



AIR COOLED CONDENSERS
09LE AND 09LDV

AIR COOLED DRY COOLERS
09GE AND 09GDV



A. INSTALLATION INSTRUCTIONS

B. SERVICE INSTRUCTIONS

C. DECLARATION OF CONFORMITY

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A. INSTALLATION INSTRUCTIONS

1. GENERAL

09LECA and 09LDV air cooled condensers and 09GECA, 09GDV air cooled liquid coolers are designed for refrigeration plants using refrigerants and solutions/water, which do not corrode copper.

The Manual also concerns E-models, where applicable (E = non-standard model). In these cases please always check from the delivery documents, in which way the difference has to be taken into notice in installation, service and use.

2. TRANSPORT AND STORAGE

09LECA and 09GECA units are transported in an upright or horizontal position fixed into a wooden flat (see fig. 1). 09LDV and 09GDV models do not have a wooden flat.

Products may not be stored in humid outdoor spaces, where water may condensate in their motors.

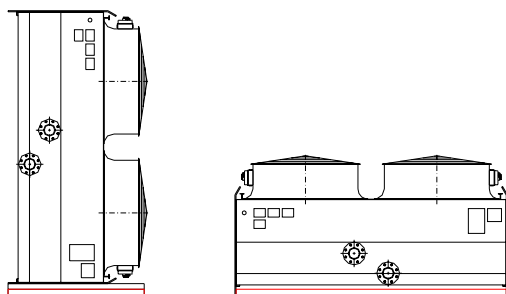


Fig. 1

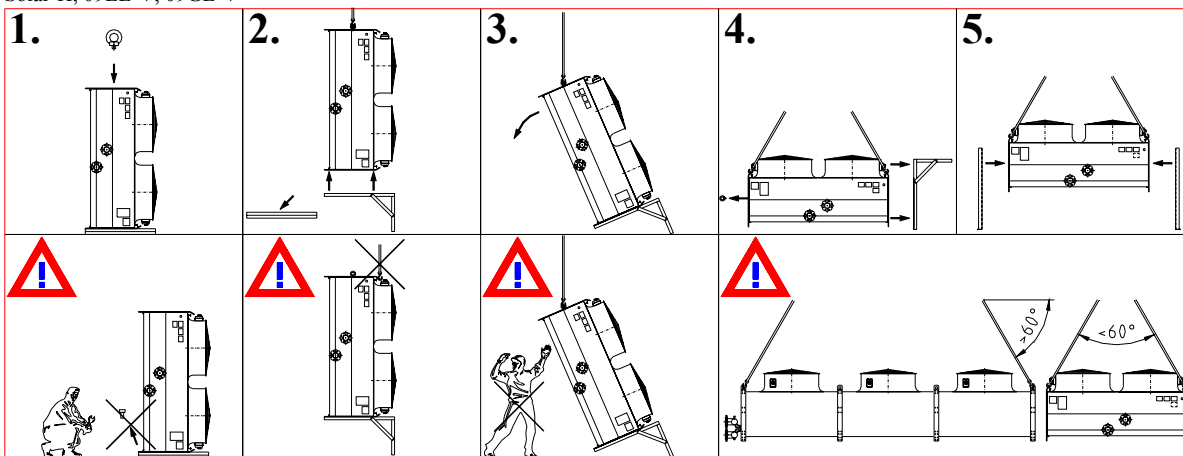
3. LIFTING

The condensers and liquid coolers may be turned and lifted only by using appropriate lifting device. For lifting in vertical side position (H position) please use the lifting eyes (s. fig. 2, parts 1, 2 and 3). For lifting in horizontal position (V position) please use the lifting bracket (s. fig. 2, parts 4 and 5).

V-models:

Fig. 2. Turning and lifting the V-model into installation position

Solar-H, 09LE-V, 09GE-V



Always follow the lifting angles shown in fig. 2. The legs are in transport position and must be adjusted into operating position, while lifting the equipment.

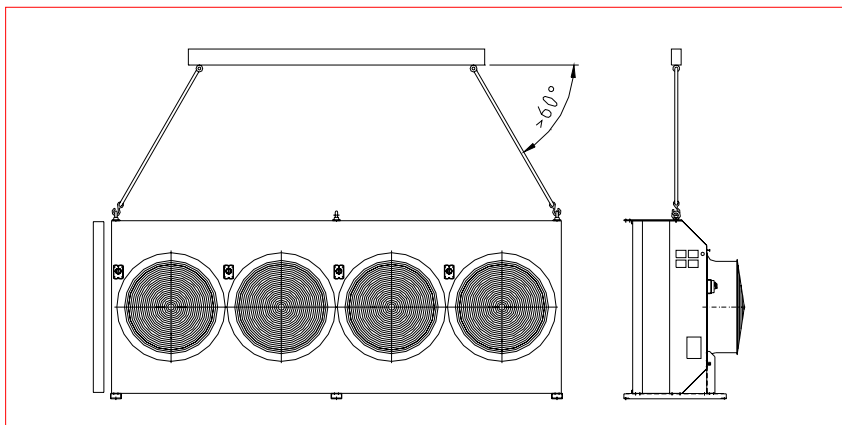
- Do not remove the leg from transport position until the unit is connected to the crane!
- Do not allow people to stand under the unit being turned or lifted!

The lifting device (s. fig. 2, part 3) is available as optional extra.

H-models:

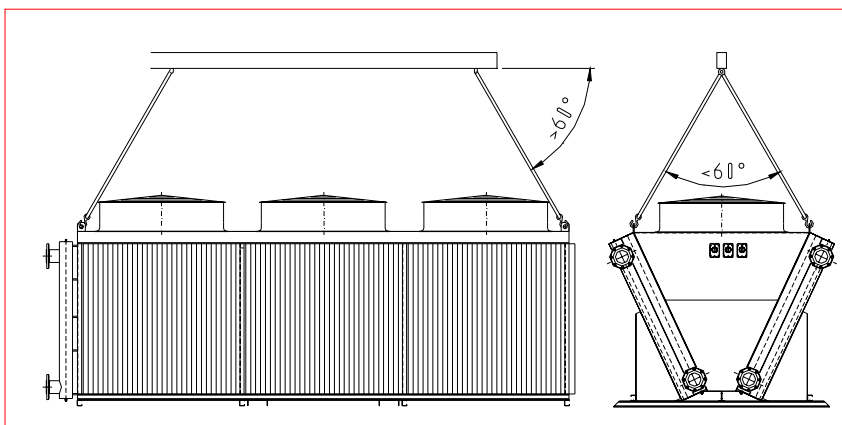
The legs are ready-fitted at the factory.

Fig. 3 Lifting the H-model



09LDV and 09GDV:

Fig. 4 Lifting the 09GDV



4. PLACING

Air cooled condensers and liquid coolers shall be mounted so that their air flow is not obstructed and no air re-circulation can occur. When choosing installation site and type of equipment, please note, that there is no wind blowing against the condenser's airflow. This especially regards the H-models with horizontal airflow as well as the models with low rpm. If necessary, use windshields. In dimensioning note the actual temperature in the sun at installation site. Figures 5, 6 and 7 show the minimum distances between the condensers and their distances from the wall. Larger distances are recommended. If air cooled condensers and liquid coolers are surrounded by three or four walls, the minimum distances from the walls are larger and must be checked according to the number of the equipment and to their air flows.

1) Recommended service space min. 600 mm.

If there are only two condensers, the narrow models ($B=1,85$ m) may also be installed side by side. Check the leg height and, if necessary, install the equipment on a stage.

2) If the wall is lower than the equipment, the min. distance is $B/2$ or $A/4$, minimum 600 mm.

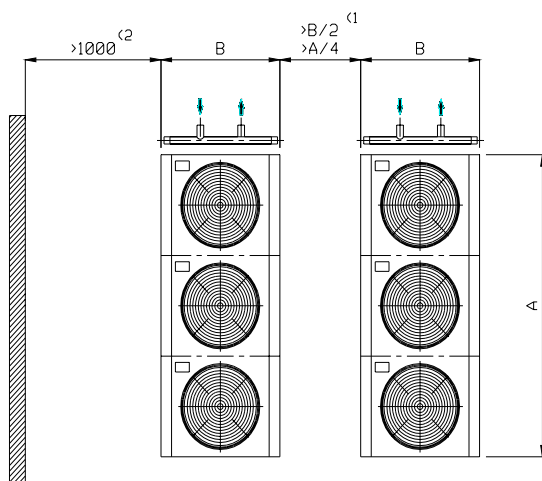
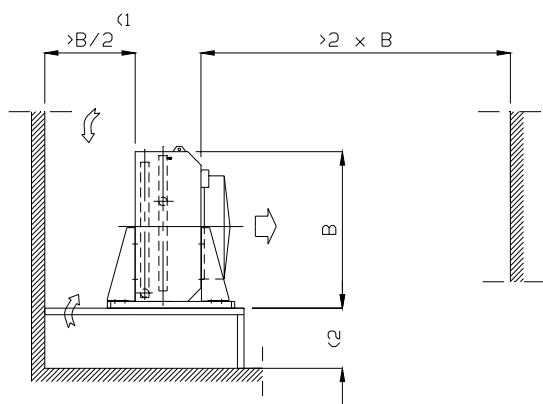


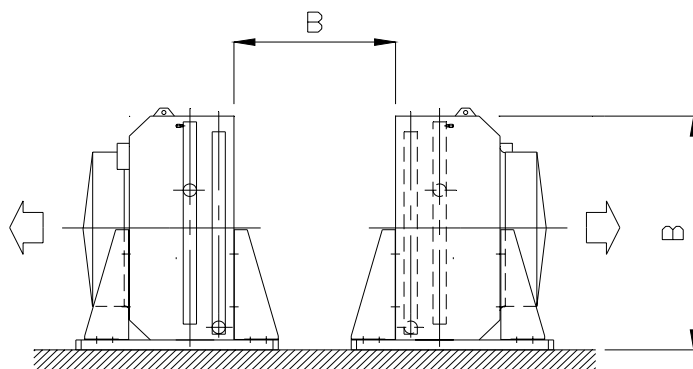
Fig. 5. V--models

Fig. 6. H--models, wall mounting or floor mounting



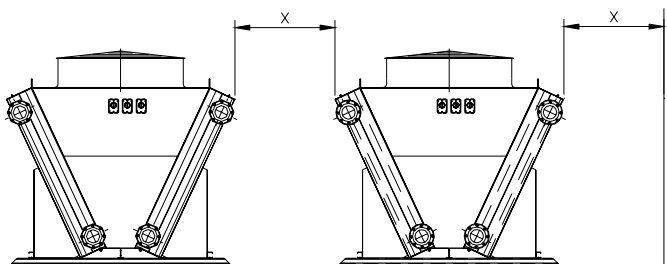
1) Recommended service space min. 600 mm. The installation stage under the equipment shall be open e.g. because of snow

Fig. 7. V-models, side by side



09LDV/GDV

When locating the products take care that the air flow is neither obstructed nor recirculated. If the heat exchanger is not installed on a higher mounting base, there shall be free space at least 1 m (x) around each equipment.



5. INSTALLATION

Before fastening the equipment at site please check the possible transport damages. The supplier is not responsible for costs caused by broken equipment as a result of faulty handling or transport.

Also check the endurance of fixing point constructions before installation.

Air cooled condensers and liquid coolers are installed with tubes of heat transfer section in horizontal position. Trouble free operation of liquid coolers provides good air venting in the system by using the venting screws on the headers. Water circulated liquid coolers must be drained, whenever the ambient temperature is below $\pm 0^{\circ}\text{C}$. Standard liquid coolers are not gravity drained.

6. TUBE CONNECTIONS

External tubing shall be installed in a way that their weight, vibration or heat expansion will not strain the tubes of heat transfer section. Transmission of compressor noise or vibration to the condenser is eliminated by sufficient vibration dampers. Correct charging and oil separation shall be taken care of in the plant.

7. FANS

Fans are direct driven axial fans. Fan motors are squirrel-cage motors built to the IEC standards, designed for outdoor use in particular and provided with condensing water outlets and shaft seals. Their protection class, except for condensing water outlets, is IP-54. Motors are pre-wired to lockable safety switches (IP-65). The locks are not included in the delivery.

8. FAN CONNECTIONS

NOTE! Only an authorized person may make electric connections.

The motors are pre-connected to safety switches (fig. 8).

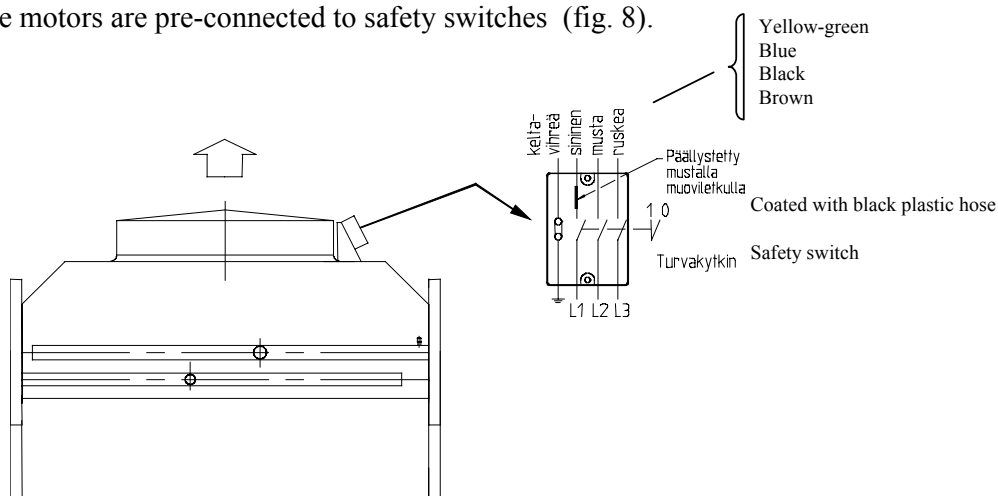


Fig. 8

The inner connection of fans, when phases L1, L2 and L3 are connected to the safety switch (junction box) as shown in figure, i.e. the air flow as shown in brochure and in figure above.

In 09LDV/GDV, the safety switches are mounted to same end with the tube connections.

9. FANS' POWER VALUES

The type shield indicates power values at temperatures of +20 °C and -30 °C. For defining the set value of overload protector the power value at other temperatures might be required. It can be linearly calculated by using the points mentioned below (fig. 9).

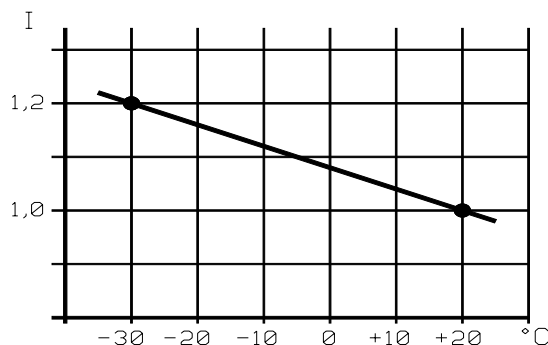


Fig. 9

10. CHECKINGS

Air cooled condensers and liquid coolers are pressure-tested and the fans test-run at the factory. Please check at site before installation possible transport damages, especially those in heat transfer section. The supplier is not responsible for costs caused by equipment broken as a result of faulty handling.

After electric installations check that the fans run properly and that their airflow direction is correct. If the capacity is regulated by changing stepwise the number of fans, change now and then the fans' starting order.

11. ADDITIONAL REMARKS

NOTE!

Venting/draining valve of 09GE and 09GDV standard dry coolers are not adapted for refrigerant based on potassium formate; DANGER OF LEAKAGE!

When using a refrigerant which is based on potassium formate, it has to be checked from the documents if the heat transfer section's piping system and the venting/draining valves are adapted for the refrigerant.

Instructions from refrigerant supplier have to be followed at installation, pressure test, use as well as in maintenance.

NOTE!

Applicability of the material of fins and heat transfer tubes to ambient conditions shall always be checked to avoid external corrosion.

In the air there should be no particles, which - together with water or other solvent condensing on the surface of the heat transfer section - might form corrosive combinations. These combinations can corrode the fins and tubes of the heat transfer section.

B. SERVICE INSTRUCTIONS

Trouble free operation of air cooled condensers and air cooled liquid coolers provides regular service to check

- Outward condition of the equipment
- Fixing of the equipment and its fans
- Cleanness of heat transfer section

WARNING!

Switch off the current from safety switch and lock the switch.

1. HEAT TRANSFER SECTION

Heat transfer section needs regular service, if it is in use in dirty conditions. The dust gathered on fins can be vacuum-cleaned on air inlet side, or the fins can be washed e.g. by a pressure washer. The washer's water jet may not be too strong and it must be directed perpendicularly to the fin's side prevent them bending. Strong alkaline detergents or acids may not be used. Recommendable detergents are e.g. Hydro-Klean and Hydro-Coil. Outward condition of the heat transfer section must be checked in service.

2. FANS

The electric fan motors are squirrel-cage motors, designed for outdoor use, built to the IEC standards and provided with condensing water outlets.

Check the motors in service. Should the fan make any unusual noise, stop it immediately. Repair or, if necessary, replace the motor.

Do not keep the fan motors outdoors or in corresponding conditions for longer periods not running in order to avoid water condensing in them.

NOTE!

During stand-stills the fans must be allowed to run for 3...4 hours at least once a month.

It is also recommended to change the fans' starting order when using the fans to stepwise regulation of the condenser capacity.

Other fan parts (blade, motor bracket and fan guard) do not require any service. However, in regular service please check their attachment and outward condition.

3. REPLACING THE FAN BLADE (fig. 10)

WARNING! Switch off the current from safety switch and lock the switch.

- Remove the fan guard by unscrewing the four fixing screws.
- Remove the fan blade by screwing off the retaining screw.
- Pull the blade out with an extractor.
- Clean and lubricate the shaft.
- Place the new blade onto the shaft (do not forget the wedge!).
- Do not knock the blade onto the shaft, as the motor bearings are damaged easily.
- Attach the bottom plate and the retaining screw on the shaft end.
- Tighten the retaining screw.
- Install the conic piece/fan guard.
- Finally check the fan's proper function by rotating it for a while.

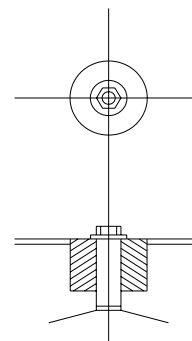


Fig. 10

Only an authorized electrician is allowed to replace the electric motor!

WARNING! Switch off the current from safety switch and lock the switch.

- Switch off the current from safety switch (1) or remove the fuses. (Lock the switch!)
- Remove the fan guard by unscrewing the four fixing screws (2.)
- Open the junction box and make sure that the motor has been switched off (3.)
- Release the screw on the motor's shaft end (4.)
- Remove the fan blade by an extractor (do not drop the wedge!).
- Release the electric cable.
- Unscrew the motor's four fixing screws (5).
- Lift up the motor.
- Install the motor back in reverse order.
- Press the fan blade onto its place by a screw, do not strike.
- Make sure that the fan is placed exactly in the middle of fan opening.
- Test-run the fan after installation in order to check its rotation direction and other function.
- Spare part fan shall be delivered by Fincoil to ensure its suitability to operating conditions.

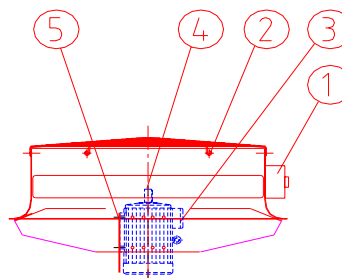


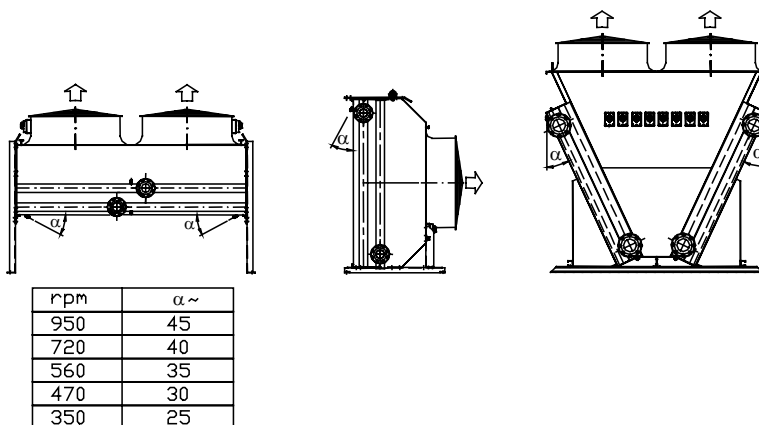
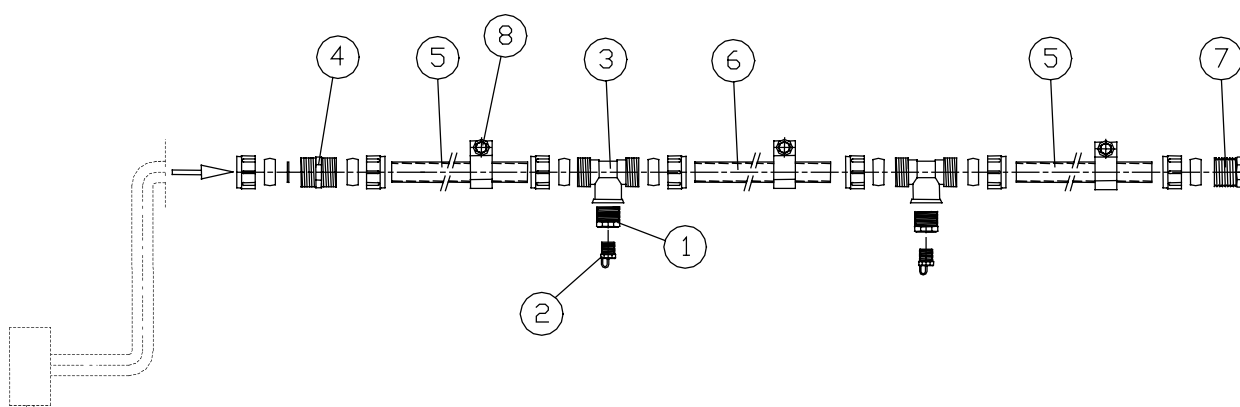
Fig. 11.

WATER JET SYSTEM (D)

ASSEMBLY AND MOUNTING

Depending on the radiator there are 1 or 2 piping/radiator. Assembly the piping in the numbered order. Tighten the joints lastly and secure that all nozzles point to the same direction. Finally hoist the piping to the place shown on the picture and tighten the fittings.

PIPING CAN BE DRAINED FROM WATER BY OPENING THE END NIPPLE.





**Declaration by the manufacturer of the component
incorporated to the machinery (Directive 98/37/EC, Annex II,
sub.B)**

FINCOIL-TEOLLISUUS OY

Ansatie 3, FI-01740 Vantaa, Finland

herewith declares that the component

09LF, 09LE, 09LDV air cooled condenser
09GF, 09GE, 09GDV air cooled liquid cooler

which is not able to function independently is intended to be incorporated into machinery or to be assembled with other machinery to constitute machinery covered by Directive 98/37/EC and changes related to it and with national implementing legislation meant machinery.

By designing of the component the following directives have been applied:

98/37/EC, 89/336/EC, 97/23/EC

and the following harmonized standards have been applied:

EN ISO 12100-1, EN ISO 12100-2, SFS-EN 294, SFS-EN 60204-1,
SFS-EN 61000-6-1, SFS-EN 61000-6-3, SFS-EN 61000-6-4

and furthermore declares that is not allowed to put the machinery into service until the machinery into which it is to be incorporated or of which it is to be a component has been found and declared to be in conformity with the provisions of Directive 98/37/EC and with national implementing legislation including the machinery referred to in this declaration.

Vantaa, 5th January 2004

A handwritten signature in black ink, appearing to read "Jouko Huotari", is written over a light blue rectangular background.

Jouko Huotari

Quality Manager