ET 910

Refrigeration training system, base unit

Learning objectives/experiments

- in conjunction with ET 910.10, ET 910.11, ET 910.13
- design of compression refrigeration circuit
- draining and filling of refrigeration systems
- operation of refrigeration components
- cyclic process of cold production
- fault finding
- different operating modes of the receiver
  - with and without receiver
  - pump-down
  - filling the refrigeration circuit
- compare different expansion elements
- a structured curriculum and a detailed representation of the range of experiments is available in our product brochure ET 910.

Description

- **setup of the most varied refrigeration circuits using modular component kits**
- **clear arrangement of components**

With this training system practical experiments relating to the operation of a refrigeration system can be implemented by dealing with differently configured compression refrigeration circuits. The components used are common in refrigeration and therefore closely related to practice.

The base unit ET 910 includes the main components of a refrigeration circuit: a condensing unit with compressor, condenser and receiver and a refrigeration chamber with integrated evaporator, fan for forced ventilation and an electric defrost heater.

A pressure switch protects the compressor against excessive pressure. The refrigerant flow can be modified via shut-off valves.

Together with the components from ET 910.10, e.g. heat exchanger, flow meter or manometer, simple refrigeration circuits are realised. For continued experiments additional refrigeration components from ET 910.11 are used, e.g. post-injection valve, capacity controller or defrost timer. All components of the training system have ball valves at the connections. Using the required accessory kit ET 910.12 the components are connected into a complete refrigeration system. For the complete experimental setup, ET 910.05, laboratory workplace with frame for mounting the components and power supply, is required. The CFC-free refrigerant R134a serves as working medium.

With the service set ET 910.13 additional exercises for the filling and evacuation of refrigeration systems are carried out.

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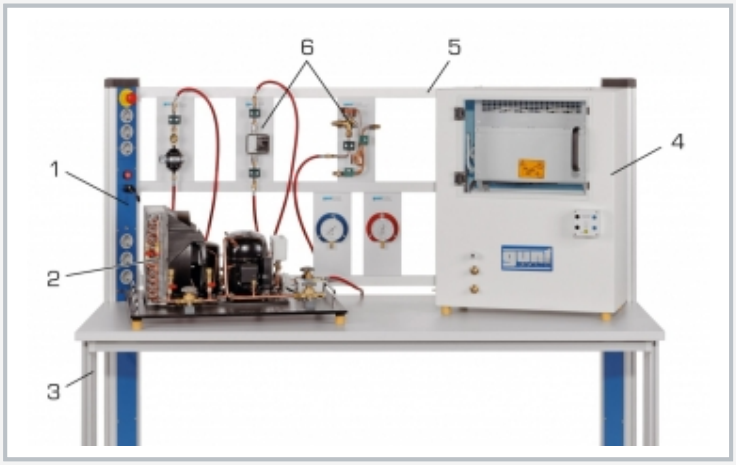
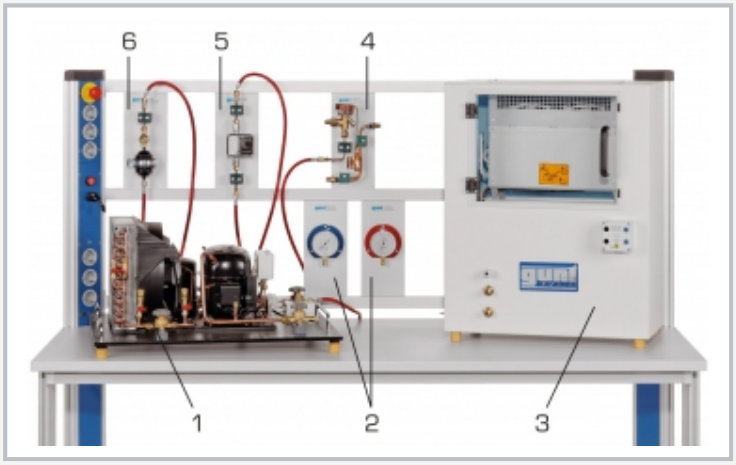


1 power supply (ET 910.05), 2 condensing unit, 3 table (ET 910.05), 4 refrigeration chamber, 5 frame (ET 910.05), 6 components from ET 910.10



1 condensing unit with compressor, condenser and receiver, 2 manometer (ET 910.10), 3 refrigeration chamber with evaporator and electric defrost heater, 4 expansion valve (ET 910.10), 5 flow meter (ET 910.10), 6 sight glass with filter/drier (ET 910.10)

The illustration shows the accessory set ET 910.12.

Specification

[1] base unit for the refrigeration training system
[2] extension with components from ET 910.10 for basic experiments using simple refrigeration circuits
[3] extension with components from ET 910.11 for advanced experiments in refrigeration systems
[4] condensing unit, consisting of hermetic compressor, condenser, receiver, pressure switches and shut-off valves
[5] insulated refrigeration chamber with integrated evaporator, electric defrost heater and condensate drip tray
[6] refrigeration chamber, condensing unit and power supply equipped with shock-proof lab jacks
[7] refrigerant R134a, CFC-free

Technical data

Air-cooled condensing unit
- power consumption: 367W at -10/32°C
- refrigeration capacity: 731W at -10/32°C
- max. volumetric air flow rate: 850m^3/h
- receiver: 1,4L

Evaporator with fan
- capacity: 190W at t=2°C, ΔT=8K
- cooling surface: 1,81m^2
- max. volumetric air flow rate: 140m^3/h
- electric defrost heater: 50W/m

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase
120V, 60Hz, 1 phase
LxWxH: 600x300x700mm (refrigeration chamber)
LxWxH: 670x550x380mm (condensing unit)
Weight: approx. 45kg

Scope of delivery

1 condensing unit
1 refrigeration chamber
1 set of instructional material

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Required accessories

061.91005	ET 910.05	Refrigeration Laboratory Workplace
061.91010	ET 910.10	Refrigeration Components for Basic Experiments
061.91012	ET 910.12	Set of accessories
061.91013	ET 910.13	Maintenance Set

Optional accessories

061.91011	ET 910.11	Refrigeration Components for Advanced Experiments