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ONLINE
PREDICTIVE MAINTENANCE

LP-TCM
DISTRIBUTION TRANSFORMERS CONDITION MONITORING

How it works?

Enging's LP-TCM system is a fully integrated solution to monitor a valuable asset in an electrical grid or industrial installation: **Distribution Transformers.**

This highly innovative system is able to perform the fault detection and the condition monitoring of distribution transformers through the analysis of electrical variables, namely the transformer's primary and secondary currents. The primary and secondary current signals are easily acquired through the use of non-invasive current sensors and processed in a server, where the detection algorithm is running. Based on these signals, the asset's intrinsic characteristics are calculated in real-time. The system detects in a very early stage, any internal problem in the windings or in the core of these assets.

This approach makes this system very sensitive to all variations in the internal transformer's parameters, allowing therefore to make an early detection of faults and provide alarms to the operator in order to avoid an early expensive outage due to a fault. Through the dedicated software, the operator can easily visualize all data in real-time, alarms information and current transformer's state. Moreover, it allows to perform historical trend analysis in order to easily correlate different information.

This system is independent of the transformer ratings and type. As a result, it can be applied to all transformers types, including dry-type transformers, where traditional diagnostic techniques based on oil analysis cannot be used.

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Benefits

Enging's distribution transformers condition monitoring solution have several benefits, such as:

- Monitor the availability and health of distribution transformers

- Real-time remote monitoring

- Non-Invasive technology

- Smart Algorithm with self-learning

- Direct analysis of electrical variables in an electrical machine

- Detection of the potential intermittent faults

- Monitoring of dry transformers (oil-free)

- Independent from physical substances subject to contamination

- Monitoring of unwanted harmonics

- Identification of faults at unload and load conditions

- Detectiond, evaluation and track of the fault evolution

- Simple and intuitive platform for non-expert users

- Warning alerts and recommendations

Online distribution transformer monitoring ⟶ Early detection of faults ⟶ Maintenance cost reduction ⟶ Increases Availability and Reability

This high-sensitivity diagnostic approach method is based on the latest innovative techniques with smart algorithms to monitor electrical assets' health. That allows to a fault diagnosis and asset condition management and management.

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Applications

Enging's distribution transformer condition monitoring solution can be applied to any transformer in an industrial installation, power plant or secondary substation:

Set-Up Transformers
Low-power Generation
Power Plants

Industrial Installations
Transformers

Distribution Transformers
Secondary substations

Main faults detected
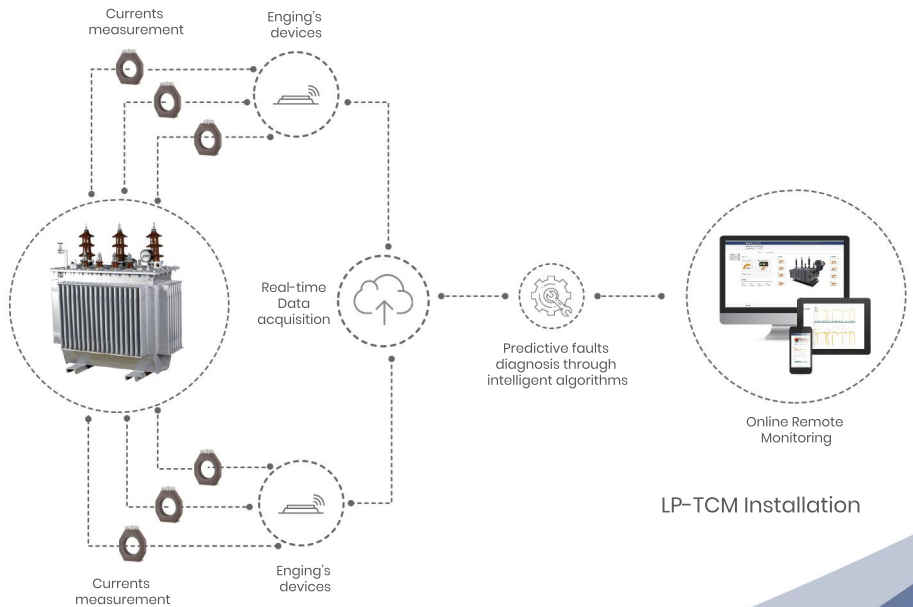
Faults in windings

Faults in the core

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Installation

Enging's devices only need to get signals access from all the current transformers, easily available near to the asset, through the installation of non-invasise sensors. These current signals are then acquired and sent to a server, where the data is processed and all distribution transformers' parameters are computed.
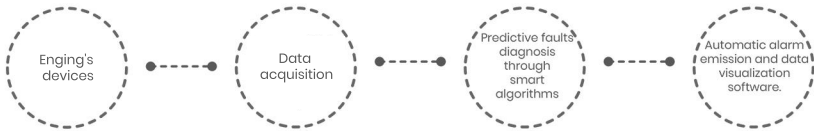
During an initial commissioning period, the platform calculates and stores all the transformer's parameters according to its operating profile. Then, the system enters in diagnostic mode where all parameters are calculated and compared with the stored values. Fault diagnosis is performed when deviations from the reference values appear.

Currents measurement

Enging's devices

Real-time Data acquisition

Predictive faults diagnosis through intelligent algorithms

Online Remote Monitoring

Currents measurement

Enging's devices

LP-TCM Installation

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An highly innovative software for any computer system, capable to provide information about different variables related to the operation of electrical motors and power transformers, through an intelligent diagnosis based on the electrical analysis of voltage and current signals.

Benefits

1. Real-time data visualization

2. Historical data

3. Trend analysis

4. Automatic alarms emission due to incipient faults

5. Data load and download

6. Detailed information about the operational conditions of assets

7. Equipment configuration

8. Events and alarms visualization

Enging's devices ···▶ Data acquisition ···▶ Predictive faults diagnosis through smart algorithms ···▶ Automatic alarm emission and data visualization software.

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Additional Features

Enging's solution presents additional features, such as:

- Easy correlation between network failures and events

- Robustness to the grid disturbances

- Robustness to the grid and load unbalances

- Independent of the load level

- Independent of the current transformer accuracy

- Could work as a standalone unit

- Independent of transformer age or core geometry

- Data visualization with a dedicated software:

Electrical Measurements	Load Level Profile	Data Load and download	Management of all devices connected in one place
Asset Database	Historical and trend analysis	Alarms history	Maintenance Recommendations

Optional Features:

- Thermal model of the transformer

- Data integration of others instruments (eg. DGA, Temperature probes)

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"Enging is committed to making a difference to its customers by its quality, efficiency and professionalism, being a reliable partner for solving its problems through engineering solutions."

– CEO

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