

Determination of hot water temporary intake in apartment blocks.

Summary

The subject matter of the doctoral thesis is determination of hot water temporary intake in apartment blocks. At the beginning of the thesis it was made the overview of analytical hot water flows determination methods in apartment blocks that had been applied since XIX century. The main emphasis was put on methods that used calculus of probability and on applied distributions used for description of variability of hot water consumption in building. The literature studies show, that the distribution taking variability of active draw-off points amount and water flow consumption from them into account wasn't applied until now.

Due to the above the distribution taking this two parameter into account was proposed in the thesis. The new distribution comprises of Bernoulli's distribution, that takes the active draw-off points amount into account and exponential distribution, that describes the variability of water flow consumption from these points. Relationships that enable the identification of this distribution parameters by moments method on the basis of results of hot water temporary intake measurements were determined in the thesis.

Then the measurements of hot water temporary intakes (duration: five seconds) in apartment blocks with thermal stations were conducted. The proper flow-meter was bought. Round-the-clock measurements of hot water consumption were conducted. The five seconds intakes during minimum of 30 days in eight buildings were recorded. On the basis of measurement data and developed computer program the distribution parameters for particular building were identified, the hot water temporary intakes with determined overdrawing probability were determined and the accordance between the taken distribution and measurements data was checked.

The property of taken distribution and obtained from measurements values of its parameters were used for hot water temporary intakes with demanded overdrawing probability determination for apartment blocks with water installations that consist of 20 – 500 sanitary appliances.

At the final part of the thesis the obtained results were compared to the values of maximum intakes that were recorded during the measurements and to the values of design flow calculated according to PN-92/B-01706 and DIN 1988:2012.

The summary of the thesis contains conclusions about usefulness of the formulated distribution and the guidelines for future analysis.

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