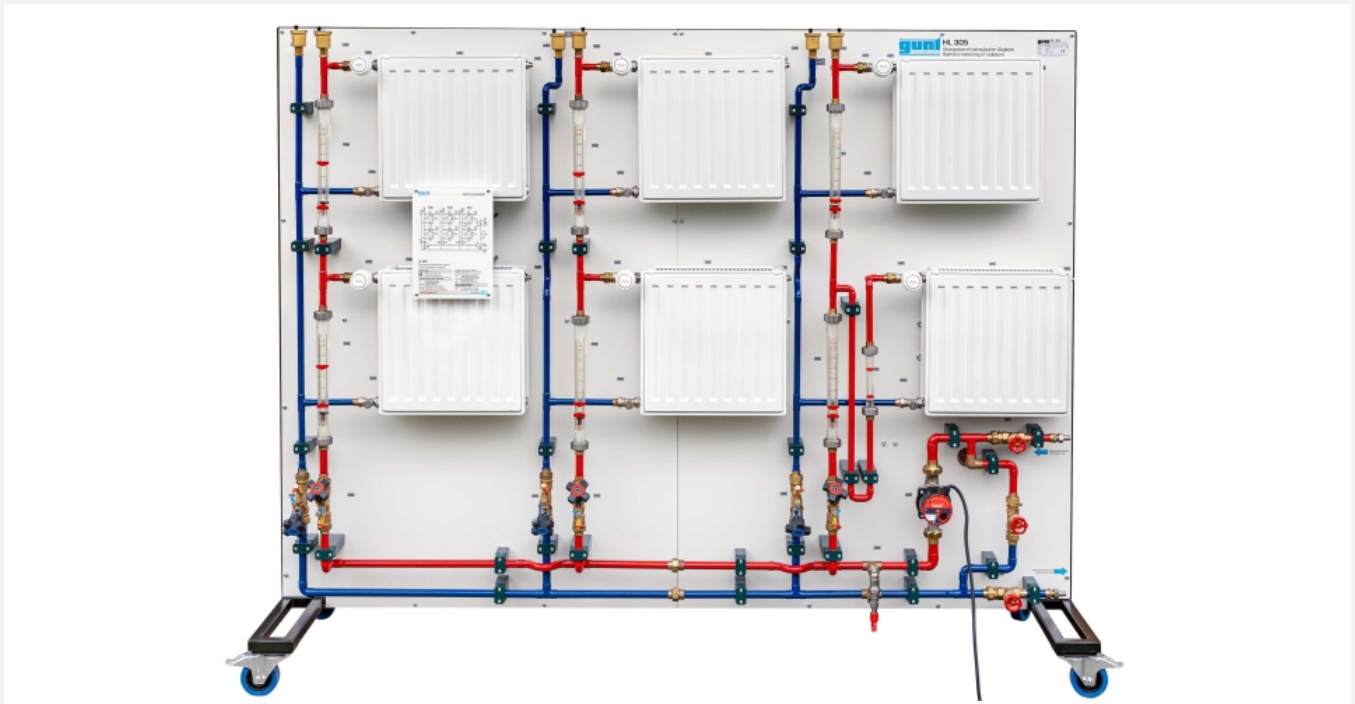


# HL 305

## Hydronic balancing of radiators



### Description

- **balancing of a heating system**
- **presettable valves**
- **connection to external heating circuit possible**
- **water connections made using quick-release couplings**

Hydronic balancing is used to limit the amount of water which is calculated for each radiator. Balancing ensures that all radiators can be supplied with hot water at all operating points according to their thermal requirement. Balancing is usually carried out via presettable thermostatic valves.

HL 305 consists of a closed heating water circuit with six radiators and a circulation pump. The pipe elements used are commercially standard components in heating and sanitary engineering. The clear panel is mounted on a sturdy, movable frame.

The piping system is divided into three heating subcircuits. Each subcircuit has an adjustable balancing valve in the flow and in the return. A different output or flow rate can be set for each subcircuit. All three subcircuits can be shut-off individually.

The adjustable lockshield valve on the radiators simulate pipe resistance as required. The differential pressure across the pipe system is limited using a differential pressure overflow valve.

The hydronic balancing of the individual radiators is carried out via the presettable thermostatic valves according to their predefined outputs. The flow is read on rotameters.

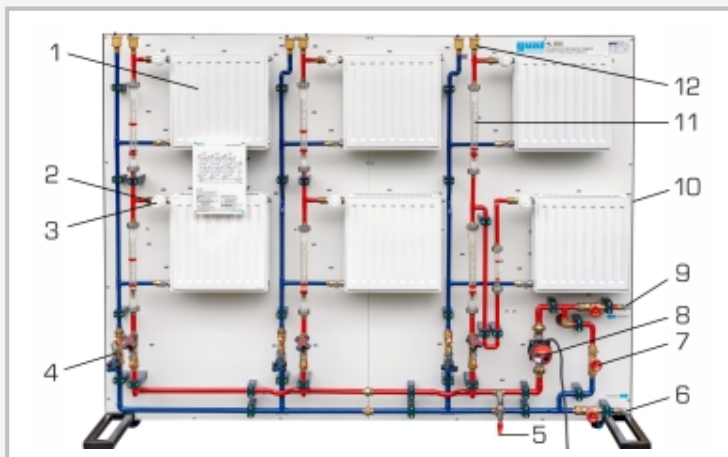
Once filled, the system is independent of the water mains or feed flow and return flow pipe connections. The trainer is equipped with a pressure expansion vessel and a boiler safety group and can also be operated as an open circuit with external heating water.

### Learning objectives/experiments

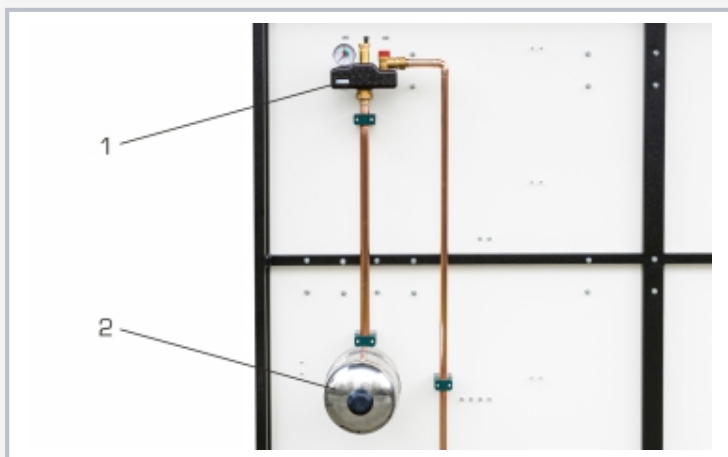
- variable pipework resistance
- familiarisation with a preset balancing valve
- familiarisation with a preset thermostatic valve
- familiarisation with a differential pressure overflow valve

# HL 305

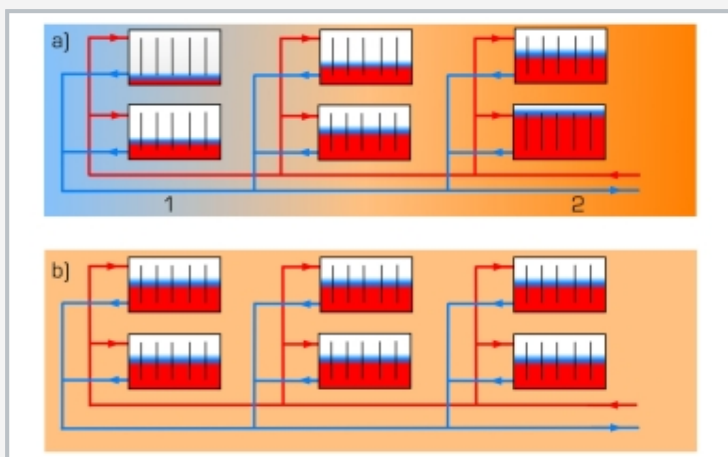
## Hydronic balancing of radiators



1 radiator, 2 thermostatic valve, 3 sensor, 4 balancing valve, 5 differential pressure overflow valve, 6 water connection return flow, 7 gate valve, 8 pump, 9 water connection feed flow, 10 bleed valve for radiator, 11 rotameter, 12 automatic air vent



On the back: 1 boiler safety group according to DIN 4751, 2 expansion vessel



a) distribution of temperature in radiators without hydronic balancing: 1 rooms are too cold, 2 rooms are too warm  
b) distribution of temperature in radiators with hydronic balancing results in equal distribution of temperature in rooms; red: feed flow, blue: return flow

### Specification

- [1] hydronic balancing of a heating system
- [2] pipe elements commercially standard components in heating and sanitary engineering
- [3] 6 radiators with thermostatic valve, bleed valve and adjustable lockshield valve
- [4] 3 subcircuits each with adjustable balancing valve in the feed and return flow
- [5] hydronic balancing can be carried out without tools
- [6] water connections using quick-release couplings for optional connection to an external heating circuit
- [7] expansion vessel, boiler safety group according to DIN 4751
- [8] differential pressure overflow valve ensures pressure equalisation
- [9] flow measurement using rotameter 7 rotameters

### Technical data

#### Pump

- power consumption: 60W
- max. flow rate: 46L/min
- max. head: 4m

6 radiators with thermostatic valves: 400x400mm

6 balancing valves: PN 16

Boiler safety group according to DIN 4751: 2,5bar

Expansion vessel: 8L, admission pressure: 0,5bar

#### Measuring ranges

- flow rate: 1x 30...320L/h, 6x 50...650L/h

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

LxWxH: 2250x750x1790mm

Weight: approx. 210kg

### Scope of delivery

- 1 trainer
- 1 manual