Capacitor discharge measurement error analysis

What is the measurement error of capacitor voltage Transformers (CVTs)?

The measurement error of capacitor voltage transformers (CVTs) has poor stabilityunder the complex environment of substations. Conventionally,error detection is performed by regularly comparing the output of standard transformers,which lacks real-time performance. Moreover,CVTs are prone to operating in an out-of-tolerance state.

How accurate are capacitive voltage transformer metering errors?

The metering accuracy of capacitive voltage transformers (CVTs) affects the fairness of electricity settlement, and the online measurement of their metering errors has become a research hotspot. This error consists of amplitude and phase errors of three-phase voltages.

Do capacitor voltage transformers detect measurement error drift?

With the widespread application of capacitor voltage transformers (CVTs) in relaying, power system control and metering, detecting their measurement error drift has become an important and urgent task.

How to detect the measurement error drift of CVTs connected to the same phase?

In this paper, an innovative approach is proposed to detect the measurement error drift of CVTs connected to the same phase. Through principal component analysis, both the ratio error drift and the phase displacement drift of the CVT can be detected on-line.

Is online measurement error a hotspot in electric power research?

Its online measurement error is one of the research hotspotsin the field of electric power. In this paper,by analyzing data characteristics and the coupling between data,an improved deep learning model based on GRU and MTL is proposed,and three strategies are used to improve the model structure.

How effective is the AM strategy in the three-phase CVT error measurement model?

The experimental results show that the AM strategy enhances the model's ability to learn key information about the three-phase CVT timing information and improves the measurement accuracy of the model,proving the effectivenessof the AM strategy in the three-phase CVT error measurement model. 4.3.3.

using a PD instrument connected to a measuring impedance ZM through the PD pulses will cross. There are standards that establish apparent charge limits for evaluating the equipment ...

This study implemented partial discharge detection for power capacitors with three fault types, insulating oil anomalies, casing wear, and sleeves with impurities. The chaos scatter diagram was derived from the measured data using the chaos synchronization detection method, and the chaos eyes coordinate values were used as the features of fault ...

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In this paper, we innovatively use this method to construct a CVT error prediction model. By mining the coupling relationship between multiple prediction tasks as shared ...

Step 2: Measure the voltage across the capacitor over time after the switch is closed. Notice how it increases slowly over time rather than suddenly, as would be the case with a resistor. You can reset the capacitor back to a voltage of zero by shorting across its terminals with a piece of wire. The time constant (?) of a resistor-capacitor circuit is calculated by taking the circuit ...

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Uncalibrated capacitive voltage transformers (CVTs) may significantly degrade measurement accuracy, because of the undetected excessive measurement error (ME). In this article, an online detection method is proposed which combines multi-source heterogeneous data composed of CVT measurements, acceptance test errors, and error limits.

To address the problem of insufficient real-time periodic calibration using standard transformers, this article proposes an online detection method for CVT measurement ...

Abstract-This study focused on the measurement and diagnostic analysis of partial discharge in power capacitors operating under prolonged periods of high voltage. An off-line test was conducted on two power capacitors, which were subjected to ...

Temperature measurement in welding constitutes relevant information for process understanding and simulation, as it can be used to validate and predict microstructure. Monitoring can be performed at specific points through transducers. The typical one is the thermocouple. In laser welding processes, due to the high energy concentration of the beam, ...

Partial discharge data measurement and diagnostic analysis were mainly conducted on power capacitors operating at a low voltage for a long time.

The experimental results show that the proposed method effectively identifies error fluctuations at 0.02% with a detection accuracy for the CVT amplitude error overshoot reaching 0.1%. The ...

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Clearly, at (t = 90) milliseconds the capacitor is in the discharge phase. The capacitor"s voltage and current during the discharge phase follow the solid blue curve of Figure 8.4.2 . The elapsed time for discharge is 90 milliseconds minus 50 milliseconds, or 40 milliseconds net. We can use a slight variation on Equation ref{8.14} to find ...

using a PD instrument connected to a measuring impedance ZM through the PD pulses will cross. There are standards that establish apparent charge limits for evaluating the equipment condition under tests made in the factory. However, resonances can provoke important errors estimating this parameter, so other parameters such as the number of PDs

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