
euroclima

5.6 Hygienic AHU's

- After assembly all grooves and joints at the connection positions must be sealed with the supplied sealing agent.
- In case of exchange of components sealing must be restored.
- Access of components is ensured by door positions upstream and downstream of the component, therefore components are accessible or side removable for cleaning and maintenance.
- Carry out installation of ducts, tubes and electrical installation in order to ensure access and function of doors.

6 Installation

The following instructions shall be observed exactly!

6.1 Heat exchanger connection

6.1.1 General notes

Before connecting the heat exchanger, the piping system must be rinsed thoroughly.

To prevent damage of the heat exchanger connection, it is necessary to hold against with a pipe wrench during the screwing (**Figure 97**).

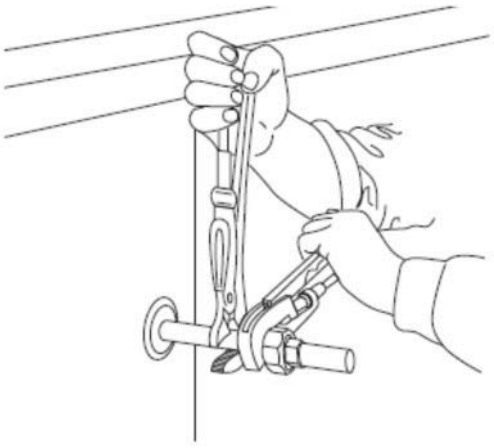

Figure 97: Holding against with a pipe wrench

An absolutely stress-free connection has to be ensured and the transmission of vibrations and longitudinal expansion between the device and the piping system must be safely prevented.

The piping of the heat exchanger should hinder a for maintenance required expansion of the heat exchanger as less as possible.

Recommended sealing material for threaded sleeves:
- Steam heat exchanger, use special sealant
- Water / glycol heat exchangers, use Teflon tape.

In these cases, hemp cannot be used as sealing material!

The connection of the heat exchanger is to execute as indicated on the label on the AHU (connection diagrams in **Figure 98**).

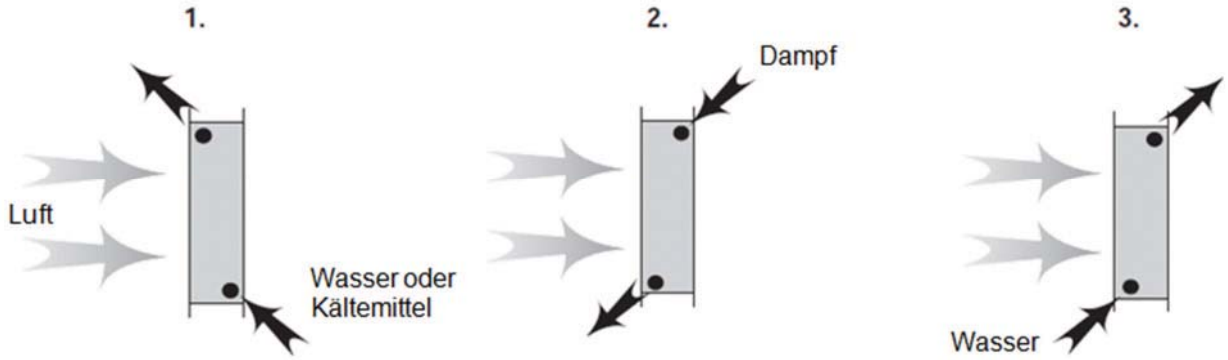

Figure 98: Heat exchanger connection

The heat exchanger operates according to the cross-counter-flow principle. Only preheat can be supplied for parallel flow operation on request.
1. All standard heating and cooling heat exchangers - counter flow
2. Steam heat exchangers: steam inlet top, condensate bottom - counter flow
3. Preheat heat exchanger (freezing risk - on request) - parallel flow

Hydraulic connection schemes of heating or cooling coil should be carried out as shown in the scheme **Figure 99** with a three way valve as a mixing valve. Compared with a flow control using a straight-through valve this connection avoids unequal temperature profiles, in that way air heating or cooling is quite uniform along the coil surface.

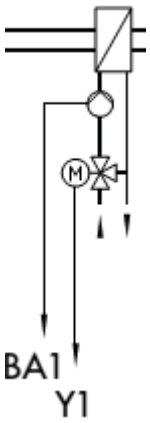

Figure 99: Hydraulic connection scheme

To vent and drain the heat exchanger connection, valves are mounted (on request). To ensure correct operation must be ensured, however, that the vent is on the highest point of the whole water cycle and the drain at the lowest. Otherwise, the valves shall be mounted on another suitable point in the circuit.

Figure 100: Drain valve

Figure 101: Vent valve

6.1.2 Steam heat exchanger

The heater is heated to above 70 °C, next to heater plastic parts are installed. To prevent damage on the plastic parts, on responsibility of the client is requested the following:

- Supply and installation of thermostat
- thermostat trigger temperature: 70°C
- thermostat probe position: approx. 100 mm downstream of airflow through steam heat exchanger / approx. 100mm below of top panel
- integration of thermostat in AHU control system in a way that immediately after triggering steam supply to heat exchanger is interrupted
- function: interruption of steam supply at overtemperature for example because of missing airflow

6.1.3 Plate heat exchangers for refrigeration circuits

Refrigeration circuits of ETA-POOL-Units may contain a plate heat exchanger as optional. Connect it to pool water or water for domestic use according to blue arrows of **Figure 102:**

- Bottom inlet
- Top outlet

Figure 102: Plate heat exchangers for refrigeration circuits

Application of plastic water tubes is not allowed because refrigerant - and therefore also plate heat exchanger - may reach temperatures of 110°C or higher!

- Never install the chloration in front of the water inlet of the plate heat exchanger. The chloration should be as far away from the plate heat exchanger as possible (see **Figure 103**).
- The water inlet should be close to the surface and the outlet near to the bottom. This improves the mixing of the heated water and mainly prevents the entrance of chlorine particles or concentrated solution into the plate heat exchanger (see **Figure 103**).

Warning: Unfortunately, in practice the chlorination is often located in front of the plate heat exchanger inlet. This improves the chlorination, but it is potentially harmful to the plate heat exchanger.

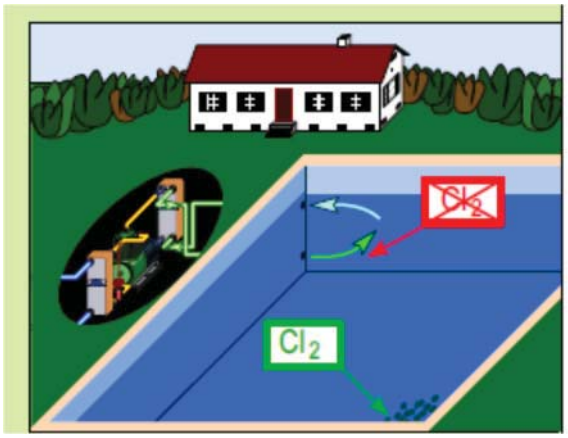

Figure 103: Notes concerning plate heat exchangers

- pH-value: should be kept as high as possible; but at least 7,5
- Cl2: continuous < 0,5 ppm near the plate heat exchanger inlet
  maximum < 2 ppm
- Cl- < 150 ppm, if the water is heated to 50-60°C
  < 100 ppm, if the water is heated to 70-80°C

6.2 Connection of indirect adiabatic cooling

ETA-PAC-AHU's are equipped with an indirect adiabatic cooling device. Carry out connection to piping system as shown in **Figure 104**.

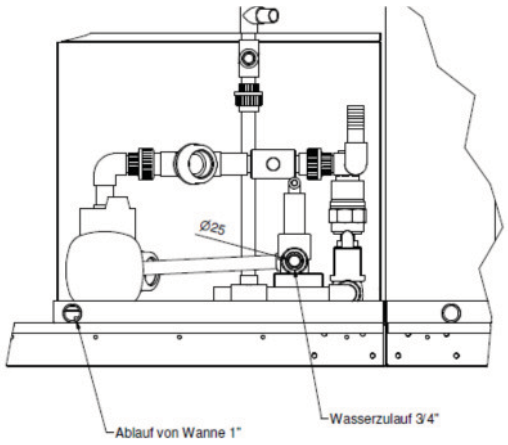

Figure 104: Indirect adiabatic cooling

6.3 Condensate drain

Each drain must be equipped with a siphon. Siphons are available as accessories from EUROCLIMA.

6.3.1 Standard siphons

A space-saving design of the necessary siphon height we can do on request. Contact your sales representative for detailed information.

The following conditions are essential for correct operation:
- At each drain a siphon must be connected.
- Several drains may not be connected to one siphon.
- The water from the siphon must run in a funnel.
- Before starting, fill the siphon with water.
- In case of outdoor units an antifreeze mechanism has to be provided on site.

The heights H1, H2 and H3 can be determined from the maximum negative pressure (p) and maximum pressure (p) in the section of the siphon or be determined by the information on the technical data sheet as follows:

Total pressure	pges	= 1196 Pa
Dynamic pressure	pdyn	= 83 Pa
Total static pressure	pstat = pges – pdyn	= 1113 Pa

1 mmWS = 9,81 Pa

H1 > 1113/9,81 = 114 mm + 15 mm (Safety) = about 130 mm
H2 = 65 mm

Siphon on suction side (in direction of airflow before the fan), see **Figure 105**.

H1 [mm] > p [mm WS]
H2 [mm] > p/2 [mm WS]

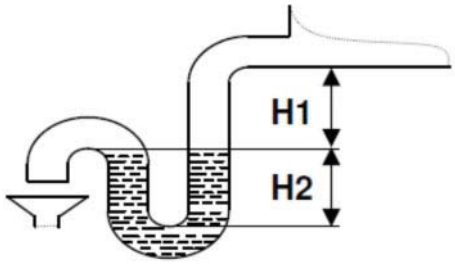

Figure 105: Siphon on suction side

Siphon on pressure side (in direction of airflow after the fan), see **Figure 106**.

H3 [mm] > p [mm WS]
H4 [mm] ≥ 0

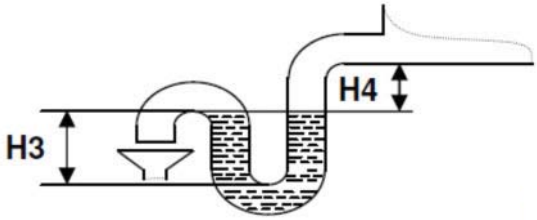

Figure 106: Siphon on pressure side

6.3.2 Ball siphons

If ball siphons with the below shown design are included in the delivery from EUROCLIMA, then the following items should be observed during installation:

Depending on the suction side or pressure side mounting position, the siphon body has to be installed so that the direction of the arrow (see **Figure 107**) corresponds to the flow direction.

- Pa = suction side
+ Pa = pressure side

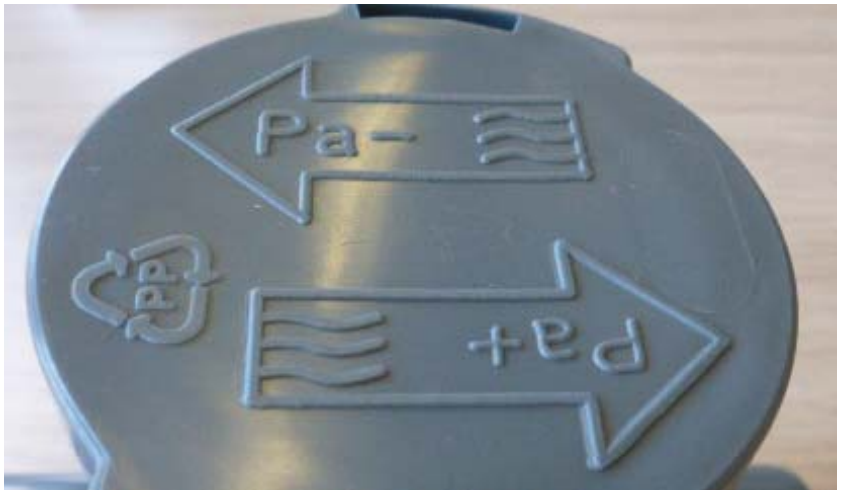

Figure 107: Observe the mounting position - flow direction according to the arrow

Siphon on suction side (in direction of airflow before the fan)

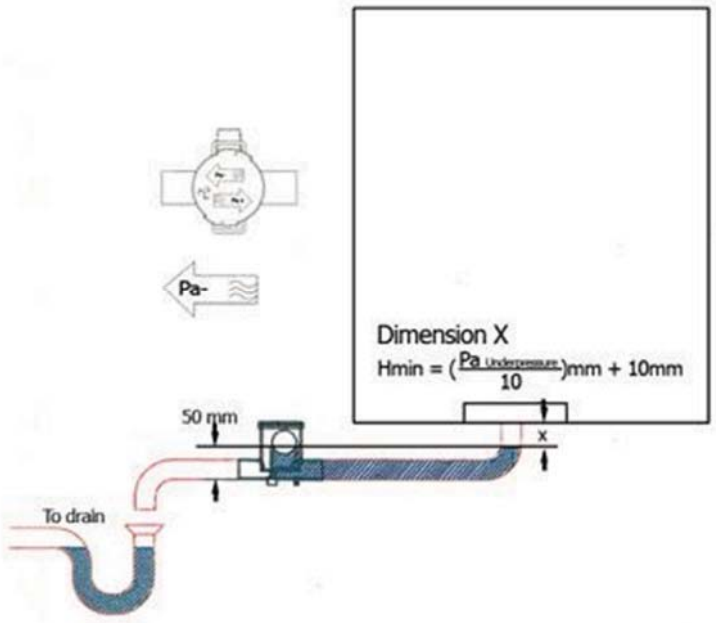

Figure 108: Suction side execution

Siphon on pressure side (in direction of airflow after the fan)

The black plug must be removed for the pressure side installation (see **Figure 110**).

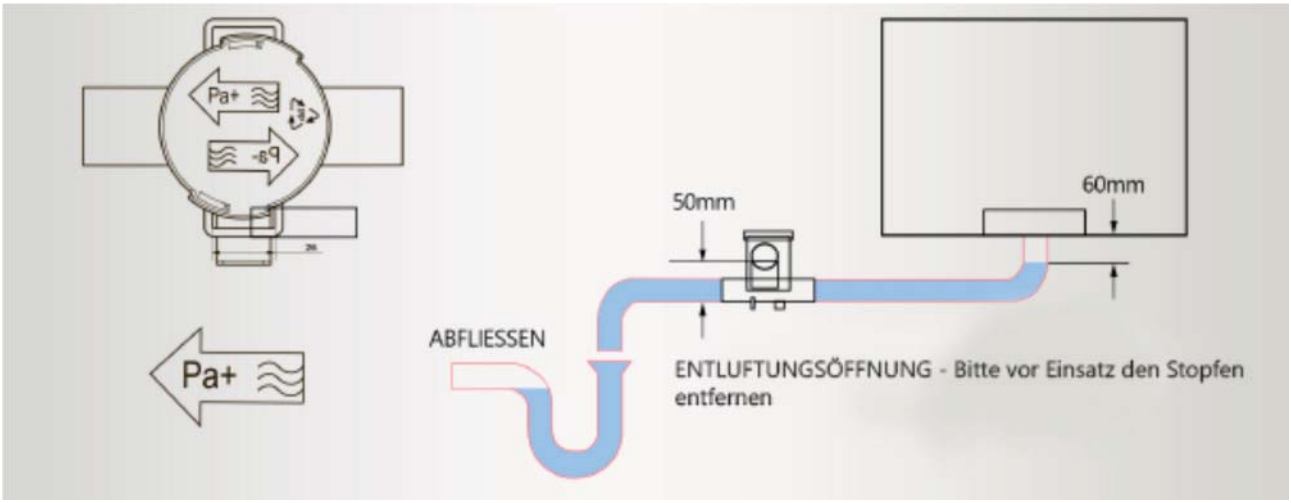

Figure 109: Pressure side execution

Figure 110: Pressure side installation: remove the black closing plug

6.4 Duct connection

- The air conditioning work must be executed tension and torsion free.
- To prevent structure-borne sound transmission is an intermediary flexible connector recommended with at least 140 mm width. It shall be installed unstrained between the duct and the AHU.
- Ensure proper performance of the AHU by avoiding of excessive pressure drops in the duct. To minimize the noise, the basic rules of the duct construction and acoustic design shall be observed.

6.4.1 Insulation of fresh air damper

Before connecting the duct section, the flange of the fresh air damper must be insulated in the course of the fresh air duct insulation on site. This action is urgently required to prevent the formation of condensation by heat transfer.
If fresh air dampers are not integrated in the AHU casing, then also the damper frame must be insulated.

6.5 Pumps

- In case of subsequent pump installation has to be noted, that the intake socket is below the water surface.
- The pump base has to be set so low, that the suction tub comes to the pump with a decline.
- For noise insulation, the foundation shall be executed as the AHU itself (refer to **chapter 4.1 (Foundation)**).
- **Fresh water supply:** The maximum allowable pressure is 300 kPa (3.0 bar).

7 Electrical connection

- The electrical connection must be executed in compliance with international regulations such as the Low Voltage Directive and the requirements of electromagnetic compatibility of national legislation and the requirements of the local electricity provider.
- For systems, which operate in hazardous areas, are special provisions for component / equipment design and used materials. For details refer to **chapter 11 (ATEX units)**.

7.1 Connecting to an external protective conductor system

The AHU must be connected to an external protective conductor system. The AHU shall be either:
- connected at the base frames or
- alternatively, at the potential compensation, that is mounted on the flexible connection by EUROCLIMA.
- Furthermore, each electrical component must be connected to the protective conductor system.

7.2 AC motors

The three-phase motors fulfill the following criteria:
- Protection class: IP 55
- Thermal class: F
- Type: B3

In thermal class F, the motor can deliver the rated capacity up to
- a coolant temperature (air temperature in the fan section) of 40 °C.