Name: AHUheating_VDI6020

Identifier: 4.1

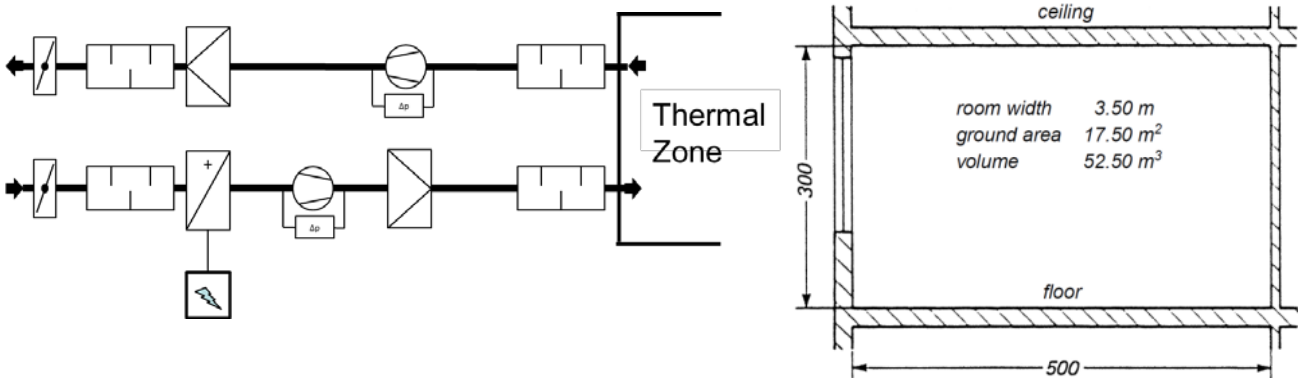
Short identification:
Single thermal zone, one room according to the German guideline VDI 6020.
The HVAC-system consists of an Air-Handling-Unit with an electric device for heating and a pressure controlled fan.

Objective:
This use case focuses on the HVAC system rather than the envelope, since this generic use case is used to investigate the needed data structure of a Modelica model compared to an ifc-file. Based in these models we establish the requirements for the dataflow from BIM to Modelica (depending on the information needed for the components of the specific library). Hence we highlight the difference between the different models and the gap of information that is needed to simulate.

Technical Description thermal zone, according to the VDI 6020:
- One room with a window, on the second floor of a three storey-building:
  - Window area: 10,5 m²
  - Room type: S "difficult"
- Adiabatic (no heat transfer through) internal walls and slabs. Heat transfer only through the outer wall and the window (directed to the south)
- Inner Loads: Occupancy, Plug loads, Lighting
- Weather-data: TRY_dataset for Germany, zone 5 (Aachen)

Technical description HVAC-system:
- Heating loss: 1300 W (Θ_i= 21°C, Θ_e= -12°C)
- An electric heating device
- Two outside air damper
- Silencer in the beginning and end of each air duct
- Filter in each air duct
- Pressure controlled fans in each air duct

Graphical description, HVAC-System and Thermal Zone:



HVAC components needed in the specific BIM/Modelica library to build this use case:

- Air duct
- Supply air damper
- Return air damper
- Silencer
- Pressure controlled fan for supply air (radial/axial)
- Pressure controlled fan for return air (radial/axial)
- Air filter (Supply and Return)
- Electric device for heating or cooling (Peltier element)

Some components listed above are not necessary to run a simulation, but are needed to represent a realistic use case.