

## **Effect of harmonic distortion on electric energy meters of different metrological principles**

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### **Abstract-**

**This paper deals with the errors of electric energy metering devices as a result of distortions in the shape of the curves of voltage and current load. It is shown and proved that the errors in energy measurements depend on the design and the algorithms used in electricity meters. There are three main types of metering devices having different principles: inductive (electro-mechanical), electronic static, and digital electronic (microprocessor). Each of these types has its measuring features. Some devices take into account all the harmonic distortions and the constant component which occur in the network while others measure the power and energy values of the fundamental harmonic only. Such traits lead to the discrepancies in the readings of commercial electric energy meters of different types. Hence, the violations in the measurement system unity occur, and a significant error can be observed in the balance of transmitted/consumed electric energy.**

**Index Terms-** current, distortion, electric energy meter, harmonics, power quality

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