

# ULTRASONIC PD SENSOR

## LDA-5/S

### Field of Application

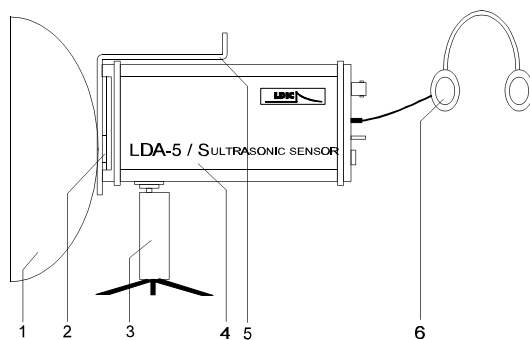
The acoustic emission (AE) technique for detection of partial discharges (PD) is a common method for in-service inspection of high voltage (HV) equipment, such as HV transmission lines, power transformers and gas insulated switchgears (GIS). If combined with electrical PD detection, the AE technique represents a cost-effective procedure for PD fault location.

The ULTRASONIC PD SENSOR LDA-5/S is intended for this purpose. It is designed as a portable, battery fed device of extremely low power consumption. The LDA-5/S can easily be handled and is modular designed, which ensures a wide field of application.



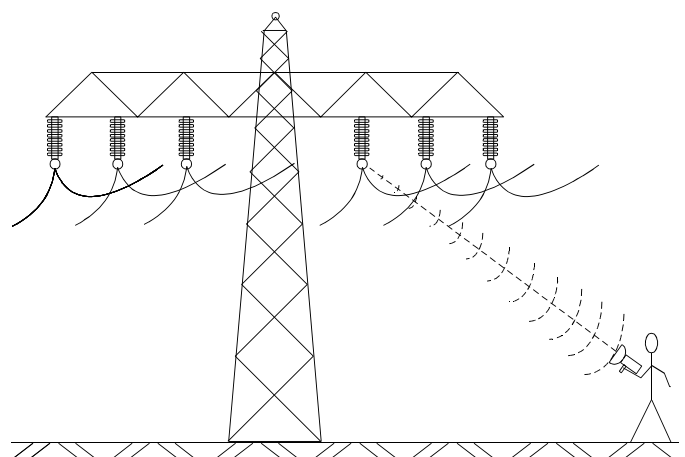
### Location of external PD sources

External PD appearing in air (corona discharges) may cause heavy electromagnetic interferences, which disturb not only sensitive PD measurements under field conditions but also communication systems, such as radio and television. Therefore it seems important to identify such PD sources. In this respect the ULTRASONIC PD SENSOR LDA-5/S can be regarded as a helpful diagnosis tool.



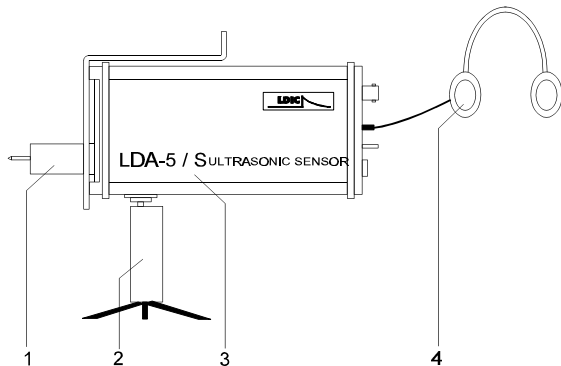
- 1 - Parabolic reflector LDA-5/S3
- 2 - Ultrasonic receiver LDA-5/S1 (airborne sound mode)
- 3 - Handle / Tripod
- 4 - Ultrasonic PD sensor LDA-5/S
- 5 - Assembling part / Direction finding tool
- 6 - Earphone

Pin-pointing of a disturbing corona discharge on a HV transmission line



### Location of internal PD sources

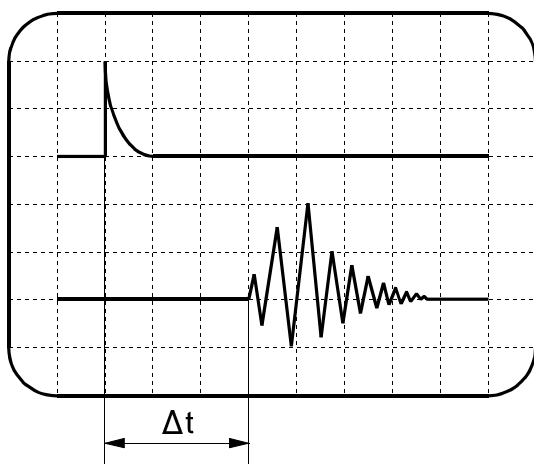
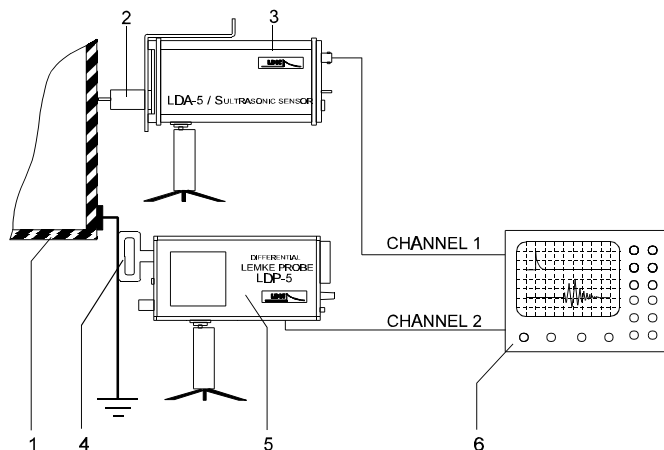
Searching of dangerous PD sources inside the enclosure of HV equipment, such as power transformers and gas insulated switchgears (GIS), is a very complex matter. This task can only be solved effectively, if multiterminal acoustic measurements are performed in combination with electrical PD detection.



- 1 - Ultrasonic receiver LDA-5/S2 (contact mode)
- 2 - Handle / Tripod
- 3 - Ultrasonic PD Sensor LDA-5/S
- 4 - Earphone

An important criterium for the identification of the PD site inside HV equipment is the time delay between the electrical and the acoustical signal. This parameter can be determined, if additionally to the AE technique the electrical PD detection is applied. For this purpose the PD Probe LDP-5 can be used advantageously.

- 1 - HV equipment under test
- 2 - Ultrasonic receiver LDA-5/S2
- 3 - Ultrasonic PD sensor LDA-5/S
- 4 - Inductive sensor L40/20
- 5 - DIFFERENTIAL LEMKE PROBE LDP-5
- 6 - Dual channel oscilloscope



Practical result of a time delay measurement between electrical (upper trace) and acoustical signal (lower trace) in order to facilitate the so-called triangulation procedure, three units of the LDA-5/S has to be placed at three different measuring points.