

**VSV 25 kV AC - Railway switcher**



**HV Switching**

## We know how

Our range of switchers is designed to ensure the best performances and reliability, which are the result of our 60-year old experience in the field of high voltage.



## Optional devices

The VSV can be supplied either in unipolar or bipolar version.

An emergency operating lever can be provided - upon request - allowing manual operating and closing operation.

Upon request, the VSV can also be provided with a specific relay to control the automatic opening of the equipment in the event of voltage failure in the power circuit of the control cabinet.



## The VSV AC - Railway switcher

The VSV is an outdoor switch specifically designed to meet the needs of railway electrification, for applications both in overhead lines (at catenary level) and in feeder substations.

The VSV is composed of a sealed enclosure filled with inert gas where a vacuum interrupter is located. This device is operated by an electromagnetic actuator which is connected to it without any outside mechanical transmission rods.

The VSV's strengths are its versatility and weather resistance, which make its installation possible also in harsh environmental conditions, with no need for adjustments or final calibrations.

Its simplicity, compactness and robustness make it easy to be installed as well as able to operate regularly, in the years, under maintenance-free conditions.

Pursuant to the most recent environmental laws on the use of sulphur hexafluoride, the VSV uses nitrogen only to guarantee the dielectric features, thus avoiding emissions of burnt gases during operations.

## Reliability and maintenance

The VSV is designed to be maintenance-free. The use of a high-quality vacuum interrupter ensures the constancy of performance in time.

The use of stainless material (or made so thanks to proper protective coatings) in the manufacturing of all components, the presence of an electromagnetic actuator and of few moving parts, the absence of external transmission rods ensure an excellent level of reliability of the VSV for many years of operation.

## Construction features

The VSV is composed of either one or two (if bipolar) poles connected to the same control cabinet through a shielded cable.

Each pole includes a vacuum interrupter and an electromagnetic actuator. The former is manufactured using high-quality material and advanced technology, which allow for short operation times and ensure the long life of the equipment.

The latter, which is bistable, is warranted for more than 30,000 operation cycles.

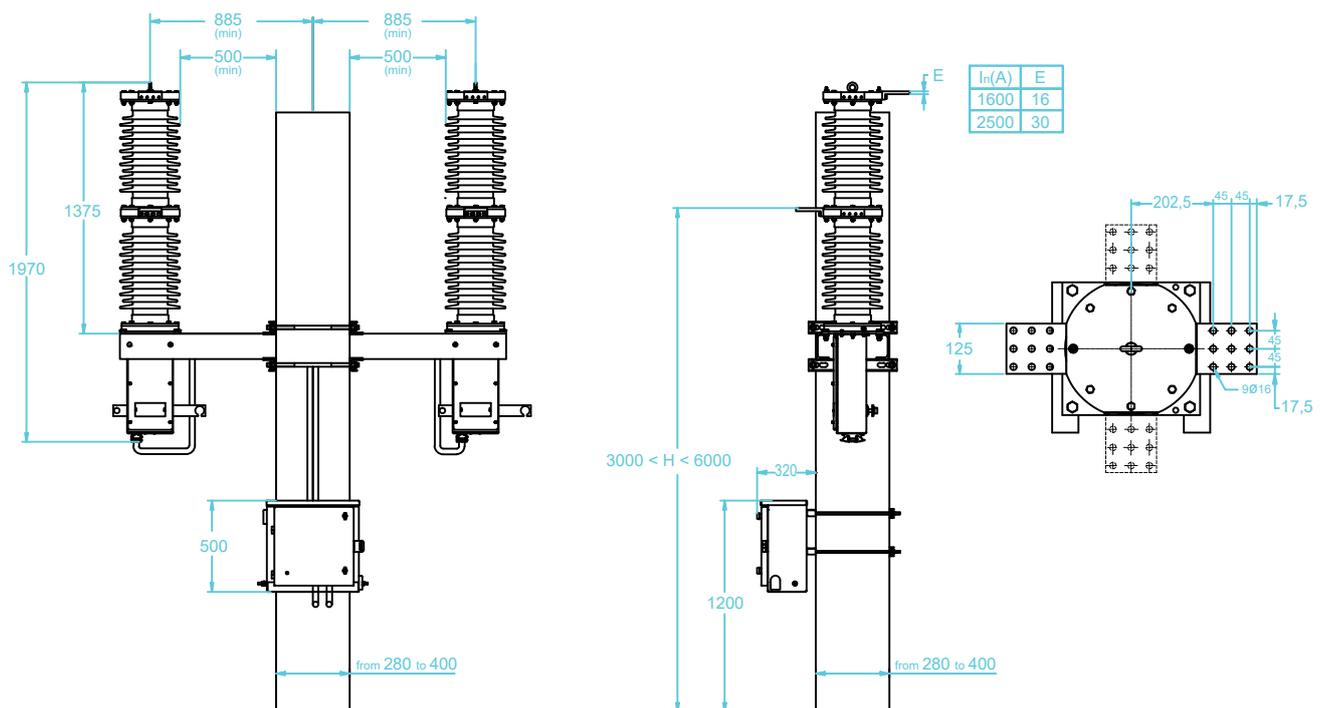
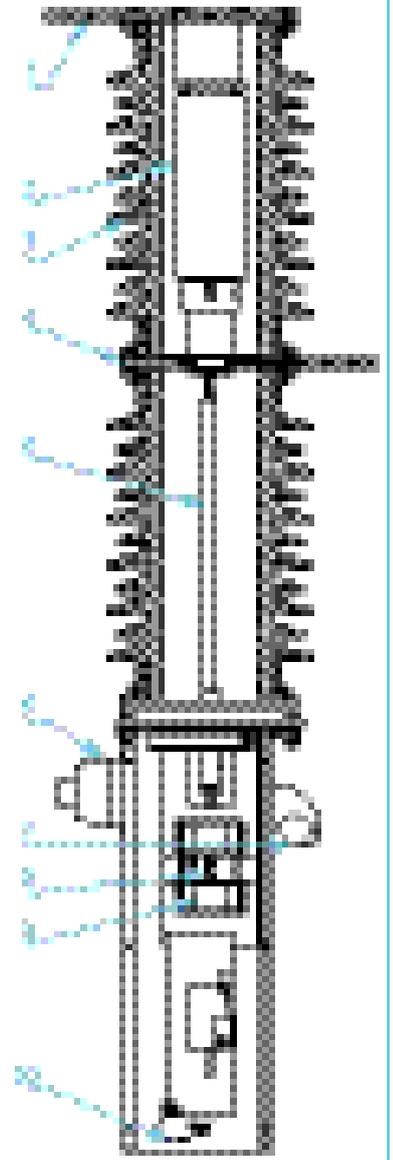
The porcelain insulators ensure an excellent dielectric withstand, also in case of high levels of pollution. Upon request, the VSV can be provided with composite insulators.

The control cabinet serves as interface between the control room and the VSV. It is provided with lockable door and allows for the following operations:

- Remote electrical operations and monitoring of the equipment via an alarm signal.
- Local electrical operations.

Each pole is also equipped with a lever device for manual emergency operations: it allows opening and closing operations also without power supply to the control cabinet.

- 1 Upper terminal
- 2 Vacuum interrupter
- 3 Hollow insulator
- 4 Lower terminal
- 5 Insulating driving shaft
- 6 Connector
- 7 Emergency manual operation device
- 8 Position sensor
- 9 Electromagnetic actuator
- 10 Position indicator



# Ratings

Quantity names and symbols are according to EN 50152-1, EN 50163 or when missing, according to IEC 62271 series.

Nominal voltage	$U_n$ (kV)	25	
Standards		EN 50152-2 IEC 62271-103	EN 50152-1 IEC 62271-100
Number of poles		1 or 2	
Highest permanent voltage	$U_{max1}$ (kV)	27.5	
Highest non permanent voltage	$U_{max2}$ (kV)	29	
Highest long term overvoltage	$U_{max3}$ (kV)	38.75	
Rated continuous current	$I_r$ (A)	up to 1600	up to 2500
Rated frequency	$f_r$ (Hz)	50 or 60	
Rated power-frequency withstand voltage	$U_d$ (kV)	95	
Rated impulse withstand voltage	$U_{Ni}$ (kV <sub>p</sub> )	250	
Rated short-circuit breaking current <sup>(1)</sup>	$I_{sc}$ (kA)	up to 12.5	up to 25
Rated short-circuit making current <sup>(1)</sup>	$I_{ma}$ (kA)	up to 50	up to 65
Rated short-time withstand current <sup>(1)</sup>	$I_k$ (kA)	up to 20	up to 25
Rated duration of short-circuit	$t_k$ (s)	3	
Rated peak withstand current <sup>(1)</sup>	$I_p$ (kA <sub>p</sub> )	up to 50	up to 65
Opening time	(ms)	< 45	
Closing time	(ms)	< 100	
Rated operating sequence <sup>(2)</sup>		O-t-CO	CO-15s-CO or O-t-CO-15s-CO
Rated mechanical endurance	(cycles)	10000	
Ambient temperature range	(°C)	up to -50/+50	

<sup>(1)</sup> Depending on rated current

<sup>(2)</sup> "t" according to customer's request

