

Calculation example 1

Office Building

General description

Office building of 6 stories above ground and basement with garage.

Orientation of building with long facades facing East and West. Zoning of office of east and west zone. Garage is calculated as a separate zone.

The building interior has an open volume from ground floor to floor 6.

Building technique

Steel frames with curtain walls.

Steel columns recessed in the wall.

Concrete hollow core slabs with steel beams.

Construction detail shown in drawings.

Ventilation

Normal flow in Office floors during office hours 1 l/s m². Nights and weekends the flow is reduced to 0.2 l/s m².

A portion of the exhaust from the Office floors is taken out through the garage continuous flow daytime 0.9 l/s m² and other times, 0.2 l/s m².

Heating cooling

Solar protection by awnings that are controlled via a solar sensor. Sun protection for solar radiation activated over 200 W/m². Awnings withdrawn at wind speed over 5 m/s.

Minimum room temperature in Office floors is 22 °C.

Maximum room temperature is 24 °C during the day but nights and weekends 27 °C.

Minimum room temperature in the garage is 12 °C.

The building is connected to district heating.

The building has its own cooling machine. Cooling factor 2 at + 20 outside and 3 at + 10 outside.

Under + 10 building is cooled directly via outdoor condenser as free cooling.

Passive forced air or night cooling is activated when the room temperature exceeds 23 °C and supply air temperature is 5 °C lower IE is below 18 °C without cooling. Passive set forced flow is enabled, when supply temperature is 1 °C lower than temperature when cooling is activated during daytime.

At cooling load VAV function primarily is activated with force ventilation flow and then supply air cooling.

Maximum of forced flow 2 l/s m²