The Detector of Warmly Isolation Condition Defects with An Independent Supply

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Abstract – Ways of construction of the detector of warm isolation condition defects of heating systems DD1 are considered. The detector of defects DD1 is intended for the remote control and monitoring of a technical condition of warmy isolation of heating systems by measurement of impedance between an alarm wire and a surface of a steel pipe of a heating system. The impedance gives the information on a condition of a heating system.

Key words – Heating system, Warmly isolation, Measurement of defects, An impedance.

I. INTRODUCTION

At operation of heating systems there is a necessity of revealing of failures which lead to losses of heat. The offered device allows to reveal beforehand an emergency condition of a heating system due to the control of a condition warmly isolation of a heating system during its operation. Revealing of damage warmly isolation will allow to remove damage operatively.

II. THE DETECTOR OF WARM ISOLATION CONDITION DEFECTS

The detector of a heating system condition is intended for measurement of impedance between an alarm wire and a surface of a steel pipe of a heating system which are part of the measuring channel. A principle of action of the detector of warmly isolation condition defects of heating systems will consist in measurement of complex impedance between an alarm wire and a surface of a steel pipe of a heating system on frequency 3 kHz.

The task of the detector of warmly isolation condition defects of heating systems DD1 to reveal:
- the poor-quality soldering of connections of wires;
- lacks of installation of a heating system, such as wet of warmly isolation;
- damages of wires of a working heating system owing to unlimited performance of excavations;
- to localize the channel of failures.

Indication is carried out between a steel pipe and a measuring wire. This value of wave resistance 200 Ohm irrespective of length of heating system and diameter of the pipeline. This value can change because of the following reasons:
- change of distance between a measuring wire and a steel pipe;
- occurrence of a moisture in warm isolation;
- poor-quality connection of wires;
- breakage of a wire.

The general view of the device is shown on Fig.1.

Fig. 1. General view of the detector of defects device DD1

The basic characteristics of the device DD1.
- Quantity of sites of the control - four.
- Length of each site ≤ 2000 m.
- The information on a condition of each site flashed on the screen of liquid crystal display LCD, namely: № of the channel, a condition of a heating system with the description such as failure, date of failure, resistance of isolation.
- Archive of the data: memory of the last of 25 found out defects (failures) with an opportunity of their viewing on the display of the device and an opportunity of archiving these data on a computer with the help of COM-port and trunk RS-232.
- Indications of liquid crystal display LCD, according to resistance of lines such:
  - 0 Ohm < R < 60 Ohm – “S.C.”;
  - 60 Ohm < R < 160 Ohm – “MOISTURE”;
  - 160 Ohm < R – “SERVICEABLE”;
  - 240 Ohm < R < 400 Ohm – “MOISTURE, BREAK”;
  - 400 Ohm < R – “DRY BREAK”.
- A supply of device DD1 is made from internal lithium battery such as SAFT - LSH14CNR, a voltage 3,6 V, capacity 5500 mA/hour.
- Overall dimensions of the device: 220×155×80 mm.
- Weight of the device 950 g.

III. CONCLUSIONS

The offered device will allow to find out operatively defects warmly isolation of heating systems and operatively to remove damages. It will allow saving means both due to reduction of losses of thermal energy, and due to preliminary revealing an emergency condition of a heating system.