

## MICAMAXX<sup>®</sup>pda – Easy-to-use Partial Discharge Monitoring System



Corrective action prompted by early warning of critical winding condition can mean the difference between a brief shut-down for minor repairs and a major over-haul involving weeks, or even months of costly downtime!

MICAMAXX<sup>®</sup>pda is PD Tech Power Engineering's state-of-the-art solution for on-line monitoring of high voltage rotating machines, ensuring greater availability of plant assets.

### The Solution

Partial discharge condition monitoring provides an early warning of critical problems in the stator winding and the HV-system, so that corrective measures can be taken before costly damages occur. Catastrophic failures will eventually develop as a result of undetected electrical defects. In this case a new stator winding is likely required and lead-times for replacement can be lengthy.

If the problem is identified early enough, the situation can be contained by implementing a temporary repair or a change in operating conditions to extend machine life, whilst necessary spares are being organized.

### Stator Winding and High Voltage System

The stator winding and the high voltage auxiliaries are monitored by PD Tech Power Engineering's MICAMAXX<sup>®</sup>pda technology.

Partial Discharge (PD) is an incomplete breakdown between the insulation or the insulation and a conductor. Over time, the insulation of the machine will deteriorate; a process accelerated by thermal, mechanical, environmental and electrical stress.

By assessing the PD parameters of the machine, deterioration can be effectively monitored. And problems such as bar vibration, loose wedges, slot discharge or pollution can be identified.

### As Easy as Temperature Monitoring!

The MICAMAXX<sup>®</sup>pda is a Partial Discharge trending system with an integrated 4...20mA Interface and Alarm Contacts. The main application is to convert the global Partial Discharge activity on electrical machines to a stabilized 4...20mA analogue signal which can be integrated into an existing machine control or data logging system. This makes the Partial Discharge monitoring as easy as temperature monitoring.

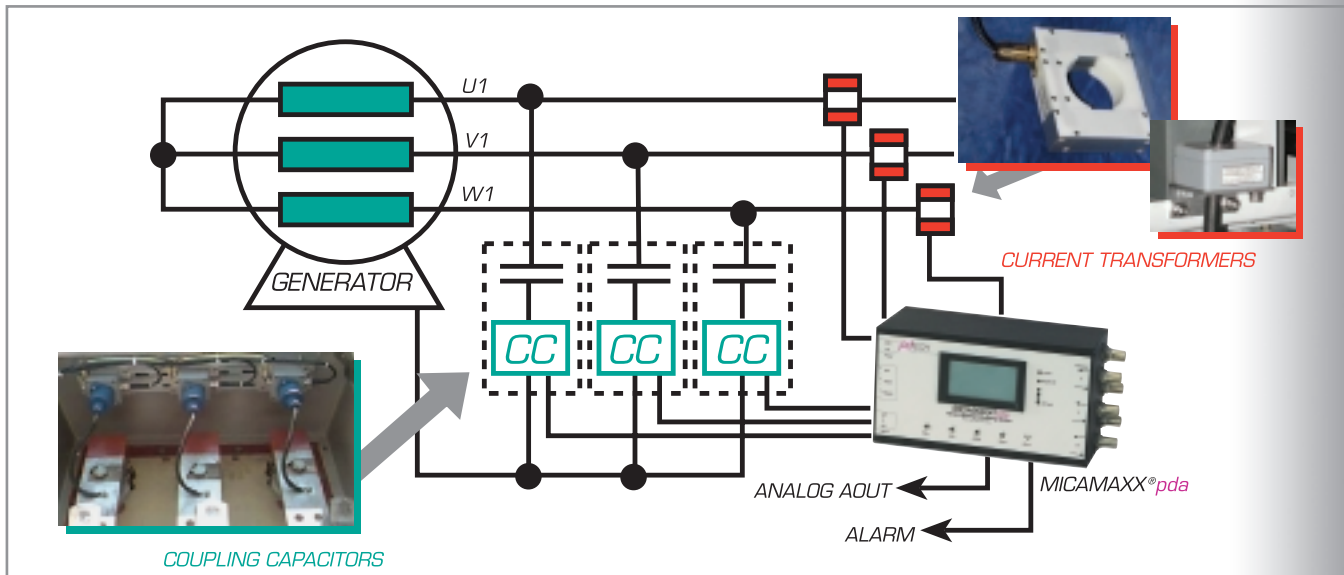
Pre-programmed selectable bandwidth filters allow using the MICAMAXX<sup>®</sup>pda in noisy areas. The best signal to noise ratio can be set in order to optimize the Partial Discharge signal acquisition.

The system itself monitors the deviation of the insulation condition from the assessed state during commissioning of the system.

During commissioning the condition of the test object is defined based on measurements using the Partial Discharge Pattern Recording Technique of the MICAMAXX<sup>®</sup>pdplus system.

### Solution for all HV Rotating Machines

MICAMAXX<sup>®</sup>pda is a partial discharge trending system comprising an on-line monitoring unit and PD transducers, which are fitted to the machine as a permanent installation to enable continuous on-line monitoring of the insulation system. Partial discharge sensors, such



as coupling capacitors and high frequency current transformers are available for all HV-machine rated currents and voltages. And of course, they can be installed in hazardous environments.

### Applications

The MICAMAXX®pda is working in industrial environments such as the gas and oil industry in on- and off-shore environments, polymer factories, steel mills, as well as on generators and motors.

PD Tech Power Engineering AG has developed couplers and systems with the respective ATEX certificates in order to allow a safe application.

The MICAMAXX®pda provides utilities with extra safety. Hydro and turbine generators of any power and voltage ratings are monitored with MICAMAXX®pda. This includes pump storage, gas turbine sets, steam turbines, emergency pumps and many more.

### Principle of Operation

Partial Discharge produces high frequency current pulses, which are 'picked up' by the PD transducers (fitted one per phase) and that are connected via coaxial cable to the MICAMAXX®pda system.

An initial assessment of machine insulation is necessary and is performed using MICAMAXX®pdplus, a sophisticated Partial Discharge analyzer, to provide a 'footprint' of the machine insulation system for future reference.

Once the initial analysis has been performed, the continuous on-line monitoring unit MICAMAXX®pda can be configured.

MICAMAXX®pda trends discharge levels over several months and displays them graphically on a LCD screen. It also has a configurable alarm level (N/O and N/C contacts) and a 4...20mA output, which is directly proportional to discharge, offering a simple method of interface to existing plant DCS and SCADA systems. If discharge levels reach the alarm set point, the alarm is activated.

A MICAMAXX®pdplus is then used to repeat the detailed analysis of the insulation system ON-LINE, without any loss of production. An

evaluation can then be made. Regular site visits to monitor and report are no longer necessary, as detailed analysis is only required when the MICAMAXX®pda has detected a change in levels.

### Advantages

Traditionally, off-line monitoring techniques such as Dielectric Loss Analysis (DLA) and Tan Delta Testing have been used. These methods, often considered as «yesterday's technology», are expensive and require a lengthy machine outage.

The MICAMAXX®pda system sets new standards for the monitoring of electrical machines and it is based on field-proven sensor technology. It can be an indispensable tool in planning, life time extension and preventive maintenance programs, serving to reduce unscheduled, expensive failures and outages.

### Installation

A system that has been designed specifically to allow a fast and predominantly non-intrusive installation. An outage, typically during a regular service interval, is all that is required. The MICAMAXX®pda is fully compatible with third party sensors, thus eliminating the need for extra investments and down-time.

### Benefits

The MICAMAXX®pda is easy to install and provides a cost effective solution for on-line PD monitoring without compromising technical integrity.