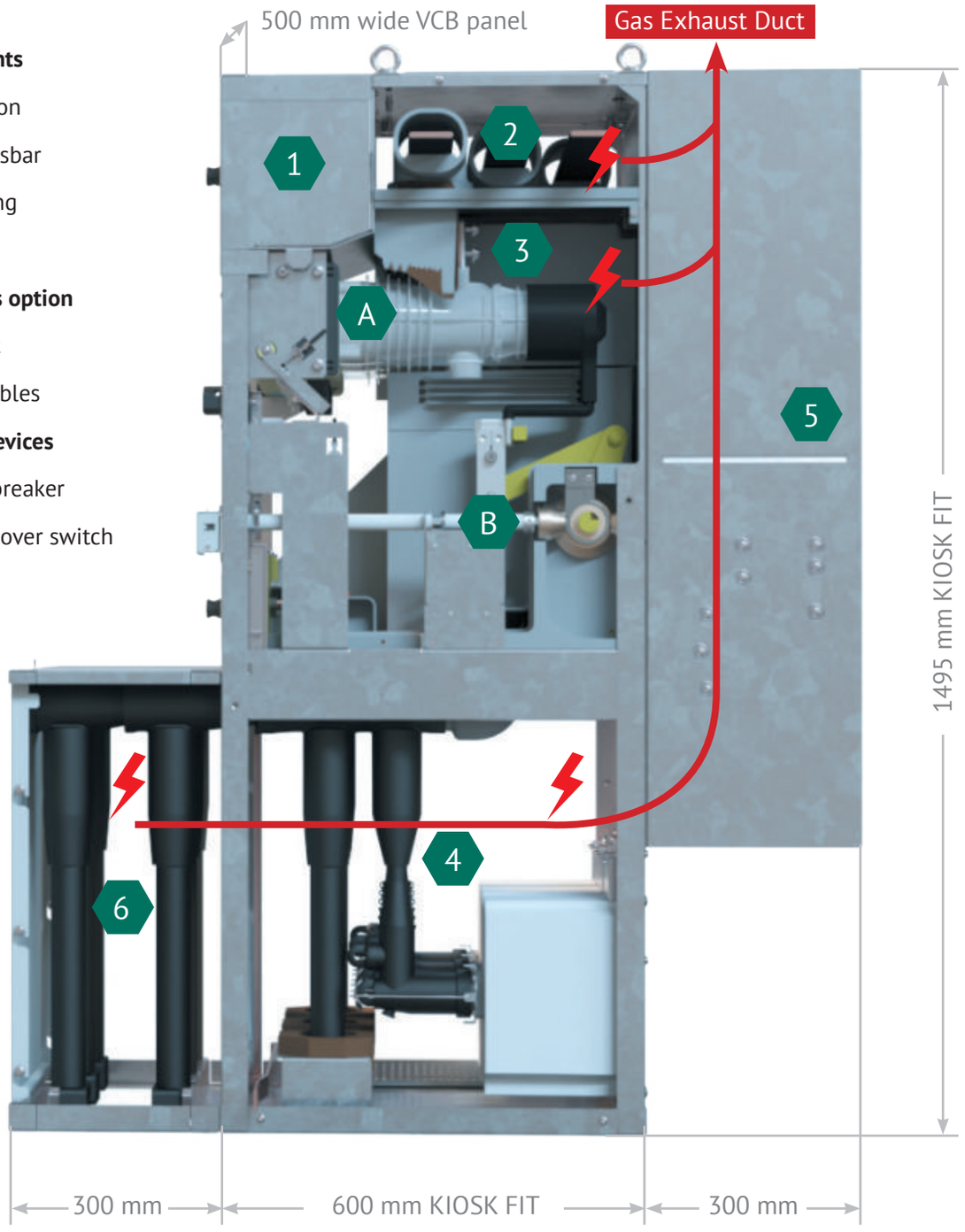
1. Protection
2. Main busbar
3. Switching
4. Cable

Attachments option

5. Arc duct
6. Extra cables

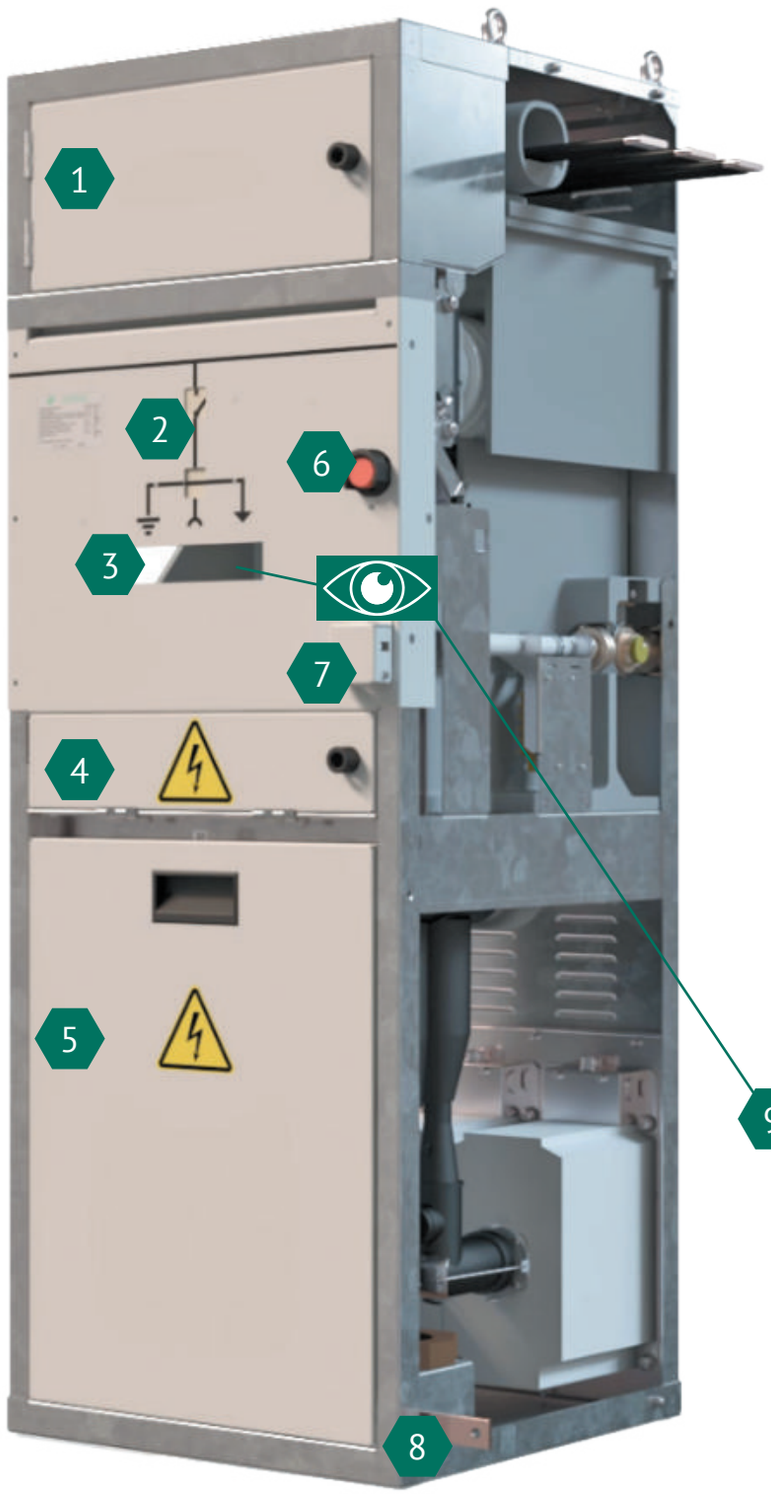
Switching devices

A. Circuit breaker
B. Change over switch

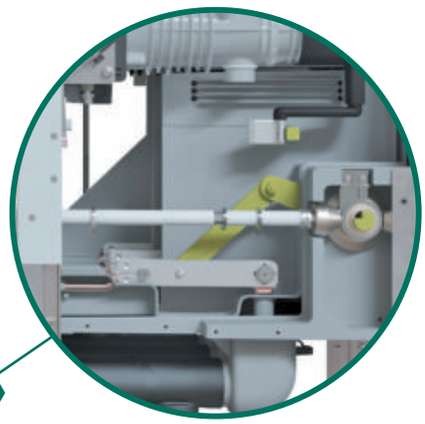


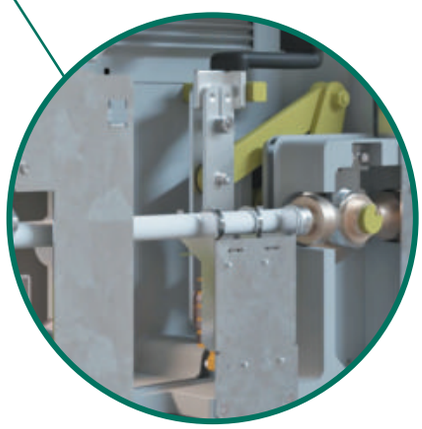
- SF6 free, environmental friendly
- No sealed reservoir with insulation medium subjected to periodical inspections
- Sandwich insulation (air and solid combination), PD free
- LSC2B-PI Class as for Heavy Withdrawable Switchgear
- IAC: AFL and AFLR with optional ARC DUCT

IN FRONT OF SCELL

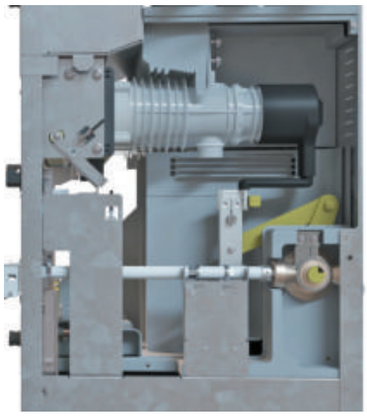


1. Protection compartment standard or extended
2. Mimic diagram with dynamicaly changing elements of switching devices
3. Inspection window
4. Cable test facility
5. Cable access door
6. VCB manual trip
7. COS operational slot
8. Earthing bar
9. Visual gap

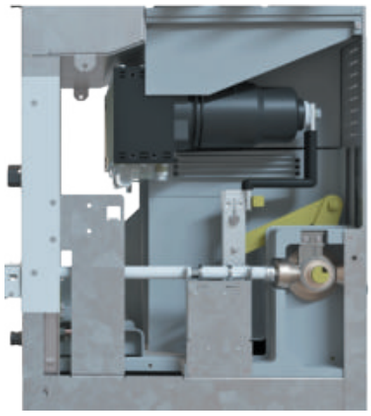




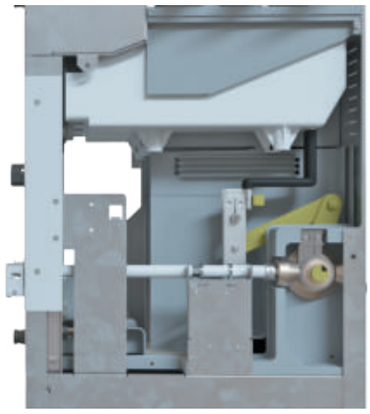
Vacuum circuit breakers ISM



ISM25_LD

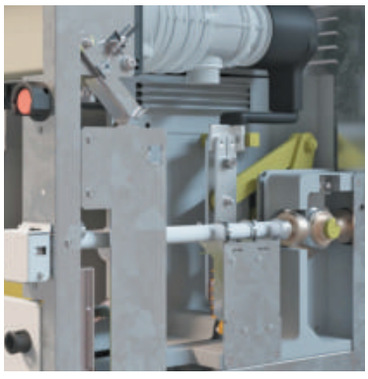


ISM15_MD

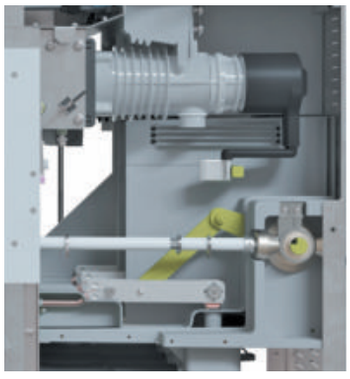


ISM25_Shell

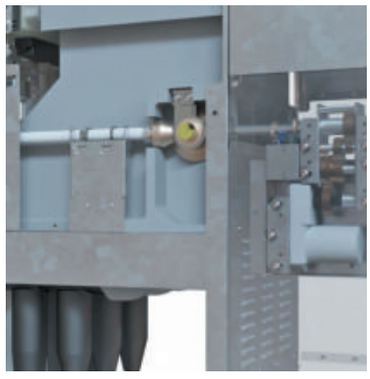
Change over switch COS25



COS25 Service position

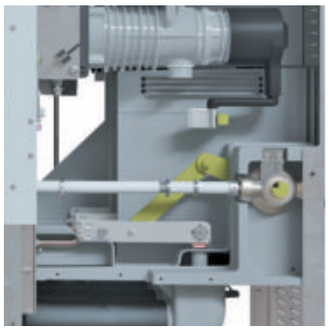


COS25 Earthed position

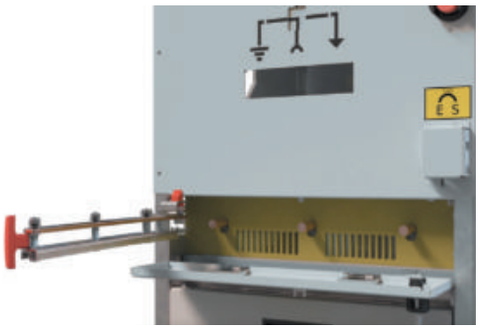


Motorized COS25 for remote control

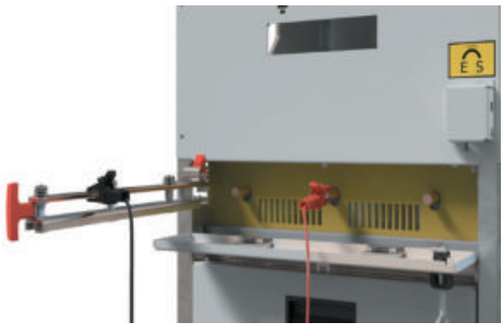
Cable testing facility



Earthed



Isolated (door open and earth detached)



Cable test

Digital instruments

Phase current sensors

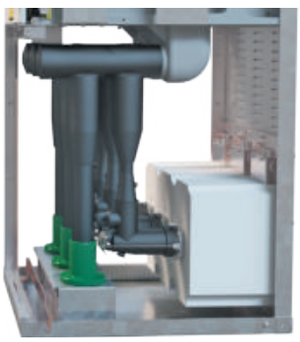
Phase and earth current sensors

Phase current sensors at T connectors

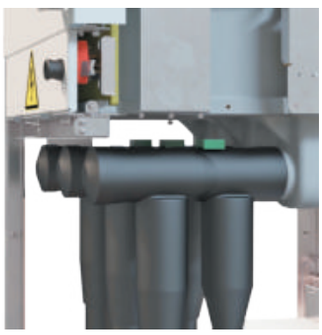
Voltage sensors at T connectors

Traditional instruments and condition monitoring accessories

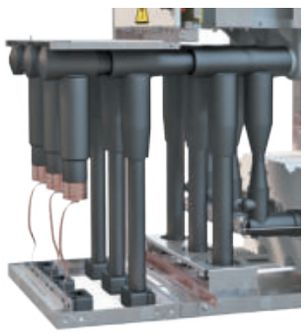
Phase current and voltage transformers



Partial discharge sensors



Temperature sensors



Surge arresters

Intelligent electronic devices

Any digital protection relay can be used, depending on customer's traditions or preferences. However, in line with the modern trends of network digitalization, Tavrida Electric offers it's all new protection relay M-series designed to interface with digital current and voltage sensors. Current sensors of different types (detachable) and diameters (depending on cable size) are available. Voltage sensors compatible with most of well known brands of T connectors.

BENEFITS

Reducing investment and ownership costs

- Instant digital network functionality allows all type applications in customer network or substation without necessity of later upgrades/investments
- Powerful ratings and reach functionality allows installation of the same product in all levels of distribution network
- Sandwich type insulation does not require periodical inspection for any pressure drops or leakages

Maximum reliability and ease of use

- Unprecedented number of VCB switching operations (30,000 CO @ Ir) makes SCELL lifetime the longest available on the market
- Use of field proven drives of VCB and COS, interlock mechanisms guarantee maximum reliability
- Operator friendly interface; dynamically changing mimic indication and availability of cable test facility make SCELL easy to use at installation and during later operation

Minimizing outage time

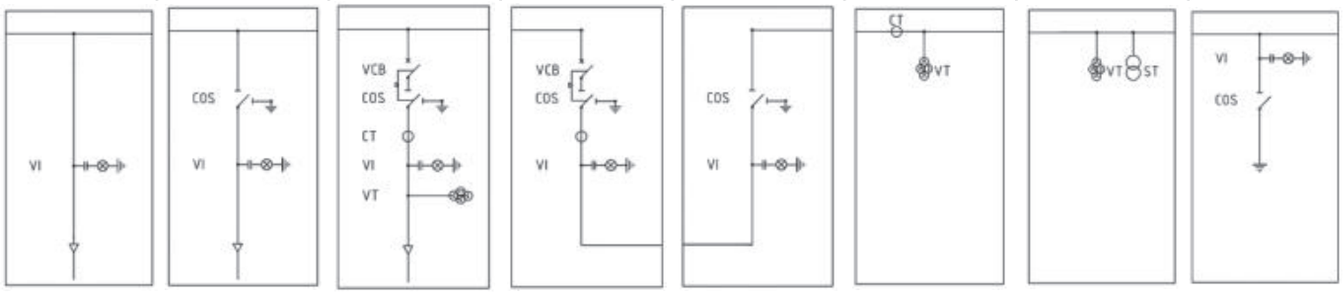
- Events of short circuit, or any other abnormal conditions are instantly detected, reported and isolated, if required
- Remote operation and online network parameters monitoring allow quick restoration of a supply
- Short delivery terms; factory tuned functionality; simplicity of installation and commissioning minimize total project time
- Availability of a typical project and ready-made solutions simplify consultant's life, minimize design time and guarantee error free project

Standards compliance

- Fully type tested as per latest IEC 62271-200; -100; -102
- Always safe, thanks to conformity of all switching devices to "an isolation device" as per IEC 61140
- Produced in EU with care and uncompromised factory testing under ISO9001 and IEC62271-200
- All materials used for production are enviromentally friendly and controlled under ISO14001

Panel Selection

LI	LS	LF; LFVT	CB (L or R)	CS (L or R)	M	ST	BE
Line input	Line switch	Line feeder	Coupler breaker	Coupler switch	Metering	Service transformer	Busbar Earthing



Main Technical specifications

Applicable and related standards and EU directives:

Equipment	Standard
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
Current transformers	IEC 61869-2
Voltage transformers	IEC 61869-3
Measuring relays and protection equipment	IEC 60255
International protection	IEC 60529
Voltage detecting systems (VDS)	IEC 61243-5
VPIS systems for rated voltages between 1kV and 52kV	IEC 62271-206
Protection against electric shock - Common aspects for installation and equipment	IEC 61140
EU LV directive	2014/35/EU
EU EMC directive	2014/30/EU

Technical parameters:

Type of panel	SG15_SCELL	SG25_SCELL	
Applicable VCB	**ISM15_MD**	**ISM25_LD**	**ISM25_Shell**
Rated voltage (Ur), kV	17,5	24	
Rated Frequency, Hz	50/60	50/60	
Rated PF withstand voltage (Ud), kV	38	50	
Across COS and VCB* open contacts, kV	45	60	
Rated lightning impulse withstand voltage, kV kVpeak), kV (Up)	95	125	
Across COS and VCB* open contacts, kV	110	145	
IAC Classification	A-FL; A-FLR with rear attachment		
IA Isc, s	25kA, 1s		
Loss of service continuity	LSC2B		
Partition type	PI		
Partial discharge level at 1.1 x Urated, pC	<20		
Degree of protection indoor	IP4X (IP41)		
Degree of protection outdoor	IP54 (outdoor design)		
Temperature range	-25 +55°C		
Maximum relative humidity	95%		
Maximum altitude, m a.s.l.	1000		
Auxiliary voltage, V	24/48/110/220DC; 230AC		
Rated peak withstand current (Ip), kA	64	40	64
Rated short-time withstand current (Ik), kA	25	16	25
Rated duration of short circuit current (t), s	3	3	3
Rated current, A	630	630	630
	1250		1250
Circuit breaker Classes	M2 (30.000CO), S2, E2, C2		
Autoreclosing cycle	O-0,3s-CO-10s-CO		
COS Class as Disconnector	M1		
COS Classes as Earthing switch	M1, E2		
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*As per IEC61140 an “isolation device”

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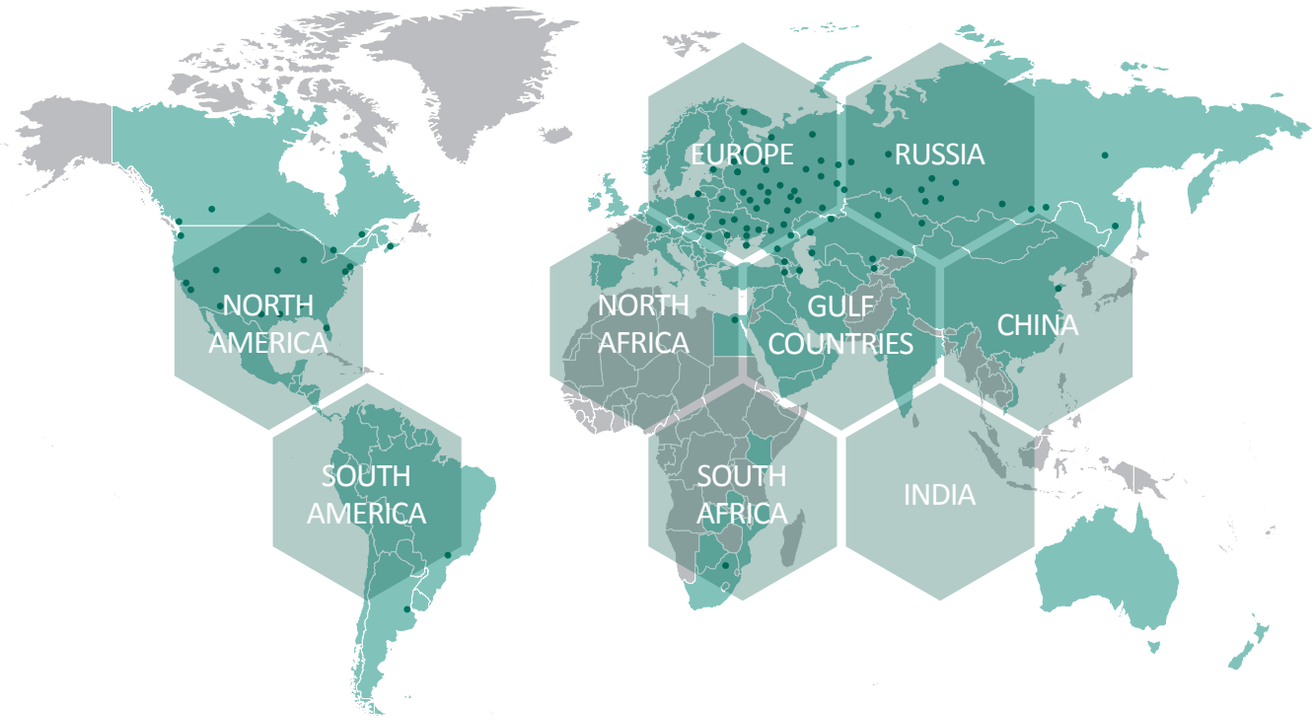

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