

ROTATING MACHINES

Measurement technology in motion

We have expanded the diagnostic options for the active part of rotating electrical machines. With our latest CPC 100 accessory, the Stator Core Measurement Upgrade Option, you can now perform stray flux measurements on the laminated core of stator cores. An auxiliary winding is placed around

the stator core and this is excited with a small portion (typically 4%) of the nominal flux. This eliminates the typical time-consuming and resource-intensive measurement at nominal flow. The stray flux is recorded with a Rogowski coil, which semi-automatically scans the surface on a rail.

Stray flux measurements detect imperfections

The stator cores of rotating machines consist of thin sheet metal laminations, which are insulated from each other. This minimizes eddy current losses in the core.

Flaws in the insulation between the sheets can lead to short circuits between two or more slats. As a result, eddy currents can form in the laminated core, which can lead to local hot spots and – in the worst case – to partial meltdowns.

If there are any imperfections in the stator core, they are reliably detected with the help of the stray flux measurement. The stator is excited to a few percent of the nominal flux by means of an auxiliary winding. This excitation provokes eddy currents in the defects, which result in an increase in the stray flux on the stator core surface. The latter is detected using a Rogowski coil.

Turnkey system

While the high-voltage insulation of the windings has long been the focus of our diagnosis, the stator core can now also

be tested with our solutions. Great value is placed on user-friendliness and time savings when performing these tests.

The modular “plug-and-play” components enable quick setup and intuitive test preparation. With the support of the Primary Test Manager™ (PTM) software, the user receives the greatest possible assistance, which means that even inexperienced users can carry out the measurement within a short time. The implementation in PTMate also enables flexibility and operation by a single person.

Scanning the stator core using the semi-automatic Rogowski coil is certainly the greatest help that the user will get from this new measurement solution. Only the positioning of the rail is done by the user. Everything else is done automatically.

The CPC 100 not only serves as a measuring unit for the stray flux measurement on the laminated core, it also performs the excitation with the multi-core cable included in the package. Here, the user can choose between

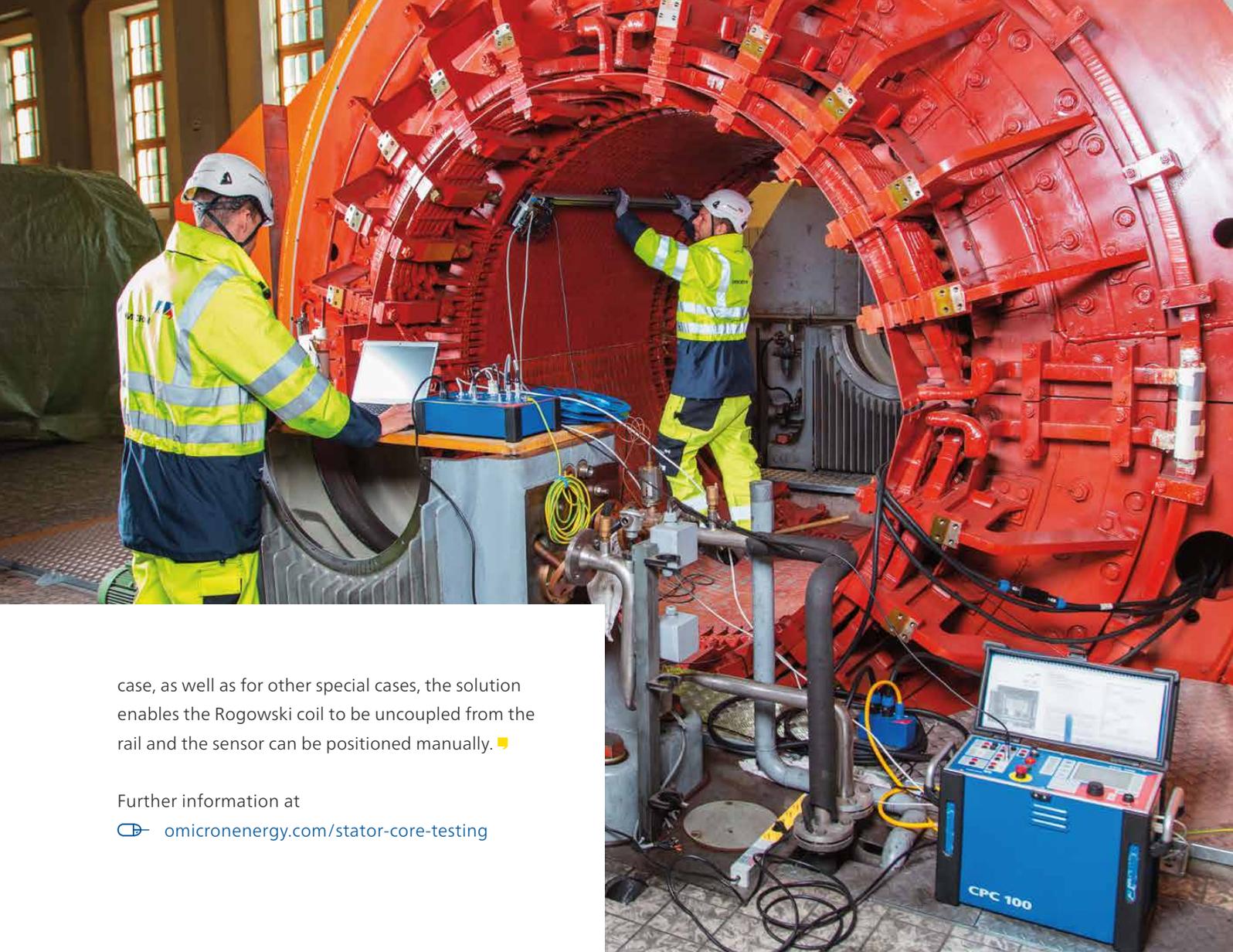
two variations. A standard cable with 8 wires (20 m/66 ft) and a turbo generator cable with 2 wires (30 m / 98.5 ft). Both variations can be extended and combined as required.

Unique features

In addition to its semi-automatic measuring procedure, the solution offers further advantages. Since the CPC 100 is also used for excitation, the test can be carried out at frequencies different from the mains frequency (15–400 Hz). This in combination with a frequency-selective measurement make a decisive contribution to interference suppression. Of course, testing at exact network frequency is also possible without problems.

The rail along which the Rogowski coil travels is held on the stator surface with magnets. Should the user still need an additional safety net, he or she can additionally fasten the rail with the supplied elastic straps.

Finally, we would like to refer to the end area of the laminated core, which is specially graded for turbo generators. In this



case, as well as for other special cases, the solution enables the Rogowski coil to be uncoupled from the rail and the sensor can be positioned manually. ▀

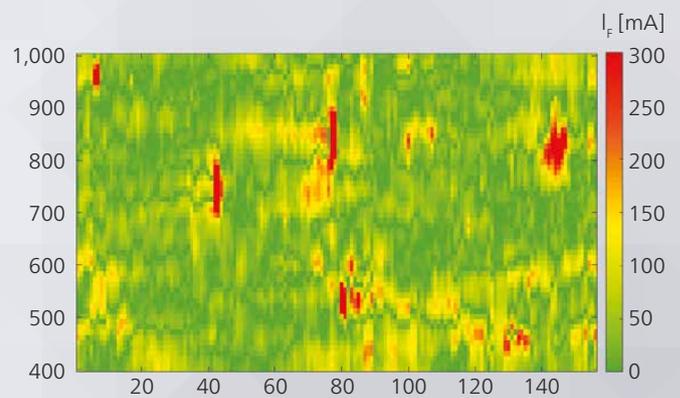
Further information at
omicronenergy.com/stator-core-testing

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Fabian Öttl,
 Product Manager,
 OMICRON

The stray flux measurement is performed on the stator core with our CPC 100 multifunctional test device and the Stator Core Measurement Upgrade Option.



The solution's intuitive software enables users to create on site reports with measurement results, graphs and a heat map.