

# CDS

## Cable Diagnostic System



- **Two cable diagnostic methods in one device**
- **For condition analysis of medium voltage cables**
- **Absolutely non-destructive diagnosis**
- **Polarization current analysis to detect local weak spots**
- **Simple menus guide you through the measurement process**

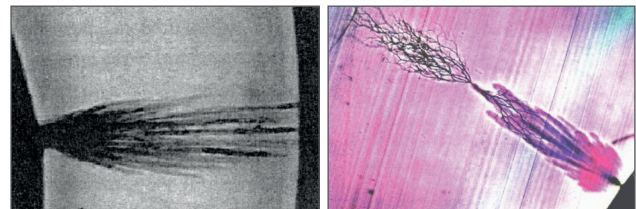
### DESCRIPTION

New forms of asset management and a liberal power market have led to installed systems requiring a longer life cycle at higher loads. Integral diagnostics is a valuable tool for non-destructive analysis of the cable network. It simplifies condition based maintenance and makes the decision to repair or replace cables and sections much easier.

The portable CDS is a universal dielectric diagnostic system for PE / XLPE and paper insulated cables. It combines the well-known methods of Isothermal Relaxation Current measurement (IRC-analysis) and Return Voltage Method (RVM-analysis) for aging and deterioration diagnostics in one portable unit.

#### IRC-analysis

An IRC-diagnosis based on relaxation current measurement provides an integral reading of the ageing and the deterioration status of PE / XLPE insulated medium voltage cables, which is essential for understanding the service reliability of the section under test. This information is very useful when making the final decision to repair or replace the cable.



**Water tree bridging the complete insulation (left) and electrical tree starting from a vented tree (right)**

One problem of cables with polyethylen insulation is the growth of water trees. Under the influence of water, temperature and electrical field strength, these trees deteriorate the insulation. The length of these microscopic structures increases with operation time. The subsequent conversion to an electrical tree can lead to the breakdown and failure of the cable segment.

The CDS uses a software-module with a neuro-fuzzy module to evaluate the IRC measurements on PE / XLPE cables. The intelligent multi-stage evaluation software considers the construction characteristics of a test object, categorises its condition and gives a prognostic maximum residual voltage level.

## RVM-analysis

The RVM diagnosis is based on the principle of return voltage measurement. After a defined charging cycle and a subsequent short discharge from the capacitor, the measured voltage curve provides characteristic information on the ageing status and moisture content of the test object's paper insulation.

Due to lead sheath corrosion, oil leakage and the decomposition of the cellulose chains through ageing, the moisture content of the insulation increases. This reduces the object's residual breakdown strength until the remaining value is close to the nominal operating voltage and cable operation becomes too risky. The lifetime of the cables in general strongly depends on the manufacturing quality, as well as laying and service conditions.



**Corrosion on the outer sheath and the building of holes in the lead sheath**

RVM cable analysis is based on proven factors and threshold values.

Since the system output voltage level is limited to about 10% of the nominal service voltage, there is no danger of incurring cable damage during the test. With the information from RVM diagnosis, the reliability of the network can be accurately judged, which is of vital importance to the operator.

The crucial decision about whether the entire cable must be replaced or only segments is based on sound technical information. Naturally, this results in substantial economic savings.

## TECHNICAL DATA\*

### CDS

<b>Max. output voltage</b>	5 kV
<b>Current measuring range</b>	- 130 nA ... 130 nA
<b>Voltage measuring range</b>	0 ... 5.000 V
<b>Capacity range</b>	10 nF ... 2 µF
<b>Resistance measurement</b>	up to TΩ
<b>Input voltage</b>	115 / 230 V; 50 / 60 Hz
<b>Dimensions (W x H x D)</b>	550 x 490 x 415 mm
<b>Weight</b>	26 kg (without laptop and cables)
<b>Operating temperature</b>	- 10° C ... + 40° C

## FEATURES

- Absolutely non-destructive condition analysis of PE / XLPE or paper-oil insulated cable systems
- Simple operation and automatic measurement procedures
- Three-phase parallel measurement
- Measurement of the polarization current to detect local weak spots

## SCOPE OF DELIVERY

- Measurement and control unit
- Laptop with software preinstalled
- Set of connecting cables in carrying bag
- Discharge stick
- Operating manual

## ORDERING INFORMATION

Product	Order no.
CDS IRC - RVM	813083

\* We reserve the right to make technical changes.