«TDM-TR» - Cooling Control System for 110kV Transformers

«TDM-TR» microprocessor system is for effective operation control of fans and oil pumps in the cooling systems of 110kV transformers. «TDM-TR» includes the whole set of monitoring and control functions, which provides sustaining optimal temperature parameters for the power transformer in all the operation modes.

«TDM-TR» system consists of the four main parts:

- the set of sensors for monitoring transformer parameters;
- the microprocessor device (controller) for the sensor signal measurement and processing and for control signals formation;
- the control board with contactor switches for connecting pump and fan motors;
- the protective enclosure for the device mounting beside the transformer.

«TDM-TR» Control Functions:

«TDM-TR» system has got the following control functions:

- Transformer cooling system activation during the transformer start-up.
- Switching on/off the fan and pump motors of the cooling system for maintaining the transformer tank temperature at the desired level for all the operational modes.
- Fast switching on/off the additional cooling system elements when the transformer loading changes.
- Switching the cooling system beforehand, in accordance with the planned loading schedule - «per-cooling» function. This function allows bringing down the temperature of the hottest spots of the winding.

For the control functions to be realized to the full extent, all the elements of the transformer cooling system are divided into several groups in accordance with their level of importance, for big transformers one group can include several fans.

«TDM-TR» Controls and Communications Interfaces

«TDM-TR» system functions automatically, in accordance with the software parameters and the local settings for each transformer. The information about the current cooling system condition is constantly displayed. All the information about the cooling system condition and mode of operation is uploaded into SCADA via RS-485 interface.

Efficient fan operation and cooling system parameter setting is done through the SCADA network computer or a laptop «on-site».

«TDM-TR» System Design

«TDM-TR» control system is supplied cased in metal, with the automatic heater. All the system elements are meant for operating at the ambient temperature of up to 40°C below zero, and up to 50°C below zero with the heater.

In the top part of the inner system panel there is the place for «TDM» diagnostic monitoring system connection, thus the system functions can be extended to monitoring and diagnostic with minimal costs.

Input and Output Interfaces of «TDM-TR»

Top tank temperature	1
Bottom tank temperature	1
Air temperature	1
Air humidity	1
Transformer phase load currents	3
4-20mA inputs, active/passive	2/2
GPS antenna	1
SCADA connection interface	RS-485
Fan control relay	4

«TDM-TR» System Specifications

Protective enclosure dimensions, mm	400*600*250
Protective enclosure weight, kg	40
Power supply, V	220 AC/DC
Power consumption, W	600
Operation temperature range, C degrees	-40 ÷ +50

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