



**KINECTRICS**

# Transformer Services

Expert Services for the Entire Transformer Life Cycle



# FULL SERVICE EXPERTISE FOR TRANSFORMER LIFE CYCLE MANAGEMENT

## Commissioning, Operations & Life Cycle Management

Kinectrics provides complete transformer testing and consulting services in Canada, the US, and worldwide to ensure the safe, reliable, and effective operation and management of power transformers.

### De-Commissioning

- Forensic Analysis / End-of-Life inspections
- Failure Mode Effects Analysis
- Material / component testing

### Operation Maintenance

- Detailed condition appraisals
- Loading / Dynamic Rating Analysis (DTR Software)
- Health Index determination
- Fleet Assessments – Asset Management
- Routine DGA and oil quality Monitoring and interpretation
- Furanic compound analysis
- Degree of polymerization
- Oil processing – Degasifying
- Insulation dry-out
- PCB destruction
- Fluid replacement - Environmental/flammability
- Thermal Issues/thermography
- Thermal uprating and auxiliary coolers
- On-site Frequency Response Analysis
- Power factor testing
- On-site Partial Discharge testing
- Dielectric Frequency Response – Insulation dryness
- Calibration of instrument Transformers up to 350 kV or 20,000 A

### Repair

- Condition appraisals
- Insulation aging analysis
- Conversion to high-temperature insulation
- Thermal upratings
- Radiator / cooler replacement



### Commissioning Support

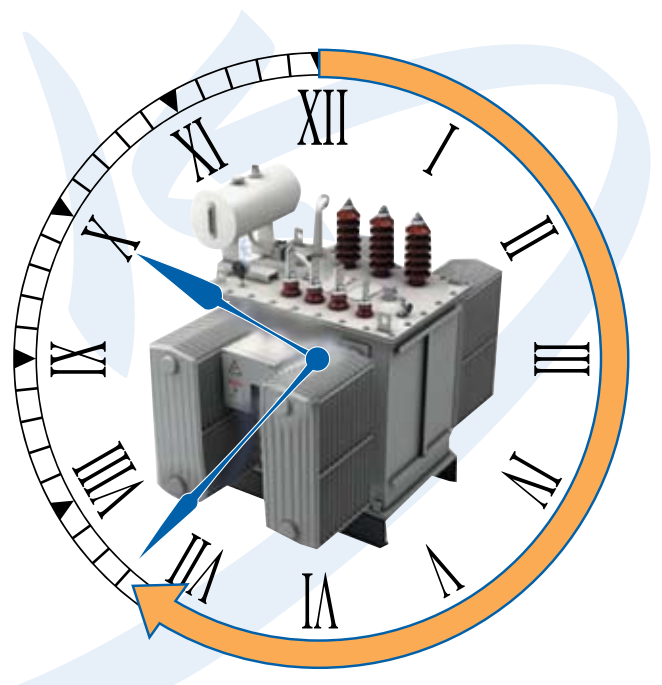
- On-site Frequency Response Analysis
- Power factor testing
- On-site Partial Discharge testing
- Dielectric Frequency Response – insulation dryness

### Special Tests / Type Tests

- Short-circuit testing
- Enclosure integrity testing (pressure)
- Environmental performance testing
- CT/PT accuracy/phase calibration
- Seismic withstand
- Mechanical Frequency response / resonance

### Factory Testing Support

- Test witnessing
- Heat run dissolved gas analysis testing
- Frequency Response Analysis baseline
- Dielectric Frequency Response
- Insulation dryness
- Recurrent surge generator (LV impulse)
- Partial Discharge (PD) testing
- PD localization testing
- Failure Mode Effects Analysis
- Material failure analysis
- Frequency response stray losses



## Design, Manufacturing & Supply Support

Kinectrics is your independent, third-party partner for laboratory testing, electrical and mechanical testing, and consulting services across the entire transformer supply chain:

**OEM:** Transformer OEMs; Component/Material Manufacturers: Transformer fluid producers

**Repair/Service:** Service companies; transformer repair shops

**End-Users:** Electric utilities; Industrials, Wind farms, Photovoltaic plants

### Pre-Order

- Material and component selection
- Material compatibility studies
- Aging Studies
- Fluid compatibility testing
- Transformer specification development
- Independent bid evaluation assistance
- Transformer loss evaluation studies
- Component testing



### Order

- Inspection and Test Plan development



### Design

- Design reviews
- Impulse voltage distribution calculations
- Short-circuit calculations
- Dielectric (insulation) design calculations
- Thermal calculations
- Material selection assistance
- Component testing

### Manufacturing

- In-plant QA inspections
- Dry-out studies and processing verification
- Degree of polymerization loss mapping

## PARTIAL DISCHARGE (PD) TESTING

Kinectrics' technical support for transformer PD measurement includes:

- Performing on-line electrical PD testing
- Custom-built bushing tap sensors
- Acoustic PD testing including PD localization/source mapping
- PD phase-resolved pattern analysis; pulse-height analysis
- Classification mapping to separate corona, noise and multiple PD sources
- PD / induced voltage testing, or witness in the field / factory
- Customized training



## OIL TESTING / TESTING OF DIELECTRIC FLUIDS AND GASES

Kinectrics' accredited Petroleum Products Group's (PPG's) Chemistry Labs provide a full range of assays on transformer, capacitor, Load Tap Changer, and bushing fluids, ranging from routine testing (PCB, General Oil Quality and Dissolved Gas Analysis) to more complex assays (e.g. bio-degradability), to large-scale R&D testing (e.g. aging testing of fluids and insulation materials; material compatibility testing). Kinectrics' advanced oil diagnostics provides early warning of incipient fault conditions and we can follow-up with other testing as required.

Kinectrics' technical expertise includes consulting on dielectric fluid monitoring practices, condition assessment/fault diagnosis, equipment health index, and equipment life extension.

## MORE VALUE-ADDED SERVICES

### Factory Acceptance Testing (FAT)

Kinectrics offers qualified FAT services (independent lab testing or factory test witnessing) and in-plant QA inspections for power transformers directly to end users. Capabilities include: LV distribution and testing, turns-ratio, polarity/phase, DC winding resistance, power factor, core insulation, sweep frequency response analysis, dielectric spectroscopy and DGA.

### Additional High-Voltage and High-Current Lab Capabilities

Kinectrics' HV and HC Lab services include short-circuit, no-load loss and load-loss testing, temperature rise, lightning impulse testing, applied potential testing, induced voltage testing, sound level, RIV, and partial discharge measurement.





[www.kinectrics.com](http://www.kinectrics.com)

**Head Office**

800 Kipling Ave., Unit 2  
Toronto, ON M8Z 5G5  
Canada  
416-207-6000

**Canada**

393 University Ave. 4th Floor  
Toronto, ON M5G 1E6

**USA**

2135 City Gate Lane, Suite 100  
Naperville, IL 60563

**United Kingdom**

17-18 Frederick Sanger Road  
Surrey Research Park  
Guildford, Surrey GU2 7YD

**Germany**

Hertha-Lindner-Strasse 10-12  
01067 Dresden

**Denmark**

c/o 360 Law Firm  
Gl.Kongevej 60  
DK- 1850  
Frederiksberg C

**Romania**

59 Grigore Alexandrescu Street.,  
2nd Floor Bucharest 010623

**India**

Sy No.125,  
Banda Mailaram Village,  
Mulugu Mandal, Siddipet District  
Telangana – 502 336

