

Refrigerator Model

Overview

Refrigerator model is a part of the refrigeration and air-conditioning training system. In combination with the base unit, the operational model of a domestic refrigerator is created. The model is plugged onto the base unit, secured using fasteners and connected with refrigerant hoses to become a complete refrigeration circuit.



Specifications

- The model of a refrigerator is designed to be plugged into the base unit to simulate a real refrigerator.
- The refrigerator model is composed of inlet and outlet valves, solenoid valves, expansion valves, capillary tube and refrigeration chamber.
- The refrigeration chamber is provided with evaporator, fan and cooling load.
- The chamber is provided with transparent front.
- The expansion elements are selected via solenoid valves to be either expansion valve or capillary tube.
- The sensors are used to record temperature and pressure at different measuring points, the measured values of the sensors can be observed through the software.
- The software operates the solenoid valves, fan, heater and fault simulation.
- The software with control functions and data acquisition are via USB.
- The software acts as an educational software, data acquisition, system operation.
- A non-linear electric heater is used to generate the heating load.

Experiments

Operation Experiment

Faults Simulation Experiments

- Delivery Pipe at the Compressor Clogged
- Intake Pipe at the Compressor Clogged
- Condenser Fan Fault

- Evaporator Clogged
- Evaporator Fan Fault
- Expansion Valve at Refrigeration Fault
- Capillary Tube Clogged Fault

Technical Data

- Refrigerant: R-134a.

Solenoid Valve

- » Ambient temperature range [°C] [Max]: 80 °C.
- » Ambient temperature range [°C] [Min]: -40 °C.
- » Frequency [Hz]: 50 Hz.
- » Power consumption: 12 W.
- » Rel. Humidity [% RH] [Max]: 100 %.
- » Rel. Humidity [% RH] [Min]: 0 %.
- » Supply voltage: 220 V.

Expansion valve

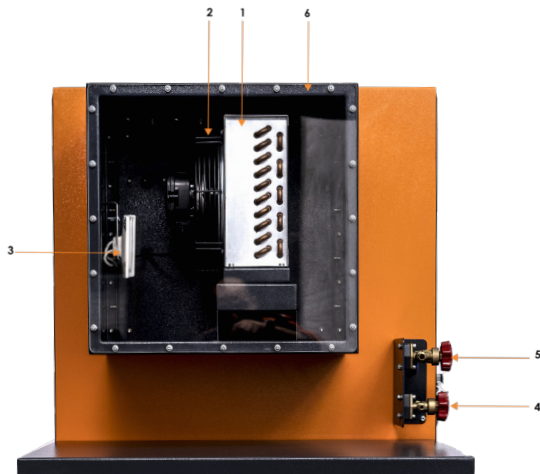
- » Body material: Brass

- » Capillary tube length [in]: 59 in
- » Capillary tube length [mm]: 1500 mm
- » Factory setting (FS) [°C]: 6 °C
- » Flow direction: Single-flow
- » Max. Working Pressure [bar]: 34 bar
- » Static Superheat (SS) [°C]: 4 °C
- » Static Superheat (SS) [°F]: 7.2 °F
- » Temperature range [°C] [Max]: 10 °C
- » Temperature range [°C] [Min]: -40 °C
- » Electric Heater Power: 250 W

Temperature sensor: pt100.

- » Measuring Range: -40 to 60°C.
- » Analogue outputs: 0-10V or 4-20 mA.

Components



1	Evaporator
2	Fan
3	Heater
4	Outlet quick connection
5	Inlet quick connection
6	Refrigeration Chamber

Scope of Delivery

- Refrigerator Model - (AR - 005)
- Hard copy user manual

Options

- Digital Content (BI-01)

Required for Operation

- Base Unit of Refrigeration & A/C System (RA-001)