

# Transformer Oil Quality Monitoring

Predictive



maintenance



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*Pioneering the future of power testing and monitoring*

# Transformer oil Degradation Monitoring



## Advanced reporting and communication

Most advanced reporting and communication protocols

## Description

The oil quality is monitored by our state of art Transformer OIL QUALITY MONITORING The DGA monitoring system as described above covers all the major electrical faults in the transformer it gives no information about the transformer oil quality.

While the DGA gives valuable information on the fault severity- it gives very limited information on the oil quality aging etc. .

Ever since the beginning of transformers use the transformer oil breakdown voltage testing has been used as proven method for evaluating the dielectric properties of the transformer oil

Our revolutionary sensor measures and monitors breakdown voltage directly mounted on transformer tank. With this chemical properties and oil contamination can be identified in very early stage before sludge formation takes place. This reduces significant service costs as sludge.

The TRO Degradation monitor was specially developed for permanent use in the field at the transformer and is used exclusively for continuous real-time measurement of breakdown voltage, water content and temperature of a mineral oil-based transformer oil.

This robust and compact online sensor is permanently installed on power transformers. The core is an aluminum-coated piezoelectric resonator, expanded to include a humidity and temperature sensor, is housed in a compact aluminum housing.

Only materials that can be permanently exposed to transformer oils have been used. The test and calibration routines were developed based on the evaluation of over 3800 oil samples from over 900 different transformers.



## Measurement

The calculation, which considers the strong correlation between oil moisture (WC), acid number (TAN), temperature (T) and breakdown voltage, is carried out in the sensor by a 32-bit embedded system using a floating-point process (FPU) using a look-up table (Look-up-table). The representation of the limit behavior of the oil samples has already been considered in the look-up table

The Breakdown voltage and moisture sensor is equipped with a Parker RI1EDX3 / 471 connector which allows the device to be screwed on at the target location. The sensor can be mounted in any orientation, but a free oil flow through the measuring chamber must be guaranteed. The connection for the cable is located at the top of the sensor. The connection between the TRO degradation monitor and the control unit is established with the connection cable supplied.

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Technical specification  
oil quality and Breakdown Voltage Monitoring

## Measured parameters

Breakdown Voltage	10kV to 120kV ( ± 2.5%)
Water content (WC)	2 ppm to 80 ppm (± 2%)
Temperature	-40 to 120 ± 0,2°C
Measurement interval	max. 0.1s

## Operating environment

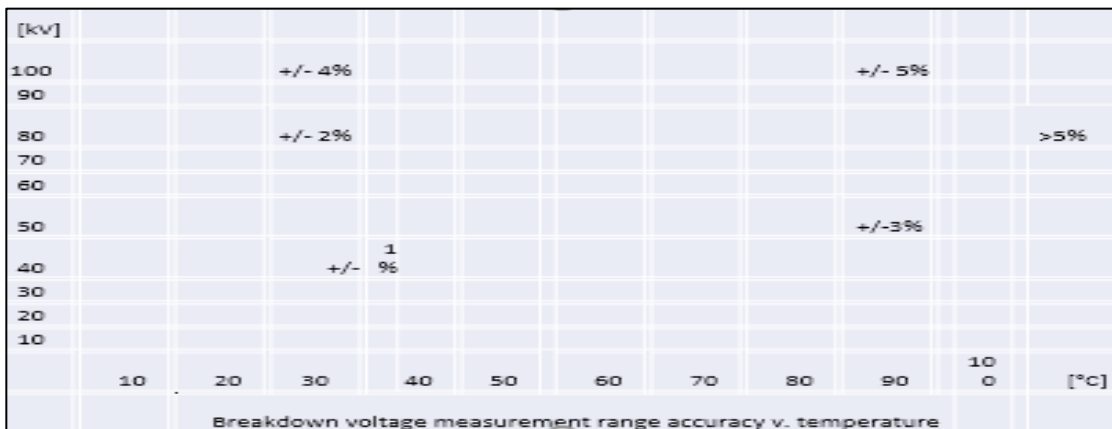
Ambient temperature	-20°C to 70°C
Oil temperature range	-20°C to 85°C
Operating pressure	Up to 3bar
Output	4.5V to 7.5V (5.0V recommended)

Interface	Digital Protocol MODBUS TCP/IP
Internal data logging capacity	dynamic latch buffer

Mechanical connection	Parker RI1EDX3
Housing classification when assembled	IP68

Control software	Windows 7 or better
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Operating temperature	-40°C to 100°C
Operating pressure	5bar
Storage temperature	-65°C to 150°C



2416 Main Street  
Tel: + [1 \(778\) 8194363](tel:17788194363)  
Vancouver  
Fax+ [1 \(778\) 8194363](tel:17788194363)  
BC V5T 3E2, Canada  
Email: [filip@powerview-energy.com](mailto:filip@powerview-energy.com)  
Web: [www.powerview-energy.com](http://www.powerview-energy.com)



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