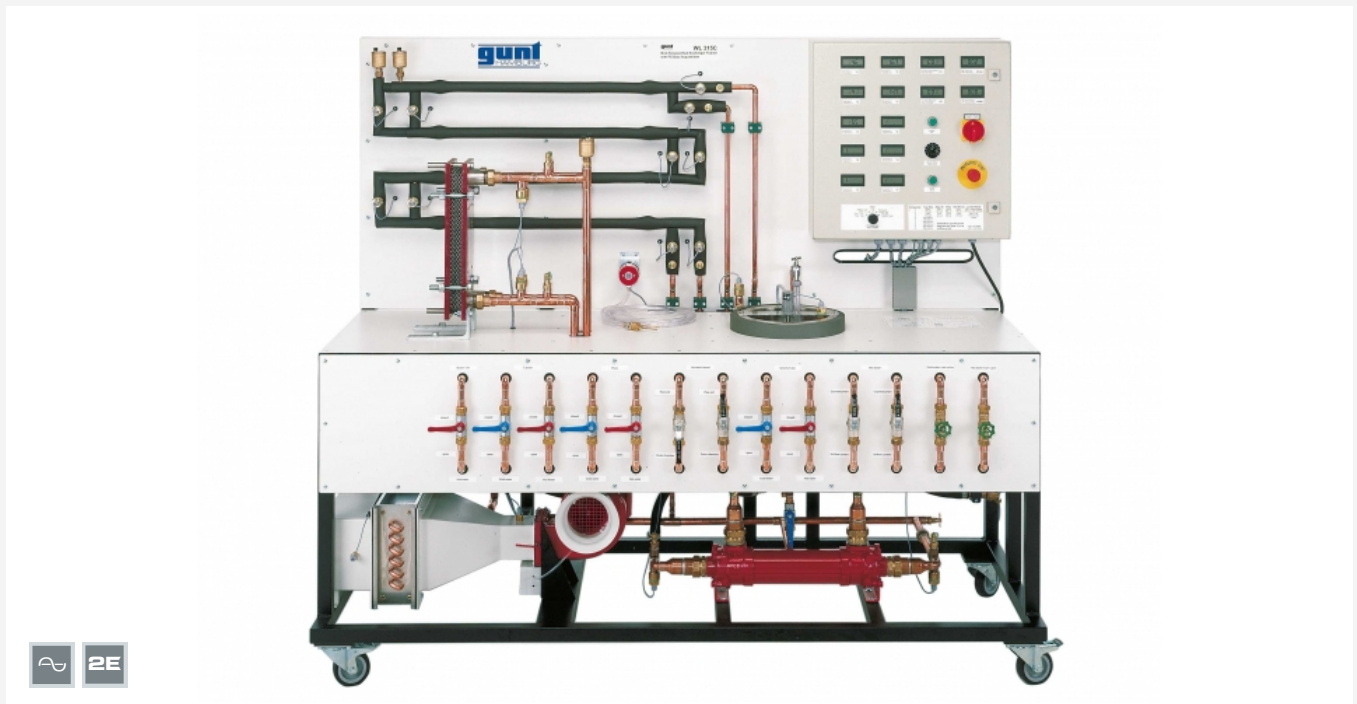


WL 315C

Trainer for various heat exchangers



Description

- examination and comparison of various types of heat exchangers
- various operating modes selectable
- GUNT software for data acquisition

In heat exchangers, thermal energy is transferred from one mass flow to another. The two mass flows do not come into contact with each other in this process. To avoid losses, efficient heat transfer must be ensured. For this reason, different types of heat exchangers are used in practice, depending on the requirements.

The WL 315C trainer enables students to examine and compare five different types of heat exchangers. The heat is transferred in the heat exchangers according to the counterflow or parallel flow principle with different fluids.

The heat exchanger to be examined is selected at the switch cabinet. Valves are used to switch between parallel flow and counter flow. The flow rate in the hot water and/or cold water circuit is also adjusted via valves. The hot water flows through the heat exchanger and transfers part of its thermal energy to the cold water in this process.

The trainer is equipped with sensors for differential pressures and temperatures. The flow rate is measured with an electromagnetic flow meter. The 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.

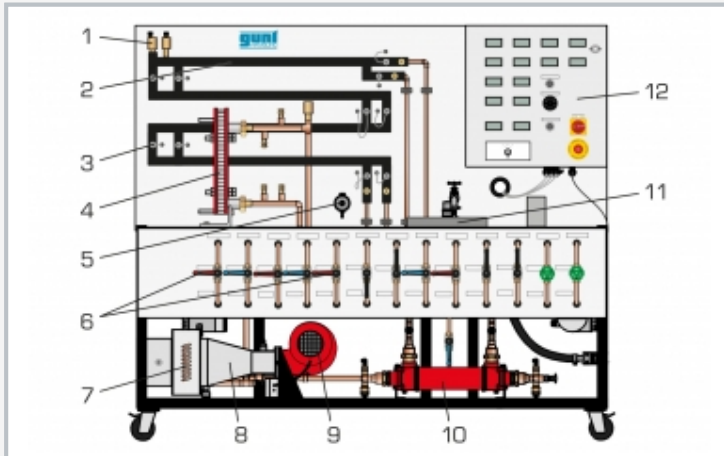
The hot or cold water is supplied from the laboratory or with the accessories WL 312.10 Hot Water Bench and WL 312.11 Cold Water Bench. An optionally available water/steam heat exchanger unit (WL 315.01) and the electrical steam generator (WL 315.02) extend the scope of experiments.

Learning objectives/experiments

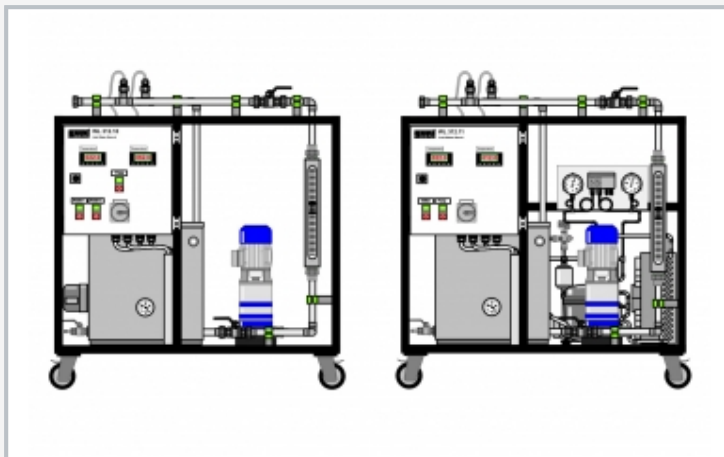
- familiarisation with heat transfer processes
 - ▶ heat transfer
 - ▶ heat conduction
- measuring of relevant temperatures and flow rates
- determination of the overall heat transfer coefficient
- preparation of temperature curves for the various types of heat exchanger
 - ▶ parallel flow
 - ▶ counterflow
 - ▶ cross parallel flow
 - ▶ cross counter flow
- comparison of various types of heat exchanger
 - ▶ plate heat exchanger
 - ▶ tubular heat exchanger
 - ▶ shell and tube heat exchanger
 - ▶ finned cross-flow heat exchanger
 - ▶ jacketed vessel with stirrer

WL 315C

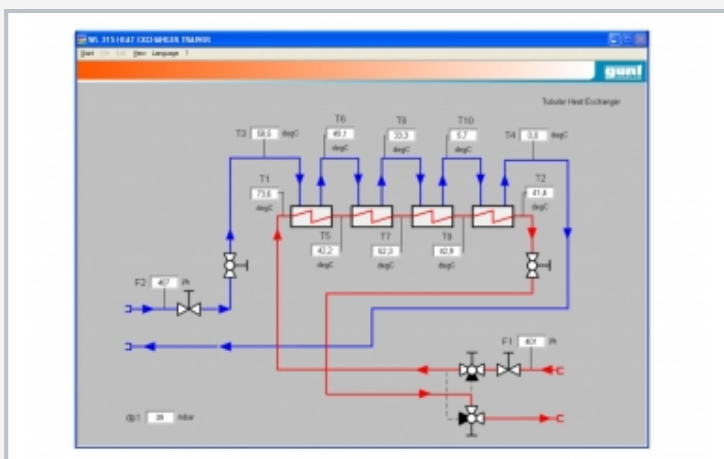
Trainer for various heat exchangers



1 bleed valve, 2 tubular heat exchanger, 3 temperature sensor, 4 plate heat exchanger, 5 pressure sensor (water), 6 adjustment valves and fittings, 7 finned cross-flow heat exchanger, 8 inlet duct, 9 fan, 10 shell and tube heat exchanger, 11 jacketed vessel with stirrer, 12 switch cabinet



Supply of hot water (WL 312.10) and cold water (WL 312.11). This ensures that the WL 315C can be operated as an independent system with a closed water circuit.



Software screenshot: process schematic of a tubular heat exchanger

Specification

- [1] examination and comparison of various heat exchanger types
- [2] 5 different types of heat exchangers included in the scope of delivery
- [3] finned heat exchanger with fan
- [4] operating mode (parallel flow or counter flow) selectable via valves
- [5] flow rates adjustable via valves
- [6] electromagnetic flow meter
- [7] digital displays for temperature, pressure differences and flow rate
- [8] hot and cold water benches (WL 312.10 and WL 312.11) available for independent operation
- [9] water/steam heat exchanger unit (WL 315.01) and electrical steam generator (WL 315.02) available for further experiments
- [10] GUNT software for data acquisition via USB under Windows 7, 8.1, 10

Technical data

- Plate heat exchanger, 10 plates
 - heat transfer surface area: approx. 0,26m²
 - capacity: 15kW
- Tubular heat exchanger
 - heat transfer surface area: 0,1m²
- Shell and tube heat exchanger
 - capacity: 13kW
- Finned cross-flow heat exchanger
 - heat transfer surface area: approx. 2,8m²
 - max. flow rate fan: 780m³/h
 - max. pressure difference fan: 430Pa
- Jacketed vessel with stirrer
 - heat transfer surface area (vessel): 0,16m²
 - heat transfer surface area (coil): 0,17m²

Measuring ranges

- differential pressure:
 - ▶ 1x 0...10mbar (air)
 - ▶ 1x 0...1000mbar (water)
- flow rate: 2x 0...3m³/h
- temperature: 10x 0...100°C

230V, 50Hz, 1 phase
 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase
 UL/CSA optional
 LxWxH: 2010x800x1760mm
 Weight: approx. 250kg

Required for operation

cold and hot water connection, drain
 PC with Windows recommended

Scope of delivery

- 1 trainer
- 1 GUNT software CD + USB cable
- 1 set of instructional material

WL 315C

Trainer for various heat exchangers

Optional accessories

060.31210	WL 312.10	Hot water bench
060.31211	WL 312.11	Cold water bench
060.31501	WL 315.01	Water/steam heat exchanger unit
with		
060.31502	WL 315.02	Electrical steam generator 12kW