

CDI-1000

Cable Defect Indicator

Easy to use safety device for analyzing high-voltage joints and cable condition

Technical data

Range of PD signals frequencies	2-100 MHz, 0.1-2 MHz, 40 kHz
Range of measured temperatures, °C	- 40 to +120
Radio interface	Bluetooth 4.1
Temperature of device operation, °C	- 20 to +40
Battery operation time, h	10
Device dimensions and body material, mm	205 x 85 x 75 Plastic (ABC)
Device mass, kg	0.3
Transport case dimensions, mm	300 x 270 x 145
Transport case with device weight, kg	2.0
PD resolution	1 deg.
Time resolution	10 ns
Dynamic range	65 dB



ZTZ Services' Cable Defect Indicator (CDI-1000) is a compact and portable test device to ensure operational quality and safety of insulated cable. The CDI-1000 is intended for rapid, preliminary evaluation of cable runs and connecting joints condition of HV and MV type cables starting from 4 kV. This highly advanced device has been designed for ultimate simplicity by creating clear visual and audible feedback allowing operators, installation and test personnel of potential safety issues with active cables. Pre-work space condition assessment is essential for all electrical utilities. CDI-1000 has been designed especially for utilities' MV and HV cable installations. Users find this especially useful when personnel will be working near cables and cable splices/ joints that are energized any length of time. In the past, many utilities use only infrared cameras to detect hot spots on cables.

This alone is not enough for safe assessment but has great potential when added to existing practices.

CDI-1000 adds to safety and inspection practices without special device training or calibration. The tool employs a one button on/off operation with clear read out that defines exactly which part of the cable is possibly near failure. The CDI-1000 is also hot stick mountable for hard to reach locations and has capability with Android[™] powered products through an easy to use application and Bluetooth interface.

CDI-1000 is a great additional layer to safety and inspection practices without special device training or calibration. Simply turning on the device and moving it across the cable or joint will immediately provide clear readings of abnormal conditions with a diagram of the transversal cable section.

CDI-1000 device technical features

CDI-1000 includes five, distinct, built-in sensors:

- · Acoustic ultrasound sensor for partial discharge level
- Partial discharge using electromagnetic high frequency sensor
- Partial discharge capacitance level using VHF sensor
- Contact-free pyrometer designated for the joint temperature monitor
- Industrial frequency current sensor to synchronize the measurements.

These sensors provide information that allows for immediate relay of cable insulation conditions, working simultaneously. Partial discharge signals are recorded in three frequency ranges: ultrasonic (US), high-frequency (HF) and ultra-high-frequency (UHF). Our proprietary algorithm identifies a variety of the insulation defects because of distinct behavior variety of frequency ranges. Additionally, a contact-free pyrometer is designated to assess the joint temperature and search local zones of elevated temperature defects. Simultaneously using a current sensor allows the CDI-1000 to detect the insulation defect type in the cable's joint.

To use the CDI-1000, simply move the device along live insulated cable and is will perform diagnostics on HV joint technical condition. Since all sensors are located in the same area on the rear side of the display screen, no special movements are needed to analyze the four distinct test points. These areas correspond to the joint zones, where the insulation defects are located. Information of the partial discharge intensity and amplitude obtained by analyzing the different frequency ranges.

- 1 Maximum level
- 2 Gain
- 3 Values, dB
- 4 Defects visualization
- 5 Cable schematic section
- 6 Temperature
- 7 Synchronization
- 8 Battery charge

A visual read out is provided with schematic drawing of the cable's transversal section, on which the recorded partial discharges are displayed in form of flashing sparks. The number of sparks and their brightness depend on the relative intensity of the partial discharges in this joint zone. Depending on the results of the CDI-1000's built-in expert, the point of the discharges formation on the cable schematic section can be located on high voltage conductor, inside the insulation or in the cable external monitor.

Recorded frequency high discharges are differentiated as interferences and are displayed on the monitor as intermittent flashing sparks, however the zone of their location is outside the cable. This increase in partial discharge activity is confirmed by sound signal. Information of measured temperature of the cable joint surface element is also displayed on the monitor in digital mode and a bar chart. The current sensor in the device records current in the cable line, the symbol «N» appears on the monitor and defect diagnostics are attached to the sinusoid phase of the supply network. If the synchronization is absent, the monitor will display symbol «G» and the diagnostics is performed using internal generator.





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