

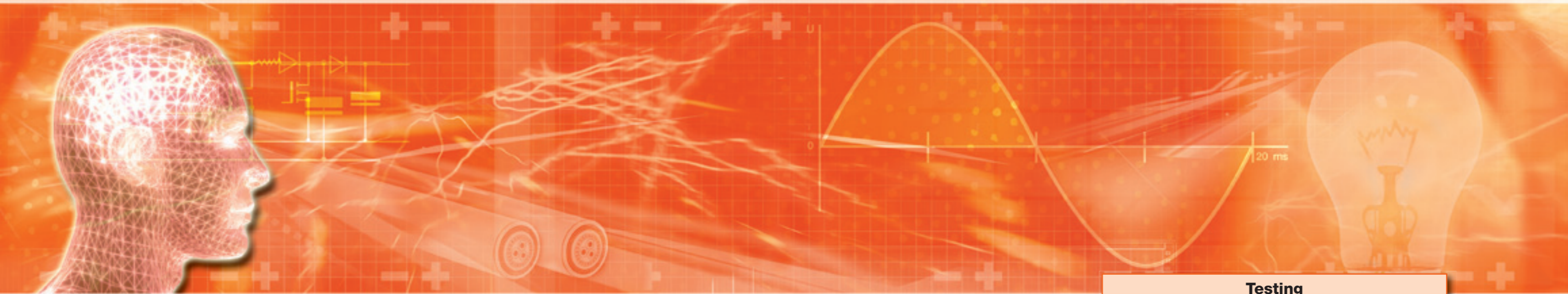
Test systems made by SebaKMT



Don't stress over tests!
SebaKMT has the right
answers:
reliability, speed, economy.

sebaKMT

Know how to do it. And what happens next.



Test first and save later

► Testing is still essential!

Cable faults aren't just infuriating. For the network operator, they usually take up enormous resources in terms of logistics, time and therefore money. That is why it's vital that electrical installations and equipment are checked to see that they fulfil all the necessary standards, both before they are first used and after any modifications or repairs.

► Test systems made by SebaKMT

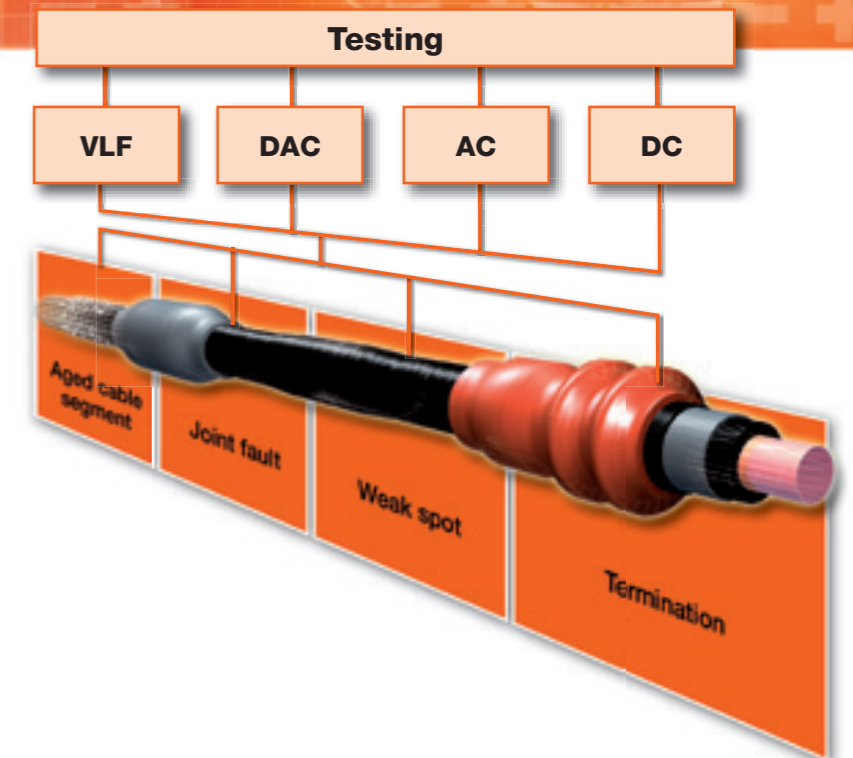
As the world's leading developer of measuring instruments, SebaKMT can offer the whole palette of useful and efficient testing technologies. For medium voltage networks SebaKMT offers VLF sine wave test systems as well as its patented VLF cosine rectangular wave test systems. Solutions are available ranging from portable units to powerful systems with 25 μ F testing capacity.

The DC test used originally for the medium voltage range is becoming more and more widespread for high and extra-high voltages. This has essentially been the result of the increase in HVDC connections in on- and off-shore applications.

► Connected to the future

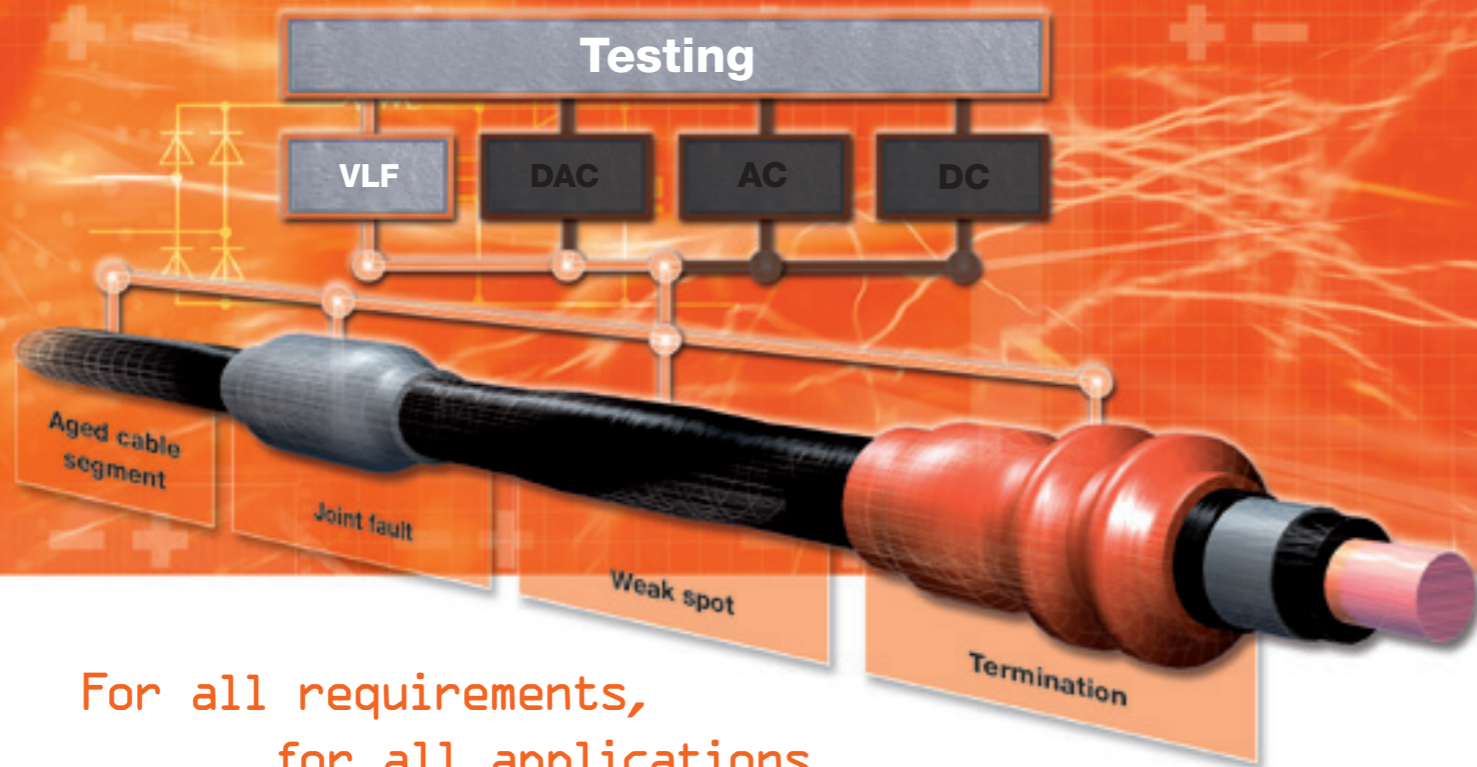
To make networks more economical and to increase the reliability, commissioning tests are being increasingly performed in combination with partial discharge with a partial discharge diagnosis.

You can find more detailed information about this subject in the SebaKMT diagnosis brochure.



Along with the withstand test, the quality of the cable laying and installation is being increasingly combined with a PD diagnosis (pictures ABB)

VLF sine wave testing: compatibility and convenience as standard.



For all requirements,
for all applications ...

The SebaKMT VLF sine wave test systems range from portable, robust and versatile systems such as the VLF sine wave 34 kV to integrated test systems, for example diagnostic test vans. All the systems are designed for continuous operation which prevents unnecessary waiting times and increases test efficiency drastically.

► **Compatible and expandable**

SebaKMT test systems with a sinusoidal voltage can be upgraded with SebaKMT diagnostic technologies to create universal test and diagnostic systems.



VLF sine wave 34 kV

A tan delta test attachment can turn the portable devices into the ideal solution for mobile loss factor measurements.

You can find more detailed information about the tan delta test attachment in the SebaKMT diagnosis brochure.

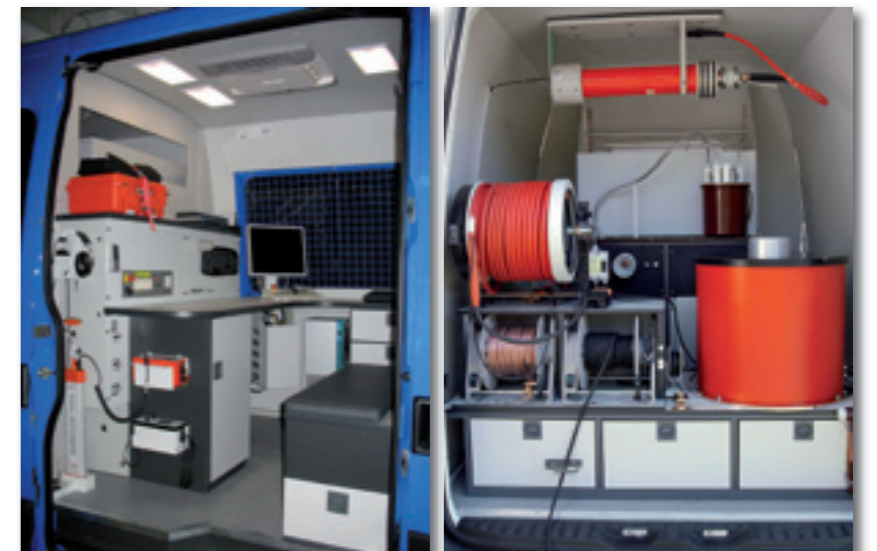


SebaKMT diagnosis brochure

► **Convenient and multifunctional**

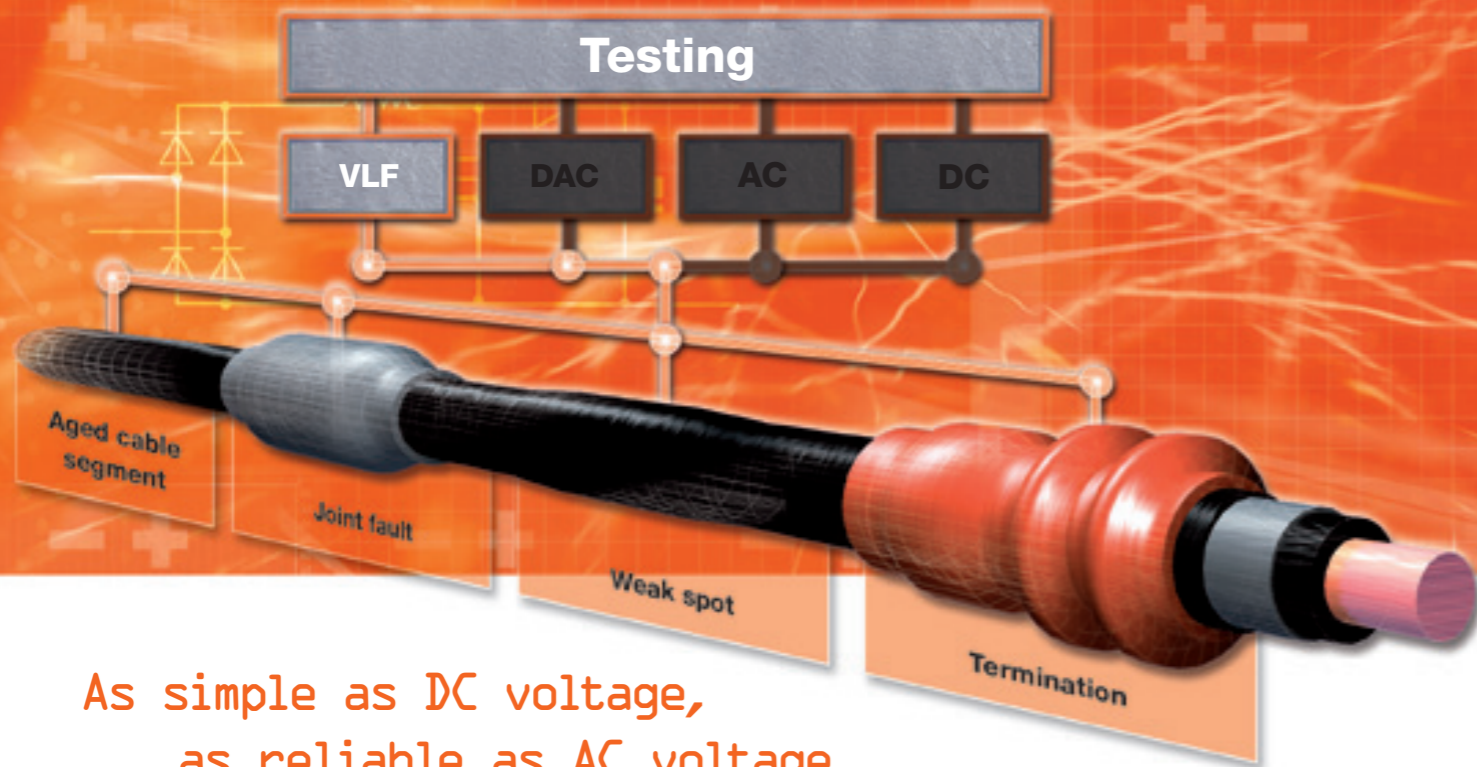
Whether it's a portable device or a unit integrated in a test van, a SebaKMT system can always be operated easily and reliably. The convenient single-button operation is based on the well-established Centrix software, the fruit of decades of development experience from SebaKMT. All SebaKMT VLF sine wave test systems have USB logging as standard. This makes working in the field far easier.

Furthermore all systems are provided with an integrated sheath fault testing and fault pinpointing facility, using step voltage procedures and automatic frequency adjustment.



Test, diagnosis and fault location van Centrix 1-40 + VLF sine wave 54 + TanD + OWTS M 28

The VLF CR test: achieve more with less!



As simple as DC voltage,
as reliable as AC voltage

► **Test passed**

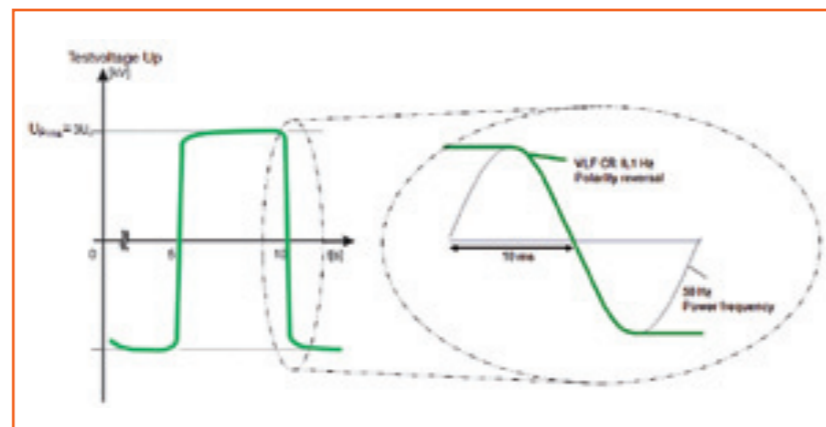
The 0.1 Hz VLF test, based on the cosine rectangular wave voltage, was developed and patented by SebaKMT more than 25 years ago. There are now in excess of 2,500 systems with this technology being used.

Practical field experience and numerous scientific studies have confirmed the effectiveness of SebaKMT 0.1 Hz VLF cosine rectangular wave systems for PE/XLPE, paper-impregnated cables and their accessories. This is reflected today in all the common standards.

► **Clear benefits**

The main advantages of the cosine rectangular wave technology used by SebaKMT are the near-operational test parameters and extremely low power consumption, combined with the high testable capacity.

Low power consumption is possible because the electricity stored in the cable is reused. Any losses are compensated for and the cable is recharged with the opposite polarity. It is precisely this polarity reversal that allows the test to be performed with a near-operational frequency.



VLF cosine rectangular wave voltage and polarity reversal

Because even if the VLF test uses 0.1 Hz, the polarity reversal itself is a full sine or cosine wave that ranges from 50 to 100 Hz.

The extremely efficient use of energy compared to conventional technologies allows effective testing with very low power consumption. Three-phase testing can even be easily performed on long cables, subsequently the test time is reduced by a third.

► **Suited for special requirements**

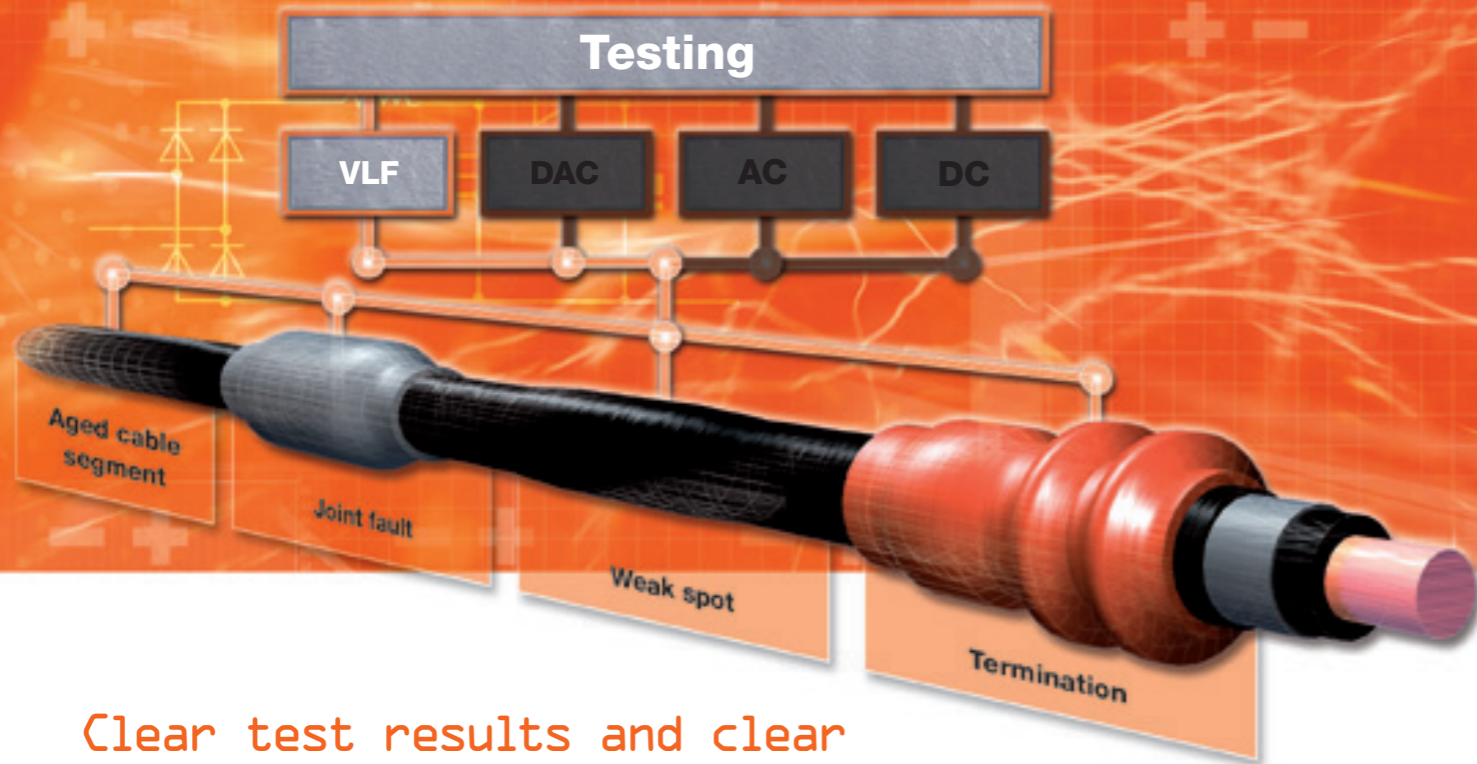
Cosine rectangular wave technology is particularly useful due to the wide range of testable voltages.

This also enables highly powerful, customised solutions to be created. A 60 kV/25 μF installation has already been set up, for example.



Our test equipment is also ideally suited for offshore applications, e.g. testing of 35 kV rated cables using the VLF CR-60

The VLF CR test: because simple is simply better.



Clear test results and clear benefits in terms of mobility

► Time will tell!

Both the VDE standard and international standards recommend a test duration of one hour for XLPE cables. This makes sense since defects, particularly water trees, in the XLPE insulation very often lead to a breakdown just shortly before the 60 minutes' test duration passes.

All SebaKMT test systems are ideally suited for this test duration and are even designed for continuous operation.

► Hightech for easy handling

VLF cosine rectangular wave test systems from SebaKMT have a host of features that make work far simpler for your staff and reliably document the test results.

► Leakage current measurement

The leakage current measurement is used for evaluating the quality of the cable by recording the trend during the test.

► Parameterisation

The measurements taken are stored on a chip card, ready for further processing, and printed as a report using the software supplied. At the same time, the measurement parameters can be transferred to the chip card, allowing the VLF system to be programmed directly with the test parameters stored. This avoids operator error and provides very high consistency in test quality and repeatability. After the test, all the results are stored on the chip card.



Test and diagnosis van with VLF CR-80 + OWTS M 60 and SPG 40

A print-out of the report, automatic breakdown detection and storage of the measurements also make up the package alongside the test results.



VLF CR-40

► Easytest – now even easier!

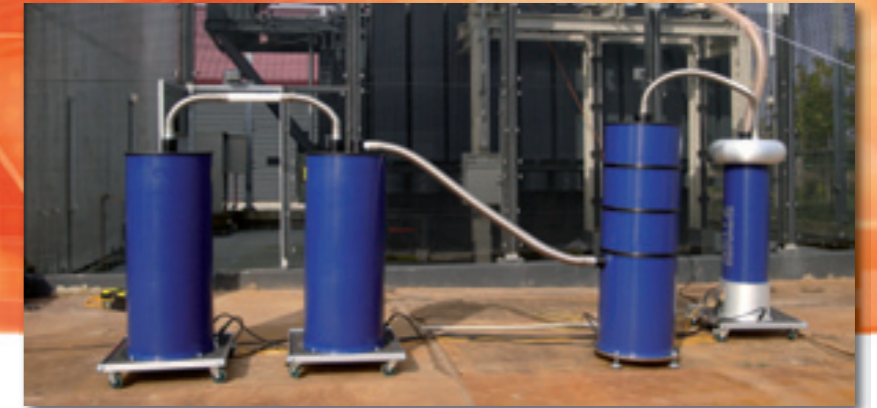
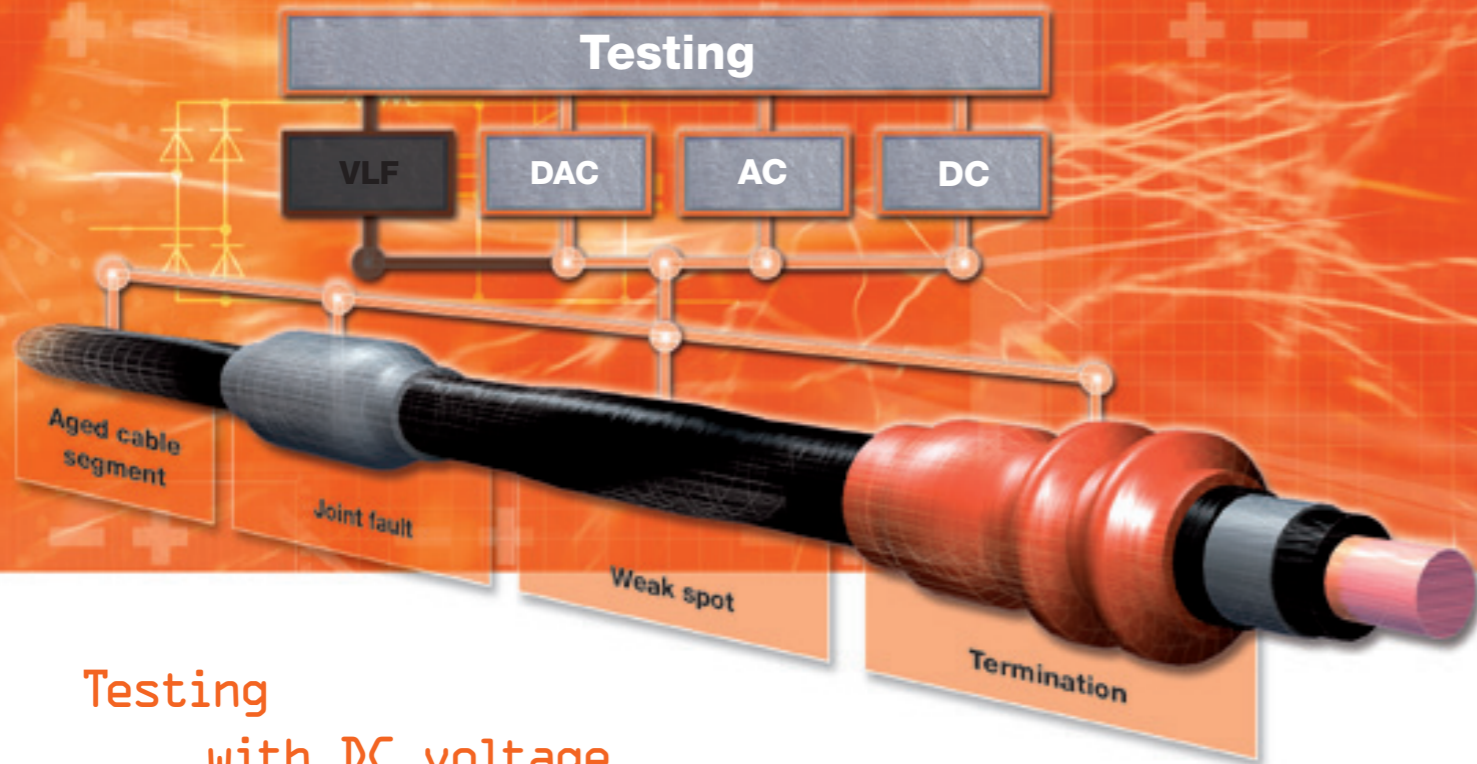
The Easytest represents a simplified version of the standard VLF test. It has been designed to verify operational integrity versus operational reliability, which is the objective of a standard VLF test in accordance with the respective standards. Typically, a simplified test is performed in accordance with company specifications after repairs or after a new cable or circuit has been installed. The purpose of this test is a

workmanship test to verify the integrity of splices and terminations before switching a circuit back into service. Unfortunately, it is still common practice to perform this type of testing with a traditional DC hipot tester. The test voltage of 20 kV is well above the normal operating voltage in order to provide a safe indication regarding operational integrity.



Easytest 20 kV

DC and AC testing: trusted technology at its most modern.



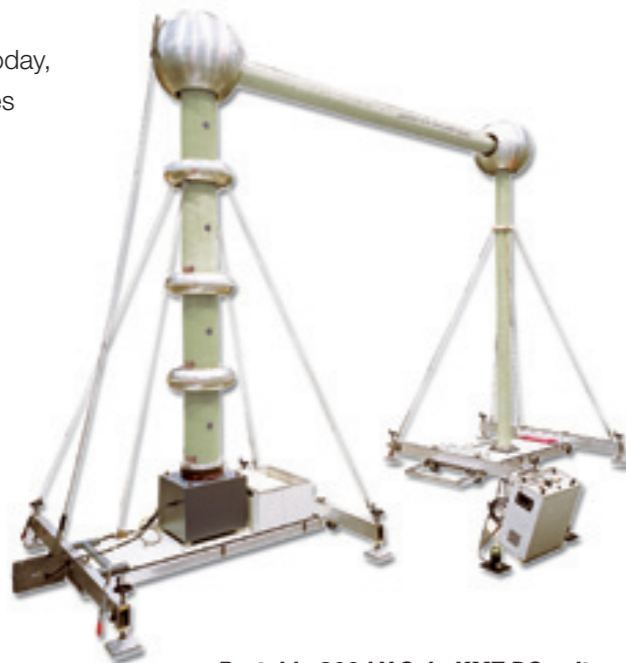
The OWTS HV 250 allows testing up to 250 kV using the DAC method.

Testing with DC voltage

► Flexibility is the trump card

DC voltage testing was the first, and for a long time, the only method to check cables. This is reflected in its widespread use. It offers outstanding performance even today, especially with cables with PVC and paper insulation.

SebaKMT DC voltage testing devices cover all applications ranging from low voltage to high and extra-high voltage.



Portable 800 kV SebaKMT DC voltage test system

They are used ideally for:

- paper-insulated cables and accessories
- HVDC cables
- HVDC transformers
- switchgear/bushings

SebaKMT has solutions, starting with small, portable and battery-operated appliances through to the modular and bipolar 800 kV system for testing HV transmission cables.

Testing with AC voltage

► Effective and flexible

Today, the 50 Hz test is still the most effective method because its voltage shape and frequency come closest to the operating parameters of the test objects. Due to their small and portable design, SebaKMT 50 Hz test devices were developed specially for analysing transformers, switchgear and other components with low capacity.

These products range from 35 kV to 350 kV AC. Using the same basic components as for the AC voltage test, optional rectifiers can also be employed for a DC voltage test.

► The DAC method

For a number of years now, SebaKMT has also been offering the DAC method in addition to the 50 Hz test. The advantage of this standardised process with damped AC voltage is that, despite being small, the corresponding systems are extremely powerful. The integrated PD detection and localisation facilities also enable norm-compliant PD measurements to be performed. Because of the

valuable information it provides, the PD measurement is being increasingly used for commissioning testing. The DAC test and diagnostic systems range from 28 kV to 350 kV.

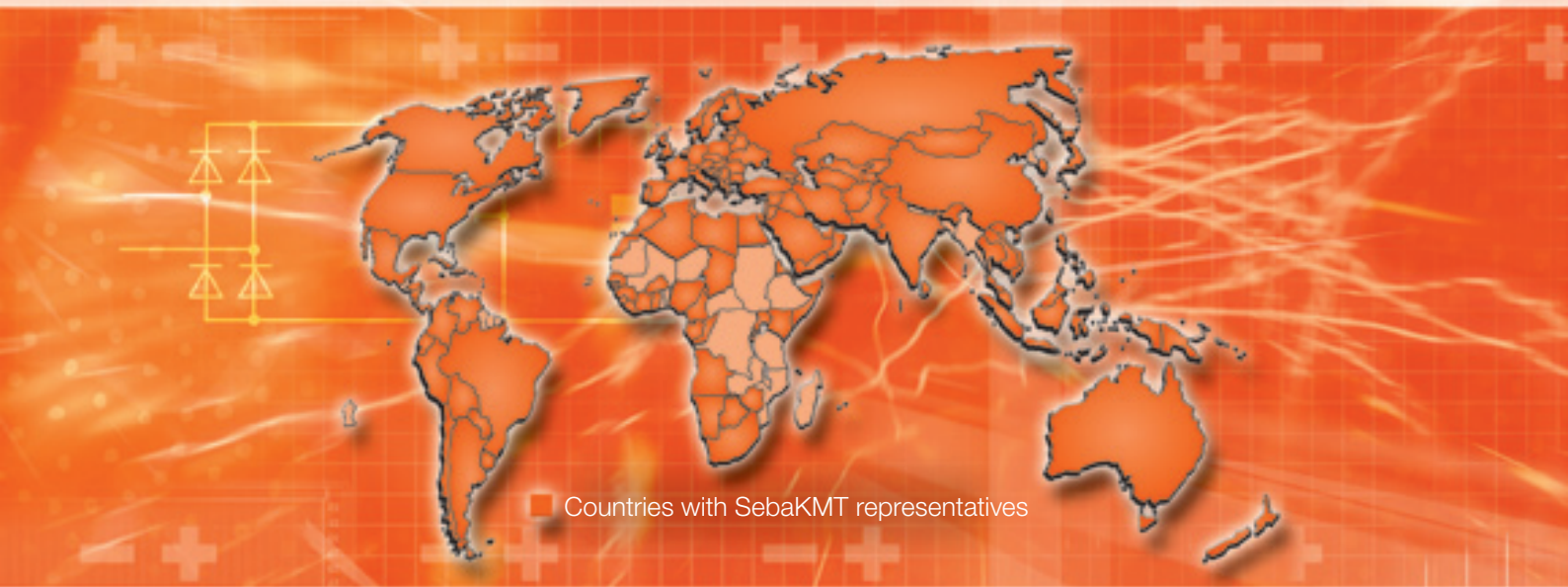
You can find more information about this technology and SebaKMT OWTS systems in the SebaKMT diagnosis brochure.



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SebaKMT diagnosis brochure



Expertise:

We are the world's leading developer and manufacturer of measurement equipment for diagnosing the condition of networks and for locating faults. Our market sectors include electricity supply networks as well as communication and pipe networks.

Performance:

We concentrate on five areas: network condition analysis, cable fault location, leak location, sewer TV inspection and line location. We are thus in the position to offer high performance in each of these areas.

Availability:

SebaKMT has representatives in 130 countries worldwide with excellently trained staff and the most modern technology. This means we have the best service and support network coverage in the industry. Wherever your international activities may lead you – we look forward to speaking to you.

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