



# PD Doctor

**ON-LINE MONITORING OF ISOLATION CONDITIONS AT MEDIUM AND HIGH VOLTAGE LINES AND DEVICES, AND RELIABLE PARTIAL DISCHARGE DIAGNOSTICS**

- ▶ INCREASES OPERATIONAL RELIABILITY AND SECURITY OF SUPPLY OF ELECTRIC ENERGY
- ▶ SIGNIFICANTLY DECREASES THE POWER OUTAGE PERIODS AND FREQUENCIES
- ▶ HELPS TO PREDICT REMAINING SYSTEM (CABLES) LIFETIME AND DECREASE COSTS ON NEW DEVICES INSTALLATION
- ▶ SAVES OPERATIONAL/PROPHYLACTIC COSTS
- ▶ DECREASES CO<sub>2</sub> EMISSION PRODUCTION
- ▶ DETECTS AND REPORTS INSULATION DAMAGES OF CABLES AND ELECTRICAL DEVICES OPERATING IN THE WIDE RANGE OF 230 V – 400 KV

## ➔ PD DOCTOR SYSTEM - MAIN CHARACTERISTICS

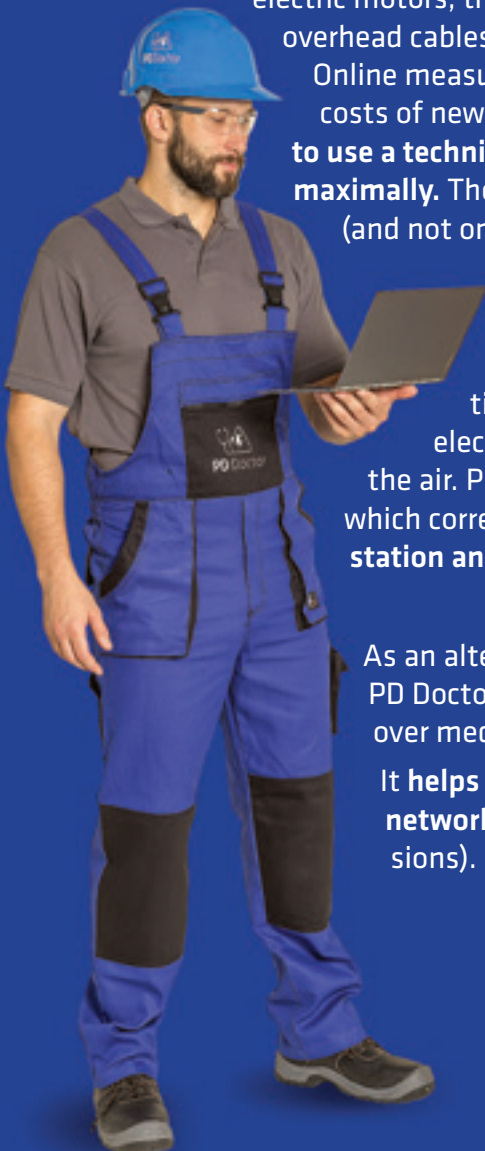
PD Doctor brings **precise and reliable diagnostics and online monitoring of isolation conditions at medium (and low) voltage lines and devices in transformer and switchboard stations**. It increases the reliability of the power supply, as it detects the power line damage, and immediately **identifies and reports operational states and anomalies**. The system saves online data and plays the role of a black box, where it is possible to analyze the history of operational states, including incidents just right prior to the failure.

Partial discharge online monitoring **enables to observe of the degradation process of power lines and devices** and indicates the necessity of intervention for **better repair planning**. PD Doctor allows to decrease actually necessary **prophylactics costs by thousands of USD annually** and lowers field visits.

**PD Doctor helps to protect every electrical device** – generators, electric motors, transformers, cable lines, overhead cables, switchboards and switchgears. Online measuring significantly decreases costs of new devices installation, as it **allows to use a technical lifetime of devices and lines maximally**. They can thus be safely and reliably operated until the physical (and not only theoretical, and statistical) end of their lifetime.

From the point of view of reducing CO<sub>2</sub> emissions, PD Doctor **contributes to lowering of the technical losses**, decreases operation of distributor's measuring vehicles, or prevents fire-starting at electric devices and subsequent release of CO<sub>2</sub> and toxic gases into the air. PD Doctor can **decrease technical losses by 20 percent** on average, which corresponds with **lowering CO<sub>2</sub> production by 7 tons per transformer station annually**.

As an alternative communication channel, it is possible to use the PD Doctor system also for secured and reliable powerline communication over medium voltage lines, which are fully under power distributor control. It **helps to accelerate network automatization and operational power network optimization** (with a positive impact on decreasing CO<sub>2</sub> emissions).



## ➡ WHY IT IS NECESSARY TO MONITOR PARTIAL DISCHARGES?

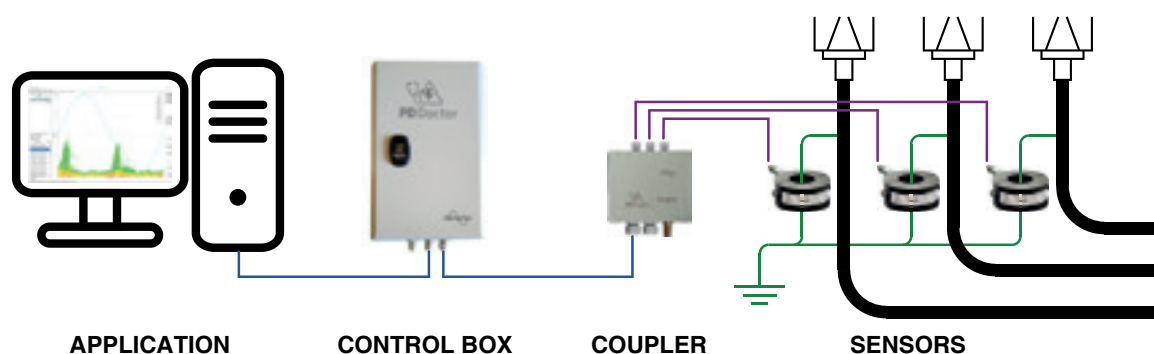
If you want to operate any electrical device, there is one condition – the non-failure state of its isolation system. It is not possible to operate the device, once the critical state – the breakdown of the isolation system (short circuit) – is reached. Isolation system degradation is caused by various mechanisms (heat, chemical, mechanical, bad manufacturing process, etc.), but the concurrence with partial discharges creation plays every time a role.

**Hand in hand with continuing degradation of the isolation system, the frequency and size of the partial discharges are increasing.** There is a direct correlation between isolation state worsening and the amount of losing energy that is presented by partial discharges (there is a repetitive connection there).

**Online continual partial discharges monitoring can observe the degradation process, and, in time, indicate the necessity of intervention, better plan repairs, and significantly decrease the power outage periods and frequencies.**

## ➡ HOW PD DOCTOR SYSTEM WORKS?

**PD Doctor** is a modern online diagnostics solution based on measuring the activity of partial discharges. The monitored object is equipped with a **Sensor** that scans even the weak discharge signal. Acquired anomalies proceed to the coupling unit (**Coupler**), where the signal is amplified and separated for processing in Control Box. This box includes an **Analyzer** module with a patented algorithm, where the single partial discharges are extracted. Subsequently, **PD Doctor Application** creates long-term measuring history for single points, matured presentation of realized measurements, and the possibility of summary reports creation. PD Doctor system is also available in the form of a server solution.



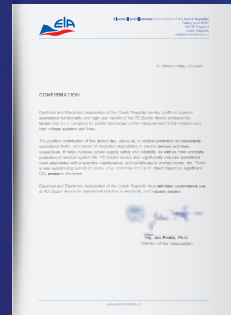
**PD Doctor offers three basic types of values for measuring insulation states through partial discharges detection:**

- QIEC – apparent charge, by EN 60270
- PRPD – standardized graphics of discharge activity with regard to the network frequency
- Measuring environment – temperature, humidity, pressure

PD Doctor system received a recommendation from the Electrical and Electronic Association of the Czech Republic, as a solution with superior operational functionality and high user benefit for partial discharges online measurement at medium and high voltage systems and lines.

ModemTec is a reliable producer and supplier of comprehensive solutions in the field of medium and low voltage lines diagnostics, and power line communication. Metering International magazine placed ModemTec in the TOP 50 world's most important companies in the area of Smart Metering / Smart Grid. ModemTec has production facilities, installation competence and provides premium post-warranty services for its customers in more than 40 countries of the world.

**We innovate today and solve the needs of tomorrow.**



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