



CBA-III

Circuit Breaker Analyser



KEY FEATURES

- Timing on 12 contacts, four three-phase groups
- O, C, C-O, O-C and O-C-O with process times
- Bounce time, count and waveform per pole
- Speed to 20.00 m/s with travel characteristic curve
- Coil current to 20.00 A with waveform capture
- DC 30 to 250 V adjustable action voltage supply
- Built-in thermal printer · RS-232 · 9 kg case

Twelve Contacts, One Operation.

A mechanical characteristics tester for medium and high voltage switchgear: vacuum, SF6, minimum-oil and bulk-oil breakers, indoors or in the yard. One operation of the breaker captures the whole picture, timing on twelve contacts, travel and speed, coil current and the resulting waveforms, rather than a separate test for each.

Timing covers opening and closing on all twelve contacts with in-phase and out-of-phase discrepancy, and the reclosing sequences C-O, O-C and O-C-O with their process times. Bounce is reported as time, count and waveform per pole, alongside total travel, opening travel, over-travel, overrun and rebound.

A built-in DC supply adjustable from 30 to 250 V drives the mechanism, so the low-voltage action test runs automatically and reports the voltage at which the breaker actually operates. Results print on the built-in thermal printer at the switchgear, or transfer over RS-232, and the instrument holds field data with a real-time clock for later recall.

IDEAL FOR

- Substation commissioning and acceptance testing
- Periodic maintenance of MV and HV switchgear
- Diagnosing slow mechanisms, bounce and coil faults
- Vacuum, SF6, minimum-oil and bulk-oil breakers
- Utilities, rail, petrochemical and heavy industry

MEASUREMENT RANGES AND ACCURACY

Measurement	Range	Resolution	Accuracy
Timing			
Contact timing, below 100 ms	0 to 4000.0 ms	0.1 ms	$\pm(0.1 \text{ ms} + 1 \text{ digit})$
Contact timing, 100 ms and above	0 to 4000.0 ms	0.1 ms	$\pm(0.1\% \text{ rdg} + 1 \text{ digit})$
Phase discrepancy	Within the timing range	0.1 ms	$\pm 0.1 \text{ ms}$
Travel and speed			
Speed, 0 to 2 m/s	0 to 20.00 m/s	0.01 m/s	$\pm(0.1 \text{ m/s} + 1 \text{ digit})$
Speed, above 2 m/s	0 to 20.00 m/s	0.01 m/s	$\pm(0.2 \text{ m/s} + 1 \text{ digit})$
Travel, vacuum breaker	0 to 50.0 mm	0.1 mm	$\pm(1\% \text{ rdg} + 1 \text{ digit})$
Travel, SF6 breaker	0 to 300.0 mm	1 mm	$\pm(1\% \text{ rdg} + 1 \text{ digit})$
Travel, minimum-oil breaker	0 to 600.0 mm	1 mm	$\pm(1\% \text{ rdg} + 1 \text{ digit})$
Coil current and action voltage			
Coil current, opening and closing	0 to 20.00 A	0.01 A	Waveform captured
Action voltage supply	DC 30 to 250 V	Digitally adjustable	20 A, instantaneous duty

Travel is measured with the sensor matched to the mechanism, so the range and resolution above follow the breaker type rather than a switch setting. The low voltage action test runs from the instrument's own adjustable DC supply and reports the voltage at which the mechanism operates.

WHAT IT REPORTS

TIMING

Opening and closing time on 12 contacts · in-phase and out-of-phase discrepancy · fixed times per contact

BOUNCE

Closing bounce time and number of bounces per pole, with the bounce waveform · rebound magnitude per pole

TRAVEL

Total travel, opening travel, over-travel, overrun and rebound magnitude

RECLOSING SEQUENCES

C-O, O-C and O-C-O per breaker · process times: first opening, first closing, second closing, metallic short-circuit time and no-current time

SPEED

Instantaneous opening and closing speed · maximum speed · time against travel characteristic curve

COIL CURRENT

Opening and closing coil current with the current waveform, which is what separates a sticking mechanism from a failing coil

GENERAL SPECIFICATIONS

CONTACT INPUTS

12 contacts on four three-phase sockets, A₁B₁C₁ to A₄B₄C₄ · suits single and multi-break interrupters

OUTPUT SUPPLY

DC 30 to 250 V digitally adjustable, 20 A instantaneous duty, for operating the mechanism and running the low-voltage action test

INTERFERENCE

Designed to hold accuracy alongside 500 kV substations and live busbars, where induced voltage would otherwise corrupt a timing measurement

POWER

AC 220 V $\pm 10\%$, 50 Hz $\pm 10\%$

DIMENSIONS · WEIGHT

360 × 280 × 300 mm · 9 kg · aluminium flight case with a foam-lined lid

OTHER CONNECTIONS

Control power output · external trigger input · travel and speed sensor input · RS-232 for transfer to a PC

RESULTS

Built-in thermal printer for a record at the switchgear · internal storage of field test data with a real-time clock · backlit LCD with waveform display

SAFETY

Insulation resistance above 2 M Ω · supply to chassis withstands 1.5 kV power frequency for 1 minute with no flashover or arcing

ENVIRONMENT

-10 to 40 °C · relative humidity 80% or below · atmospheric pressure 86 to 106 kPa

WARRANTY

1 year, subject to product registration with GPS LTD · service and calibration available