

# HL 392C

## Safety & control in heating systems



### Description

#### ■ trainer for the investigation of heating system safety fittings with data acquisition

Using the trainer various safety and control devices can be investigated and evaluated. Typical industrial components are used.

The measured values are transmitted directly to a PC via USB where they can be analysed using the software included, e.g. representation of the data in diagrams.

### Learning objectives/experiments

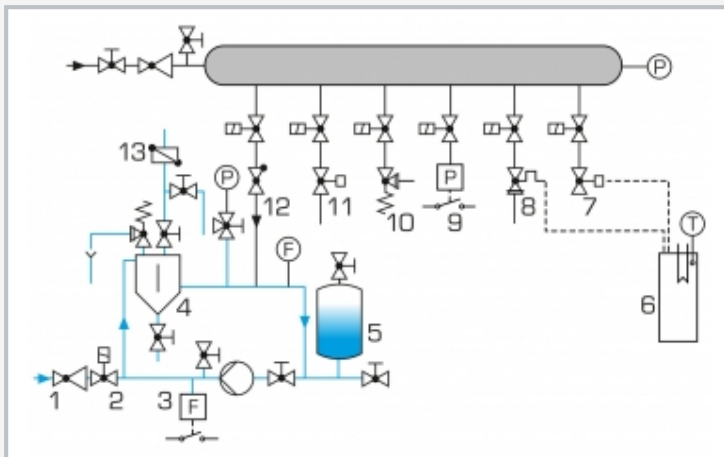
- function and operating behaviour of
  - ▶ safety valve
  - ▶ quick-action ventilating valve
  - ▶ safety pressure cut-out
  - ▶ thermal discharge safety device
  - ▶ thermostatic valve
  - ▶ temperature controller
  - ▶ air separator
  - ▶ flow switch

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## Safety & control in heating systems



1 thermostatic valve, 2 quick-action ventilating valve, 3 safety valve, 4 air separator, 5 non-return valve, 6 pressure reducing valve, 7 flow switch, 8 pump, 9 expansion vessel, 10 heater, 11 thermal discharge safety device, 12 temperature controller, 13 safety valve, 14 safety pressure cut-out



Process schematic: 1 pressure reducing valve, 2 solenoid valve, 3 flow switch, 4 air separator, 5 expansion vessel, 6 heater, 7 temperature controller, 8 thermal discharge safety device, 9 safety pressure cut-out, 10 safety valve, 11 thermostatic valve, 12 non-return valve, 13 quick-action ventilating valve; T temperature, P pressure, F flow; blue: water circuit, grey: compressed air

### Specification

- [1] investigation of heating safety fittings
- [2] demonstration of the function of safety fittings using compressed air: thermostatic valve, safety pressure cut-out, safety valve, temperature controller, thermal discharge safety device
- [3] demonstration of the function of safety fittings in a closed water circuit with circulating pump and expansion vessel: air separator, quick-action ventilating valve, safety valve, flow switch, pressure reducing valve
- [4] electrical heater for thermal safety fittings: temperature controller, thermal discharge safety device
- [5] GUNT software for data acquisition via USB under Windows 7, 8.1, 10

### Technical data

#### Thermal discharge safety device

- actuated at: 98°C

Temperature controller: 70...100°C

Safety pressure cut-out: 1...10bar, adjustable

Safety valve: 2,4bar

Flow switch: 7,7...13,4L/min (increasing flow rate)

Pressure reducing valve: 1,5...6bar

Heater: 800W

#### Pump

- power consumption: 70W
- max. flow rate: 60L/min
- max. head: 4m

#### Measuring ranges

- flow rate: 1...25L/min
- temperature: 0...160°C
- pressure: 2x 0...10bar

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

230V, 60Hz, 3 phases

UL/CSA optional

LxWxH: 2010x750x1910mm

Weight: approx. 226kg

### Required for operation

compressed air: 3bar

water connection, drain

PC with Windows

### Scope of delivery

- 1 trainer
- 1 collecting tank
- 1 GUNT software CD + USB cable
- 1 manual