

«IDR 10» – Insulation Condition Monitoring Relay for Switchgears, Generators, High-Voltage Motors and Cables

The «IDR-10» smart relay (Insulation Diagnostics Relay) is used for online insulation condition monitoring of high-voltage equipment of different types.

«IDR-10» can be used for monitoring of the following equipment:

- Stator winding insulation of turbogenerators, hydrogenerators and high-voltage motors.
- Busbar insulation of 6-36 kV switchgears, cells, output cables, objects.
- Insulation of cables with rated voltage of 6 kV and more.

The condition of the high-voltage equipment insulation is assessed on the basis of PD measurement and PD distributions analysis. This diagnostic method is universal and very sensitive, it allows early finding the defects in the insulation.

«IDR-10» inbuilt algorithms calculate the discharge integral power which characterizes the defect danger; it allows adjusting the output relay operating levels.

«IDR-10» has the automated function of insulation defect type determination. For that the results of PD measurements are processed by «PD-Expert» software, which can identify the defect type. The relay version with expert firmware is also available at customer's wish.

«IDR-10» relay can also act as a voltage indicator for the monitored busbars. Lighting the three LEDs indicates high voltage in the phases even when there is no supply voltage.

Switchgear Insulation Monitoring by «IDR-10».

Coupling capacitors are used as PD sensors in switchgears; nowadays they are installed in the busbars of all the new switchgears. If these sensors are not installed in the switchgear, then they can be easily mounted instead of the three busbar base insulators, as these sensors perform all the functions of the base insulators and have the same size and shape.



«IDR-10» measuring device is mounted on the front of the switchgear. The three LEDs relay indicate the presence of voltage on the switchgear busbars and its correspondence to the nominal voltage fluctuation range. PD intensity is shown by digital indicator. If PD level exceeds the critical one, then the signal LEDs lit up and the output electromagnetic relay switches on.

If «IDR-10» reveals higher PD level on switchgear busbars, then the PD source can be located by consecutive switching off and on the switchgear cells while monitoring PD level.

PD Measurement in the Stator Insulation of Generators and Motors by «IDR-10».

High-voltage coupling capacitors are used as PD sensors in stator windings of motors, generators and electrical machines (as well as in switchgears). They are mounted in the place of cable connection to the outputs of stator winding.

«IDR-10» measures PD level in phases, reveals the rate of discharge intensity change during operation. «PD-Expert» can define the defect type and analyze the level of its development by comparing to the defect «fingerprints» database.

Power Cables Insulation Monitoring by «IDR-10».

High-voltage coupling capacitors are also used as PD sensors for cable insulation condition monitoring by «IDR-10»; they are connected to the cables rated voltage. «RFCT-7» sensors can be used for this purpose; they are installed on the cable shield grounding conductors. One relay «IDR-10» can monitor the insulation condition of three three-phase cables or one cable with separate phases.

Expert system defines the insulation defect type, and evaluates its danger for the further cable operation. If PD level exceeds the critical one, then the signal LEDs lit up and the output electromagnetic relay switches on.

Specifications of «IDR-10» Relay

№	Parameter	Value
1.	The number of PD measuring channels	3
2.	Rated voltage of coupling capacitors	(6 ÷ 10), 24, 36
3.	SCADA interface	USB, RS-485
4.	Dimensions, mm	144*144*50
5.	Temperature range without heating, °C	-40 ÷ +50