



Advanced Test Equipment Rentals
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OMS 600

Continuous partial discharge monitoring system for power generators and electrical motors



Condition monitoring for extending the life of your machines



Turbo generators



Hydro generators



Electrical motors

Knowing the condition of stator insulation is vital

Statistics for rotating electrical machines show that a major source of failure is linked to defects in stator insulation.

Aging of the stator winding insulation can occur both in the slot and end-winding areas. If the insulation condition is not monitored correctly, an inadequate assessment can lead to improper maintenance. In worst cases it can also lead to dielectric failure and costly downtime.

Early detection of partial discharges prevents failures

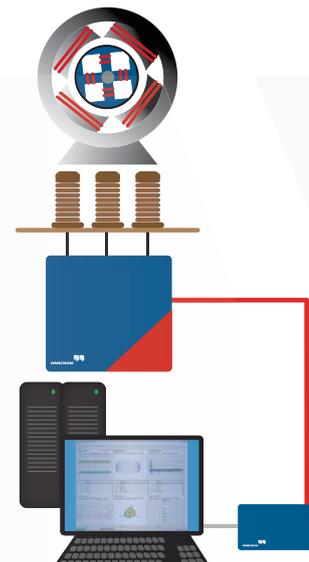
A majority of defects can be detected early through the permanent monitoring of partial discharges (PD). PD reveals weak spots in the insulation caused by aging and stress factors during normal operation.

PD monitoring is a very effective and well-established technique used to continuously assess the condition of a stator winding insulation system. The data collected is used to identify the source of PD inside the stator winding and to trend its evolution over time.

The earlier monitoring is started, the more efficient your assessment will be throughout the entire operating life of a machine. Failures can be avoided through the timely implementation of maintenance and repair measures.

Modular, expandable design

The OMS 600 PD monitoring system can be implemented at any point of time during the service life of your rotating machines. Its modular design allows it to be easily customized and expanded to match your exact requirements – whether for single or multiple machines.



Monitoring of a single machine

OMS 600 at a glance

Continuous PD detection for rotating machines

Our OMS 600 on-line PD monitoring system combines advanced hardware and software for complete assessment of stator insulation in:

- > Turbo generators
- > Hydro generators
- > Electrical motors

Reliable online results

OMS 600 continuously records PD phenomena and reliably indicates the state of the stator insulation.

You can easily select the center frequency and the bandwidth of the PD measurement to reach an optimal signal-to-noise ratio, even in noisy on-site conditions.

Synchronous, multi-channel and multi-spectral evaluation techniques are applied by the OMS 600. They ensure the efficient separation of different types of PD sources and it allows you to distinguish them from external noise.

Centralized data processing and analysis

The collected PD data is stored on a central monitoring computer. The OMS 600 system database is scalable to handle large amounts of data over time.

The OMS 600 monitoring software analyzes and displays the PD data. You can also compare PD data from multiple machines connected to the central computer.

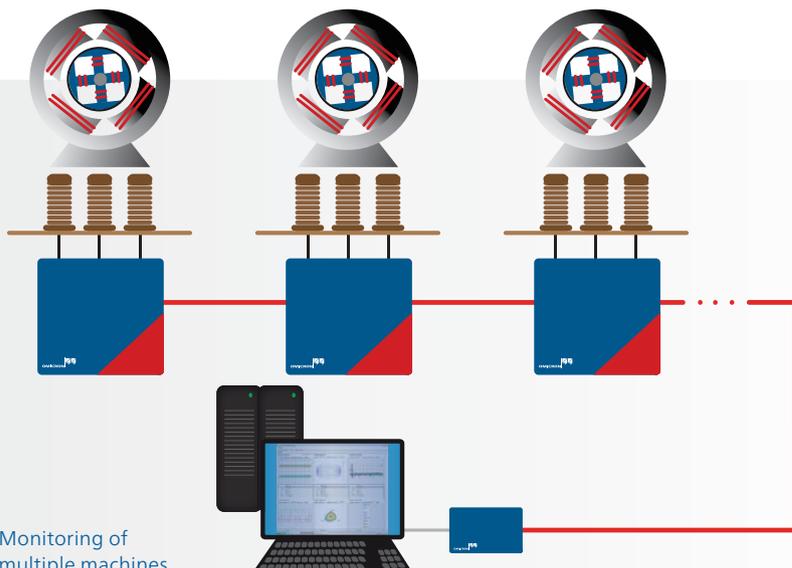
Actionable data to optimize maintenance strategy

The OMS 600 provides you with detailed trend data and early warnings well before failures occur. You can define threshold values so that the system issues a warning or an alarm when there is a violation.

Trend diagrams of statistical parameters, such as PD magnitude and frequency of PD pulse occurrence, can be displayed according to your specific interest. Using this actionable data, you can assess the risk of dielectric failure in your machines and optimize your maintenance strategy.

Complete expert support & advice

Our dedicated team of high-voltage engineers provides you with complete guidance and support. This includes on-site consultations to evaluate your monitoring needs; system installation, setup and training; as well as data evaluation support.



Monitoring of multiple machines

Your benefits

- > Customized system approach to match specific monitoring requirements
- > Continuous on-line evaluation of insulation condition in stator windings
- > Synchronous, multi-channel PD data acquisition for complete assessment
- > Advanced noise and source separation for reliable PD detection
- > Scalable database of PD trend data enables effective risk assessment

One system for complete on-line PD monitoring

OMS 600 system overview

The complete OMS 600 partial discharge monitoring system for rotating machines includes a wide variety of PD sensors, an acquisition unit for data recording, a central computer and monitoring software.

The system can be customized for a wide variety of power generators and electrical motors.

1 PD sensors



- > Especially designed for detecting PD signals on generators and motors with up to 24 kV rated voltage
- > Nominal capacitance of up to 2.2 nF for high sensitivity
- > Integrated impedance and transient voltage suppressor diode for enhanced safety
- > Detect PD in the frequency range according to the international standards IEC 60034-27-1, IEC 60034-27-2 and IEEE 1434
- > Strong mechanical robustness allows installation in both horizontal and vertical positions



Typical OMS 600 system configuration for a turbo generator. The system can also be used for monitoring hydro generators and electrical motors.



2 Acquisition units

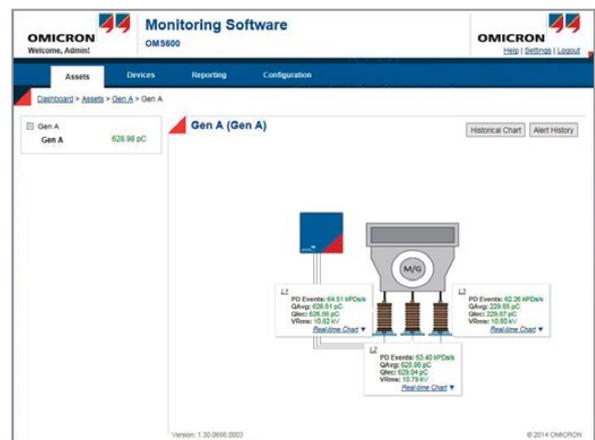
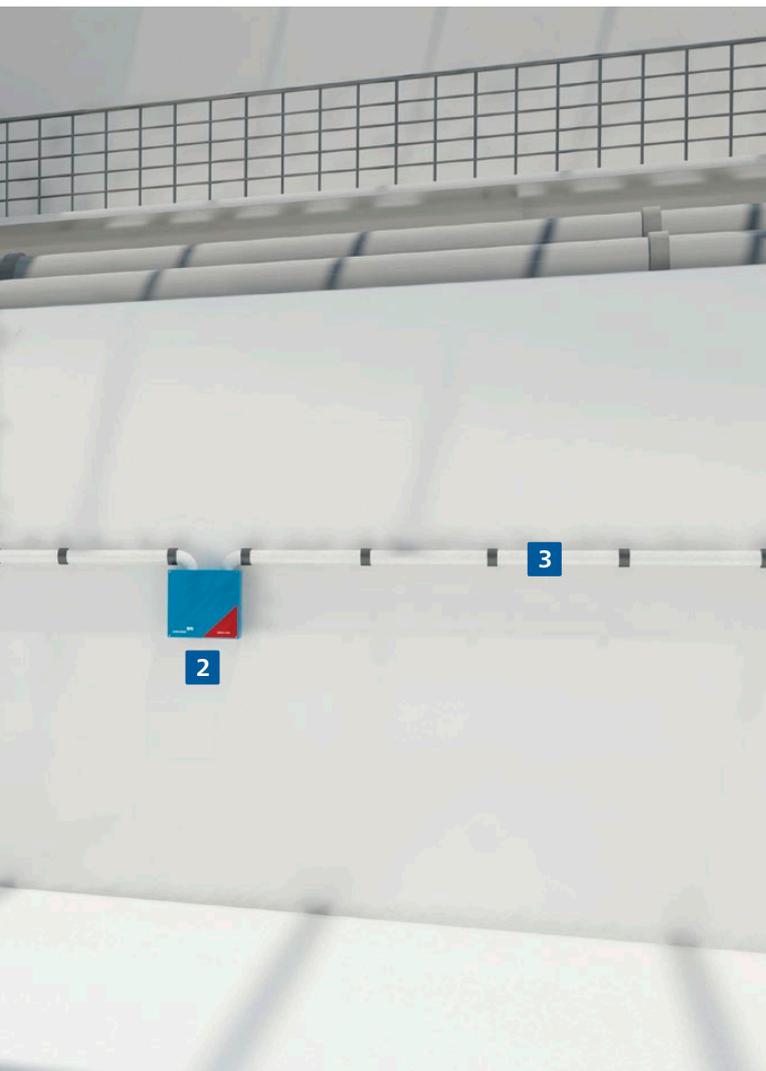
- > Fully digital PD monitoring in one compact enclosure
- > 3-channel, simultaneous acquisition of PD data from all three phases
- > Adjustable bandwidth of PD measurements
- > Synchronous PD signal processing with advanced source separation
- > Accurate PD source identification
- > Robust design for long-time field application in industrial environments

3 Fiber optic communication

- > Connects each acquisition unit to the central computer
- > Provides uninterrupted data transmission over long distances
- > Eliminates electrical interference and ensures personal safety with complete galvanic isolation

4 Central computer and monitoring software

- > Ensures long-term data storage and retrieval with a state-of-the-art database system
- > Handles large amounts of monitoring data
- > Performs data post-processing to provide useful information about insulation state
- > Manages monitoring parameters and defined thresholds for warning and alarm levels
- > Classifies and visualizes events and trends



Reliable and early PD detection in stator windings

Effective source separation

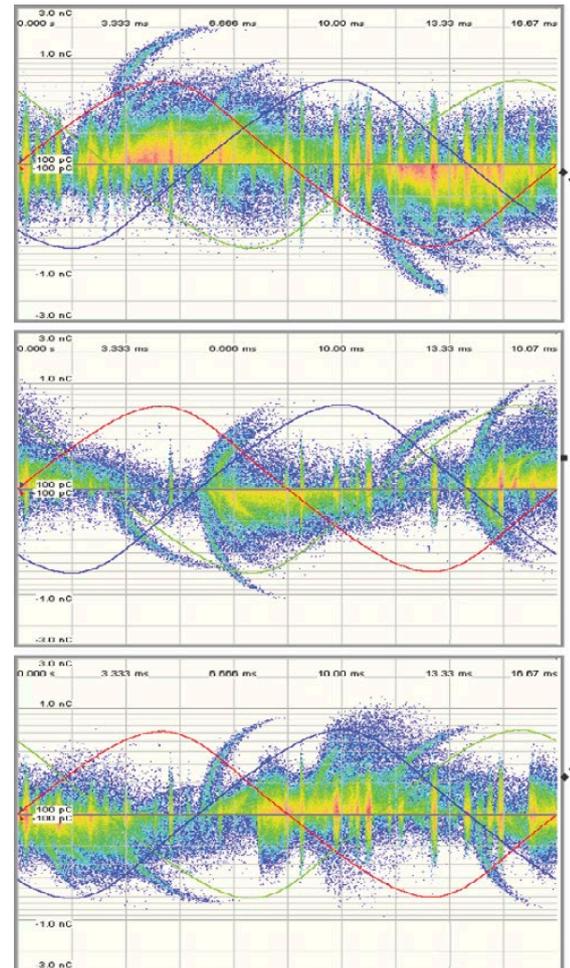
PD is especially challenging to monitor, because it is greatly influenced by external noise. The OMS 600 helps you to overcome this challenge.

In order to separate clusters of different PD sources, the synchronous, multi-channel 3PAR (3-Phase Amplitude Relation Diagram) evaluation technique is applied.

The 3PAR diagram visualizes the relationship between amplitudes of a single PD pulse in one phase and its crosstalk-generated signals in the other two phases. By repetition of this procedure for a large number of PD pulses, PD sources within the machine as well as external noise appear as a clearly distinguishable concentration of dots.

By examining individual clusters in the 3PAR diagram, a separation between external noise and PD phenomena is possible.

This method allows PD sources to be easily separated and assessed. Based on the resulting PD pattern, you can identify and localize the sources of PD in the machine.



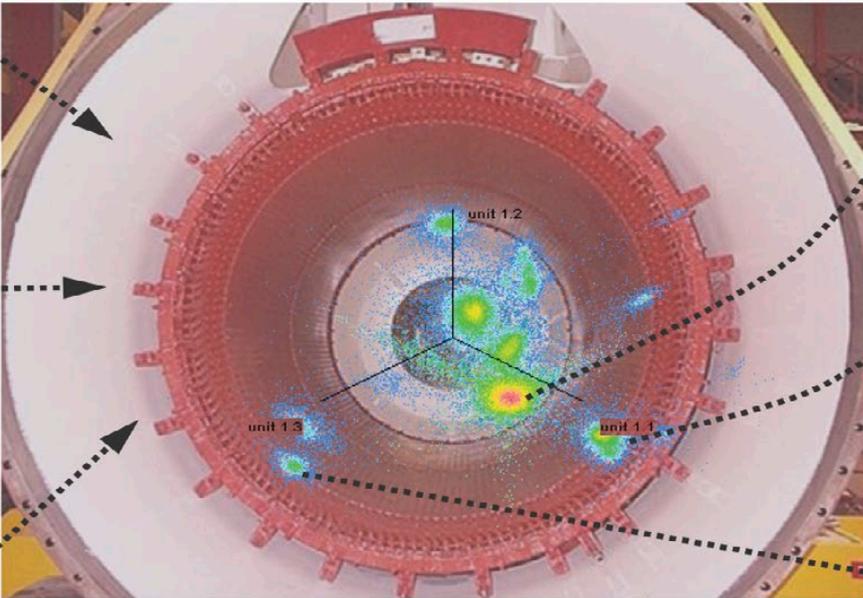
PD diagrams of three phases without separation



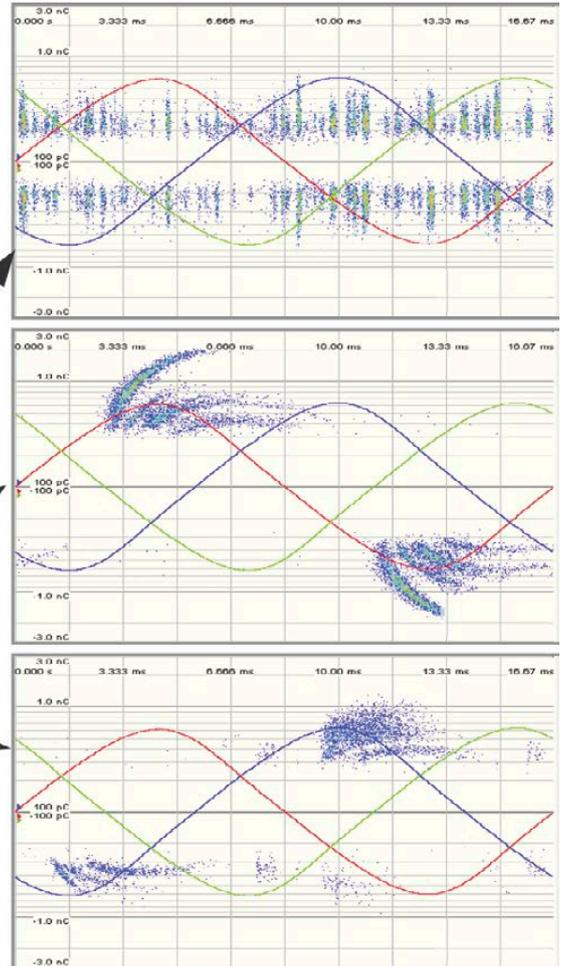
High-quality support at every stage of your project

The OMS 600 continuous PD monitoring system is not only a set of excellent system components. It also includes the dedicated service we provide you. Our knowledgeable experts are working for you to support you in all stages of your monitoring project.

We provide you with peace of mind while matching the actual needs of your high-voltage equipment over its operational lifetime.



Measurements related to each other in a 3PAR diagram



Separated PD activity

We start the implementation of your monitoring system by understanding your needs and challenges. With this input, the system can be designed according to your needs. Our team of specialists then installs the system for you on-site.

During the commissioning of the system, its performance and measurement sensitivity are verified. You are then trained on how to use the system and how to take maximum advantage of its features.

The measured data is stored, processed and visualized by the monitoring software. Our HV experts are available to help you interpret and analyze the data. We can also provide you regular asset condition reports and recommendations for further action.

Monitoring project knowledge and expertise you can rely on

- > Evaluation of monitoring requirements
- > Project-specific monitoring system design
- > Integration of monitoring system into existing infrastructure
- > Installation, commissioning and calibration of the monitoring system
- > Monitoring system and data evaluation training
- > Data analysis and interpretation
- > Worldwide customer service & hotline

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. Service centers on all continents provide a broad base of knowledge and extraordinary customer support. All of this together with our strong network of sales partners has made our company a market leader in the electrical power industry.

For more information, additional literature, and detailed contact information of our worldwide offices please visit our website.