

**Product Name :**  
Astra Scientific Computerized Cascade Refrigeration Trainer

**Product Code :**  
RefrigerationLab0007



**Description :**

Astra Scientific Computerized Cascade Refrigeration Trainer

**Technical Specification :**

The cascade Refrigeration systems with two-stage compression are used for the generation of particularly low temperatures. At very low temperatures large pressure differences are required between the evaporator and condenser. In a compressor the volumetric efficiency drops significantly at high-pressure ratios.

Therefore, two compressors are connected in series, with each compressor only having a relatively low-pressure ratio. This makes a more favorable dimensioning of the low-pressure stage compressor possible. Due to the large specific volume it requires a larger capacity at lower drive power.

In addition, intercooling between the low-pressure compressor (LP) and the high-pressure compressor (HP) reduces the outlet temperature of the HP compressor to harmless values and improves the efficiency of the compression.

All relevant measured values are recorded by sensors and displayed. The simultaneous transmission of the measurements to the software enables analysis and the representation of the process in the log p-h diagram in

real time. Additionally, two flow meters indicate the total volumetric flow rate and the volumetric flow rate in the intercooling.

#### FEATURES:

- Design and function of a refrigeration system with two-stage compression and injection intercooling
- Effect of the inlet temperature at the HP compressor on the efficiency of the compression
  - o With intercooling
  - o Without intercooling
- Effect of the additional refrigerant intercooling
- Distribution of the compressor pressure ratios
- Represent and understand the refrigeration cycle process in the log p-h diagram

#### SPECIFICATION:

- Low-pressure compressor (LP)

Displaced volume: 25,93cm<sup>3</sup>

Power consumption: 550W

Refrigeration capacity: 1744W at -10/32°C

- High pressure compressor (HP)

Displaced volume: 8,86cm<sup>3</sup>

Power consumption: approx. 275W

Refrigeration capacity: 583W at -10/32°C

- Refrigerant

Filling volume: 1,29kg

CO<sub>2</sub>-equivalent: 1,8t

- Measuring ranges

flow rate: 2...29L/h, 4...40L/h

Pressure: 1x -1...15bar, 2x -1...24bar

Temperature: 8x -75...125°C

Power:

0...562W (heater)

0...750W (LP compressor)

0...2250W (HP compressor)

- Required for operation

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase



## Astra Scientific

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