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VENTILATION AND AIR CONDITIONING CONTROL SYSTEM DEVELOPMENT FOR SURGERY ROOMS - CASE STUDY

A. Klūga, R. Beļinskis
Riga Technical University
Lomonosova iela 1, LV-1019 Riga – Latvia

A. Krūmiņš
Institute of Heat, Gas and Water Technology
Azenes street 16/20, Riga, Latvia

ABSTRACT

This paper describes ventilation, the air conditioning and its control system's development for surgical operating rooms in Daugavpils, Latvia. In total there are seven operating rooms in the hospital. The air conditioning system in the operating rooms is developed according to standard DIN 1946/4. The air handling unit's technical data, energy consumption, and sequence of operation and control systems development is analysed according to average meteorological year in Latvia.

Ventilation and air conditioning system consists of 3 main air handling units, VAV type air handling units for each surgery room and advanced hydraulic system for heat recovery, heating and cooling.

Control system is developed with two different BACnet controllers, which are working according to common logics from one visualization software. The main assignment of control system is to maintain necessary climate in surgery rooms (temperature, humidity, and overpressure).

This paper discusses the importance of trendlogs for adjusting control and regulation parameters, gives information about improved air volume control logics and importance of using open building automation controllers. Used air volume, temperature and humidity regulation methodology decreases electrical and heating energy consumption compared to the constant volume systems as the speed of the supply fan is altered using a Variable Frequency Drive and it thus runs below full speed most of the time.

Keywords: surgery rooms, variable air volume, control logics, BACnet, trendlogs.