

Close Control AC - High Density Cooling

High Density Heat Loads

With the deployment of modern IT hardware including blade servers and the like, today's data centre is experiencing heat load concentrations which go far beyond the capabilities of traditional cooling solutions. That said, in most data centres, it is not necessary to cater for such a high heat load throughout but it is essential to ensure that it is planned for in a particular high density area or areas.

Heavy promotion of "in-row" or "in-rack" cooling solutions in recent times has led to a popular misconception that downflow systems providing cooling air via a raised floor void are inadequate to cope with high heat load densities. With the products and technologies offered by Uniflair this is simply not the case. Indeed TÜV laboratories have certified the Uniflair solution at heat load densities up to 40kW/rack.

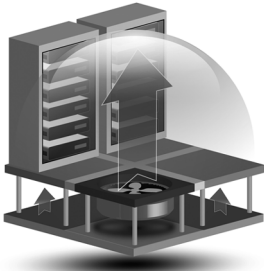
First Steps

The first steps in any modern data centre are to:

1. "Go with the flow" of the servers themselves, with their cool air intake at the front and exhaust at the rear, by adopting a "hot-aisle cold-aisle" rack configuration;
2. Ensure that the clear raised floor void is deep enough to ensure adequate air distribution. This may be anywhere between 300 and 1000mm depending upon the size of the area and the layout of cables and other services beneath the floor;
3. Ensure that there are adequate floor grille outlets in the cold aisles for the cooling air requirements of the servers in the adjacent racks.

Active Floor

As the heat load per rack approaches 15kW or more, then further steps are required to ensure that there is an adequate supply of cooling air into the cold aisle in front of the servers that need it. Uniflair Active Floor® is a 600mm square unit that fits exactly into the space of one tile of an access floor. Located in the cold aisle directly in front of a rack, it incorporates a variable speed ec motor-driven fan controlled by temperature sensors located at the rear of the rack to automatically adjust the airflow in accordance with the instantaneous demand of the servers within the rack. With its adjustable diffuser vanes it also ensures that the cooling air can be

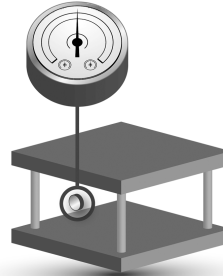


directed as required across the whole of the front face of the rack, avoiding any starving of the uppermost servers.

With adequate cooling and airflow available from the perimeter downflow units, installation of Active Floor® enables the handling of heat loads of up to 25kW per rack.

AFPS

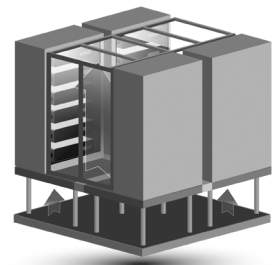
AFPS is the Automatic Floor Pressurisation System pioneered by Uniflair. Pressure sensors beneath the raised floor are used in conjunction with Uniflair downflow units with variable speed ec fans and AFPS software to ensure a constant pressure within the void. This system fulfils two primary objectives:



1. Adequate airflow within the floor void at all times, especially in conjunction with Active Floor® modules;
2. Saving energy by automatically keeping downflow unit fan speeds to the minimum necessary to meet the requirements of the data centre at the time. This is especially valuable when racks are only deployed or loaded over a period of time according to customer requirements.

Cool Pool

For the ultimate heat load densities of up to 40kW/rack, the Uniflair "Cool Pool" solution is deployed. This combines downflow units with ec fans, AFPS, Active Floor® modules and the segregation of the hot and cold air streams. This is achieved either by cold aisle containment: enclosing each cold aisle with transparent doors and ceiling, or by hot aisle containment in a similar fashion. Either method prevents any risk of short-circuiting of air from the hot aisle back to the cold aisle.



These techniques offer a solution which is as modular and scalable as the in-rack or in-row alternatives but is much more flexible. Required levels of redundancy are much more easily incorporated and the absence of water or other liquid coolants in or around the racks minimises the risk of damage to hardware in the event of any leakages.

Uniflair is an ISO9001 and ISO14001 certified manufacturer and an official Endorser of the EU Code of Conduct on Data Centre Energy Efficiency.

