DK_Aarhus_Aarhus Kommune

Image 01: Northwest view ©Schmidt Hammer Larsen Architects	**Image 02:** North façade ©Schmidt Hammer Larsen Architects	**Image 03:** Exterior view of façade ©Window Master
		

Building Specifications

Address	Grøndalsvej, 8260 Viby J, Denmark
Building Category	Office
Year of Construction	2012
Special Qualities	Zero Energy Building
Location	56° northern latitude, 10° eastern longitude, located on a slope. Surrounded by buildings of the same size in south and a motorway in north
Climate	Cfb (warm temperate climate, moist with adequate precipitation in all months and no dry season, warm summer with the warmest month below 22°C)

Vent. Cooling Site Design Elements (Solar Site Design and Wind Exposure Design, Evaporative Effects from Plants or Water)

The building is sheltered from the wind and sun from an existing building in south. Tree plantings to the west shelter the buildings from direct wind exposure

Vent. Cooling Architectural Design Elements (Form, Morphology, Envelope, Construction &Material)

Form: Building consists of two parallel three storey segments stretched along east – west direction. The two squared shape segments are coupled together with three small tunnels.

Morphology: Internal layout of the building is designed as cellular plan office. Internal walls are made of glass panels to provide daylight in the corridors and other inner rooms. Total floor area is 6.286 m^2

Envelope: The use of custom-made thermal panels (λ value of 0.023 W/mK) and special vacuum insulation ensures that the U – value of the external walls is below 0.09 W/m^2K. Glazing area is 38% of the total façade area. Energy efficient windows with an U value of 0.6 W/m^2K

Construction: Heavy mass building

Vent. Cooling Technical Components (Airflow Guiding Components, Airflow Enhancing Components, Passive Cooling Components)

Single side ventilation. Top mounted automatic window openings located at the same face of the building. Additional cross ventilation. Natural ventilation is active during summer, while balanced mechanical ventilation is used during the wintertime. Automated external solar shading shutters

Actuators, Sensors and Control Strategies

Chain actuators operate the façade windows and roof openings, room sensors for temperature, humidity and CO2
Weather station measuring temperature, humidity, CO2, rainfall, wind and solar irradiation on the rooftop
NV Advance™ control system integrated in BMS system controlling the indoor climate in the building
Users can manually open the windows via desktop-solution on their computers that allows opening the nearest window, as well as control the external solar shading device. After a certain time period system switch back to automatic regime

Building Energy Systems (Heating, Ventilation, Cooling, Electricity)

PV installation (1100 m^2)
Solar thermal heating (240 m^2)
Solar cooling with absorption heat pump
Night ventilation is performed by automated window openings
Comfort ventilation is ensured by hybrid ventilation: single side/cross ventilation driven by natural forces or by mechanical ventilation, when the outdoor conditions are not suitable for natural ventilation (wintertime)
Information about the heating system is not available

Building Ownership and Building Facility Management Structures

The building is owned and occupied by Aarhus officers.
Architect: Schmidt Hammer Larsen Architects

Acknowledgements

n/a

Datasheet Source:
WindowMaster A/S