BOK ELECTRIC



VCB side-mounted 35KV

The bid-winning enterprise of SGCC&CSG

ZN85-40.5

35kV Side-Mounted Vacuum Circuit Breaker

Model: ZN85-40.5C Series

Type: Indoor AC High Voltage Vacuum Circuit Breaker (Side-Mounted Configuration)

Core Concept: Compact Side Layout · Reliable Breaking · Switchgear Integration

1. Product Overview

The ZN85-40.5C is a three-phase indoor AC vacuum circuit breaker designed for 35kV (40.5kV) power systems operating at 50/60Hz. It is specifically configured in a side-mounted arrangement, where the operating mechanism is positioned laterally relative to the interrupting chamber, enabling flexible integration into switchgear cubicles with space constraints or specific layout requirements.

The breaker is suitable for protection and control of power plants, substations, and industrial installations. It handles load current switching, overload interruption, and short-circuit breaking duties, and is particularly suited for applications requiring frequent operation.

2. Configuration & Mounting

2.1 Side-Mounted Design

Unlike conventional front-mounted or handcart configurations, the side-mounted variant places the spring operating mechanism on the lateral side of the pole assembly. This arrangement offers:

- Reduced cubicle depth – the mechanism does not protrude forward, allowing shallower switchgear enclosure design.
- Flexible installation orientation – suitable for both fixed installation and withdrawal-type switchgear integration.
- Direct access to mechanism – maintenance and inspection can be performed from the side without removing the front panel.

2.2 Mounting Options

Option	Description
Fixed installation	Bolted directly to the switchgear frame
Withdrawal-type	Mounted on a chassis for racking between service and test positions

3. Operating Principle

The circuit breaker employs a vacuum interrupter as the arc-quenching element, housed within an epoxy resin insulated cylinder for enhanced dielectric performance and environmental protection.

Closing operation: The spring mechanism releases stored energy, driving the moving contact into the fixed contact within the vacuum bottle. The contact spring maintains adequate contact pressure.

Opening operation: The trip latch releases, allowing the opening spring to separate the contacts. The vacuum environment rapidly extinguishes the arc at current zero crossing.

Insulation coordination: The epoxy-encapsulated vacuum interrupter provides main insulation between phases and to ground, while the external insulating cylinder protects against environmental contamination.

4. Technical Parameters

4.1 Main Electrical Parameters

Parameter	Value
Rated voltage	40.5 kV
Rated frequency	50 / 60 Hz
Rated current	630A / 1250A / 1600A / 2000A / 2500A / 3150A
Rated short-circuit breaking current	25 kA / 31.5 kA / 40 kA
Rated short-time withstand current (4s)	25 kA / 31.5 kA / 40 kA
Rated peak withstand current	63 kA / 80 kA / 100 kA
Rated short-circuit making current	63 kA / 80 kA / 100 kA
Power frequency withstand voltage (1 min)	95 kV
Lightning impulse withstand voltage (peak)	185 kV
Rated short-circuit duration	4 s

4.2 Mechanical Parameters

Parameter	Value
Mechanical life	10,000 operations
Rated short-circuit breaking operations	20 times
Contact clearance	18 ± 1 mm
Overtravel	4 ± 1 mm
Closing bounce time	≤ 3 ms
Three-phase opening/closing synchronism	≤ 2 ms
Average opening speed	1.8 ± 0.2 m/s
Average closing speed	0.8 ± 0.2 m/s
Opening time (rated voltage)	20 – 50 ms
Closing time	≤ 100 ms
Main circuit resistance	≤ 80 μΩ (≤1600A) / ≤ 60 μΩ (≥2000A)

4.3 Operating Mechanism Parameters

Parameter	Value
Mechanism type	Spring-charged, motor-driven
Control voltage	AC/DC 110V / 220V
Energy storage time	≤ 10 s
Rated operating sequence	O-0.3s-CO-180s-CO

5. Product Features

Feature	Description
Side-mounted mechanism	Space-saving layout for compact switchgear design
Epoxy-encapsulated interrupter	Enhanced insulation, pollution resistance, reduced size
Spring mechanism	Stable output curve matched to vacuum interrupter requirements
High mechanical life	10,000 operations without maintenance
Flexible installation	Fixed or withdrawal-type configurations available
Anti-condensation heater	Optional heater prevents moisture ingress in humid environments

6. Operating Conditions

Parameter	Standard Range
Ambient temperature	-15°C to +40°C
Altitude	≤ 1000 m
Relative humidity (daily mean)	≤ 95%
Relative humidity (monthly mean)	≤ 90%
Installation environment	Indoor, no explosive or corrosive atmosphere

For high-altitude (>1000m) or extreme temperature applications, please consult factory for customized solutions.

7. Typical Applications

Application	Description
35kV Substations	Incoming, outgoing, and sectionalizing circuits
Industrial Plants	Motor control, transformer protection
Power Plants	Auxiliary power system protection
Mining & Metallurgy	Heavy-duty switching applications

8. Ordering Information

When placing an order, please specify:

Selection Item	Options
Rated current	630A / 1250A / 1600A / 2000A / 2500A / 3150A
Breaking current	25kA / 31.5kA / 40kA
Mounting type	Fixed / Withdrawal (handcart)
Control voltage	AC 110V / AC 220V / DC 110V / DC 220V
Accessories	Anti-condensation heater, auxiliary contacts, current transformers (internal/external)

Conclusion

The ZN85-40.5C side-mounted vacuum circuit breaker combines a space-efficient lateral mechanism layout with the proven reliability of vacuum interruption technology. Its epoxy-encapsulated pole assembly ensures stable insulation performance, while the spring operating mechanism delivers consistent switching characteristics across 10,000 mechanical operations. The flexible mounting options make it adaptable to a wide range of 35kV switchgear configurations.

(Technical data subject to final factory test report. Specifications may vary by manufacturer.)