



## Additional Information on Power Transformers Diagnostic Services

### Why is Diagnostics of Power Transformers Important?

Power transformers are key components of the power grid, responsible for voltage conversion in the transmission and distribution of electricity. The reliability of their operation directly impacts the stability of energy supply to businesses and facilities. However, over time, equipment wears out, which can lead to accidents, costly repairs, and production downtime.

Our specialists conduct comprehensive diagnostics of the technical condition of power transformers of any type, voltage, and capacity. We use modern methods and equipment to detect hidden defects at early stages and propose solutions for their elimination.

### Main Causes of Transformer Wear

To effectively diagnose the condition of a transformer, it is important to understand the mechanisms of defect development:

- **Vibration**  
Vibration causes loosening of fasteners, abrasion of the insulation layer, deterioration of contacts, and the appearance of electrical discharge phenomena. This leads to contact heating, short-circuiting of laminations in the steel core, or breakdown of winding insulation.
- **Overvoltage**  
Various types of overvoltages (lightning, switching) negatively affect the lifespan of the main insulation.
- **Load Mode**  
Sudden load changes increase vibration and weaken the fastenings of transformer elements.



## Transformer Diagnostic Methods

We apply a multiparameter approach that provides a complete picture of the equipment's condition:

### 1. Measurement of Electrical Discharge Activity (EDA)

- Detect partial discharges, sparking in contacts, discharges in bushings, and other elements.
- Isolate each type of signal separately, allowing precise identification of the problem source.

### 2. Harmonic Analysis of Capacitive Current

- Evaluate the reliability of fastenings for current-carrying elements and the active steel core.
- The method is completely immune to interference as it considers only the geometric arrangement of internal transformer elements.

### 3. Harmonic Analysis of Vibrations

- Identify zones of maximum vibration for each type of defect (current-carrying elements, active steel core).
- Measure individual contributions rather than total vibration, improving diagnostic accuracy.

### 4. Thermal Imaging Control

- Detect local heating of the housing caused by internal issues to identify already developed defects.

### 5. Dissolved Gas Analysis in Oil

- Clarify the defect development timeline, types of discharge phenomena, and their impact on paper-oil insulation.

## Advantages of Our Diagnostics

### ○ Compliance with Standards

EDA measurement and thermal imaging control methods comply with the international standard IEEE Std.1436.

### ○ Comprehensive Approach

We consider operating conditions, number of repairs, service life, and other factors affecting the transformer's condition.

### ○ Cable Line Diagnostics

Separately check the cable lines feeding the transformers to exclude external interference.

### ○ Database and Experience

With a significant database and deep understanding of transformer design, our specialists can accurately characterize the condition of nodes and elements, provide recommendations for further operation, repair, or calculate residual life.



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## What Benefits Do You Get?

### 1. Accident Prevention

Timely defect detection helps avoid serious breakdowns and downtime.

### 2. Resource Savings

Minimization of repair and maintenance costs through prevention.

### 3. Extended Service Life

Recommendations for operation and repair allow for maximum utilization of equipment resources.

### 4. Operational Stability

Guarantee of uninterrupted operation of transformers and the entire power system.

## Summary

Our company offers professional diagnostics of power transformers using advanced methods and technologies. We help our clients ensure the reliability, safety, and economic efficiency of their power systems.

Contact us to order diagnostics and receive a detailed report on the condition of your equipment and recommendations on its efficient maintenance and repair.

## Contact Information

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