WL 110
Heat exchanger supply unit

The illustration shows the WL 110 supply unit and the WL 110.01 accessory, screen mirroring is possible on up to 10 end devices

Description

- **comparison of different heat exchangers**
- **intuitive experiment execution via touch screen (HMI**
- **integrated router for operation and control via an end device and for screen mirroring on up to 10 end devices: PC, tablet, smartphone**
- **automatic identification of accessories via RFID technology**

Heat exchangers transfer thermal energy from the flow of one medium to another. The two flows do not come into direct contact with one another. Efficient heat transfer is a prerequisite for economical processes. Therefore, different heat exchanger types are used in practice depending on the requirements.

The main function of the WL 110 is to provide the required cold and hot water circuits. To do this, the supply unit is equipped with a heated tank and pump for the hot water circuit as well as connections for the cold water circuit. The cold water circuit can be fed from the laboratory mains or the water chiller WL 110.20.

The measurement, control and the communication systems are provided by WL 110.

Different types of heat exchangers are available as optional accessories. The accessories are simply and safely positioned on the worktop of WL 110. After positioning, the supply unit identifies the respective accessory via RFID technology, automatically selects the appropriate software in the PLC and performs an automatic system configuration. The unit is operated via a touch screen. By means of an integrated router, the experimental unit can also be operated and controlled via end device. The user interface can be displayed on up to 10 end devices (screen mirroring). The user interface includes a guided experiment setup, learning modules with theoretical basics and a graphical representation of the measured values.

For tracking the experiments, up to 10 external workstations can be used simultaneously via the local network using a LAN connection. Via the PLC, the measured values can be stored internally. Access to stored measured values is possible from end devices via WLAN with integrated router/ LAN connection to the customer's own network.

Learning objectives/experiments

- in conjunction with a heat exchanger (WL 110.01 to WL 110.05)
  - plotting temperature curves
  - determining the mean heat transfer coefficient
  - comparing different heat exchanger types
- PLC software content adapted to the specific accessories with
  - info: device description and learning module with theoretical fundamentals
  - experiment preparation: guided experimental setup
  - experiment overview: digital recording of measured values with graphical representation
  - taking screenshots
  - access to stored measurement data from end devices
- screen mirroring: mirroring of the user interface on up to 10 end devices
  - menu navigation independent of the user interface shown on the touch screen

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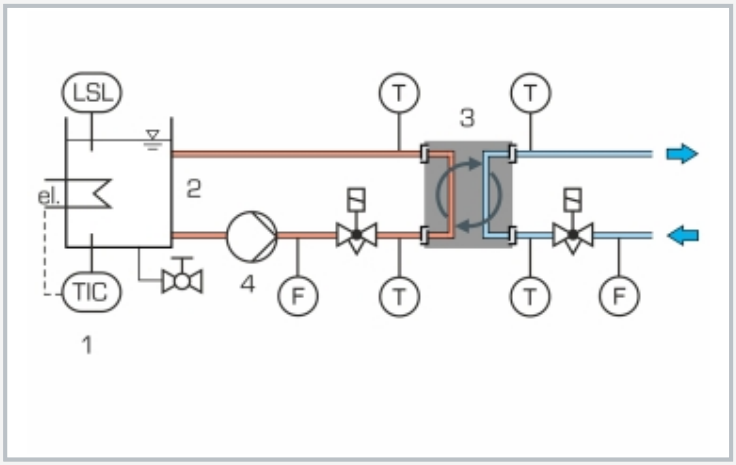
1 touchscreen of the PLC, 2 connections for heat exchanger sensors and power supply, 3 heat exchanger positioning, 4 RFID identification, 5 connections for cold water circuit, 6 water connections for heat exchanger, 7 water tank for hot water



1 temperature controller, 2 heated tank, 3 heat exchanger available as accessory WL 110.01 to WL 110.05, 4 pump; red: hot water circuit, blue: cold water circuit; F flow rate, T temperature, TIC temperature controller, LSL level

Intuitive user interface on the touch screen: temperature curve for WL 110.01 in counter-flow operation

Specification

[1] supply unit for investigation and comparison of different heat exchangers (WL 110.01 to WL 110.05)
[2] automatic identification and configuration of accessories via a contactless, electronic RFID interface
[3] plant control with PLC, operation via touch screen
[4] screen mirroring: possible to mirror the user interface on up to 10 end devices
[5] hot water circuit with tank, heater, pump and protection against lack of water
[6] cold water circuit from laboratory mains or water chiller WL 110.20
[7] water connections with quick-release couplings
[8] data acquisition via PLC on internal storage, access to stored measured values via WLAN with integrated router/ LAN connection with customer's own network

Technical data

PLC: Weintek cMT3092X

Pump
- power consumption: 120W
- max. flow rate: 600L/h
- max. head: 30m

Heater
- power output: 3kW
- thermostat: 10...70°C

Flow control for hot and cold water circuit: 0,3...3L/min

Hot water tank: approx. 10L

Measuring ranges
- temperature: 5x 0...100°C
- flow rate: 2x 0,3..3L/min

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase; 230V, 60Hz, 3 phases
UL/CSA optional
LxWxH: 1000x700x600mm
Weight: approx. 52kg

Required for operation

WL 110.20 or cold water connection, drain
PC with Windows recommended

Scope of delivery

1 experimental unit
1 ventilation
1 water drain
1 set of instructional material

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Required accessories

060.11001	WL 110.01	Tubular heat exchanger
or		
060.11002	WL 110.02	Plate heat exchanger
or		
060.11003	WL 110.03	Shell & tube heat exchanger
or		
060.11004	WL 110.04	Stirred tank with double jacket and coil
or		
060.11005	WL 110.05	Finned tube heat exchanger

Optional accessories

060.11020	WL 110.20	Water chiller
020.30009	WP 300.09	Laboratory trolley