ET 605

Air conditioning system model

Description

- **climatic chamber with latent and sensitive heat source as cooling load**
- **recirculating and outer air operation**
- **optional data acquisition software (ET 605.01)**
- **connection options for the use of different automation solutions**

Air conditioning technology is a key topic in building services engineering. For this reason air conditioning technology plays an important role during the training of skilled workers and engineers.

The clear trainer ET 605 represents a complete air conditioning system with an air duct and a climatic chamber. The main components of the air conditioning system are the air cooler with condensing unit, fan, steam humidifier and air heater. Three motorised ventilation flaps control the air distribution in the air conditioning system. The climatic chamber is equipped with two different heat sources (wet and dry). Temperature and relative humidity are measured at relevant points in the air duct and displayed digitally. For the refrigeration circuit two manometers with integrated temperature scale and a flow meter provide all relevant measurements.

ET 605 is operated manually. A key feature of the air conditioning system is that it is fully ready for various automation solutions. The user can thus focus on this important topic during a lesson. The following solutions are available:

- Software controller ET 605.01
- Industrial air conditioning controller ET 605.02
- Signal connection box ET 605.03 for the integration of an individual user solution.

Learning objectives/experiments

- air conditioning system and its components
- conditioning room air
- mixing different air flows
- representation in the h-x diagram for humid air
  - humidification and dehumidification
  - heating and cooling
- representation of the circuit in the log p-h diagram
- effect of a cooling load (dry and wet)
- recirculating and outer air operation In conjunction with optional accessories
- automation in an air conditioning system

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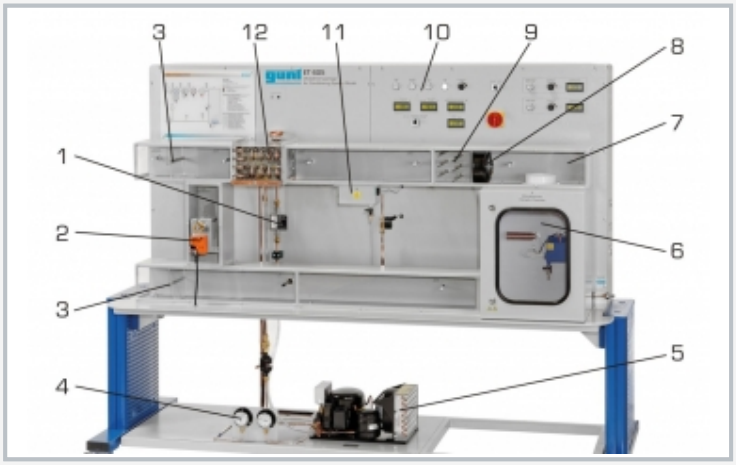
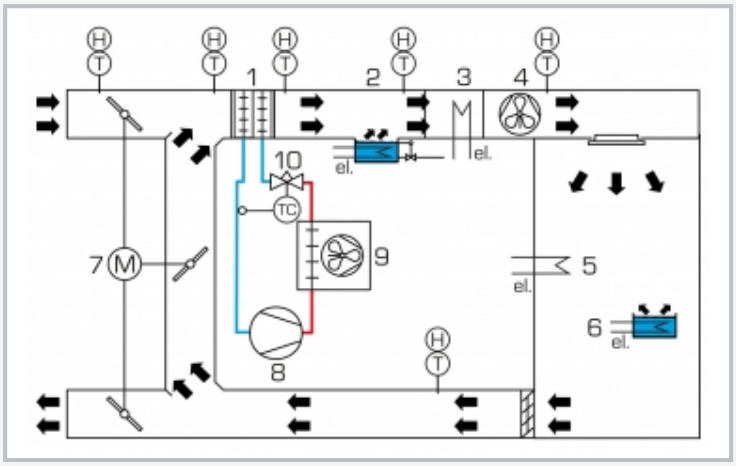
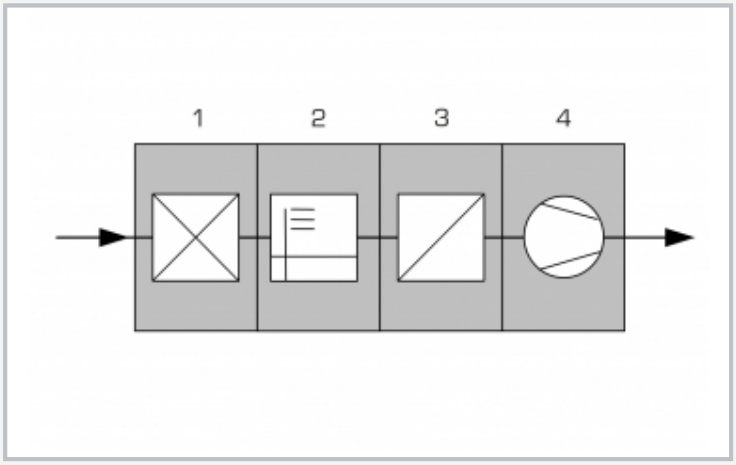


1 refrigerant flow meter, 2 servomotor, 3 ventilation flap, 4 refrigerant manometer, 5 condensing unit, 6 climatic chamber with sensitive and latent heat source, 7 air duct with temperature/humidity sensor, 8 fan, 9 air heater, 10 displays and controls, 11 humidifier, 12 air cooler



1 air cooler, 2 humidifier, 3 air heater, 4 fan, 5 sensitive heat source, 6 latent heat source, 7 servomotor for ventilation flaps, 8 compressor, 9 condenser, 10 expansion valve; T temperature, H humidity



Schematic setup of the air conditioning system in accordance with DIN 1946
1 air cooler, 2 air humidifier, 3 air heater, 4 fan

Specification

[1] model of an air conditioning system with outer air and recirculating operation
[2] air duct with transparent front
[3] air duct with fan, air cooler, humidifier, flaps, air heater and sensors
[4] chamber with wet (latent) and dry (sensitive) heat source as cooling load
[5] motorised flaps for recirculating and outer air operation
[6] process schematic with signal lamps
[7] air conditioning system ready for different automation solutions: 4 data cable connections to integrate the accessories
[8] refrigerant R134a, CFC-free

Technical data

Air-cooled condensing unit
- power consumption: 140W at -10°C
- refrigeration capacity: 320W at +5/40°C

Humidifier
- heating power: 400W

Air heater
- heating power: 360W

2 heaters in the chamber as cooling load
- power output: 0...250W each, freely adjustable

Flow cross-section of the air duct
- WxH: 155x155mm

Measuring ranges
- temperature: 0...50°C
- rel. humidity: 10...90%
- power consumption: 0...600W (condensing unit)
- power: 2x 0...300W (cooling load)
- pressure: -1...9bar / -1...24bar (refrigerant)
- Dflow rate: 1,5...23,5L/h (refrigerant)
- air velocity: 0...2,5m/s

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase
230V, 60Hz, 3 phases
UL/CSA optional
LxWxH: 2250x790x1750mm
Weight: approx. 309kg

Required for operation

water connection

Scope of delivery

1 trainer, filled with refrigerant
1 set of instructional material

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Optional accessories

061.60501	ET 605.01	Software controller with data acquisition
061.60502	ET 605.02	Air conditioning controller
061.60503	ET 605.03	I/O connection box