

## WL 312 Heat transfer in air flow

The base unit and an extensive range of accessories enable comprehensive investigations on heat exchangers, as used in air conditioning and ventilation technology.

- investigation of convective heat transfer in heat exchangers from air conditioning and ventilation technology
- how different pipe surfaces affect the temperature change of the air

- determination of the flow profile in the air duct downstream of the heat exchanger with the vertically movable Pitot tube, the static probe at the air duct and an inclined tube manometer
- determination of the air flow velocity over the measuring nozzle at the inlet into the air duct. The velocity can be set within wide limits via a throttle valve at the blower outlet.
- optional hot and cold water generators (WL 312.10, WL 312.11) allow operation independent of the laboratory network
- optional condensing unit WL 312.12 for use with the direct evaporator WL 312.03



### Optional accessories for supplying the heat exchangers



**WL 312.10**  
Hot water generator

The heat exchangers WL 312.01 and WL 312.02 can be supplied from the hot water generator. The heat exchangers then function as air heaters.



**WL 312.11**  
Water chiller

The heat exchangers WL 312.01 and WL 312.02 can be supplied from the cold water generator. The heat exchangers then function as air coolers.



**WL 312.12**  
Condensing unit

The condensing unit is used for air cooling while operating the WL 312.03 direct evaporator.

### WL 312 + heat exchangers WL 312.01 – WL 312.03

**WL 312.01**  
Heat transfer with plain tubes



Heat exchangers with **smooth tubes** are used in systems where deposits on the tube must be avoided and fast and effective cleaning is desirable. This **water-to-air heat exchanger** is inserted into the air duct of WL 312 and fixed in place with fasteners. It is connected to the hot or cold water supply via hoses with quick-release couplings. A transparent cover provides a view inside the heat exchanger. The water flows through the tube bundle. The air travels through the heat exchanger in cross flow.

**WL 312.02**  
Heat transfer with finned tubes



Heat exchangers with **finned tubes** are used when optimum heat transfer between gaseous media and liquids is to be achieved and the media must not be contaminated. This **water-to-air heat exchanger** is inserted into the air duct of WL 312 and fixed in place with fasteners. It is connected to the hot or cold water supply via hoses with quick-release couplings.

The tube bundle consists of finned tubes, which are often used in water-air heat exchangers. A transparent cover provides a view inside the heat exchanger. The water flows through the tube bundle. The air travels through the heat exchanger in cross flow.

**WL 312.03**  
Heat transfer on refrigerant evaporator



This device, known as a **direct evaporator**, is inserted into the air duct of WL 312 and fixed in place with fasteners. It is connected to a condensing unit via hoses with quick-release couplings.

The refrigerant evaporates in the tubes and extracts heat from the air. The **tubes** are **ribbed** to increase the heat transfer surface. Again, the transparent cover provides a view inside the evaporator.

### Optional accessories

**WL 312.10**  
Hot water generator

or

**WL 312.11**  
Water chiller

**WL 312.10**  
Hot water generator

or

**WL 312.11**  
Water chiller

**WL 312.12**  
Condensing unit