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Study of the thermal transpiration applied to a CDG with an adjustable temperature

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The so-called thermal transpiration is a phenomenon well known to users of the thermostated capacitance diaphragm gauges (CDGs) at low absolute pressures below 100 Pa. It leads to a pressure difference between the internal chamber of the CDG with respect to the vacuum chamber to which it is connected. The associated correction ratio has been studied over several decades, for CDGs thermo-regulated around 45 °C. In the framework of the EMPIR project JRP 14IND06, the company INFICON AG has built a special model of CDG in which the temperature can be adjusted up to 90 °C. It has been calibrated at three different temperatures, including 45 °C, in the pressure range from 0.1 Pa to 100 Pa. The data have been analysed using existing empiric correction functions of the thermal transpiration, and the results will be discussed.

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