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3AF04 / 3AF05

Outdoor vacuum circuit breakers for AC traction power supply

The 3AF04 / 3AF05 series vacuum circuit-breakers are 1-pole or 2-pole circuit-breakers for outdoor applications suitable for the special requirements and switching tasks in AC traction power supply systems.

Features

- Proven vacuum switching technology for reliable switching duties
- Maintenance-free up to 10,000 make-break operations
- Weather-proofed, compact design

Technical data		
Rated voltage	[kV]	27.5
Rated frequency	[Hz]	50 / 60
Rated short-circuit making current	[kA]	≤ 80
Rated short-circuit breaking current	[kA]	≤ 31.5
Rated short-circuit duration	[s]	4
Rated normal current	[A]	≤ 2500
Rated power frequency withstand voltage	[kV]	≤ 95
Rated lightning impulse withstand voltage	[kV]	≤ 200
Height	[mm]	3,615
Width	[mm]	1,930
Depth	[mm]	638
Weight of 3AF04 (1-pole)	[kg]	approx. 530
Weight of 3AF05 (2-pole)	[kg]	approx. 630
Maximum site altitude above sea level*	[m]	1,000
Maximum humidity	[%]	≤ 95
Permissible ambient temperature	[°C]	- 50 to +50

* For altitudes above 1,000 m the insulation level must be corrected.

Design

The design is based on the proven 3-pole type of the outdoor vacuum circuit-breaker 3AF01 for power supply companies and industrial plants.

It comprises a minimum of moving parts and a simple construction, which guarantees a long electrical and mechanical endurance, offering the same advantages as indoor vacuum circuit-breakers.

The 3AF04 / 3AF05 circuit-breakers are of the live-tank type. "Live" means, that the vacuum interrupter which is arranged in a weather-proof way inside an insulating enclosure is at electrical potential.

Due to their light and space-saving design, the outdoor vacuum circuit-breakers are easy to transport and can be divided into separate modules.

Construction

Outdoor vacuum circuit-breakers consist of the pole assembly (1), the operating mechanism box (2) and a steel structure (3) to accommodate all components. The pole assemblies are mounted on a base frame (4) equipped with a common operating shaft. The vacuum switching technology, proven and fully developed for more than 30 years, serves as arcquenching principle by using vacuum interrupters.

Pole assembly

The pole assembly consists of the vacuum interrupter (5), porcelain insulators (6) and the terminal connectors (7 and 8). The vacuum interrupter is mounted in a porcelain insulator. At the upper end it is fixed to the terminal connector (7). The lower part allows free axial movement and is connected to the lower terminal connector (8) via flexible connectors (9).

Another porcelain insulator, which separates the terminals from the steel structure and the operating mechanism box, contains the switching rod (10), which transmits the switching movement from the operating mechanism box to the vacuum interrupter.

Operating mechanism box

The operating mechanism box contains the circuit-breaker operating mechanism with motor, releases and auxiliary switches, as well as the completely wired control cabinet. It comprises the connections for remote operation, the auxiliary voltages for circuit-breaker operation and the necessary low voltage supply. Further it accommodates the control elements for local operation of the circuit-breaker.

Standards

These vacuum circuit-breakers conform to the following standards (and the previous versions respectively applicable at the time of the type test):

- General standards: IEC 62271-1, IEC 62271-100
- Standards for railway applications EN 50152-1, EN 50163

References

More than 300 vacuum circuit-breakers 3AF04 / 3AF05 have been installed in traction power supply systems since the market launch in 2007.

And of the basic 3-pole type (3AF01) of this outdoor vacuum circuit-breaker more than 2,000 units are in service till now.



3AF05 installed in traction substation in China

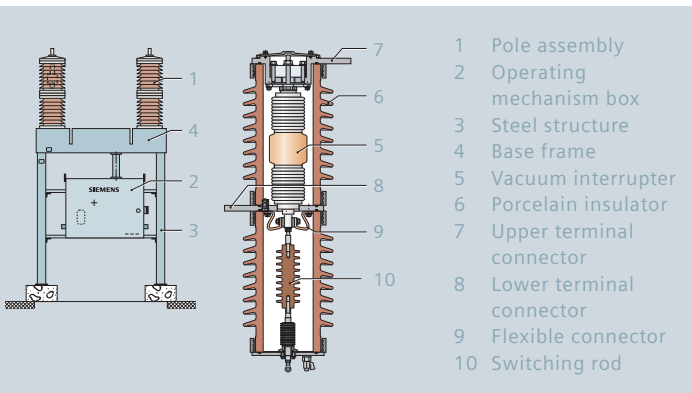
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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. If not stated otherwise, we reserve the right to include modifications, especially regarding the stated values and dimensions.



Construction and pole assembly