

Meet Fabian Oettl – our product manager for rotating machines testing & monitoring



Fabian Oettl is the product manager for rotating electrical machines testing and monitoring at OMICRON. We asked him recently about his job, the importance of machine testing and current trends, as well as how OMICRON solutions help engineers daily with the assessment of machine condition and reliability.

Why has this position been created and please describe what you do?

FO: OMICRON engineers and develops reliable diagnostic solutions for a variety high-voltage assets, many of which offer numerous testing and monitoring possibilities for rotating machines. Since electrical machines are an important asset in the generation (e.g. generators) as well as in the consumption (e.g. high-voltage motors) of electrical power, it was logical to establish a product manager for this asset.

My job focuses on both commercial and technical aspects of rotating machine testing and monitoring. On the technical side, I respond daily to customer inquiries and I perform various product-related services for them in the field. Through direct contact with engineers on site, I can define market requirements for electrical machine testing solutions and implement these into development projects together with my colleagues. Lastly, I participate actively as a presenter at numerous conferences and I am a working member of various standardization groups and project teams at universities.

What practical experience do you have with rotating machine testing and monitoring?

FO: After my studies in electrical engineering, I joined a big manufacturer of rotating electrical machines as a member of the insulation experts group in their R&D department. As you can imagine, the electrical diagnosis of insulation systems in rotating machines was an essential part of my daily work.

How long has OMICRON been involved in the testing and monitoring of rotating machines?

FO: The testing and monitoring of rotating machines is not a new field for OMICRON. It started over ten years ago with the development of our CP100, CP TD1 and CP CR500 high-voltage test source for capacitance and dissipation/power factor testing. This field became more and more important over time

with the addition of our MPD series for partial discharge (PD) measurement and most recently with our MONGEMO system for on-line PD monitoring on rotating machines.

What types of tests is OMICRON focused on for rotating machines?

FO: We are focused on the electrical testing of the winding and the winding insulation for both stators and rotors in motors and generators. This ranges from a simple winding resistance test to capacitance and dissipation/power factor measurements as well as more complex partial discharge (PD) analysis and beyond.

This has been our core business for many years, not only for rotating machines, but also for other high-voltage assets. Therefore I believe that we can offer the customer not only the best measurement equipment solutions with proven reliability over time, but also a lot of experience and knowledge about measurement principles and data interpretation.

On which types of rotating machines are these electrical tests performed?

FO: In principle on every machine. Starting from low-voltage motors up to the biggest hydro generators with an inner diameter of higher than 15 meters or even nuclear power plant turbo generators with a nominal voltage up to 27 kV. Testing of high-voltage industrial motors has become more and more important too, as an unplanned outage of such machines stops the whole manufacturing line they are a part of.

On these machines, we are testing every electrical part. This can include the stator or the rotor as well. Also the magnetic circuit can be tested with our products. We offer most of the tests for the stator winding, as this is the most important part of the machine and its insulation must withstand the highest electrical, thermal and mechanical loads.



Why is the regular electrical testing of rotating machines so important?

FO: In research and development, electrical tests are performed in order to evaluate new materials and designs during the development of rotating machine insulation. For manufacturing, electrical testing helps to confirm the quality of machine components in order to react on a timely basis when measurement results deviate from the standard. During factory acceptance testing (FAT) and commissioning, electrical testing verifies the material and performance quality of machines. For utilities and at industrial plants, electrical testing and PD monitoring help engineers to avoid costly unplanned outages, as well as to manage resources and plan maintenance periods more efficiently for in-service machines. Lastly, service providers rely on electrical testing and PD monitoring to verify whether machine repairs were performed successfully and to ensure long-term stability.

Are there any specific trends that are driving the importance of rotating machine testing?

FO: There was always some kind of testing and monitoring activity on rotating machines, both at the manufacturer and at utilities, since it is important for them to know about the condition of the insulation system in their machines to ensure reliability. Nevertheless, the market has experienced an increase in testing and PD monitoring during the past decade. This is due in part to the fact that the in-service behavior of the machines has changed. For example, an increasing amount of starts and stops per year exposes machines to a higher stress level than they were designed for. Additionally, machines have been economically streamlined to such a degree from a thermal, electrical and mechanical point-of-view. There is very little buffer should something go wrong. Last but not least, operators are moving from a time-based maintenance to a more optimized condition-based maintenance. This is made possible through regular electrical testing and PD monitoring.

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Product Manager for Rotating Machines
OMICRON electronics GmbH

What are the most important tests to be conducted on rotating machines?

FO: Of course every test has its importance, nevertheless the off-line partial discharge measurement in combination with the injection of a high-voltage source and parallel dissipation/power factor measurement gives you the most valuable information. The differentiating character of PD measurements allows single weak points of the insulation system to be clearly identified and enables their classification according to a characteristic fault.

Why do customers select OMICRON solutions for rotating machine testing and monitoring?

FO: Besides the ruggedness of the test equipment, current customers appreciate our highly sensitive test modes and our easy-to-use software, even for more complex testing, such as PD measurements. Fast and reliable measurement is one part, but also the reporting effort has to be considered. OMICRON provides engineers with several tools for interpreting the data quickly and precisely for the most reliable statements about machine condition.

Do you have to be an expert to conduct these tests and to interpret the data?

FO: Our testing solutions offer many complex features, but they are designed for intuitive use. Also, the service of OMICRON does not stop with the purchase of the device. Many additional benefits come with the product to support the user, such as support from field experts on our customer hotline. In addition, everyone can participate in our training programs, which have a practice-oriented focus. And last but not least, knowledge sharing is very big at OMICRON, whether at our conferences, through the many application notes and technology papers available in the user area of our website, or on-site when we are performing a measurement with the customer.

Thank you for the interview Fabian!

To get a better idea about essential tests and recommended testing solutions for motors and generators, be sure to read our application brochure, *Diagnostic testing and monitoring for rotating machines*.

www.omicronenergy.com

