

HEAT PUMP



DL DKC031

The system can easily demonstrate the operation of an air/water heat pump.

It is possible to study the utilization of environmental energy used to heat water. The refrigerant absorbs the heat environment while passing through the evaporator fan, and subsequently, it is transferred to the water in the condenser.

The hot-water storage tank includes an internal heat exchanger, which can be connected also to the network, in order to exchange energy with the flow of tap water.

The heat, absorbed by the water in the condenser, goes to the hot-water storage tank, where this heat energy it is stored and it can be exchanged with tap water flow.

The system is also ready to operate in an open circuit: the mains water can enter directly to the condenser providing instantaneous heating.

TRAINING OBJECTIVES

- Study of the operation of a heat pump.
- Study of the main components of the heat pump.
- Representation of reversible thermodynamic processes.
- Monitoring temperatures and pressures in the process.
- Use of stored heat.
- Energy balances:
 - in an open circuit.
 - in a closed circuit.

Requirements:

- Power supply: 230V/50 Hz.
- Tap water inlet
- Drain

TECHNICAL DESCRIPTION

The trainer is composed of :

- compressor
- circulation pump
- flow control valve
- accumulator tank
- condenser
- filter/drier
- expansion valve and evaporator fan, water flow meters
- temperature and pressure sensors with display in strategic points of the circuit

TECHNICAL DATA

- Refrigerant: R 134

Compressor:

- Power: 533 W
- Cylinder capacity: 6,1 cm³
- Rated current: 1.58A
- Maximum current: 2.23 A
- Rated voltage: 220-240V

Evaporator

- fins evaporator with fan
- Power: 380W

Fan

- Rated voltage: 230V
- Rated speed: 1500rpm
- Airflow: 250m³/h

Flowmeter

- Scale: 35-350l/h

Condenser:

- Concentric tube exchanger.

Accumulator

- Hot water accumulator with exchanger internal
- Capacity:5.5l

- Circulation of hot water by means of a circulating pump

Temperature sensors:

- Coolant inlet and outlet in condenser
- Water inlet and outlet in condenser.
- Water inlet and outlet in accumulator's coil.

Pressures:

- Compressor coolant inlet and outlet.

Flow rates:

- Water flow over condenser.
- Water flow on accumulator's coil.