



# REACH NEW HEIGHTS

How the CPC 100 can be expanded to become an even more powerful, modular and mobile high-voltage source



At their factory in Wirges, Germany, Ritz Instrument Transformers manufactures cast resin, dry type power transformers for a variety of customers worldwide. In addition to performing partial discharge (PD) measurements with the MPD 600 during factory acceptance testing and commissioning, Ritz Instrument Transformers gets frequent requests to perform on-site PD testing for customers to check insulation condition after a period of operation.

#### **Taking PD measurement on the road**

"We are always asked by customers about whether we are able to make on-site PD measurements for them after a few years of operation, or if an error event has occurred," says Michael Schlag, Test Field Manager at the Ritz factory in Wirges, Germany. "Since transformers are an important resource in the network, PD measurement provides our customers with meaningful information about the ▶



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**Michael Schlag**

Test Field Manager, Ritz Instrument Transformers

insulation state of their assets,” he adds. “That is why we have decided to offer on-site PD testing as a service to them.”

“I have been searching a long time for a complete solution we can use to conduct off-line PD measurements in the field. For several years, we have been using the MPD 500 and MPD 600 PD measuring systems with great satisfaction for the routine testing of our transformers in our factory test field. So for off-line testing at customer locations, it was just a matter of finding a suitable high-voltage source for excitation of the transformer windings.”

#### **Finding a suitable high-voltage source**

“Selecting the right HV source for off-line, on-site PD testing is often very complex,” Michael Schlag clarifies. “The challenge with the PD measurement on transformers is that PD signals are of low magnitude and getting the basic noise level down in the field to where you can see PD activity is not simple.”

“With the CPC 100, we have found a voltage source solution that can deliver the flexibility and performance we were looking for. The most important thing about this solution is that the CPC 100 ensures low noise levels that do not compromise my measurements.”

#### **Need for more power**

Ritz Instrument Transformers received a request for on-site PD testing at a hydroelectric power station built into a mountain in north central Portugal.

“We delivered nine dry type transformers to the power station,” said Michael Schlag. “The customer wanted us to verify the insulation condition of these transformers after they were put into operation.”

Since his new CPC 100 was only recently delivered, Michael Schlag and his team contacted the Engineering Services team at OMICRON to assist with the on-site tests.

"All of the transformers were taken out of service for the test and were energized using the CPC 100 as a voltage source," says Christoph Engelen from OMICRON Engineering Services who performed the PD measurements with members of the Ritz team in Portugal. "However, the transformers were all so large that the required power to energize them exceeded the power ratings of just one CPC 100."

To solve this, the new CPC Sync function was used to create a powerful and scalable HV source. Thereby, up to three CPC 100 units can be synchronized to create a HV source with up to 15 kVA.

#### Flexible and modular setup

"We had three CPC 100 units with the CPC Sync function and three matching transformers for excitation of the Ritz transformers," remembers Christoph Engelen. "The PD measurement was then carried out phase-by-phase with a one-channel MPD 600 system."

"The CPC 100 with the CPC Sync function allows you to put it together depending on how much power you require. The MPD 600 can also be expanded to include a second measurement channel for gating in noisy environments, and it can be connected to a variety of PD sensors like a coupling capacitor and HFCT."

"The biggest advantage of the setup we used is that we could test the Ritz transformers on site with comparatively little equipment. The alternative would have been to bring a huge HV source in on a truck, which would have been

very difficult to get into the cavern power plant. Instead, we had only the three small and transportable CPC units. This was definitely more suitable for the limited space we had to work in," he adds.

#### Smooth going

"We spent a total of two and a half days for the PD testing of all nine transformers," recalls Christoph Engelen. "After we set everything up and made adjustments to minimize interference, everything went relatively quickly."

"We looked at the PD data on the spot directly after each measurement and recorded data streams for reporting. All of the transformers were in good condition without noticeable PD activity."

"By using the MPD 600 together with the CPC 100 as a voltage source for PD testing at our customer's site in Portugal, we could successfully measure off-line in a rather challenging facility," concludes Michael Schlag. "This experience taught us hands-on about the setup and execution of such on-site PD tests." 📌



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RITZ Instrument Transformers is one of the world's leading specialists for instrument transformers, cast resin applications, cast resin insulated busbar systems and cast resin insulated power transformers.

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