

# Structure Mounted Outdoor Switchgear (SMOS)

Simple, reliable solution  
for AC railway applications



- Flexible design
- Reduced project duration
- Easy installation and Commissioning
- Plug and play factory tested solution

# Pre-engineered, factory assembled and tested solution for project-specific requirements

The SMOS is a complete solution that integrates all components required to supply power to AC railway applications.

In contrast to a conventional outdoor solution where components are installed, connected, and tested on site, the SMOS can be delivered as a complete solution.

High level of integration in a one place of manufacture and assembly shifts a significant part of the detailed design from the customer to the supplier. SMOS is delivered from a single source to sites, as an assembled units including associated installation accessories.

The SMOS is factory designed, assembled, and tested. Components are designed and tested according to relevant IEC and EN standards. The full setup is managed under the same project execution team and passes extensive factory quality inspections prior to shipment.

## Key Features



### Reduced project duration

Overall investment costs and project execution time decreased



### Reduced engineering and civil costs

- Modules are delivered from a single source to sites with one point of contact for the complete solution
- Compact construction with significant land savings
- Less civil works



### Flexible

- Less compromises in customization and fewer limitations on design compared to other products
- Life cycle of individual components does not affect lifetime of complete assembly



### Simple and quick installation and commissioning on site

- Factory assembled and tested solution
- Simple interface with other contractors/subcontractors
- Less site activities
- Easy logistics



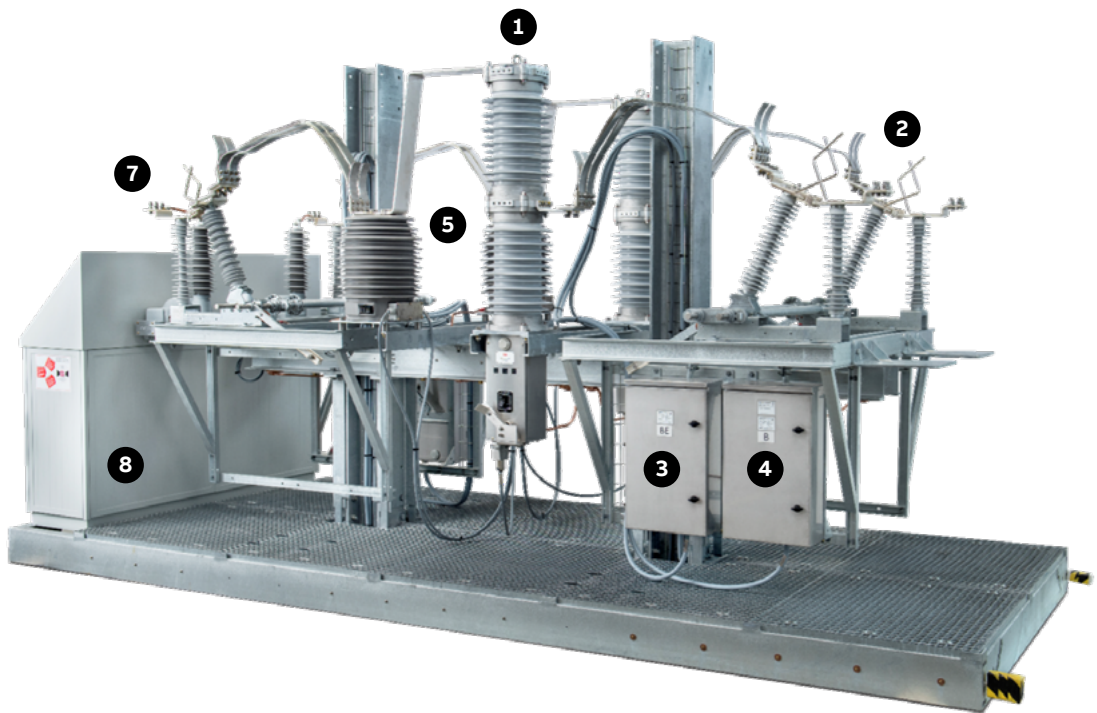
### Environmentally friendly

Air insulated solution with vacuum CB (No SF6)

# Components and technical data

SMOS integrates circuit breakers, disconnecter switches, earthing switch, load break switches and instrument transformers where they can be built up into any configuration to meet site specific requirements.

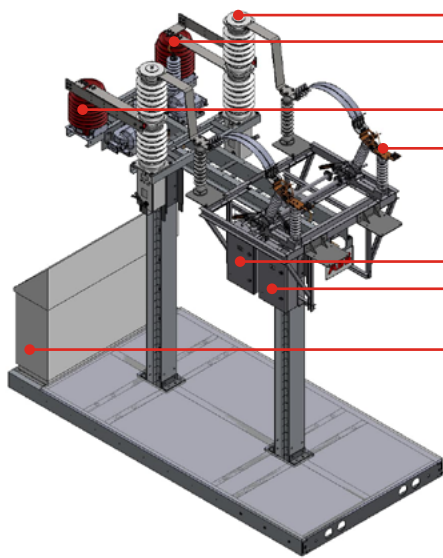
The design is modular and based on standard platforms, but also covers project-specific requirements through predefined options, significantly reducing substation engineering.



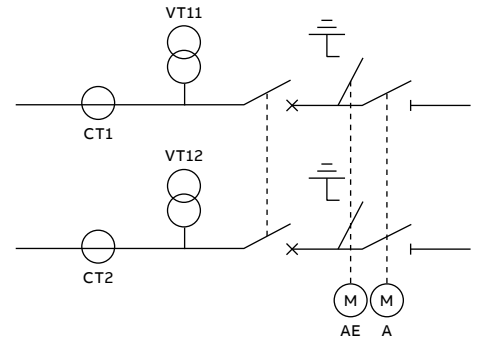
- 1 Circuit breaker FSKII+
- 2 3-position switch
- 3 Disconnecter control box
- 4 Earthing switch control box
- 5 Current transformer
- 6 Voltage transformer
- 7 HV connection point
- 8 Marshaling panel (LV compartment)

# Applications

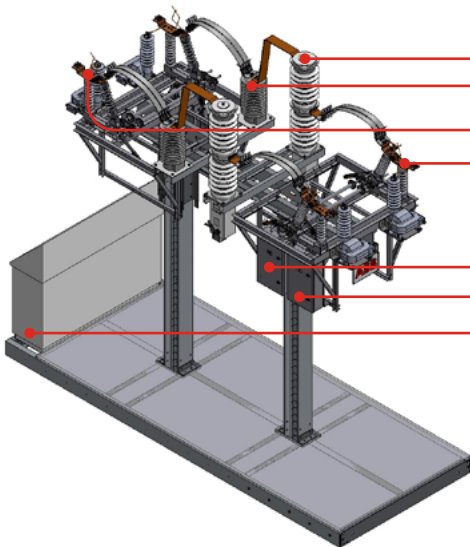
## Incoming Feeder/ Outgoing Feeder/ Interconnector



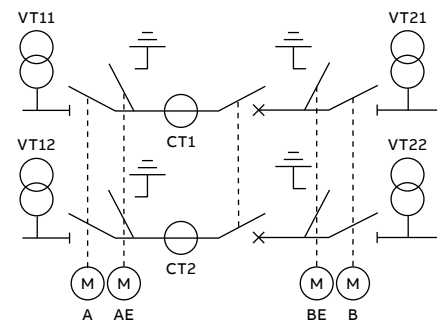
- Circuit breaker FSK II+
- HV connection point
- Current transformer
- 3-position switch
- Earthing switch control box
- Disconnecter control box
- Marshaling panel (LV compartment)



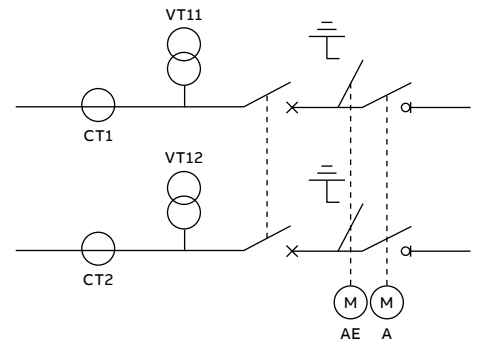
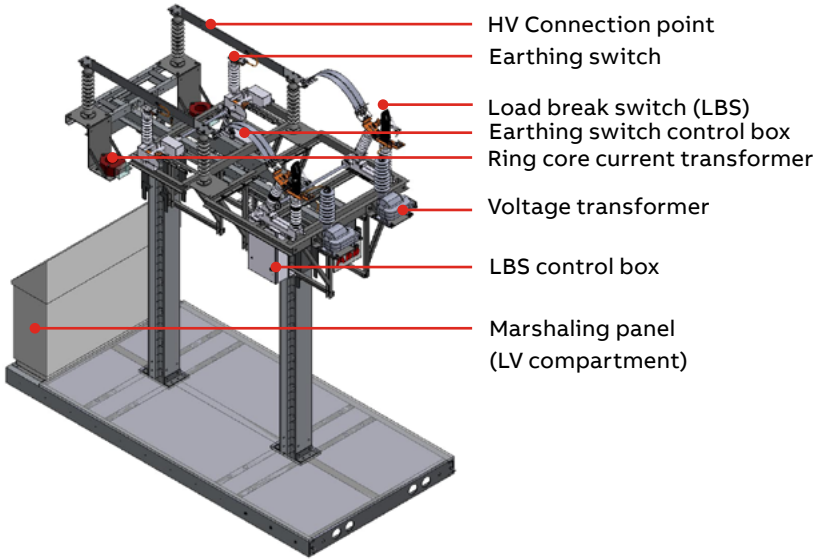
## Bus Section



- Circuit breaker FSK II+
- Current transformer
- 3-position switch
- 3-position switch
- Earthing switch control box
- Disconnecter control box
- Marshaling panel (LV compartment)

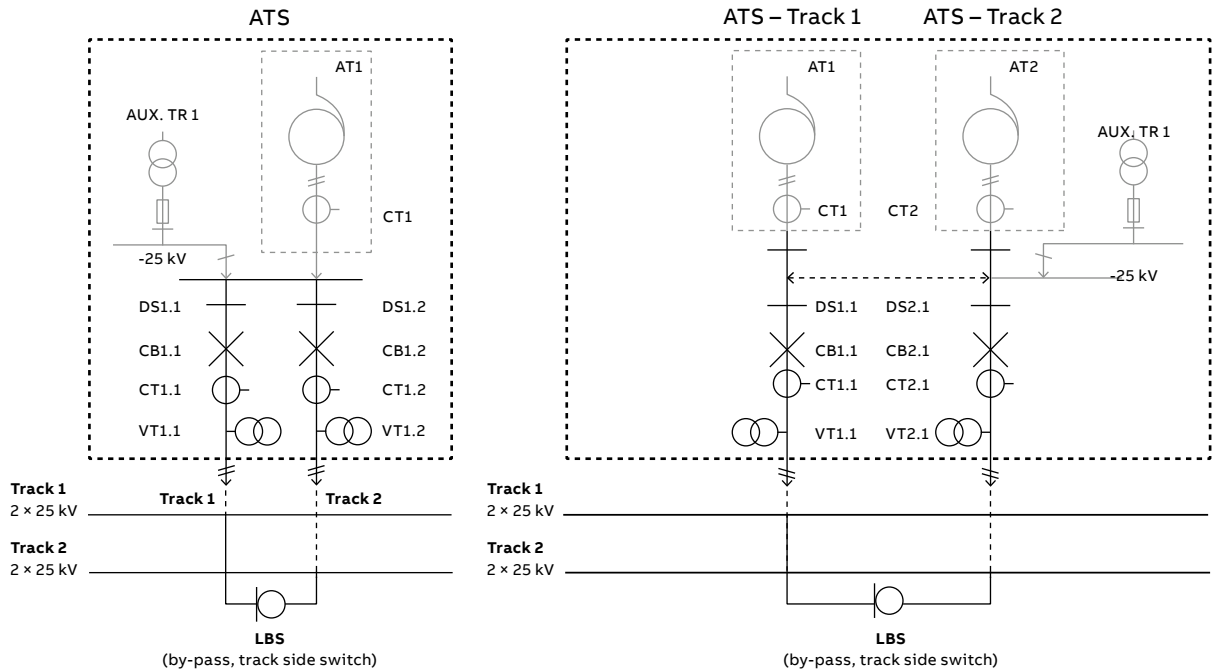


Autotransformer



# Autotransformer post

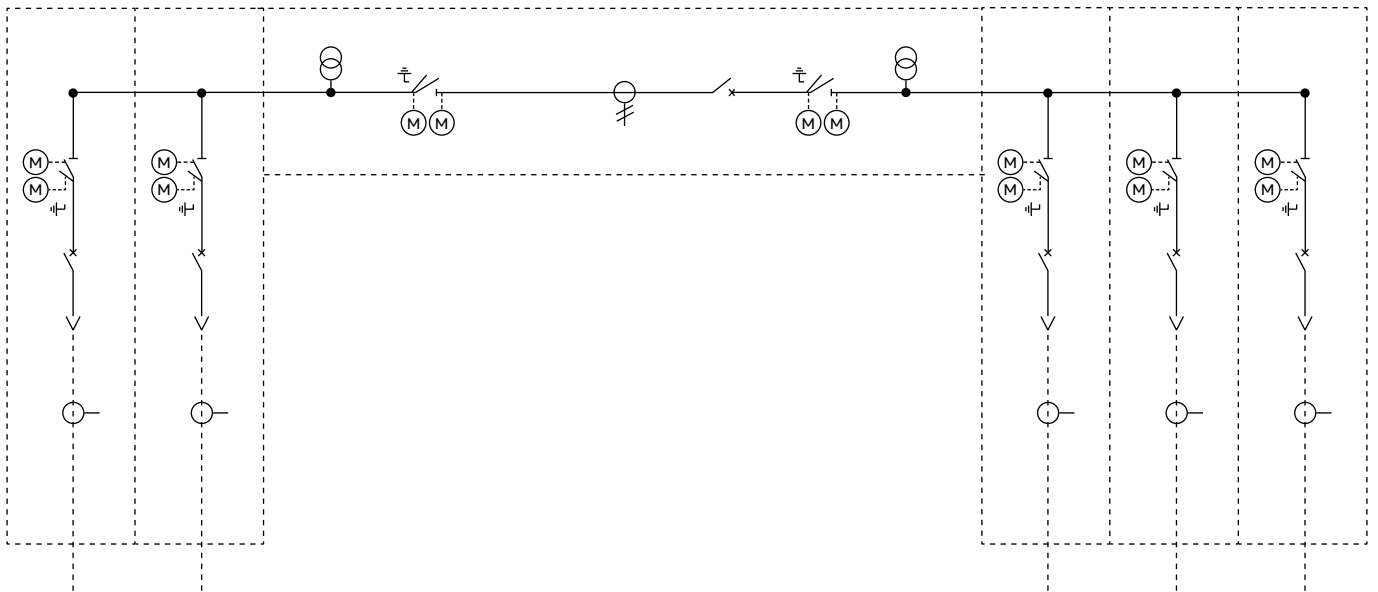
SMOS modules can be utilized for different ATS Schemes, below are schemes examples



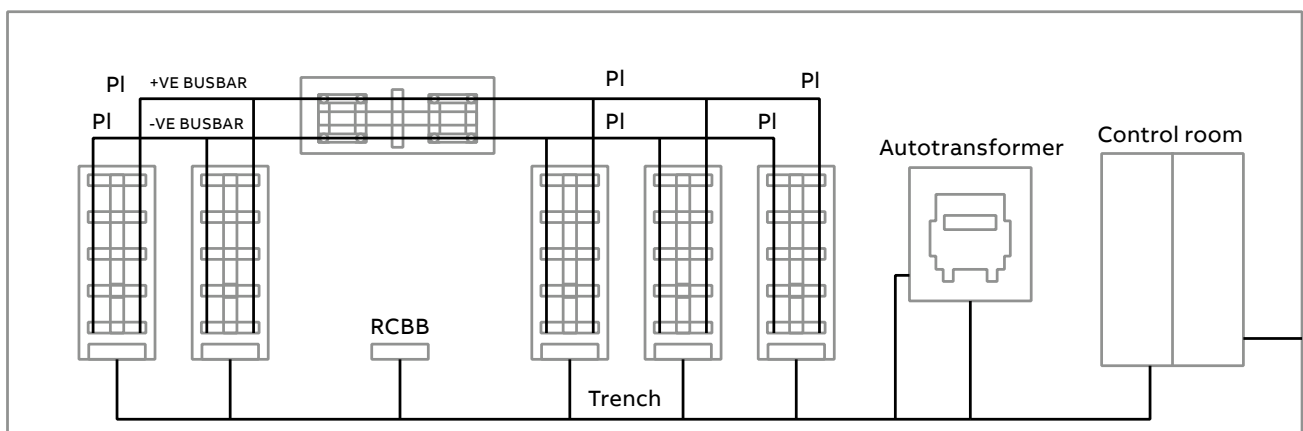
# Switching substations

By combining multiple modules, a switching station can be constructed

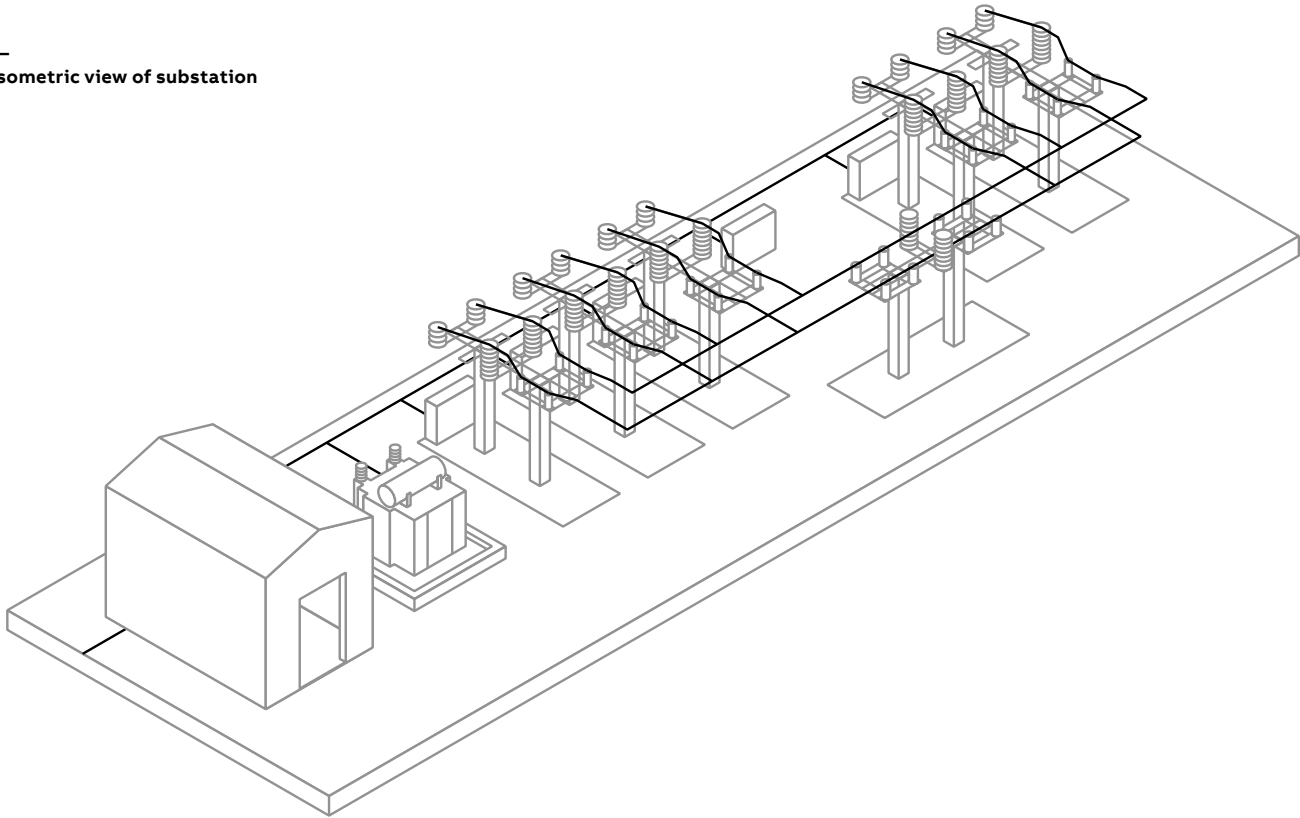
Example of a switching station



Plan view of substation



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Isometric view of substation



## Technical data

General technical data			
Rated operation voltage		17.5 kV	27.5 kV
Number of phases		1	1/2
Rated continuous current		...2500 A	...2000 A
Rated frequency		16.7 Hz	50/60 Hz
Rated short time withstand current (1 s)		31.5 kA	25 kA
Rated power frequency withstand voltage (50 Hz, 1 min)	Phase to ground	70 kV	95 kV
Rated impulse withstand voltage (1.2/50 $\mu$ s)	Phase to ground	170 kV	250 kV
Clearance, mm	Phase to ground	$\geq 310$	$\geq 480$
	Height of live parts over access area	$\geq 2730^*$ (acc. to IEC 61936-1)	
Creepage		$\geq 25$ mm/kV*	
Service conditions *	Temperature	-25/+40°C	
	Wind speed	< 34 m/sec	
Standards applied	General standards	IEC 62271-1, EN 50124-1, IEC 62497-1	
	Circuit breaker	IEC 62271-100, EN 50152-1, IEC 62505-1	
	Switches	IEC 62271-102, IEC 62271-103, EN 50152-2, IEC 62505-2	
	Current transformer	IEC 61869-1, IEC 61869-2, EN-50152-3-2	
	Voltage transformer	IEC 61869-1, IEC 61869-3, EN-50152-3-3	

\* Other values on request



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