

HL 720

Ventilation system



Learning objectives/experiments

- design and operation of a ventilation system
- pressure measurements in the air duct
- measure the electric drive power of the ventilator
- determine the flow rate
- design and operation of components such as
 - ▶ protective grating
 - ▶ multi-leaf damper
 - ▶ filter
 - ▶ heat exchanger (operation via HL 722 possible)
 - ▶ ventilator
 - ▶ inspection cover
 - ▶ sound insulation link
 - ▶ ventilation grill with adjustable flow rate
 - ▶ fire protection flap
 - ▶ ceiling vents

Description

- ventilation system with air handler
- high practical relevance due to the use of industrial components from ventilation technology
- representation of pressure curves

In building services engineering ventilation systems are used for commercial premises, hospitals, restaurants or conference rooms to ensure the air exchange in the individual rooms. In real air handling units the air is heated or cooled by a heat exchanger and cleaned by filters, e.g. from pollen.

HL 720 demonstrates the operation of a ventilation system and its components. The components used are common in commercial ventilation technology and therefore are of high practical relevance. The ventilation system is operated as a pure air supply system.

The air enters via a weather louvre and flows through the components of the ventilation system, such as multi-leaf damper and filter. A ventilator ensures the air transport. Further down the air duct, typical components, such as sound insulation link, inspection flap, various air outlets and fire protection flap are arranged.

Sight windows enable an insight into the sound insulation link, filter, ventilator and multi-leaf damper. The original component function remains intact.

The record of pressures and differential pressures at relevant measuring points enables the representation of a pressure curve for the whole system. The components act as in real ventilation systems as flow resistances. The electric drive power of the ventilator is measured and the volumetric air flow rate is calculated.

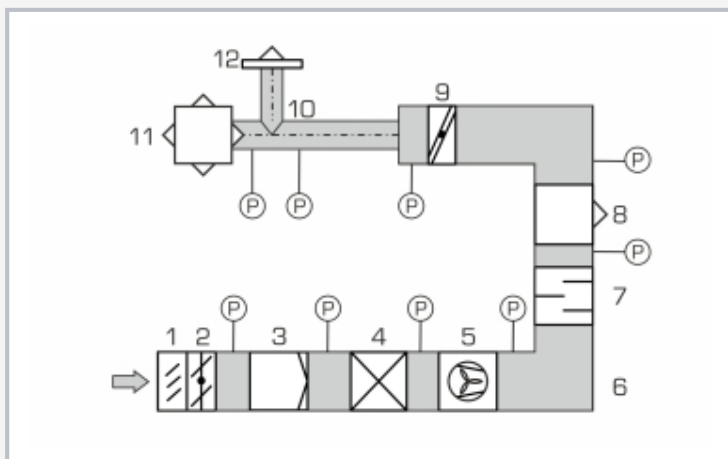
For further experiments, the room temperature control in ventilation systems can be investigated together with HL 722 and an external source of hot water. The heat exchanger of HL 720 is connected to HL 722 using quick-release couplings.

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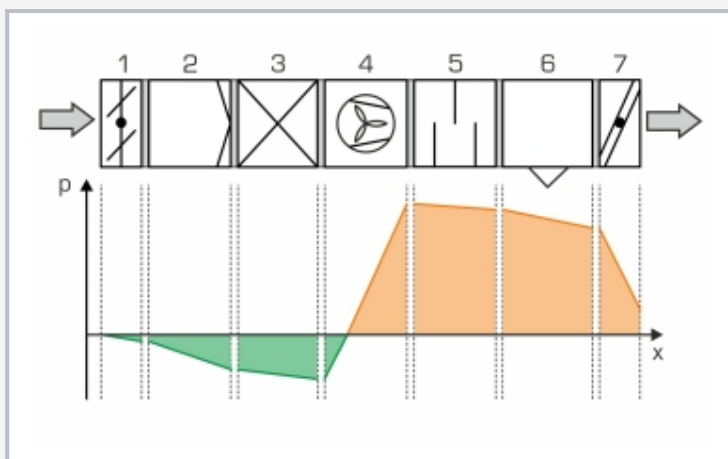
Ventilation system



1 fire protection flap, 2 hand-held measuring unit pressure, 3 weather louvre, 4 multi-leaf damper, 5 filter, 6 heat exchanger, 7 inspection cover, 8 ventilator with drive motor, 9 air duct, 10 sound insulation link, 11 ceiling vent, 12 wall vent



1 weather louvre, 2 multi-leaf damper, 3 filter, 4 heat exchanger, 5 ventilator, 6 air duct, 7 sound insulation link, 8 wall vent, 9 fire protection flap, 10 branch, 11 air outlet for ceiling installations, 12 disc valve; P pressure



Pressure curve within the ventilation system: 1 multi-leaf damper, 2 filter, 3 heat exchanger, 4 ventilator, 5 sound insulation link, 6 wall vent, 7 fire protection flap; red: overpressure, green: vacuum

Specification

- [1] design and operation of a ventilation system
- [2] all components from ventilation technology, some with sight windows
- [3] protective grating and adjustable multi-leaf damper at the air inlet
- [4] filter for air purification
- [5] ventilator with electronically commutated (EC) motor
- [6] 3 sound insulation links
- [7] various air outlets for air distribution in the room: disc valve, ceiling vent and ventilation grill with adjustable flow rate
- [8] inspection cover for inspection purposes
- [9] fire protection flap prevents the cross-over of fire and smoke in the air duct
- [10] air duct with pressure measurement connections
- [11] pressure measurements with hand-held measuring unit
- [12] effective power measurement of the ventilator
- [13] determine the flow rate via differential pressure

Technical data

Air duct

- 2 parts with WxH 612x409mm and 710x304mm

Ventilator

- max. flow rate: 2200m³/h
- max. power drive motor: 1,18kW

Measuring ranges

- pressure: -1...25mbar
- effective power: 0...1200W

400V, 50Hz, 3 phases

400V, 60Hz, 3 phases; 230V, 60Hz, 3 phases

UL/CSA optional

LxWxH: 2150x795x1970mm

Weight: approx. 263kg

Required for operation

drain, cold and hot water connection

Scope of delivery

- 1 experimental plant
- 1 set of instructional material

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Optional accessories

HL 722 Control unit for ventilation system