CBV

Circuit Breaker Vibration Analyzer

CBV performs diagnostic tests on high-voltage circuit breakers using a new vibration analysis technique developed by Hydro-Québec. It is marketed under licence by Zensol. With this innovative instrument, mechanical anomalies can be detected in the circuit breaker drive mechanism and other moving parts in the interrupting chamber.

Used in conjunction with accelerometers, CBV has a high (≥ 150 kHz) sampling rate, which enables it to detect a wide range of mechanical anomalies.

Driven by powerful, user-friendly software, CBV first records signals, primarily from the accelerometers. Its DVA analysis software then searches for anomalies by comparing amplitude and time deviations with reference thresholds. The software features a noise suppression algorithm and a routine that calculates amplitude and time deviations between measured and reference signals. A spectrogram shows the vibration signal's dominant frequencies.

Key advantages

- Easy to install
- Robust and portable
- Compatible with any type of breaker
- Thoroughly tested in a high-voltage environment
- Simplified detection of mechanical anomalies
- Extensive software functions (e.g., noise suppression and calculation of amplitude deviations before and after mechanical event timing adjustments)
- Allows programming of test plans
- Able to verify and record breaker opening and closing operations

Specifications

CBV-8 (8 channels)	**6 BNC** inputs **(±10 V)** for accelerometers **2 current** inputs **(±20 A)** for breaker operating coils
CBV-16 (16 channels)	**12 BNC** inputs **(±10 V)** for accelerometers **2 current** inputs **(±20 A)** for breaker operating coils **1 Neutrik** input **(0 to 10 V)** for a displacement sensor **1 contact** input for breaker contact position (open/closed)
Sampling frequency	**35 Hz** to **340 kHz**
Recording time	**1 ms** to **99 min.**
Resolution	**16 bits**

Anomalies detected on substation circuit breakers

- Loosened closing resistor contacts
- Drive rod overtravel
- Low oil level in closing and opening dampers
- Loosened drive linkage components
- Bent transmission shaft

For information:

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