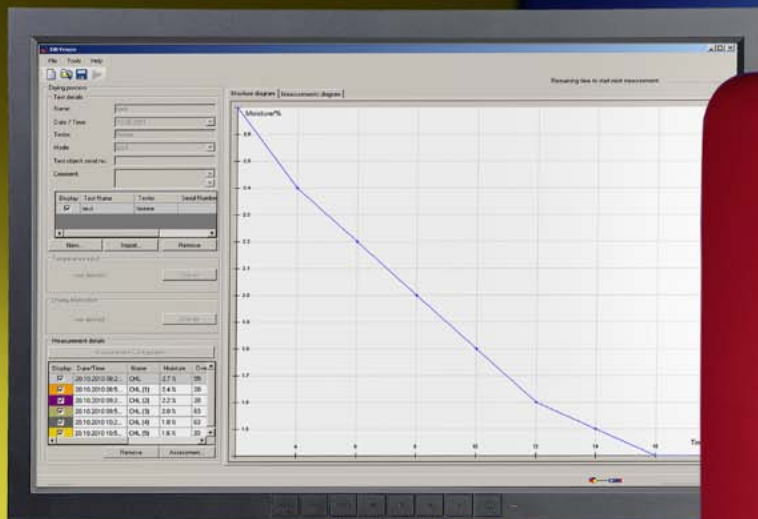


# DRYmon

First drying process monitoring system for oil-paper insulation using dielectric response measurements



# Drying process monitoring with DRYmon

## Your challenge: Optimization of drying process

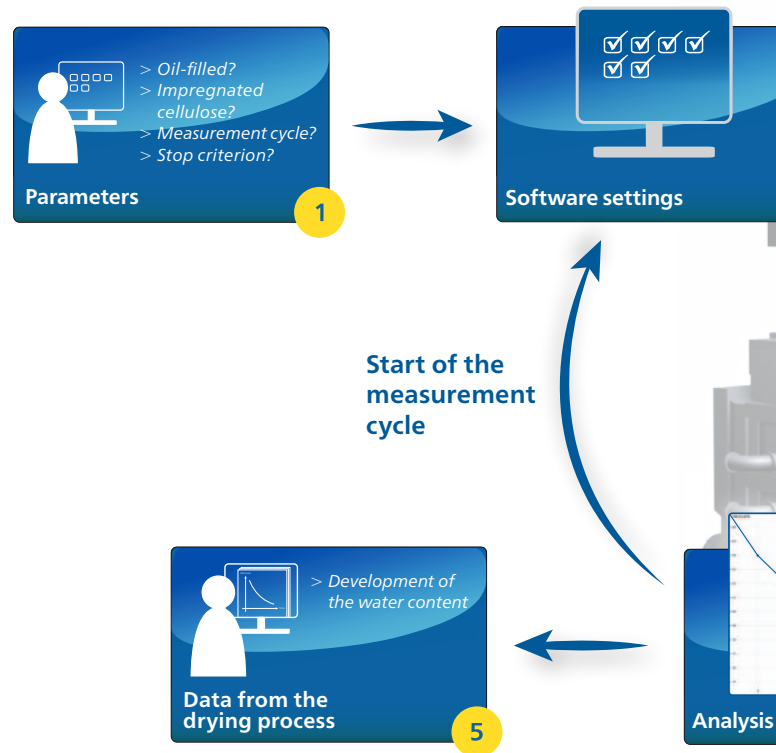
Accumulated water in oil-paper insulation, for example in power transformers and instrument transformers, significantly reduces their lifetime and can finally lead to premature failure. The water should, therefore, always be removed already during the manufacturing process and also after repair.

During the construction of transformers the aim is to reduce the water content in the solid insulation to a level of 0.5 %. Also during maintenance and repair work water can penetrate the insulation which is why drying must subsequently be performed.

However, due to a lack of real-time monitoring possibilities, the drying – for example in a vacuum oven – is an extremely time-consuming process.

Therefore, anything which can reduce the drying time offers a major benefit. It not only significantly reduces the overall production or repair time, it also considerably increases the throughput of the drying ovens.

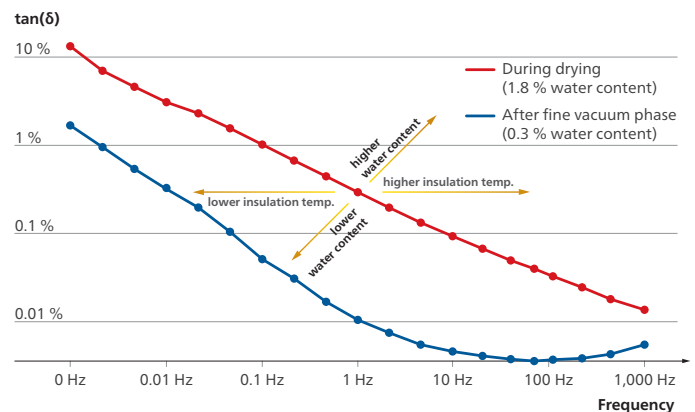
At present, the length of the drying process is often still based on the personal experience and estimates of the operators as it was previously not possible to monitor the progress of the drying process in real time.

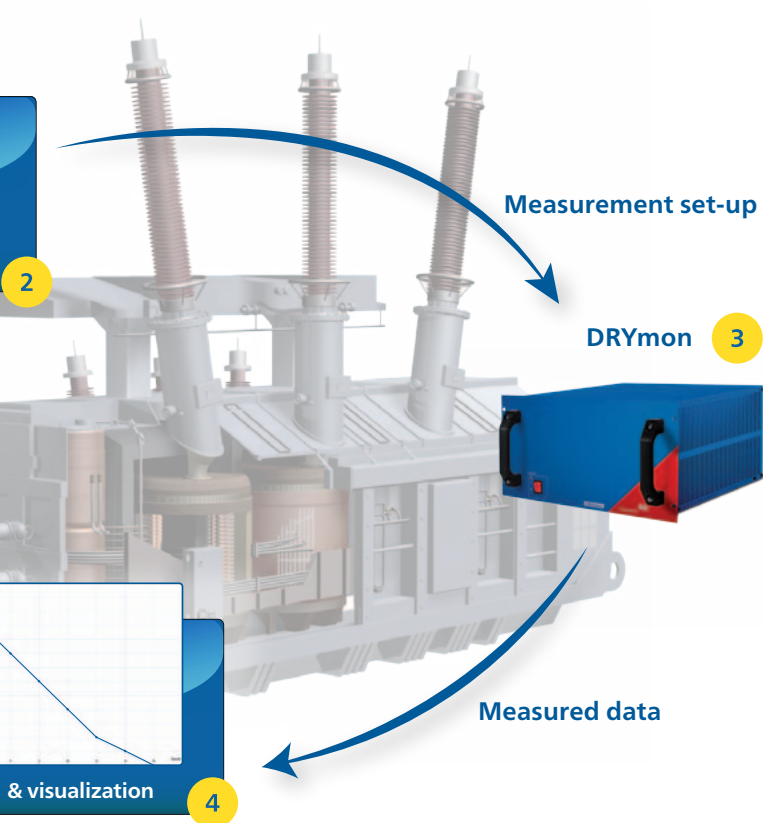


Monitoring the drying process with DRYmon



## Influencing factors on the dielectric response





## Our solution: DRYmon

OMICRON's DRYmon is the world's first measuring device for monitoring the drying process of oil-paper insulations in real time using dielectric response, for example, a  $\tan \delta$  measurement over a wide frequency range.

This direct measurement of the insulation provides you with accurate water content values of cellulosic insulation before and after oil-impregnation. The results help you with optimizing your drying times.

While monitoring with DRYmon you can be assured that the quality of your insulation is constant;

- > in new and aged transformers,
- > in transformers of all power ratings,
- > during all offline drying methods, such as hot air, vapor phase, hot oil spray, low frequency heating,
- > during manufacture, as well as after maintenance or repair work.

Potential deviations of the measurement curves due to different temperatures are compensated by an integrated temperature measurement, and therefore, do not have any influence on the results.

With this integrated temperature measurement the monitoring process reaches a high degree of automation making it much easier for you.

As DRYmon is rack-mountable it can be directly integrated into your existing drying equipment.

## Specifications

### Voltage source

|                                   |                       |
|-----------------------------------|-----------------------|
| Maximum measurement voltage       | 200 V <sub>peak</sub> |
| Maximum continuous output current | 50 mA <sub>peak</sub> |

### Power/dissipation factor, capacitance

|                                |                            |
|--------------------------------|----------------------------|
| Power/dissipation factor range | 0 ... 10                   |
| Resolution                     | 10 <sup>-5</sup>           |
| Accuracy                       | 2 % + 5 x 10 <sup>-4</sup> |
| Capacitance                    | 10 pF ... 10 μF            |
| Accuracy                       | 0.5 % + 1 pF               |
| Frequency range                | 0.05 mHz ... 1 kHz         |

## Your benefits

- > Real-time information on the water content
- > Universally applicable measuring principle
- > Accurate water content results due to direct measurement of the insulation
- > Highly automated and easy monitoring due to integrated temperature measurement
- > Optimization of the drying time

**OMICRON** is an international company serving the electrical power industry with innovative testing and diagnostic solutions. The application of OMICRON products allows users to assess the condition of the primary and secondary equipment on their systems with complete confidence. Services offered in the area of consulting, commissioning, testing, diagnosis, and training make the product range complete.

Customers in more than 140 countries rely on the company's ability to supply leading edge technology of excellent quality. Broad application knowledge and extraordinary customer support provided by offices in North America, Europe, South and East Asia, Australia, and the Middle East, together with a worldwide network of distributors and representatives, make the company a market leader in its sector.

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