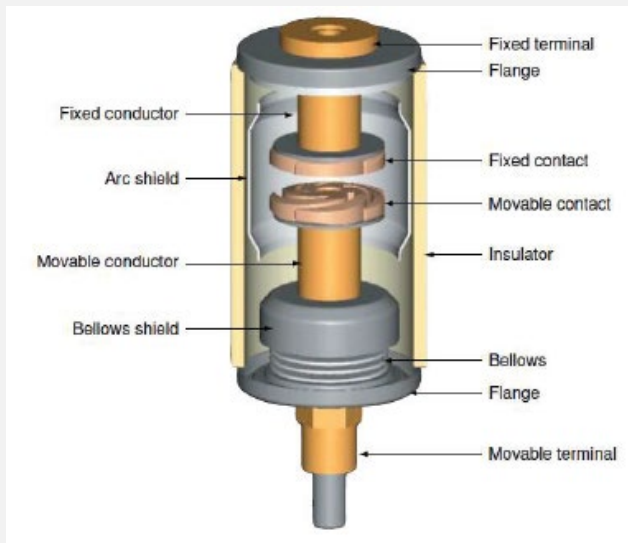


The scope

Vacuum interrupters are used to interrupt medium voltage AC current. Depending on the construction of the vacuum circuit breaker, the bellows allows the movable contact to move while maintaining vacuum. The arc is thus extinguished at the first natural current zero and the high dielectric strength of the vacuum ensure that there will be no subsequent breakdown due to the recovery voltage.



Internal view of a typical vacuum interrupter

Comparison between maintenance strategies

Strategy	Advantages	Disadvantages
Corrective maintenance	Low to moderate maintenance cost during operations	High risk of damage resulting in long downtime. Safety of personnel during switching operations not knowing the risk of failure.
Preventive maintenance	Maintenance can be scheduled.	Maintenance cost is moderate to high with scheduled downtime.
Predictive condition based maintenance	Maintenance can be scheduled – as and when required, leading to lower cost and downtime. Knowledge of premature defects to eliminate the risk of failure	Cost is moderate to high for the In-Time monitoring technologies.

Routine and type testing

Dielectric Test

The dielectric test are performed to verify the rated insulation strength of the switchgear, ensuring that the breaker is capable to withstand over-voltages occurring due to lightning and switching operations.

High Potential Test / Vacuum Integrity

The only practical and widely use practice to verify the vacuum integrity is by means of a dielectric test across the open contacts. This is in the ANSI/IEEE standards.

One minute power frequency voltage

This test is carried out to verify the capability of the equipment to withstand the power frequency test voltage for one minute. OEM should prescribe test procedures and settings.

Lightning Impulse Voltage Withstand test

The test demonstrate the ability to withstand the rated lightning impulse withstand voltage. Refer to the testing standards.

Temperature Rise Test

The temperature rise test determines the highest continuous current that the switchgear can carry without exceeding the maximum permitted temperature at any point. The current rating is dependent upon the maximum ambient temperature.

Short Time Current Withstand Test

This test verifies the capability of a circuit breaker to carry the specified power frequency short-circuit current for a rated duration of 1 second or up to 3 seconds.

Short-circuit Current Duty Test

This test proves that the circuit breaker will reliably interrupt the complete range of fault currents up to its maximum short-circuit current rating.