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## DSP-BASED DISSIPATION FACTOR & CAPACITANCE MEASURING SYSTEM LDV-5



### Field of application

The measuring system LDV-5 operates fully automatically. It displays the relevant measuring quantities, such as the dissipation factor ( $\tan \delta$ ), the capacitance ( $C_x$ ), the test voltage and the frequency. All measured parameters are stored in the real time mode on the computer hard disk. The device is applicable for dielectric diagnostics of high- and low-voltage insulation, where also grounded test objects can be measured without any loss of the measuring accuracy.

- **Using potential-free measuring sensors:**

The sensors are installed in both, the reference arm and the test object arm of the bridge, which are connected via fibre optic links to the measuring and controlling computer. This potential separation allows not only the measurement on grounded test objects without restrictions, but also an effective reduction of external interferences in the measuring surroundings.

- **Using advanced digital signal processing (DSP) hardware:**

This allows a very high measuring speed for evaluation of both the dissipation factor and the capacitance of the test object.

- **Using integrated Personal Computer:**

This makes the measuring procedure very simple and hence user-friendly. The measured data are stored within the real-time mode on the hard disk of the PC. The data interchange format allows the processing of the stored data with standard software like MS-EXCEL and others. The external data transfer is possible by standard PC interfaces like floppy disk or serial interface.

- **Internal MODEM:**

The in the PC integrated MODEM, including the software, offers the possibilities of the long-distance data transmission (e.g. via the Internet), telediagnosics as well as the maintenance of the system.

**High measuring performance, characterized by the following topics:**

- Full automatic, high accurate computer-aided measurement of the dissipation factor ( $\tan \delta$ ) and the capacitance ( $C_x$ ) in the frequency range between 10 to 400 Hz.
- Comprehensive information not only on the actual values of the dissipation factor and the capacitance but also on the magnitude and the frequency of the test voltage.
- Graphic user interface displaying the spectrum and the time dependent trend of the dissipation factor and capacitance as well as the time function of the test voltage.
- Fibre optic link up to a distance of 20 meters for the standard option (can be extended up to 50 m on customers request).
- The integrated digital signal processor (DSP) permits the evaluation of the data within each cycle of the applied AC test voltage (20 ms).
- Status of frequency selective measurements on FFT-basis which reduces the interference by harmonics superimposed to the test voltage.
- The integrated hard disk and floppy disk are used for data storage and file transfer.
- The LDV-5 uses PC compatible interfaces for connecting standard printers and others.

**Electrical parameters**

Measuring frequency range	10 - 400 Hz
Maximum test current (r.m.s.)	1 A for $f \geq 50$ Hz (extension unit 15 A on enquiry)
Measuring range $\tan \delta$	0.000001 ... 100
Resolution $\tan \delta$	0.000001
Measuring range $C_x$	0.1 pF ... 2 $\mu$ F
Resolution $C_x$	0.1 pF
Cycle-time of successive measurements, minimal	1 measurement within 20 ms
Capacity range of the standard capacitor $C_N$	10 pF...10 nF, recommended value: 100 pF

**Measuring accuracy**

Loss factor	$\pm (0.01 \text{ rdg} + 10^{-5})$
Test voltage	$\pm (0.005 \text{ rdg} + 1 \text{ V})$
Capacity	$\pm (0.001 \text{ rdg} + 1 \text{ pF})$
Frequency	$\pm (0.0001 \text{ rdg} + 1 \text{ mHz})$

**Hardware / Software**

Signal processing	Digital signal processor (DSP), Industrial PC (Pentium)
Display	Flat panel (TFT)
Data storage	Hard disk, Floppy disk drive
PC-compatible interface	Printer, V.24/RS232C
Operating system	MS Windows NT 4.0

**Supply voltage**

115 V / 230 V, 50 or 60 Hz, approx. 60 VA