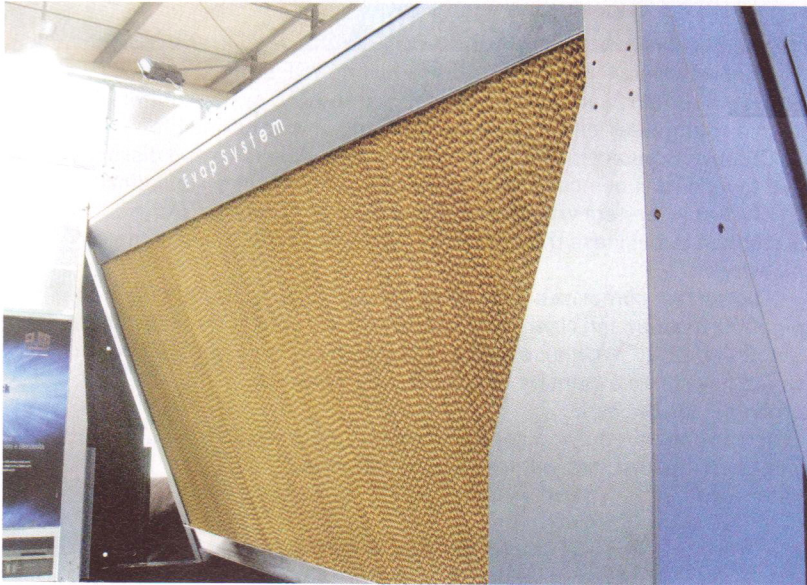


# ADVANCES IN AIR CONDITIONING



workspace for installation and service.

The system uses a DC Inverter in conjunction with individual indoor unit electronic expansion valve control, allowing for temperature control of +/- 0.5 deg C. Command for operational mode switching can be controlled via three options: dedicated remote controller, external input terminal of outdoor unit or system controller.

Meanwhile, Hitachi claims its S Series SX8 is the most efficient AC unit on the market, achieving a COP rating of 6.13 – the only unit on the market that's rated above 6 – and an EER figure of 6.0.

Its Eco-Scroll compressor's motor runs at low voltages after reaching a preset temperature, while its Real Dry function controls humidity levels between 40 per cent and 70 per cent and can humidify the air, re-emitting condensate as an ionised mist.

The DC Inverter is capable of running down to 0.5 kW, which is said to be two to three times lower than several of its rivals.

One company that's making big claims with its VRV technology is Daikin, which when employing heat recovery in balance mode achieves a COP of 10.07 – based on an REYQ10P in mixed-mode at nominal conditions.

Like conventional heat recovery, balanced mode operation involves cooling an area of the building which is experiencing the highest heat gains and transferring the reclaimed heat to other areas of the building that require heating.

Daikin engineering manager John Durbin says: "An intelligent approach to heat recovery can deliver efficiencies of up to nine or even 10. Yet while heat recovery is already being embraced in other areas of the world, the benefits of operating in a balanced mode are still not widely realised in the UK market."

On the chiller front, the already-efficient Turbomiser chiller (pictured above) now uses an adiabatic evaporative system for greater efficiency. The system features a panel made of porous natural fibre honeycomb on the condenser coils.

The medium is fed by nebulised water, which is absorbed by the honeycomb and effectively reduces the wet bulb temperature of the air stream around the coils.

The 'adiabatic advantage' that results effectively reduces ambient temperatures in the immediate vicinity of coils by 8 deg C, lowering condensing temperatures and improving the chiller's energy performance.

Aided by the onboard LPA system, it's claimed that it delivers energy savings of up to 50 per cent compared with conventional screw and reciprocating chillers. In addition, EERs of 10 and above can be achieved without the need for additional free-cooling circuits with expensive glycol, saving on initial cost and ongoing secondary pump energy.

Star Refrigeration's Indigochiller (pictured below) is designed for medium to large AC requirements, with the company claiming that it eliminates refrigerant leakage.

It features a low-maintenance oil-free Turbocor compressor that operates on electromagnetic bearings and uses synthetic refrigerant R134a.

Available as an air-cooled or water-cooled unit, the Indigochiller's capacity ranges from 250 kW to 1,650 kW; a PLC control system allows the user to monitor the refrigerant charge.

Star say the Indigo uses only 60 per cent of the energy required by a standard chiller operating on typical load and ambient profiles.

Also improving chiller efficiency is the asymmetric screw compressor, developed by the McQuay Technology Centre in Kent, in conjunction with J&E Hall, is designed to maximise the energy efficiency of air-cooled chillers.

When used in large commercial and residential buildings, chillers will usually operate at a load capacity anywhere between 25-75 per cent of their capacity, depending on the season.

The ASC works by having each compression process operating independently, yet still maintains an infinitely variable capacity control, enabling response to varying system demands.

Assuming an average of 1 kg of CO<sub>2</sub> per kWh, the resulting saving is 0.018 kg of CO<sub>2</sub> per kW of cooling capacity per hour. For a mid-range chiller running 2,000 hours a year, the emissions saving is 36 tonnes of CO<sub>2</sub> per annum.

