Customised multi-zone AHU

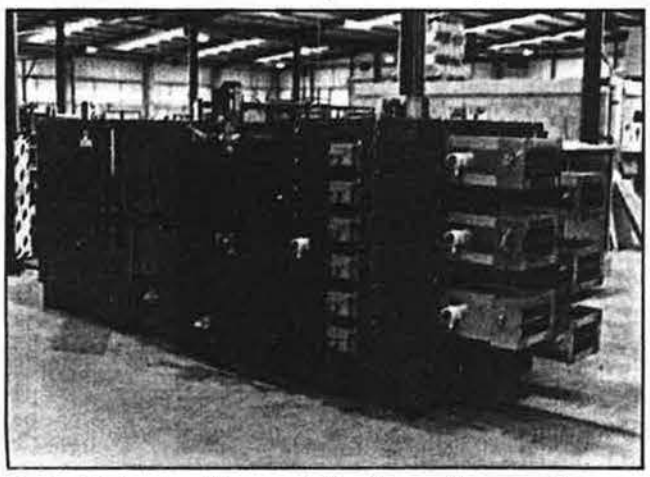
There are many applications where a group of small areas need air conditioning, but with different load requirements. For example, some rooms may face north and others south. In this situation the individual air volume requirements may not make separate air handlers economic.

Senior Moducel has been designing and manufacturing multi-zone air-handling units for many years to meet requirements of this type. Each unit is custom-built to the client's specification and can provide up to 12 separately controlled supplies.

Generally an air-handling plant will include mixing, filtration, heating and cooling of the supply air. The multi-zone plant does all this in one unit with controls, valves and pipework built in.

Control of each zone is achieved by mixing hot and cold air to create the correct balance, using special damper blades to mix the required proportions of supply air from the heating and cooling coils.

Reader Reply No. 105



Senior Moducel multi-zone air-handling units are custom-built to the client's specifications. This one supplies six zones.

Inefficient legislation

Proposed amendments to the Building Regulations to curb the use of air conditioning are misinformed and misguided, argues Andrew Jackson.

In January last year, the Department of the Environment published proposed amendments to Part L of the building regulations which would effectively outlaw the installation of air conditioning in all but a handful of buildings. The reasons given included the need to improve energy efficiency — and hence reduce UK CO_2 emissions.

Urgent talks

The Air Conditioning Industry Board (ACIB) considered that the proposals were an unwarranted attack on an efficient and responsible industry and requested urgent talks with officials at the department. In December, after many meetings, the Department of the Environment published its response in the shape of revised proposals.

Sadly, far from accepting industry arguments about the unnecessary nature of the legislation, the new revisions are even more oppressive in that the floor area threshold limit has been lowered from 500 m^2 to 200 m^2, and the scope of the regulations has been expanded to include all types of air conditioning — not just ducted systems.

For a Government publicly committed to a policy of abolishing unnecessary red tape, this interference in the free market seems somewhat perverse, and it may be helpful to try to estabiish the validity of some of the arguments.

The issue of efficiency dates back to the 1960s, when a combination of primitive equipment and poor building design made not just air conditioning, but even basic heating inefficient and expensive to run. However, the developing awarness of the need to conserve energy, vastly improved standards of design, better insulation and the widespread use of heat pumps — which can achieve particularly high coefficients of performance — have changed the picture entirely.

"Research also casts doubt on the perception of a link between air conditioning and sick building syndrome"

Proof of this may be found in the entries for the Beta section of the electricity industry's annual Business Energy Awards. Recently, numerous air-conditioned buildings have achieved better energy consumption figures than those recommended in the good practice guidelines issued by the Energy Efficiency Office (EEO). For example in 1992, a winner in the refurbished building category — a computerised broker centre in Oldham — registered an annual energy consumption of 121 kWh/m^2. This figure even compares favourably with the EEO good-practice guidelines for a heated-only building (131 to 156 kW/m^2)!

Moreover, recent studies carried out at the National Swedish Institute of Building Research have developed the long-established link between *working* efficiency and internal temperature. In particular, Dr David Wyon, head of human factors, has shown that an internal temperature of 27°C (by no means uncommon in a non-air-conditioned building), can produce a drop in working efficiency of up to 30% compared to the levels of output achieved at an optimum working temperature of 20°C.

The latest research also casts doubt on this perception of a link

between air conditioning and sick building syndrome (SBS). In a paper presented to the Building Research Establishment (BRE) Conference in June 1993, Dr Jouni Jaakola (department of public health, University of Helsinki) concluded that by maintaining certain internal conditions,* air conditioning could reduce the incidence of SBS. Latest BRE research on SBS points to inadequate cleaning of offices as being a more likely culprit.

With regard to CO_2 emissions, the DoE's own statistics show that while energy for buildings accounts for 49% of UK CO_2 emissions, only 1% is attributable to air conditioning. Moreover, this 1% includes applications such as operating theatres and computer clean rooms which are, in any case, exempted.

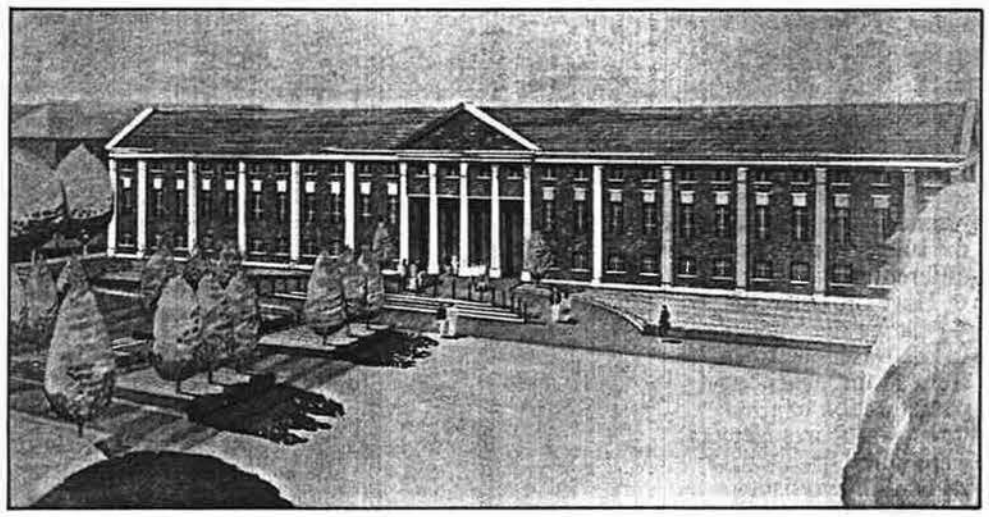
Banning comfort air conditioning in new and refurbished buildings is not seriously going to assist the Government in its commitment to reduce CO_2 emissions by 10 Mt of carbon per year.

Meaningless

Finally, DoE figures for the projected growth in energy use associated with air conditioning are based on an EEO report published in 1988 at the height of the property boom. The recession has rendered these projections all but meaningless. □

* *An internal temperature of around 20°C, a relative humidity exceeding 20% and a minimum fresh air flow of 10 litres per person.*

Andrew Jackson is secretary of the Air Conditioning Industry Board, 30 Millbank, London SW1P 4RD.



Carrier equipment has been chosen for the new £7 million headquarters building in Portsmouth housing the combined staffs of the Second Sea Lord and the Commander in Chief Naval Home Command.

Carrier chosen for Naval contract

Carrier air-conditioning equipment was selected for a major development in Portsmouth's Dockyard Conservation Area. The £7 million headquarters building is to house the combined staffs of the Second Sea Lord and the Commander in Chief Naval Home Command.

The 7500 m² three-storey neo-classical building overlooks the historic ships *HMS Victory* and *The Mary Rose*. It accommodates up to 520 staff who will administer all service personnel matters.

Two Carrier reciprocating liquid chillers are housed in the ground-floor plantroom, with the centrifugal fan condensers in the roof space. The building was designed for maximum usable office space, so chiller footprint was a major consideration. The Carrier chillers, at 2.9 x 0.9 m, achieve the required cooling capacity of 780 kW within the tight confines of the plantroom.

Air conditioning is provided via a four-pipe system supplying over 320 Carrier vertical fan coil units. Chilled and heated water are available simultaneously at the units to give greater individual control over comfort.

The building has a high fresh air changeover rate, with 1.5 changes per hour made through the fan coil units. Air is extracted via the light fittings.

Because the building is close to the dockyard basin the fan coil and air-cooled condensers have been supplied with copper coils to minimise corrosion from the sea air.
Reader Reply No. 106

Designing for small space situations

Biddle has overcome many of the technical problems associated with low profile fans to produce a slimline fan coil unit 121 mm deep for installation in ceiling voids.

The company hopes to take advantage of a rising refurbishment market as the construction industry moves out of recession.

To achieve the narrow dimensions a special low profile fan has been developed which is directly driven. By eliminating the drive belt, performance and reliability are improved.

High external resistance is a common problem with small fans trying to push air through long duct runs. Much of the preliminary work on this problem was carried out using Biddle's powerful CAD systems. Final product testing achieved results of 60 Pa external.
Reader Reply No. 107

Absorption chillers

PHM Distribution now offers two ranges of steam-powered absorption chillers.

These 2-stage units are available in 25 sizes with cooling capacities from 280 to 5270 kW. They require steam at 3 to 10 bar gauge and have a coefficient of performance of 1.17.

Patented inhibitors are used in the lithium-bromide solution. They are non-toxic lithium nitrates formulated to reduce corrosion and extend tube life.
Reader Reply No. 108