

Frequency Variable Series Resonant Test Systems For Power Cable On-Site Testing



**THE ADVANCED SOLUTION FOR
HIGH VOLTAGE AC TESTING**

agea - kull ag
Electric Apparatus, Meisenweg 1
CH-4552 **Derendingen** Switzerland

Fon: +41 32 681 54 24
Fax: +41 32 681 54 20

E-mail: info@agea-kull.ch
Web: www.agea-kull.ch

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General

agea-kull on site cable test sets work according the series resonant principle. They are modular constructed and especially designed for the requirements of on-site testing. Easy to handle and robust reactors with the possibility of series and parallel connection of more units allow an optimised adaptation of the system to the load capacitance. Transport and control containers enable a world-wide transportation by ship and truck. For air freight transportation, special housings are available. For erection of the test set on site, only a common truck crane is required.

In difference to other on-site test techniques as 0,1Hz, DC or oscillating wave, resonant test sets generate a voltage stress for the insulation similar to the operating condition. This gives the test result more evidence and is nowadays the preferred on-site test method. The systems are in line with IEC 60060-3

Partial Discharge Measurements

The testing can be accompanied by a partial discharge measurement. The static frequency converter generates only four switching impulses per cycle which do not disturb the PD-pattern or can be suppressed by gating if a suitable measuring system is used.

Ambient Conditions

The test sets are designed to be operated at fine weather conditions all over the world - on the land or off shore.

Examples of Test Sets

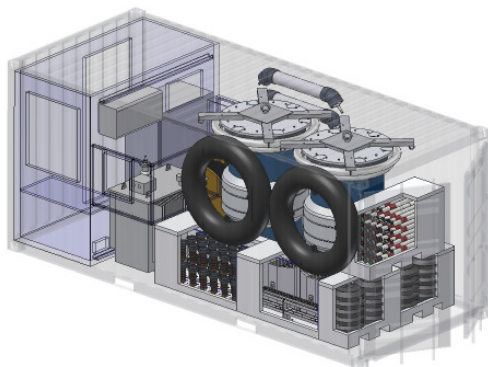
280/560kV Test Set for High Voltage Cables

Converter	150kVA
Exciter	25kV 150kVA
Reactors	6x DSH6W 360H, 280kV
Divider	600kV, 3.3nF
Frequency	20-250Hz

Max. Load	1µF	up to 280kV
	260nF	up to 560kV



< Test configuration 560kV with 6 reactors DSH6W



One of two transport containers (with control room)

Design of Components

Reactor Coils

The bar core reactors are oil impregnated and built-in a hermetical closed resign cylinder. Two units can be stacked to increase the output voltage of the system. The reactors are of low weight design with fix inductance.

Exciting Transformer

Tank type transformers with surge arrestor protection and an automatic grounding are used to excite the resonant circuit. Voltage and power are adapted to the requirements of the system.

Frequency Converter

The converter generates a square wave voltage of adjustable frequency between 15Hz and 250Hz. This voltage energises the exciting transformer. Due to the series resonance principle, the test voltage is however of a perfect sin-wave shape. The system is tuned to resonance by varying the frequency.

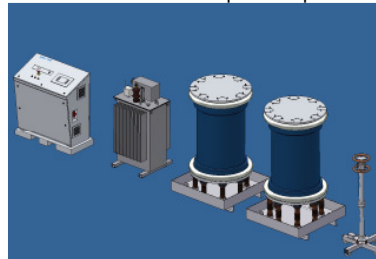
Control Unit / Voltage Measurement

The control unit with touch screen panel is integrated in the frequency converter housing and enables automatic and manual testing. A separate computer stores the measured data and generates the test protocol. The high voltage is measured by a built-in peak voltmeter in collaboration with the high voltage divider which works at the same time as base load capacitor.

40/80kV Test Set for Medium Voltage Cables

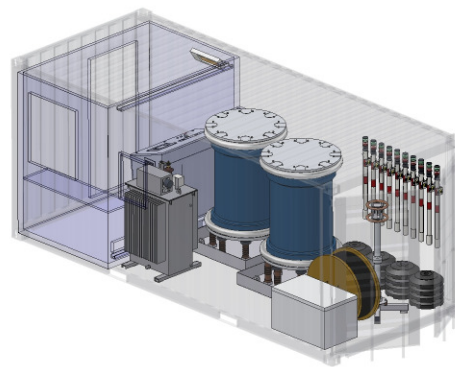
Converter	75kVA
Exciter	2kV 50kVA
Reactors	2x DSH5 12H, 40kV
Divider	100kV, 20nF
Frequency	20-250Hz

Max. Load	10µF	up to 40kV
	2.6µF	up to 80kV



< Test set overview

During operation, the system remains in the container



Transport arrangement in the container