

# Contemporary electric energy meters testing under simulated nonsinusoidal field conditions

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## Abstract-

The influence of distortions in voltage and current waveforms on state-of-the-art single-phase and three-phase power meters, commonly used in the utility power system of the Slovak Republic, was studied. A computer-controlled test system capable of generating nonsinusoidal voltages and currents and a reference power quality analyzer were used for this purpose. The results of the experiments on several revenue meters are presented. Some samples exhibited high errors under the tests, while the others operated within their tolerance limit. The overview of the current standards and previously published related studies on the operation of electric energy measuring equipment under determined and random nonsinusoidal conditions is given. The discussion including possible explanations of the phenomenon supervised under the conducted tests is provided.

**Index Terms-** Electric energy meter · Energy measurement · Power quality · Nonsinusoidal voltage · Reactive energy · Definitions of power quantities

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