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Cinema air-conditioning: Much more than just a lot of hot air?

Maintaining a great brand image for cinemas is essential. Visitor comfort plays a large part in this as no one wants to sit in a draught, or overheat. Both are sure fire ways to receiving requests for refunds or reducing attendance.

BG Controls specialises in designing and installing automated building control solutions for cinema applications throughout the UK - including Vue and Odeon. On behalf of its exhibitor clients, BG ensures visitor comfort is assured through the installation of flexible and energy efficient air-conditioning systems.

Director of BG Controls, Duncan Biggins, explains why air-conditioning in cinemas is so important and that the key to getting it right is through the implementation of energy saving initiatives and control strategies.

“The cinema environment is unlike any other,” says Duncan. “Occupants remain static for long periods of time and are therefore more likely to notice any changes in temperature.

“Also, cinema auditoriums are big spaces which can mean large temperature differentials between the ceiling and the ground. Add to that the fact that some audience members may be wearing layered clothing and others just a t-shirt, then the challenges are great.”

Taking all these factors into account, BG believes that exhibitors should outsource the management of their heating, ventilation and air-conditioning (HVAC) to external contractors. In turn they will benefit from a system that is properly maintained, achieves maximum energy and cost savings, as well as allowing cinema staff to focus on their primary job responsibilities.

BG Controls' most recent cinema installations use equipment provided by world leading developer and manufacturer of native BACnet™ building automation systems, Delta Controls Inc. These systems utilise the ISO certified BACnet™ communication protocol to integrate the various building technologies.

The sophisticated, BACnet™ based, automated building controls system delivers optimum temperature comfort levels for cinema visitors. In addition, the system is also capable of delivering significant energy savings and financial returns. There are several control strategies that can be deployed via the system to ensure these objectives are achieved. Duncan suggests the following:

“There needs to be air movement within the auditorium. This is because the temperature must be given every chance to spread itself around and so reduce the amount of potential hot or cold spots. The temperature sensors that control the air-conditioning ensure the correct flow of air movement. Therefore it is vital that these are strategically positioned at various heights within each auditorium to facilitate this.

“Also, it may be surprising to know that internal temperatures should be relatively cool in winter. This is because winter cinema goers wear more layers when watching the film and may have a tendency to overheat if the temperature setting is too high.”

In addition, to ensure that maximum energy and cost savings are also achieved, BG maintains that every auditorium within each cinema should be automatically controlled in accordance with changing screen times.

This is achieved using BACnet™ protocols over a corporate Wide Area Network (WAN) on standard IT equipment. BG Controls uses this technology to connect to and remotely monitor cinema sites across the country from its central service bureau. The bureau facility means that trained BG engineers can monitor and control the individual cinema environments as well as diagnosing any faults when necessary.

To take full advantage of the bureau service, exhibitors submit a weekly 'Occupancy Table' to bureau technicians for each cinema. This lists the screenings for the coming week and means that technicians can programme the building controls for each screen and within the public areas. As a result, energy consumption is correlated to fluctuating occupancy levels, which means valuable energy is only being used when necessary and not wasted on unoccupied space.

Traditional air-conditioning systems usually only allow on-site managers to make local adjustments to temperature settings. When there is a need for more warmth there may be a tendency to up the setpoint from 21°C to 29°C in an attempt to heat the area quicker. When inevitably, this becomes too hot, the temperature is turned back down again. To get back to 21°C, the system will switch off the heating system and start to pump in fresh air. As well as being an inefficient use of energy, this invariably leads to static occupants experiencing unwelcome draughts.

However, the Delta system affords centralised control from BG's remote bureau. This eliminates the need for local user adjustment and ensures temperatures can be varied but properly controlled at all times. What's more if there is a problem, cinemas only need to make one telephone call to the bureau and this can be quickly rectified without any further input from cinema staff.

Energy is also conserved via optimum start / stop programming strategies so that the heating plant starts just in time to get the building up to the right temperature, and falls gradually, but imperceptibly, well before occupancy comes to an end.

Similarly, the system can also be automatically programmed to switch off for a couple of hours during the middle of the day. The inertia of the building fabric will contain the warmth so a drop in temperature won't be noticeable and further energy and cost savings are being made.

"These strategies go above and beyond the normal thermostat control found in typical building management systems. What's more they could potentially save around £10,000 per cinema in electricity consumption alone," continues Duncan.

"Properly controlled air-conditioning systems also require less maintenance and can cost less to run as a result. This is because mechanical plant equipment such as fans, pumps and condensers do not need to work as hard. The result is less wear and tear and reduced maintenance costs.

"In short, customer comfort will always be an exhibitor's top priority but added commercial benefits can be obtained through fully automated air-conditioning systems with energy saving control strategies."