1 Mounting

1.1 Place of installation

The place of installation should be chosen in such a manner as not to interfere with the functional cooling and particularly so that no person shall be annoyed by air draft or noise. Cooling air shall flow in and out freely. Re-circulation of warmed up air must be avoided. A safe distance to the stream of heated cooling air is to be guaranteed.

1.1.1 Mounting in closed rooms

In closed rooms sufficient ventilation must be available. Heat transfer from the cooling system to ambient air may not increase room temperature. If these conditions are not met, air ducts have to be installed between the cooling system and the outside to provide sufficient ventilation.

1.1.2 Mounting outdoors

Installation outdoors results in high efficiency for cooler installations with high capacity. In this case electric motors must be protected against the weather.

Oil type coolants, standing in coolers at low outside temperatures, can become highly viscous. When coolant flow is started at low temperatures the increased viscosity may cause high-pressure peaks exceeding the permissible range.

Therefore, a temperature controlled by-pass valve must be provided or, as an alternative, an additional coolant heating system with continuous thermostatically controlled coolant circulation may be installed.

For water radiators, the use of suitable corrosion protection and anti-freeze additives is required, especially at low ambient temperatures. Select type of corrosion protection and anti-freeze additive according to instructions of motor manufacturer.

1.1.3 Mounting in dirty ambient air conditions

Mounting in polluted ambient air will result in dirt deposits on the cooling surfaces causing reduced cooling efficiency. Therefore, in dusty or thick oil-bearing air environments, regular cleaning must be provided (see point 5, maintenance).

1.2 Manner of mounting

Mounting is usually vertical by means of existing legs or fastening brackets. The bleeder valve should be at the highest point of the coolant circuit as possible.

To avoid environmental pollution of the ground or sewage system through possibly leaking coolant, we recommend to equip the area of installation with a collecting basin.

2 Assembly of cooling system

2.1 Mounting and operating conditions

Pertinent precautionary measures must be carefully observed. During installation and operation please make sure that the cooler is mounted without pre-stressing it.

Please employ flexible elements to reduce tension. When mounting pipes, filters and fittings, please make sure to hold connection fittings with spanner in order to avoid damage of coolers by transference of forces.

Connecting fittings should not be damaged or exposed to static or dynamic stress caused by filters, pipes etc. Use flexible hoses.

Thermo shocks and pressure peaks must be avoided because of excessive strain. Temperatures of cooling medium and medium to be cooled must not be changed abruptly.

2.2 Temperature regulation

Temperature of coolant can be regulated with a by-pass valve or by intermittent fan operation. A sudden flow of hot coolant into a cold cooler must be avoided. When using a thermostatic valve for coolant flow, regulation the opening temperature must not exceed 45 °C. Complete opening must be achieved at 50 °C.

For intermittent operation of cooling system, rapid temperature alteration of inlet coolant should not exceed 5 K. Coolant temperature should not exceed 65 °C.

Switching of motor may be done by a thermostat (not included) to be screwed into tank close to coolant return flow.

2.3 Electrical connection

AKG cooler installation shall be connected in accordance with VDE regulations (regulations of the association of German electrical engineers). Attention to the prescribed voltage and frequency is necessary to assure conformance with technical data on the rating plate. Check that the direction of fan rotation matches with the direction of rotation arrow on the cooling system.

2.4 Air-bleeding, compensation of thermal volume expansion

Cooling units require purging of air. They have to be equipped with bleeder- screws or -valves and, if required, with a compensating tank.

2.5 Connection of oil circuit

In hydraulic systems and also in intermittent operating lubricant oil systems peak pressures may arise well in excess of the permissible operating pressure. Due to their short duration, they are traceable only by an oscilloscope.

In such cases, as a precautionary measure and for reasons of long-term reliability, a separate cooling circuit should be provided as shown in figure 1. Experience has proven that spring loaded excess pressure valves are often not sufficient for reducing spikes and intermittent pressure peaks.

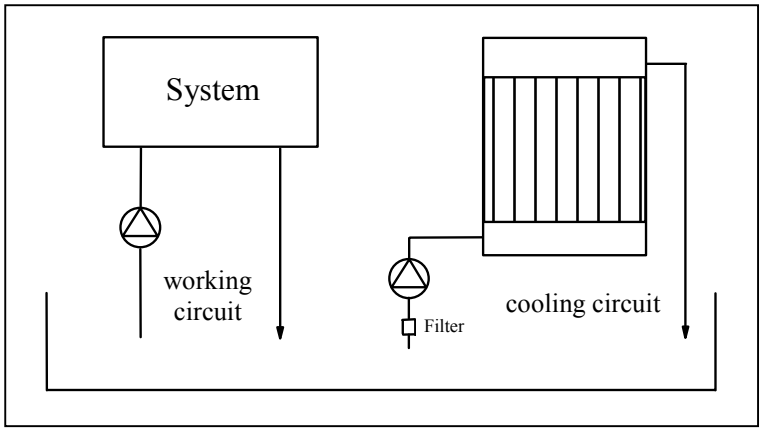

Fig. 1: Cooler installation as separate circulation system

3 Precautionary measures

Coolers under pressure or hot coolers must not be opened (screw plugs, caps).

Do not touch area behind the guard. A rotating fan could cause injuries. Remove guard only after electrical disconnection.

Please make sure, that our published limitations of operation are not exceeded, and that mechanical stress, vibrations, and tensions are avoided.

Especially cooling circuits with compressed coolants, e.g. air/air aftercoolers, have to be equipped with suitable excess pressure- and check-valves. Instructions of complete installation must be observed.

4 Operating instructions

4.1 Starting operation

After filling the installation with coolant, it has to be purged of air.

4.2 Checks

If required coolant temperature is not attained after start of operation, or if the temperature rises gradually during initial running, the following should be checked:

1. Speed and direction of fan rotation
2. Electrical connection
3. Coolant quantity
4. Cooling air in and out flow
5. Soiling condition of cooling surfaces
6. Entering temperatures of cooling air and coolant

Deviations from given installation data, obstacles to coolant or cooling air flow, or soiling of cooling surfaces are causes of inefficient cooling. Such deviations must be eliminated for safety and proper cooling function.

5 Maintenance

AKG cooling systems require no particular maintenance. However, in operation with heavy soiling regular cleaning must be carried out.

5.1 Cleaning of air side

Soiled cooling air fins lead to reduce cooling capacities. Condition of fins is to be checked during daily inspection.

Cleaning shall be carried out by means of compressed air or water. The direction of cleaning stream shall be parallel to the fins in order to avoid damage. Efficiency of water can be improved by additives.

Be careful that cleaning additives are not aggressive to aluminium. Oil and grease soiling may be washed off with steam or hot water. Care must also be taken not to damage the fins with too strong cleaning streams. The motor shall be covered during the cleaning procedure.

Cooler must be dried completely before restarting operation.

5.2 Cleaning of coolant side

Cooler shall be disconnected from circulation system for cleaning of coolant side. Soiled coolant passages are to be cleaned with suitable cleaning agents. Cleaning time depends on soiling. After cleaning procedure, the cleaning medium shall be completely drained and blown out by means of compressed air.

6 Waste Management

Use a suitable collecting basin during opening and cleaning of cooling system. Coolant and cleaning medium have to be selected, handled and disposed of, according to legal requirements.

7 Transport and storage

Transport has to be carried out carefully and only in suitable packing. Avoid blows and jolts.
Store under dry ambient conditions. Storage outdoors is not allowed. Please note details from our general storage instructions.

8 Guarantee

In compliance with our quotation and our general sales and delivery conditions.

Axial blowers, with non-exchangeable carbon brushes do have an operating lifetime of approximately 1000 hours, according to supplier's specification. Therefore our warranty period for these parts is limited to 1000 hours operating time, and also to a maximum of 12 months after delivery.

9 Other

The listed items are preconditions for safe operation. Further conditions for installation and operation could have influence in some cases. A complete listing of all aspects cannot be guaranteed.

When in doubt please contact AKG.