



ZHK NANO

INSTRUCTION MANUAL



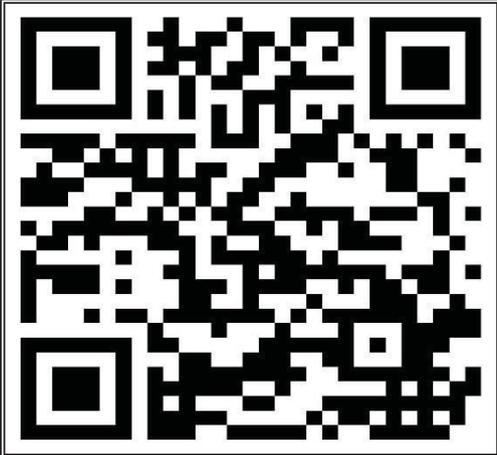
In addition to the instructions in this guide, subject-specific standards, as well as local, national and international regulations must be observed.



Please give this instruction manual after completion of the work to the operating staff of the AHU. Please keep the complete instruction and operating manual at your documents.



euroclima[®]



Betriebsanleitung!
Instruction manual!
Manuale d'istruzione!



ET 174-0

8.1.2 Heat exchanger

The heat exchangers, fittings and valves shall be tested for tightness.

Water heat exchangers

Normal heating, cooling coils filled with water and additives for freeze and corrosion protection:

- Open vent valve.
- Water valve is initially only to open slightly, so that the coil will be slowly filled with water. To avoid heat stress.
- When the heat exchanger is filled, close the vent valve.
- Water valve is to open fully, start the fan.
- Subsequently, the entire piping system must be vented properly.

Attention!

For a temporary shutdown of the system, because of frost and corrosion, is to avoid that condensate is remaining in the pipes.

8.1.3 Electric heater

Observe specifications of **chapter 7.4 (Electric heaters)** -safety thermostats.

8.1.4 Filters

- Before the commissioning, all filters should be checked for tightness, as otherwise they could be sucked in and could lead to damage.
- The mounted differential pressure switches are pre-set according to the final pressure loss on the technical data sheet.
- These ensure the output of a warning message when the final pressure loss is reached. The resulting maintenance actions are described in **chapter 9.3 (Air filters)**.

8.2 Test run

After having done the preparatory work the unit can be started for the test run.

- For testing the device and measuring the motor data and the volumetric flow rate, the device must be fully connected to the operational duct system.
- The unit doors must be closed, because by eliminating the system-side pressure drop measurement errors will be the result.



Before starting the fan open the dampers! Fan may not run against closed dampers.

In addition, the actual power consumption of all phases' shall be measured and compared with the nameplate. If the actual power consumption is too high, there is maybe a faulty connection. The system must be shut down immediately.

Measure the volume flow and the pressure difference. Often the measured airflow does not match with the design data of the device.

Possible causes for low airflow:

- The external pressure drop is higher than indicated on the technical data sheet.
- e.g. closed fire or VAV dampers in the duct

If the airflow is incorrect, then please contact in doubt the competent EUROCLIMA office.

9 Maintenance

EUROCLIMA units are built mostly maintenance free and easy to maintain. The maintenance intervals (see **Table 6**) are indicative for normal operating conditions. Widely differing applications may require different intervals, ask EUROCLIMA for details.

The entire unit and all components must be checked for corrosion, damage and fixing and, if necessary, they must be cleaned.

Depending on the material used and the ambient conditions, it can lead to a superficial corrosion on components like e.g. motor, fan shafts, pulleys, bushings, sheet metal cutting edges and the like. The resulting corrosion layer protects the underlying material from further corroding and does not represent a deficiency of the component or of the device. The removal of surface corrosion and treatment of the corresponding sites are generally not required. Depending on the material used, a superficial oxidation can be removed as part of regular maintenance and the appropriate site treated with suitable protective measures.



Before servicing any electrical parts such as fan motors, damper motors, electric heater etc. use the emergency-stop control devices, to separate the parts completely from the power supply. Indications of **chapter 2 (Safety instructions)** have to be observed!

Please understand that we cannot take care of damage caused by improper handling of solvents and cleaning agents, and no liability for mechanical damage. Solvents and cleaning agents may not contain alcohol for use on coated surfaces.

In order to avoid corrosion in case of components of stainless steel like drain pans or bottom take care that parts of carbon steel laying around are removed and stainless steel parts are cleaned from swarf of carbon steel.

For ordering spare parts please contact your EUROCLIMA sales partner.

EUROCLIMA recommends to perform maintenance and repair work in consideration of the specifications according to VDI 6022 sheet 1 chapter 5.

9.1 Electrical connection, control cabinet

All electrical connections must be inspected annually and deficiencies (e.g. loose cable strands, loose screw and clamp connection,...) must be eliminated immediately.

The following maintenance work is recommended for the control cabinet of AHUs with integrated control:

- annual change of the filter
- annually check the function of the fan for the control cabinet ventilation (if present)
- annually check the function of the heater (installed in roof units)
- cleaning of possible dust deposits

9.2 Fan / motor group

9.2.1 Fan

- Check for dirt, debris, damage and corrosion, clean if necessary.
- Coat surface damage of the housing and impeller with zinc dust paint.
- Flexible connections are to be checked for damage / visual inspection.

- Check the protection grid (Fan in and/or outlet) if available for correct installation / damaged (visual inspection).
- Test the wheel by rotating it by hand for abnormal noises.
- Deposits on the wheel can cause damage (risk of fatigue fracture) - impeller can burst - Danger!
- Visual inspection: Check the wheel for any particular weld cracking.

9.2.2 Motor

- Check the motor for cleanliness and clean if necessary.
- Measure current consumption which must not exceed the rated current indicated on the name-plate.

9.3 Air filters



To ensure the performance and the energy-efficient operation of the air handling unit, the air filters must be replaced regularly. Use only filter types and filter sizes, which are intended for assembly. Please view the technical data for getting this information (**Figure 88**).

TF	Bag Filter	610,0 [mm]	2,41 [m2]	94,00 [kg]	101 [Pa]
Manufacture	Camfil	Filter surface [m2]	8,20		
Type	Basic-Flo-M5 tmax.=70°C	Cells pcs x size [mm]	2 x 592,0 x 592,0		
Init.-Dim.-Final [Pa]	48-99-150	Stainless steel frames AISI 316L (front removable) clean air sid			
Airflow [m³/h]	6.000				
Bag length [mm]	520,0				

Figure 88: extract (filter section) of technical data

All filters should be checked for tightness, as otherwise they could be sucked in and could lead to damage.

If units are equipped with EUROCLIMA control, then a corresponding warning message is displayed on the HMI (see **Figure 89**) when the differential pressure limitation is reached.

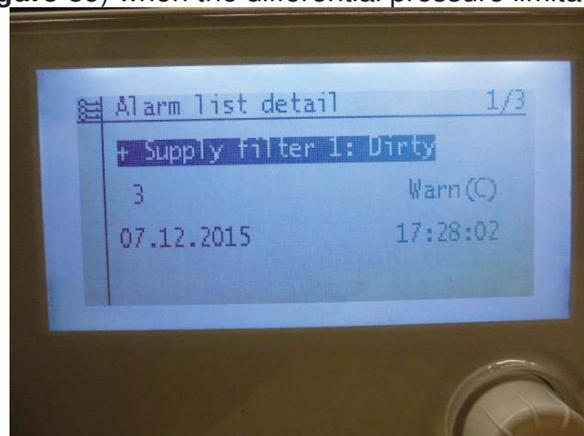


Figure 89: Warning message filter

If such a warning message is displayed, then appropriate actions have to be taken immediately (e.g. change of air filters).

9.3.1 Panel filters

Dry panel air filters (cleanable). The contamination level of the filter can be controlled by the differential pressure drop (check every 14 days to 1 month). Reaching the pressure difference indicated in the technical data sheet, cleaning or replacement is required.

Cleaning:

- Dirty filters dismount, tapping, suck off with a vacuum cleaner or clean it with air pressure (max. 5 bar).
- Wash the filter in max.35 °C warm water with mild commercial detergent, then rinse thoroughly.
- Let fatty filters about 1h in suds.
- Not wrestle cleaned filter, let filters drain before mounting. The synthetic fibers dry quickly and can be installed and put back into service also if they are still wet.
- Clean also the filter section before remounting the filters, check filter tightness and reseal if necessary.
- Filters can be cleaned 2-3 times then a replacement of the filters is necessary.

Seals for panel filters and soft bag filters

Seals are self-adhesive and are supplied loose. Sealing: only the front side, only 1 sealing stripe...

- between the filters,
- between filter and door,
- between wall and filter.

9.3.2 Bag filters

Contamination level of the filter can be controlled by the differential pressure drop (check every 14 days to 1 month). Reaching the pressure difference indicated in the technical data sheet cleaning or replacement is required.

Bag filters of class G3, G4 are repeatedly reclaimable. Clean the bags from the dust airside with a vacuum cleaner. This cleaning can be repeated several times. If this cleaning is not sufficient, also wet cleaning can be executed. Remove the bag filter, keeping the opening up, see **Figure 90**.

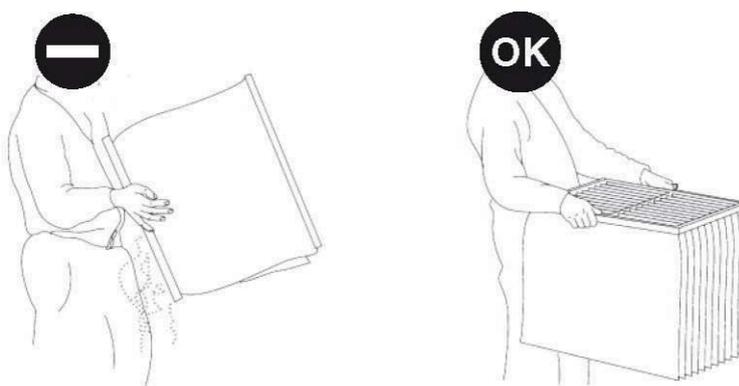


Figure 90: Transport of filter bags

Wet cleaning

- Rinse the bag with upward opening with a not too strong jet of water. The mud must pass flushed through the filter material to the outside. Possibly, add to the water a little bit detergent.
- Let the clean filter bags drain well, they can be remounted wet and immediately put back into service.
- Clean also the filter section before remounting the filters, check filter tightness and reseal if necessary.

- Filters can be cleaned 2-3 times then a replacement of the filters is necessary.
- Filter elements in the clamping frame must be fitted with four springs per filter. Check air tightness!
- Bag filter with class EU5 and above cannot be regenerated and must be renewed after the first lifetime.

9.4 Heat exchangers

- For prolonged standstill, we recommend the complete emptying of the heat exchanger.
- At each refill the heat exchanger must be vented properly.

9.4.1 Medium water

Heat exchangers special maintenance is not required, only occasional cleaning is recommended. Depending on the hours of operation and filter maintenance approximately every three months, the heat exchanger fins shall be check for dust contamination, debris and cleaned if necessary. The piping is to check for leaks.

Cleaning

Cleaning is carried out in the mounted state with a strong vacuum cleaner from the dust airside. For strongly adhering dust the heat exchanger can be dismantled and cleaned with water. Galvanized steel coils can be cleaned with steam cleaner or by washing the fins with a strong water jet. You may take a soft brush to help, but not damage the fins.



The fins of copper-aluminum heat exchangers are particularly sensitive, therefore, use water with low-pressure for cleaning. Damaging the fins by mechanical force leads to premature deterioration of the heat exchanger.

Corrosion spots must be cleaned and protected with zinc dust paint.

Antifreeze protection

Check antifreeze activity before each winter season. Check frost protection thermostat for correct setting.

Drain pan

Drain pan and drain should be checked for debris and cleaned, if necessary – **Figure 91**.

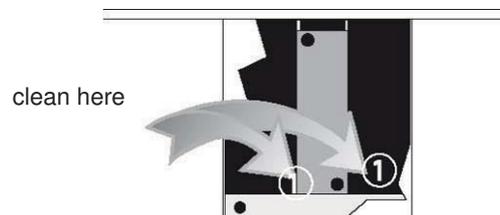


Figure 91: Cleaning of air coolers

Droplet eliminator

Check droplet eliminator about once a year for contamination. Remove fins and clean if necessary. Contamination can cause damage by water drops and reduce the performance of the device. Please make sure that the fins are installed properly and are not bent.



Pollutants can cause poor performance of the AHU as well as damage due to drop flight.

9.4.2 Electric Heater

- When working on the electric heater, refer to instructions in **chapter 2 (Safety instructions)**.
- Check electric heaters for dirt and corrosion, clean heating elements if necessary.
- Check built-in safety devices and electrical parts for proper functioning.

9.5 Dampers

EUROCLIMA dampers of type J are nearly maintenance free. Check for dirt, damage and corrosion, clean if necessary with compressed air or steam jet. Check the function and correct rotation. Spray the wheels with silicone spray if necessary.

Warning!

Gears cannot be treated with organic oils! Check linkages, tighten the screws if necessary.

9.6 Weather louver

Check for dirt, damage and corrosion, free from leaves, paper, etc.

9.7 Energy recovery systems

9.7.1 Plate heat exchangers

Plate heat exchangers are made of highly corrosion-resistant high-grade aluminum and have no drive or moving parts. The lifetime is nearly unlimited, as long as the differential pressure between the plates does not exceed the max. allowed.

The only maintenance required is cleaning:

- Clean the condensate drain, control and fill the U-trap. The plate pack is normally self-cleaning.
 - o Removed fibers and dust at the exchanger inlet with a brush.
 - o Clean oils and fats with hot water, household cleaners or degreasing steam.
- If there is a bypass damper, please refer to **chapter 9.5 (Dampers)**.

9.7.2 Heat wheels

Check the drive unit according to manufacturer's instructions.

In general:

- The construction of the storage mass is nearly complete self-cleaning.
- The rotor can be cleaned with compressed air, water, steam and grease-dissolving household cleaning products.
- The sliding seal, which seals the rotor, is to check and adjust if necessary.