**Description:**

In this project, the goal is to implement a humidity control for a room. The aim is to ensure that both parameters temperature and humidity remain stable over time, regardless of changing outdoor conditions in winter or summer. Such a humidity control is needed in environments where sensitive items are stored, for example in a museum to protect artworks), archives, laboratories, or in data centers where precise climate control is critical.

The system includes a mixing box for heat recovery, an air cooler for cooling and dehumidification, a vapor humidifier and an air heater. Additionally, it comprises the thermal zone, the building, and the two controllers for indoor temperature and for indoor humidity.

**Humidity control logic:**

The relative humidity of the outdoor air is measured, from which the absolute humidity is calculated (w\_0).

If the absolute humidity of the outdoor air (w\_0) is lower than the desired indoor setpoint (w\_6\_sp), the air is humidified by the vapor humidifier and then heated by the air heater to achieve the needed supply air temperature.

If the absolute humidity of the outdoor air (w\_0) is higher than the indoor setpoint (w\_6\_sp), the air is dehumidified by the air cooler and subsequently heated by the air heater to reach the needed supply air temperature.