

Designing ComfoClima

Overheating is becoming a more and more common issue with properties in the UK. Although temperature is subjective, overheating is a term used when a property becomes uncomfortably warm. Such overheating problems are most prevalent during sudden spikes in temperature or during prolonged periods of time.



What is ComfoClima

ComfoClima is an air temperation device used in conjunction with the ComfoAir Q range of MVHR units. The ComfoClima reduces the humidity of the incoming fresh air before distributing it to the habitable rooms. In addition to this dehumidification it also helps to temper the incoming air, resulting in comfortable supply air during warm periods.

The ComfoAir Q range of units have a unique modulating summer bypass. If the external temperature is lower than that of the internal temperature then it will activate to bring the cooler air into the property without the need for activating the ComfoClima. This can activate down to much lower temperatures than a standard summer bypass whilst avoiding hitting the dew point due to it being able to partially recover some of the heat. The ComfoAir Q range of units also have 3 temperature profiles which react to the average external temperature. This means during spikes in external temperature the unit is more inclined to react to these sudden changes by opening the bypass or activating the ComfoClima accordingly. The ComfoConnect KNX C or LAN C enable the end user to control and monitor the unit using the KNX building automation infrastructure or the ComfoControl free app (available on iOS and Android). These can be used to set activation points including an activation schedule of the ComfoClima in addition to enabling remote activation and support via the ComfoControl app.

ComfoClima
in conjunction
with with
ComfoAir Q



ComfoClima cannot be compared to air conditioning since air conditioning recirculates the stale cooled air, whilst the ComfoClima delivers fresh filtered air. This helps to meet ADF ventilation rates whilst having the added benefit of dehumidification and air temperation. The ComfoClima also doesn't require any external unit like an air conditioner would.

Design out overheating

The ComfoClima can help to temper the incoming supply air, however if the gains exceed the cooling capacity of the unit then the property will still overheat. Things to consider to combat overheating would be as follows:

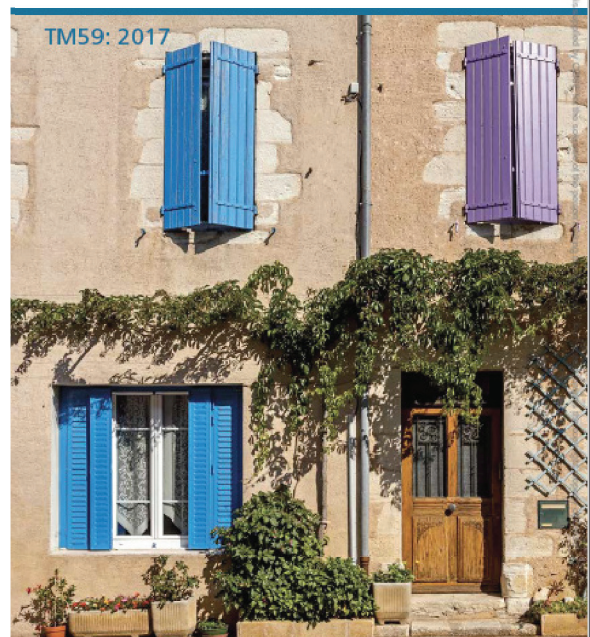
- Improve thermal mass
- Options to cool thermal mass such as false ceiling or hollow core concrete flooring
- Reduce the size of windows and avoid too much south-facing glazing
- Solar shading through overhangs or external shutters
- Window glass type such as reflective, photochromic, thermochromic or electrochromic
- Insulate hot water pipes and tanks
- Reduce electrical appliances
- Use higher efficiency appliances that emit lower heat levels such as LED lighting
- Openable windows for purge ventilation without a security risk

Thermal modelling

It's important that thermal modelling is carried out to ensure the ComfoClima is sufficient to meet the cooling demands of the property. Thermal modelling is entirely reliant on the model inputs, we recommend modelling to the new TM59 guidance which draws from TM52 and CIBSE Guide A. Modelling should be based on the unit running at a minimum of 360m³/hr (100l/s) to provide 1.5kW of cooling capacity to the incoming air. With default profile BALANCED and a mean external temperature above 15°C, the setpoint for the extract temperature is 25°C.

The ComfoClima activates automatically as soon as the ventilation system notices that passive cooling with summer bypass cannot maintain the indoor climate as cool as 25°C. With the profile COMFORT and ECO the setpoint is 23°C and 27°C respectively. When modelling the property it's important that any solar shading requiring user intervention, such as blinds, is modelled with and without them. Window opening modelling should also include any restrictions and take into account noise, security and air quality issues which would reduce the opening area. The windows should also only be modelled as open when rooms are scheduled to be occupied unless security isn't an issue.

Design methodology for the assessment of overheating risk in homes





ComfoAir Q600

Key design considerations

- Minimum design rate of 360m³/hr (100l/s)/hr with pipework velocity <3m/s
- 200mm circular or equivalent duct size for external terminations
- 200mm circular or equivalent duct size for internal terminations
- 12 x 90mm semi-rigid duct alternative for internal terminations (all ports used)
- Thermal modelling to achieve 1.5kW of cooling capacity, and 1.6kW of supplementary heating capacity if required split across all habitable rooms
- Insulate intake/exhaust ductwork to a minimum of 25mm of insulating material, with a thermal conductivity of 0.04W/Mk.
- Use Zehnders pre-insulated air distribution ComfoTube Therm on the supply ductwork, or insulate supply ductwork to a minimum of 9mm of insulating material, with a thermal conductivity of 0.033W/Mk.
- Enthalpy cube within the ComfoAir Q used as standard.
- Ensure adequate attenuation is factored in at the higher flow rate
- Ensure the intake/exhaust terminations are separated by a minimum of 2m and terminate to the external façade
- Unit must be floor mounted, the floor stand is ordered separately
- Locate the unit on an external wall if possible
- If a switch live boost is desired, then a relay linked to the Option Box is required.
- The ComfoClime can only be used in conjunction with the ComfoAir Q range of units and can only be installed directly above them.
- Intake air from north facing orientation if possible
- Avoid intake air from south facing orientation if possible.
- Don't intake air from underneath roof tiles or solar panels
- Use a water filled siphon with a water lock of at least 100mm for the ComfoClime condensate drain
- Use a dry trap on the ComfoAir Q capable of achieving 500Pa of pressure
- Access for maintenance is required, typically 1m in front of the unit and circa 250mm to the condensate drain side

Additional notes

Cooling capacity is improved when the unit is also used in conjunction with the ComfoFond-L Q to provide a more constant intake into the unit. When used with the ComfoFond-L the cooling potential is improved further.

All equipment should be installed by a competent person, poor or incorrect installation could result in the unit not achieving its desired cooling capacity.

The ISO ePM1 >55% (F7) filters within the ComfoAir Q range of units helps to reduce fine pollen and carbon black particles in the supply air, however additional filtration such as NOx filters may be required. These need to be factored into the design pressure drop and are available from Zehnder.

The ComfoClime has no motor of its own and subsequently doesn't carry an energy rating label (EER). In addition to this it cannot be accurately modelled in SAP and so no information can be entered into the SAP calculator. If SAP is showing the property as a high risk of overheating than the ComfoClime will unlikely provide the necessary cooling capacity to reduce this.



Filters

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