ERT105

REVERSIBLE HEAT PUMP AIR-WATER

Experimental capabilities

- **Identification of the components and the circuit of an air/water heat pump**
- **Commissioning and configuration of the heat pump**
- **Configuration of the heating curve and all the parameters**
- **Study of the thermodynamic cycle and enthalpic diagram**
- **Calculation of the thermal power**
- **Maintenance of the heat pump**

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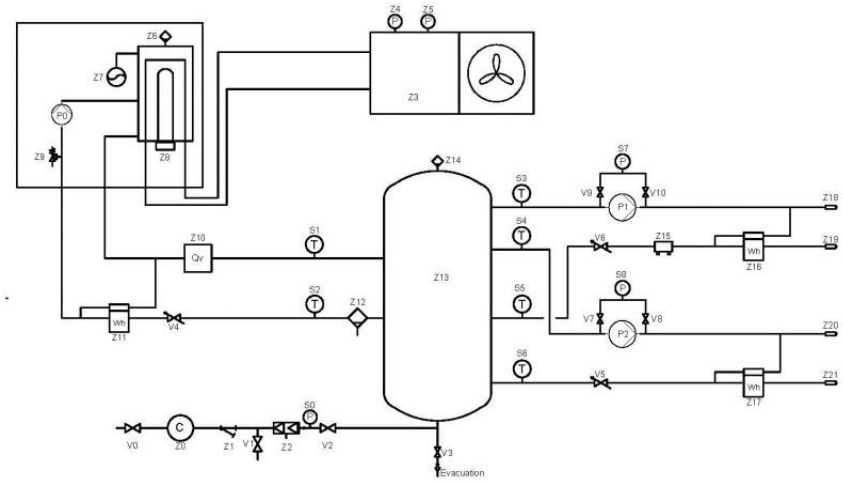
Operating principle

This bench has been designed to study a domestic heat pump (ATLANTIC brand)it includes two circuits for the dissipation of the heat and one tank. The tank is used to slow down the temperature rise and give some time to student to make the measurements and the configuration. The outdoor unit is on the same frame than the indoor unit. The hydraulic circuit include the main water circuit (with the exchanger between the fluid and water), the water tank and two water circuits for the dissipation of heat. Each circuit of dissipation includes a water pump with adjustable speed, a balancing valve on the return and two fittings for the quick connection of the dissipation units (fan heater, radiators..).
The bench is fully instrumented for a maximal pedagogical use.
The robust design of this device makes it suitable for use in schools. The equipment is set up on an Anodized aluminium frame on casters wheels. This gives it great strength and a flexibility of integration into your premises.
The manufacture of this equipment complies with the European standard for machinery manufacturing.

This equipment can be used alone or with other compatible equipment from our range (see last section of this document).

Illustrations



Illustrations

Technical details

1. Heat pump AIR/WATER including an indoor unit and an outdoor unit.
   Nominal power : 8KW
   Brand : Atlantic
   Model : ALFEA EXTENSA
2. Main hydraulic circuit including :
   -a thermal energy meter
   -a balancing valve on the return
   -a dirt separator
   -two thermometers with a dial 0/120°C
3. A buffer tank 50L with a draining valve at the bottom point and an air vent on the top.
4. A filling line with a stop valve, a water meter, a strainer, a backflow preventer and a gauge.
5. Two circuits for the heat dissipation including :
   -a water pump with variable speed (pressure regulation or flow regulation) with a gauge in parallel.
   -two thermometers with a dial 0/120°C
   -a balancing valve on the return
   - a thermal energy meter
   - two fittings for the quick connection of the dissipation units
6. The bench includes an electrical cabinet with the standard protection (main switch, GFCI, emergency stop button), the instrumentation and the regulation :
   -the ATLANTIC box to make the configuration of the heat pump
   -a potentiometer to simulate the outdoor temperature

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Electronical instrumentation

The bench include a touch screen with the display of the following measurements :

On the water circuit :
- -temperature inlet PAC
- -temperature outlet PAC
- -water flow of the main circuit

On the air circuit :
- -temperature inlet exchanger
- -temperature outlet exchanger

On the frigorific circuit :
- -temperature compressor suction
- -temperature compressor discharge
- -temperature expansion valve inlet
- -temperature expansion valve outlet
- -temperature inlet exchanger outdoor
- -temperature outlet exchanger outdoor
- -temperature inlet exchanger indoor
- -temperature outlet exchanger indoor
- -pressure LP
- -pressure HP

On the electrical circuit :
- -electrical power of the indoor unit
- -electrical power of the outdoor unit

Services required

- Electrical supply: 230 Vac – 50 Hz – 10 A
- Electrical network: 1 live(s) + Neutral + Earth.
- Water supply : 15 L/min – 3 bars
- Water drain : on the floor
- Dimensions: (LxWxH mm): 2100 x 800 x 1750
- weight (Kg): 150

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

Documentation

- User's manual
- Pedagogical manual
- Technical documentation of the components
- Wiring diagram
- Fluidic diagram (PID)
- Lab exercises
- Certificate of conformity CE

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