



## Guidance on FCUs in residential applications

### Design Considerations

Cooling & Heating Loads – ensure the loads are relevant to the acoustic criteria. The peak cooling load will be during the daytime, which will be lower than night time.

Unit size – Remember to check the unit dimensions, including electrical enclosures and valve trays, which may be extended, and any additional attenuators will fit in the space before placing the order.

Vertical FCUs – These can often provide a solution where there is insufficient ceiling space or access is limited. Vertical FCUs can be built into partition walls, behind wardrobes or other fitted furniture.

Return air path - Make sure there is an adequate return air path and where possible grilles are not directly beneath the inlet. If unit return and discharge are not coming from a common source make sure there is a facility for equalisation of air.

Ceiling – a good ceiling will help keep the unit quiet and may mean you can use a smaller unit for the same duty. Ceilings in residential applications will have different sound reduction indices than those used in commercial applications. If there is no ceiling remember to tell the FCU manufacturer so it can be considered in selecting and predicting noise levels.

Acoustics – Consider having differing noise ratings for day & night time. Additional attenuation e.g. inlet and discharge attenuators will reduce noise. Realistic external resistance figures should be provided to the FCU manufacturer. The internal finishes will affect the system performance.

Ductwork – using better quality ductwork, plenums and diffusers will again help keep the unit quiet and allow a smaller unit for the same duty. Consider acoustically rated flexible ducting for additional attenuation.

Condensate – Condensate drainage should be considered early on in the design process. A slimmer unit may help with condensate fall on gravity drain systems and condensate pumps are readily / widely available that are quiet and reliable.

Valves – It is advisable to check that valves free-issued to the FCU manufacturer will fit before ordering them. Where space is at a premium consider mounting the control valves away from the unit especially when larger PICV sets are required. Most manufacturers can offer a comprehensive range of products. Consider the system working pressure especially with respect to tall buildings.

Controls – Ensure control requirements are known and can be accommodated by the controller to be supplied by the manufacturer or free-issued. Fan fault monitoring and alarm should be considered as part of the control strategy and some (but not all) controllers can use the tachometer output from the EC motors to detect a fault. Differential pressure switches and Current transformer switches are not ideal in installations with EC/DC fans and other options are available. Other considerations such as Master / Slave, wall mounted control (with / without timeclock facility) and valve exercising and or stand-alone of integration into a BMS must be communicated.

Fire – Consideration if the services penetrate a fire compartment

## **Commissioning**

Pre-order testing of the fan coil unit – manufacturers can supply a sample unit for use in a room mock-up for performing accurate acoustic tests.

Controls and valve testing can be carried out as part of the mock up test or factory bench testing can be carried out at the manufacturer's facility.

Units should be fully commissioned (Water / Air / Controls) prior to solid plasterboard ceilings being constructed.

## **Service and Maintenance**

Access panels – Make sure there is adequate access for commissioning and routine maintenance - the bigger the better. You should be able to access the filter, control box, valves, drip tray and fans.

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