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Siemens technologies contribute to Skanska headquarters' economical operation

Automated buildings utilising modern technologies that help lower operating expenses and environmental impacts are gradually becoming the standard. One of them is the Opatov Park I administrative centre in the Czech metropolis Prague, which has become the new headquarters of construction and development company Skanska. Siemens participated in the construction of the complex, whose technologies enable the central operation of heating, cooling, lighting and outdoor blinds, thus decreasing operating expenses.

The Opatov Park I administrative centre, located in the immediate vicinity of the underground station of the same name, was constructed within the first stage of the Opatov Boulevard project. The Boulevard's centrepiece will be an administrative and housing complex with a total area of almost 45,000 sq m. The Opatov Park I building consists of two wings, with a glass-covered atrium with a reception desk and connecting footpaths located in between. The building was designed by architect Martin Kotík's OmikronK studio and offers its users six above-ground and three underground floors. Offices with an open-space layout and meeting rooms are located on the above-ground floors whereas garage parking, warehouse premises and the building's technical equipment are located underground. The building's total office premises area is almost 15,000 sq m and the built-up area covers 4,400 sq m. Today, almost 700 Skanska employees reside in the building.

The brain of the building's automated control is the intelligent Siemens Desigo system, which controls and centrally monitors heating, cooling, shared-premises lighting, dimmable lamps at workstations, and the position of outdoor blinds. All these subsystems are connected with the aim of optimising the building's interior and energy consumption based on indoor and outdoor conditions. Two meteorological stations are installed on the roof, supplying the control system with information about current air temperature, light conditions, wind strength, and precipitation amount. The control system analyses the obtained data and then adjusts heating or cooling intensity in the

building, switches the lighting sources within the building and in its immediate vicinity on or off, and changes the position of the window blinds.

Lighting and heating/cooling systems are zone-controlled which helps decrease energy consumption significantly while maintaining user comfort. During the day, lighting and heating/cooling is controlled according to the weather and workspace occupancy; between 6 p.m. and 8 a.m., one hour after the last pushing of a zone button, these systems are in savings mode, and one has to use a button again to re-activate them. In order to comply with individual temperature demands in the office premises, fan coils, which can be controlled by manual regulators on the walls, are positioned in the respective zones. Some 750 dimmable standing lamps located above office desks take care of individual requirements for lighting intensity at respective workstations. The lighting of shared premises, such as footpaths and corridors, functions according to the time of day and building occupancy. The possibility of specific settings for the corridor lighting during cleaning up or security patrols is a matter of course.

The system of some 435 outdoor blinds represents an interesting feature. The control system calculates their position based on the time of day and the season (with regard to the position of the sun), current weather conditions (clear, semi-cloudy, overcast), outdoor temperature (heat-loss elimination), and the geographic orientation of a particular window (GPS co-ordinates, facade orientation, building shape). Users can also adjust the blind manually; however, if the control system thinks its position is unsuitable with regard to the building's heat loss, it will revert back to the original position after 10 minutes (the period of the individual blind position setting can be prolonged). Apart from lighting condition regulation, the outdoor blinds also function as the building's heat shield. An individual blind position setting can be done directly from the computer of the employee who wants to change the automatic setting via a simple Intranet application. No additional software needs to be installed as everything is controlled via a web page displayed in a standard web browser. In addition, users do not have to enter any login data, as their identification has already been verified through their logging into the Windows operating system.

The Siemens Desigo Insight control system, with almost 10,000 hardware data points, takes care of integrating the data from the heating/cooling, lighting, blind, air-conditioning and fire-damping systems. The system additionally includes two heat pumps whose activity also helps decrease the energy consumption in the building. Data exchange is done via BACnet, LON, KNX and DALI communication buses. Employees of the building administration at the control centre can switch the fully automated operation of all the aforementioned partial systems to manual mode – for instance when washing the windows or the blinds.

“The system of key technologies’ automated control enables us to operate the building in an economical and environmentally friendly way. The possibility of setting some specific parameters at individual workstations takes the individual requirements of our employees into account,” said Miloslav Rovný, Skanska’s Property Administration department head.

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