WL 220  Boiling Heat Transfer Unit

* Experimental unit to demonstrate evaporation in a steam boiler fire tube
* Processing of measured values on a PC
* Operation with environmentally-friendly, special low-boiling liquid

Technical Description
The transparent process tank makes it possible to clearly observe the evaporation process at the heated cylinder. The cylinder is used as a model to demonstrate a fire tube heated from the inside.
An integrated water-cooled condenser allows for a continuous boiling process. The special liquid used evaporates at low temperatures. Relevant measured values can be read on digital displays. At the same time, the measured values can also be transmitted directly to a PC via USB. The data acquisition software is included.

Learning Objectives / Experiments
- observing different forms of evaporation (nucleate, film boiling)
- calculation of heat transfer coefficient
- effect of temperature and pressure on the evaporation process

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1 pressure switch, 2 condenser, 3 process tank with safety valve, 4 display and control panel, 5 heater, 6 discharge and filling valve, 7 water connections, 8 temperature sensor, 9 valve for adjusting the cooling water flow rate, 10 flow rate sensor for cooling water, 11 temperature sensor

Process schematic: 1 pressure switch, 2 evaporating liquid, 3 heater, 4 temperature sensor at heater surface, 5 condenser (water cooled); sensors: E power, T temperature, F flow rate, P pressure

**Specification**

[1] evaporation on a fire tube  
[2] evaporation with heating element  
[3] transparent process tank  
[4] copper piping  
[5] CFC free evaporation liquid Solkatherm SES36  
[6] safety valve  
[7] pressure switch for additional protection of heating circuit, adjustable  
[8] digital displays for measured values  
[9] GUNT software for data acquisition via USB under Windows Vista or Windows 7

**Technical Data**

**Heater**
- power: 250W, continuously adjustable  
- surface area: 0,001875m²  
**Cooler, copper coil**
- diameter: 80mm  
- surface area: 0,0578m²  
Safety valve opens at 2,2bar  
Tank: 2.85L

Measuring ranges
- pressure: 0...4bar absolute  
- power: 0...300W  
- flow rate: 0,05...1.8L/min  
- temperature thermocouple: 0...200°C  
- 1x temperature: -5...105°C  
- 3x temperature: 0...130°C

**Dimensions and Weight**

LxWxH: 900x450x820mm  
Weight: approx. 60kg

**Required for Operation**

230V, 50/60Hz, 1 phase, 120V, 60Hz/CSA, 1 phase  
Water supply and drain

**Scope of Delivery**

1 experimental unit  
2x refrigerant SES36  
1 GUNT software CD + USB cable  
1 set of hoses  
1 manual

**Order Details**

060.22000  WL 220  Boiling Heat Transfer Unit

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