

VENTILATION CONTROL BASED ON THE CO₂ AND AEROSOL
CONCENTRATION AND THE PERCEIVED AIR QUALITY
MEASUREMENTS – A CASE STUDY
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Abstract: One of the concepts of the ventilation rate control in buildings with dense and unpredictable occupancies is based on the CO₂ measurements. There are many limitations regarding the validity of CO₂ measurement inputs as suitable to the ventilation rate control. Verifying research has been conducted in an air-conditioned auditorium, in the real conditions at altered ventilation air thermal parameters and variable occupancy. The CO₂ and the number concentrations of the fine and coarse aerosol particles (> 0.3 μm) and bioaerosol particles (bacteria and staphylococci) as well as the indoor air thermal parameters were measured in the individual sectors of the occupied area. The sensory assessments and instrumental determinations of the acceptability of indoor air quality (ACC) were also performed. The ventilation control strategy based, apart from the CO₂ measurements, on the continuous monitoring of the perceived air quality (PAQ) in the auditorium sectors has been suggested. The PAQ monitoring could be accomplished by aerosol concentration measurements and the ACC instrumental determinations. This strategy should ensure a desired PAQ in sectors which benefit the occupants' comfort, health and productivity as well as energy savings not only in the case of its implementation in the considered auditorium.