VIENNA UNIVERSITY OF TECHNOLOGY

FACULTY OF PHYSICS

LABORATORY III

Laboratory Report

Heat Pump

Authors:
Raul Wagner
Martin Kronberger
Group 301

Supervisor:
Someone

conducted on:
08 May 2025

1 Preparation before measurement

1. Start the powersource and wait for 15 minutes until it is warmed up.
2. Switch of all other devices connected to the powersource.
3. Start the LabView Program for monitoring the measurment values.
4. Adjust the reading of the powersource, by turning the potentiometer besides the readout display, until the LabView program shows approximately 0.0 W.

2 Determining the performance number at different modes of operation

- At every mode of operation the heat pump was running around 20 minutes.
- The heating coil is submerged in 4.5 litres of water at ambient temperature.
- Every half minute the temperature of the warm water containers and the power consumption of the compressor is measured.
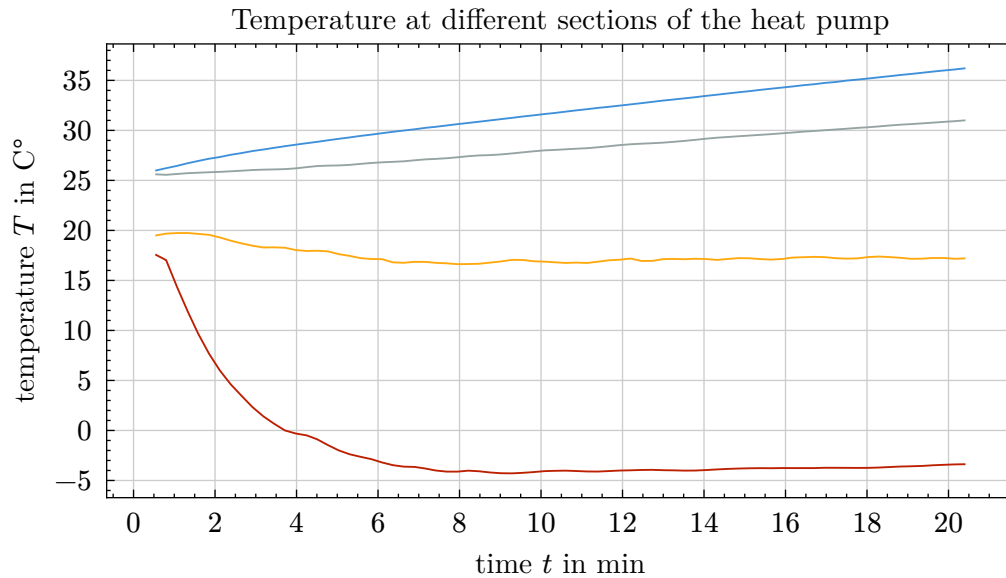- Before every measurement the vaporizer is to be dried.

2.1 Air at free convection
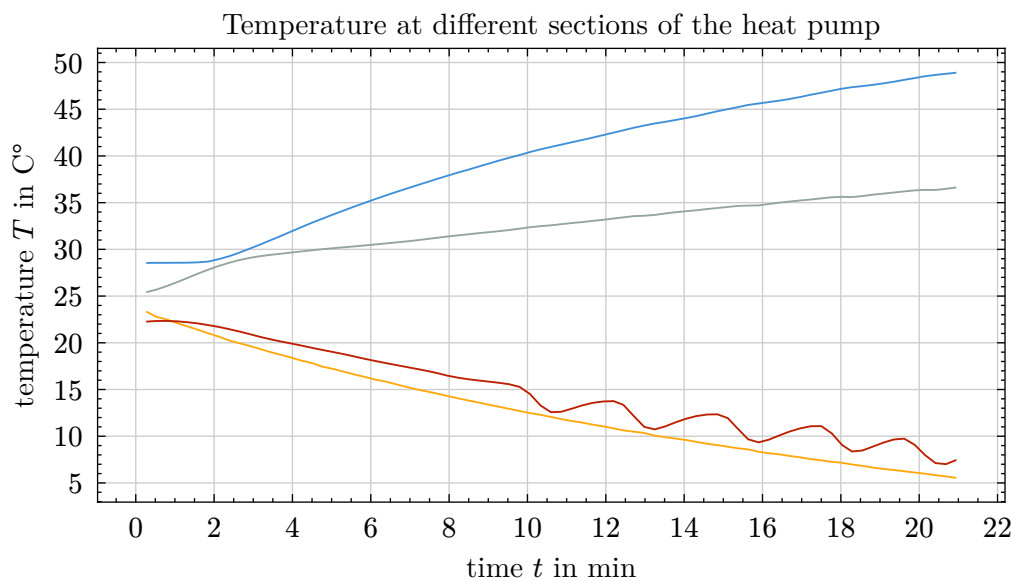
- At minute 12 the vaporizer built up ice on its surface.

Temperature at different sections of the heat pump
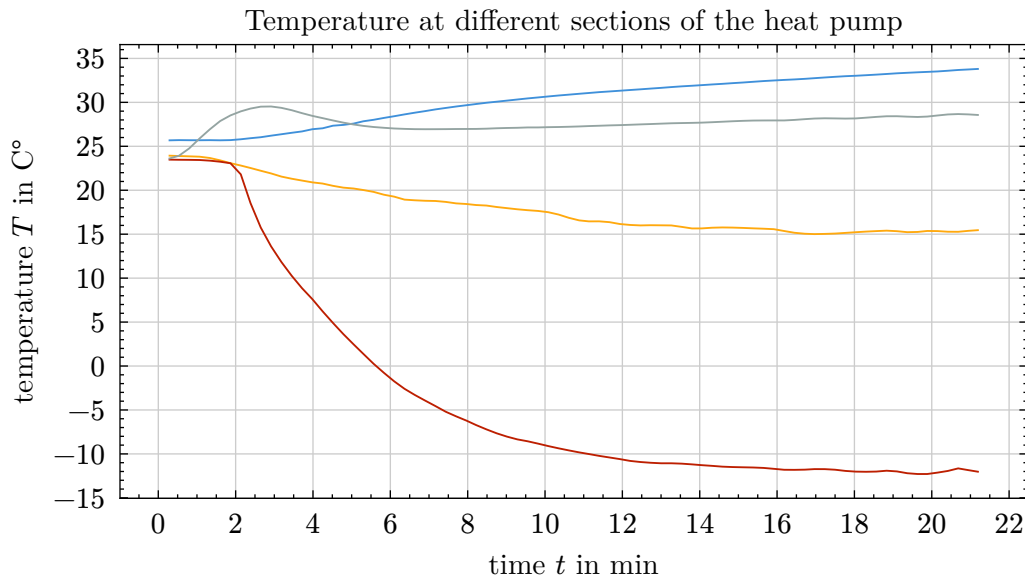
With the power factor of 1.2

2.2 Air at forced convection (ventilation)

Temperature at different sections of the heat pump

With the power factor of 1.2

2.3 Water

Temperature at different sections of the heat pump

With the power factor of 1.9

3 Measurement in the heat pump cycle

- Where in the cycle does the highest temperature occur, and what is its value?
- What is the maximum possible coefficient of performance (ε_i) according to Section 2.4? Compare it with the coefficient of performance measured in Section 2 and with the Carnot coefficient of performance (ε_c).
- What proportion of the working medium is in the gas phase after exiting the expansion valve?

Temperature A	Temperature A	Temperature A	Temperature A	Pressure A	Pressure B
41.9	23.6	25.3	37.2	5.7	11.3