DEVELOPMENT OF SOFTWARE COMPONENT OF THE OPTICAL METHANE CONCENTRATION METER BASED ON LABVIEW

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Abstract

The paper presents a software component and an operation algorithm for an optical methane concentration meter. The software component is developed on the basis of LabVIEW for carrying out experimental studies, which allowed formulating recommendations for improvements of the meter. The implementation of the recommendations made it possible to improve the accuracy of methane concentration measuring by reducing the value of the main and additional errors in the measurement result. Using the developed software component, we established that while performing (6-10) observations in the averaging interval with a sampling period of the output signals of the meter less than 80 msec, the main methane concentration measurement error is not more than 0.1% in the range from 0 to 5%, which is twice less than the regulated value. Using the proposed algorithm for compensating for the temperature drift of the optical meter output signal in the developed software component, made it

possible to provide an additional error of methane concentration measurement by not more than 0.2% with temperature changes in the range from +5℃ to + 55℃. The use of the proposed recommendations in optical gas concentration meters will reduce the probability of explosive situations at enterprises with sudden burst releases of combustible and toxic gases.

Keywords: Methane concentration, Optical meter, Temperature drift, Software component in LabVIEW.