Device for automatic testing of power capacitors

Development status

Phase 4

The transition from the prototype to the final and fully functional form. At this stage, the prototype is already fully tested, or the technology is certified and ready for mass deployment.

IP protection status

Czech patent no.304363, EPO application.

Partnering strategy

licensing

Institution

Czech Technical University in Prague

Challenge

A team of the Czech researchers have developed and successfully tested a new device, which principle is based on the invention that tested power capacitor is complemented with a low-loss inductor with loss factor comparable to the loss factor of the tested power capacitor (or lower) to form a parallel oscillating circuit. Nowadays, the capacitors are tested using Ohms method. The capacitor is feed with power signal source and the Voltage and current values are observed. The drawback of such tests is that all the current and voltage used for the test must be supplied with the signal source and the source is loaded with reactive power. The newly introduced equipment enables ultra-precise reactive-power compensation of the tested capacitor in the measuring circuit and matching of the measuring circuit to the driving generator by completing the tested capacitor with the inductor so that the resonant circuit is tuned to the measuring frequency.

Description

The inductor’s inductance is set in the way that at the testing frequency it has the same reactance as the tested power capacitor. The described solution ensures the needed precise compensation of the tested capacitor’s reactive power, which can be viewed as complementing the tested capacitor with the inductor in the way that creates an oscillating circuit tuned at the testing frequency, by automatic correction of the measuring frequency according to instantaneous value of the oscillating frequency of the measuring circuit. The frequency is controlled by a feedback loop with the voltage-controlled oscillator, integrator and phase detector.

Commercial opportunity

The researchers are looking for manufacturing partners (e.g. manufacturers of power capacitors) interested in a licensing agreement. The subject of the licensing will be know-how (power capacitor principle, detailed scheme of working etc.) as well as know-how for manufacturing of the power capacitor device.