

DIFFERENTIAL LEMKE PROBE

LDP-5



The DIFFERENTIAL LEMKE PROBE LDP-5 is a battery powered portable device for both, on-site and laboratory PD diagnosis tests. For this either the capacitive or the inductive field coupling mode can be applied.

Standard Features

- Detection of the electromagnetic transients of PD events
- Measuring the PD quantity "apparent charge"
- Mode for differential measurement with respect to PD fault location
- Exchangeable capacitive and inductive sensors
- Potential-free signal transmission via fibre optic link
- Noise reduction mode

Field of application

The differential LEMKE PROBE LDP-5 is especially designed for detection of dangerous partial discharges (PD). The differential input offers additional possibilities for PD fault location in the case, if the PD source is not completely screened electromagnetically.

The main field of application is PD diagnostics on HV apparatus in field, in order to recognize PD faults in the electrical insulation, as for instance on cable sealing ends and joints, surge arresters, power transformers, voltage transformers and electrical machines. Furthermore, it can be applied for an evaluation of the PD behaviour of low voltage components, as for instance in the case of opto-couplers, capacitors, transformers and motors.

Although especially developed for on site PD diagnosis tests, the LDP-5 can also be used as a low cost PD detector in research and development for standardized PD quality tests, because its parameters are in accordance to IEC Publication 60270.

Operation Principle

The LDP-5 bases on the well proved measuring principle of the wideband amplification of the PD pulses and the following electronically integration in order to obtain the standardized main PD quantity "apparent charge". Selecting a useful bandwidth for PD pulse processing an optimum signal-to-noise ratio is obtained. Furthermore, additional possibilities for noise reduction are given by this kind of signal processing.

After integration the quasi peak value of the apparent charge is indicated by the internal meter. Furthermore, the PD events can be recorded by means of an oscilloscope and further processed by a computer.

For potential-free signal transmission a fibre optic link is available. In this way additional noise, caused by conventional signal transmission via BNC measuring cable, can be effectively eliminated.

For the field coupling mode different capacitive and inductive sensors are available. They have to be adapted on the corresponding input jacks in the front of the LDP-5. Especially for PD fault location in not well screened test objects, as in case of machine bar insulation, the differential mode is applicable, using two capacitive sensors, which are connected to both, the non-inverting and the inverting input. In this case the PD faults can be located by means of the so called PD pulse polarity method. For this an additional output is available in order to recognize the PD pulse polarity.

The PD detection is supported by a sound generator. Furthermore, an additional earphone can be connected to the LDP-5, which is helpful especially for evaluation the PD inception as well as for distinguishing external noises from PD events.

Heavy PD are additionally indicated by a LED. Besides the indication of readiness for operation by a LED an additional LED signalizes, if the internal batteries becomes weak. In order to remind the operator, not to forget switching off the device, a sound occurs after 10 minutes operation time.

For monitoring purposes the LDP-5 can be powered by an external supplying adaptor.

Specification

Measuring function	PD detection and location
Measuring quantity	apparent charge
Quantity indication	built-in meter, LED, earphone, oscilloscope
Manual parts	switches and potentiometers
Inputs and outputs	BNC connectors, jacks
PD signal decoupling	via capacitive or inductive sensors, test prods, measuring impedance
Signal transmission	fibre-optic guide, BNC-measuring cable
Additional functions	noise reduction mode, polarity discrimination, acoustical sound
Power supply	8 mignon batteries (LR6)
Dimensions (mm)	220 x 60 x 100
Weight	1 kg approx.

Electrical parameters

Measuring sensitivity if charge pulses are directly injected into the input IN+	0.05 pC
Gain steps	1, 2, 5, 10
Vernier range	1 : 5
Output "CHARGE" at full load <ul style="list-style-type: none"> • Pulse shape • Pulse magnitude • Pulse rise time • Pulse duration • Noise level 	triangular, positive 4 V approx. < 2 μ s 50 μ s approx. < 0.2 V
Pulse resolution performance for superposition error less than 30% <ul style="list-style-type: none"> • Pulse repetition rate • Double pulse distance 	< 100 kHz > 2 μ s

DELIVERY VOLUME FOR DIFFERENTIAL LEMKE PROBE LDP-5

Carry Case 'G' which contains the basic equipment

consisting of:

Pos.	pcs.	component
1.01	1	LEMKE PROBE LDP-5
1.02	1	Handle for LDP-5
1.03	1	Charge Injector LDJ-5
1.04	1	Capacitive Sensor C70 with spacer A40
1.05	2	Capacitive Sensor C30 with spacer A20
1.06	1	Inductive Sensor L110/55
1.07	1	BNC-adaptor B/B
1.08	1	BNC-attenuator 20 dB, 50 Ω
1.09	1	BNC-measuring cable, length 1 m
1.10	1	Earphone
1.11	1	Carry Case



DELIVERY VOLUME FOR DIFFERENTIAL LEMKE PROBE LDP-5

Carry Case 'E' which contains the basic equipment and main accessories

consisting of:

Pos.	pcs.	component
2.01	1	LEMKE PROBE LDP-5
2.02	1	Handle for LDP-5
2.03	1	Charge Injector LDJ-5
2.04	1	Capacitive Sensor C70 with spacer A40
2.05	2	Capacitive Sensor C30 with spacer A20
2.06	1	Inductive Sensor L110/55
2.07	1	Inductive Sensor L40/20
2.08	2	Measuring Prod TS40
2.09	1	Optical Receiver LDO-5
2.10	1	Fibre optic cable, length 10 m
2.11	1	BNC-Opto-adaptor BOA
2.12	2	BNC-adaptor B/B
2.13	1	BNC-adaptor S/S
2.14	1	BNC-measuring cable, length 1 m
2.15	1	Carry Case



DELIVERY VOLUME FOR DIFFERENTIAL LEMKE PROBE LDP-5

Carry Case 'B' which contains extended accessories

consisting of:

Pos.	pcs.	component
3.01	1	Calibrator LDC-5
3.02	1	Telescope Handling TE3
3.03	1	Capacitive Sensor C280
3.04	1	BNC-measuring cable, length 1 m
3.05	1	BNC-T-adapter S/B/B
3.06	1	BNC-Matching Resistor 50 Ω
3.07	1	BNC-Attenuator 20 dB, 50 Ω
3.08	1	BNC-Jack Adaptor E1
3.09	1	BNC-Jack Adaptor D2
3.10	1	BNC-Connector Adaptor D2
3.11	1	Mini-Tripod
3.12	1	Earphone
3.13	1	Carry Case

