Sizing Report

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# Actuators Limits

## Fan

A close-up of numbers

Description automatically generated with low confidenceThe nominal volumetric flow of our fans is 25.2 m3/h as written in the datasheet. Converting this value to SI unit is useful to calculate the power given and extracted with the cooler and the heater, respectively.

## Cooler

The maximal specific energy that our cooler can extract is approximately 17 kJ/kg of dry air. This value is obtained by subtracting the specific enthalpy after the cooler (hcool) from the specific enthalpy of the ambient (hamb). The measurements are taken once the system is running for long time and steady state is ensured.

If we calculate the maximal useful specific energy for our set up, we receive a value of 12 kJ/kg of dry air. This means that 5 kJ/kg of dry air are lost in the tubes.

## Heater

Similar to the cooler, the maximal specific energy of the heater is approximately 23 kJ/kg of dry air. This value is obtained by subtracting the specific enthalpy at the inlet of the climate chamber (hin) from the specific enthalpy of the ambient (hamb).

# Maximal Climate Chamber Volume