



The importance of installation and maintenance

A well-designed airconditioning system for a hospital will not perform as designed if it is carelessly installed, not balanced after installation and poorly maintained. It is assumed, of course, that the solution provider has selected and approved equipment that is inherently reliable, has a long life and is as maintenance-free as possible. It is also assumed that the solution provider will frequently visit the installation site, check out installation work being carried out, ensure a thorough system balancing and check the final results with his initial design to see how closely the two match. While the designer has no control over the maintenance of the system, once the plant is handed over to the client, his actions during design and construction stages influence its maintenance greatly.

Proper balancing

Without air and water balancing of the HVAC system after commissioning, some areas of the hospital can be over-cooled at the expense of other areas that are under-cooled. An operating suite in which the OT must be at the highest pressure with diminishing pressure towards the unclean areas could end up with just the opposite allowing contaminated air to infiltrate into the OT with resulting cases of infection, all caused by poor or no system balancing being carried out.



Some examples of poor installation

Some examples will help to understand the importance of these observations.

CASE 1 :

An air handling unit feeding conditioned air to an operating theatre was installed in a cramped room on the same floor as the OT, since no service floor was provided by the architect in the building plan. The tightness of space around the AHU made access difficult and maintenance staff tended to conveniently overlook the normal cleaning and replacement cycle of the air filters. As a result the filters were choked and air supply to the OT reduced, leading to complaints of poor cooling and loss of positive air pressure. To make matters more difficult for the maintenance staff, the AHU was fabricated from galvanised steel sheets, of single skin construction, using blowers made of mild steel painted over, which corrode in seven to eight years and require replacement. Since the AHU room was extremely tight, the room walls needed to be dismantled and rebuilt after fan replacement, all of which meant the entire OT floor was shut down for at least a week. Quite a painful experience!

CASE 2:

Another example of a poorly installed system which was very clearly within the control of the installation contractor was the air distribution ducts in a hospital installation for an OT and ICCU (Intensive Coronary Care Unit). As is normal in most installation sites, the fabricated ducts were left with open ends, for weeks at a time, on the floor, exposed to dust, dirt, cement and plaster.



Galvanised steel began corroding, wherever it was cut with a scissor or sheared on a machine, as the open ends of steel were unprotected by galvanising. Once rust starts forming it spreads even below the galvanised surface. Rust, dust and cement particles or colonies of bacteria breeding on globs of cement plaster inside the ducts caused problems of infection.

CASE 3:

A well known hospital in Mumbai which had packaged airconditioners installed for the OT suffered from many instances of infection until the management decided to completely revamp the AC system. When the old supply air ducts were dismantled, they discovered several kilos of lint fibres, dust and dirt inside the duct accumulated over a period of several years. The lint fibres were green in colour and were shed by the cotton clothes worn by surgical teams.

Conclusion

The foregoing highlights the importance of entrusting the entire design, construction and maintenance of the AC system to a reliable, turnkey solution provider. His expertise in similar jobs is very vital for a well designed and proper installed AC plant for a critical application like hospital airconditioning.