

CIRCUIT BREAKER

CIRCUIT BREAKER FOR MEDIUM VOLTAGE 17.5 KV

Standards
IEC 62271-100



CIRCUIT BREAKER

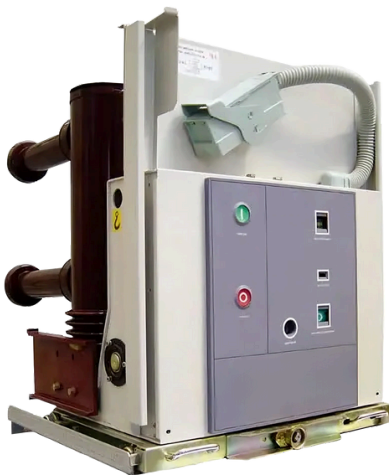
Description

Circuit breakers play a crucial role in the power system, responsible for the switching and control of various parts of the system. They have the ability to open and close their contacts under load during normal operations, thanks to an arc extinguishing mechanism involving these contacts, which can be oil, gas, vacuum, among others.

This circuit breaker is specially designed for medium voltage applications. It utilizes vacuum bottles as the arc extinguishing element in its contacts. Additionally, it is equipped with opening and closing coils, and its operation by spring pressure can be commanded or manually operated.

It features load indicators for the spring and contact status, providing a clear view of its operation. It also includes a crank handle connector for manual spring charging, and pushbuttons for manually performing opening and closing actions.

An additional feature is the presence of auxiliary contact sockets with specific pinouts for integration and communication with control, monitoring, and protection devices. The circuit breaker's main application is the control and protection of substation equipment, ensuring the reliability and safety of the electrical system.



Mechanism

Within the circuit breaker's six contacts, phase terminals are connected, with three on the supply side and three on the load side, each with a conductor for each side of each phase, along with a grounding connector to prevent safety hazards in the presence of leakage currents. This circuit is applied to medium voltage installations.

Internally, the circuit breaker features a contact composed of a fixed part and a movable part, with the contact point between these elements located within a vacuum bottle to extinguish any possible electrical arcs that may occur during switching.

Inside the circuit breaker, there are opening and closing mechanisms, composed of pressure springs and solenoids to control the opening and closing, auxiliary contacts, and status indicators.

During normal operation, the circuit breaker remains closed, allowing the flow of energy from the supply side to the load side. When any anomaly is detected by the system based on configured parameters, a pickup signal is sent by the control. If the issue persists after the pickup count, an opening command is triggered for the circuit breaker to trip and protect the system.

These signals are possible thanks to integration with control and protection systems, such as relays, for example. During the operation, the preloaded opening spring or opening coil simultaneously opens the three contacts, isolating the supply side from the load side and interrupting the propagation of the detected problem. For closing, the closing spring or closing coil performs the action of closing the contacts, restoring the connection between the supply side and the load side. The circuit breaker's status indicators change according to its current state (OPEN / CLOSED).

Technical Specifications

Standard	IEC 62271-100
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Nominal Voltage	17,5 kV
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Frequency	50 Hz; 60 Hz
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BIL (Basic Insulation Level)

Voltage withstand for 1 minute at industrial frequency (Open contacts)	50 kV
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Impulse voltage withstand (Open contacts)	95 kV
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Nominal current	630 A
	1250 A
	1600 A

Short-time withstand current	20 kA
	25 kA
	31,5 kA

Peak withstand current	50 kA
	63 kA
	80 kA

Technical Specifications

	20 kA
Rated short-circuit opening current	25 kA
	31,5 kA
	50 kA
Rated short-circuit closing current	63 kA
	80 kA
Rated short-circuit duration	4 s
Operating sequence	O-0,3s-CO-180s-CO
Estimated useful mechanical life	Class M2 (20000 operations)
Nominal operational power voltage	220 VAC / 220 VDC
Total opening time (breaking time)	≤ 70 ms
Useful electrical life	Class E2

Technical Specifications

Operating Conditions

Temperature		-25 °C ~ 40 °C
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Altitude		≤ 2000 m
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Relative Humidity	Daily	≤ 95 %
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	Monthly	≤ 90 %
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Water vapor pressure	Daily	≤ 2,2 kPa
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	Monthly	≤ 1,8 kPa
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Electromagnetic interference voltage amplitude		≤ 1,6 kV
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Note: Some parameters are customizable upon prior request

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