

CUSTOMERS MANUAL

For the drycooler

Model

VF, IV, VV

MANUEL OF RECEIPT

Your drycooler – our product – is made with great care utilizing only the best material. If you follow this manual, your drycooler should be ensured a long and effective operation.

On Receipt of Shipment

- Verify that the shipment is free of damage; the packing is included in this verification.

If damaged shipment:

- Mark the damage in the consignment note. You can now substantiate a possible complaint. This procedure is necessary for insurance and possible recourse against the conveyer.
- If possible photograph the shipment, preferably while still on the van.
- Inform the local representative of Flex coil a/s or the factory about the circumstances for the damage. Send the consignment note with your mark of damage to Flex coil a/s.

In case of larger damage:

- With substantial damage the shipment is to be refused. Mark the damage in the consignment note and give this note to the carrier with orders to return the shipment to the factory. **The damage must be noted in the consignment note!**

In case of further transportation:

- Always as a minimum for further transportation use the by Flex coil a/s used packing methods.

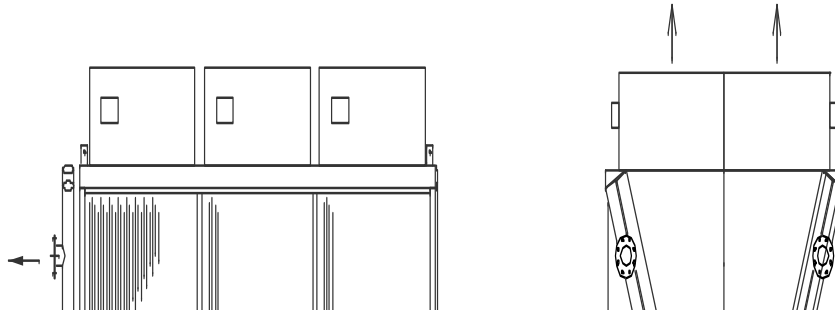
Removal of the shipment:

The shipment is removed from the van in the following way (concerning shipments where a fork-lift truck or crane is necessary).

- Ensure that the crane operator and/or the truck driver lift the unit securely. Always consider the weight of the cooler with regard to crane, forklift, ect.
- The angle of lifting by crane in relation to the drycooler must always exceed 50°.

On smaller units the mounted forklift rails should always be used. Larger units (more than 3 fan hoods) additionally have crane brackets mounted. These should be used for lifting with a crane. For lifting the smaller units with crane, use the forklift rails and/or suspension bolts. This packing method is used for drycoolers having 3 fan hoods or more.

- Remove the packing and verify that no damage, previously hidden, has occurred. Here can be added that slightly dented fins is easily repaired. You can, as habitual customer, buy a fin straighten tool, which is a useful tool for your fitter.
- Dented or slightly damaged tubes are to be repaired by a qualified fitter. By damage of the tubes return the shipment to the factory and contact your local Flex coil a/s representative or the factory directly.
- Be aware that you only have 1 working week to assert your damage complaint, according to insurance procedures, if the damage has not to been marked in the consignment note.



ASSEMBLING MANUAL

Placement

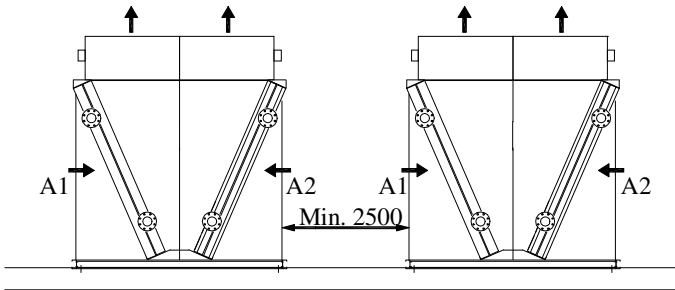
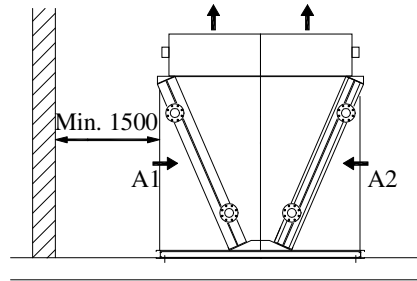
- Take care to protect all parts of the unit, including the tube connections, and avoid denting the fins, when placing the drycooler. If care is not taken when placing the drycooler, you risk having damages that are not readily noticeable and as a result do not come to your knowledge until after installation.
- The drycooler must be placed with the coil tubes completely horizontal to ensure an optimum operation.
- The drycooler should be placed on a suitable base, dimensioned for the weight of the drycooler. The drycooler is bolted to the base with minimum M 12 bolts.
- Placement of the drycooler should be such that there is, at all times, free access and discharge of airflow, so recirculation of air is avoided. If this is unavoidable, contact the Flex coil a/s technician for advice and guidance? For placement, see next page.

Connecting the Cooler to the Pipe Work

When connecting the cooler to the pipe work:

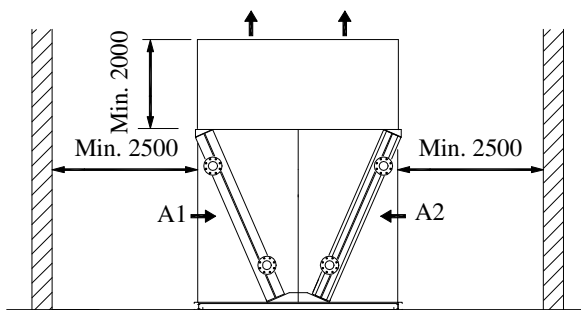
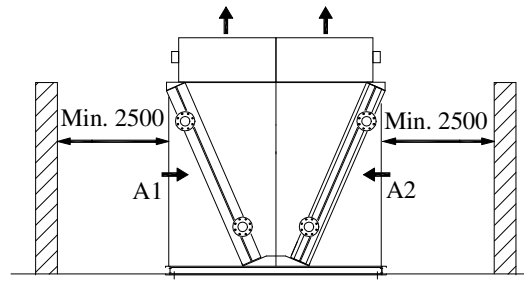
- Each unit is arrow marked to show inlet and outlet.
- Take care to avoid tension when connecting pipe work. Vibrations and pulses can damage the drycooler. The inlet and outlet tubes of the drycooler must not carry the rest of the pipe work. If necessary use flexible connectors. When tightening the threaded headers, always use torque wrenched opposite the tightening direction, to avoid damages to the tubes.
- The system is filled, if possible, from the bottom, as this allows for better air vent. Take care that the system is completely emptied for air. If air bubbles occur in the system, the heat transfer is not optimum.
- If the headers have plugs for air vent and drainage, do not use these plugs for air venting or draining the system, as leaks might occur, when retightening the plugs. Use valves designed for air venting and drainage.

The drycooler should be placed as shown to avoid recirculation of air.



Several drycoolers next to each other demand a minimum space of 5 m.

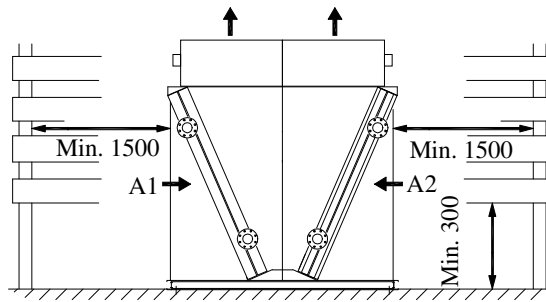
If the drycooler levels with for instance a roof, the distance from this to the drycooler should be minimum 2,5 m.



Roof and walls must not exceed the drycooler. If this happens, a yield channel must be mounted on the drycooler.

If screened for decorative purposes, a min. of 50 % of the screening should be open space and distances should be as shown.

If the drycooler levels with for instance a roof, the distance from this to the drycooler should be minimum 1,5m



If other kinds of placement are required – please contact Flex coil a/s.

- Be particularly aware of temperatures around zero and below, as these temperatures could mean danger of breakage due to frost in the tubes of the drycooler. Always consider the temperature when choosing a brine mixture. To avoid damages the unit should be emptied **completely** for fluid. To ensure the complete emptying of the drycooler, compresses air should be used, until the drycooler is empty.
- Never braze or weld on the drycooler, as long as pressure still exists in the system and the cooler contains fluid. Ensure that the drycooler is enclosed from the rest of the system and empty for fluid before working with the drycooler.
- If the cooler is placed on vibration mufflers, check that the mobility of the muffling is on concurrence with the mobility of the headers.
- If you have any doubts, please contact your local Flex coil a/s representative or the factory for advice.

Electrical Connection

All mounted electrical components are in accordance with the regulations of CENELEC, but always control as follows:

- Verify that the supply voltage, current and frequency are in accordance with the motors of the drycooler.
- Verify that mounted electrical components are intact. This means electrical terminal boxes, wires and motors.

IMPORTANT!

- By assembling, it is recommended to use a suitable filter to protect the pump, movable parts etc., from small particles of material from the tubes and/or the cooler. This filter after a short time has to be cleaned in order to remove these eventual particles.
- Ensure that the motors when operating are not exposed to temperatures above 70° C at the actual operating conditions.
- Ensure that dry coolers manufactured with nozzles made of polystyrene are not exposed to temperatures above 80° C at the actual operating conditions.

- Before starting the motors of the drycooler, the safety guard must be securely mounted. The safety guard must never be off or loosened, if there is electrical connection to the drycooler's components.
- When starting up the motors, the direction of rotation and the speed should be checked. Also ensure, that the fan blades/wings are dynamically balanced, and no noise from the bearings of the motor arises.
- Be aware that in periods of no operation by the motors of the drycooler, especially during periods with large shifts in temperature, the motors must be started at regular intervals. This also applies to heatexchangers installed in aggressive environments. The motors must run until they are warm, approximately 30 min. Under maximum loaded installation conditions the motors must be started every second week. If the conditions are less loaded the motors can be started more infrequently.

USER'S MANUAL

Starting up

- After placing the drycooler securely on the base and connecting the pipe work and electrical connection, please verify that the motors run uniformly and balanced as well as no dissonance arises from the motors. Please verify that the pipe work/the pumps do not cause any pulses and vibrations that could be transferred to the drycooler.
- Check for leaks!
- Check that no loose objects, like paper, leafs etc. is close by, as they can be sucked unto the fins.
- If possible, measure for control the performance of the drycooler according to the DS/ENV 1048 standard and file these measurements. These measurements can be used to control the performance reduction due to fouling of fins: These measurements can be used to plan the cleaning frequency of the drycooler.

MAINTENANCE MANUAL

Cleaning

It is essential to understand that fouled or dirty fins reduce the heat transference substantially.

- After operation for a period of time, please check for fouling of the fins. Use a flash light to light between the fins to establish the accumulations of dust and smudge. Furthermore check whether these accumulations have resulted in a reduction of airflow and/or performance or if the motors use more Amps. Than normal for a clean unit.
- Dry dust can normally be removed by means of compressed air (against the direction of air in the drycooler) or by means of a suitable industrial vacuum cleaner or use a **soft** brush. Sweep along the fins and **under no circumstances** across the fins.
- Moist or sticky smudges or grease should be removed by means of hot water or steam jet cleaning appliances (against the air direction).
- Keep the jet of the cleaning appliance at an angle of no more than 15° from vertical position, to

avoid bending the edges of the fins.

- **Under no circumstances use organic solvents and cleaning products!!!**
- Please contact the producer of the cleaning products to clarify which products you can use without damaging the components of the drycooler. If you have any doubts, please contact your local Flex coil representative or the factory.
- **Mechanical cleaning with hard objects might damage the tubes, fins etc. of the drycooler!!!**

Wear and tear

- Normally nearly no wear and tear can be found on the drycooler. Only the bearing of the motors can with times be worn and if dissonance arises from the motors or the current changes, the motors have to be replaced. The bearings are dimensioned for 40.000 hours of operation.
- As a rule is aware of corrosion of metals, check for this when cleaning the unit.

SAFETY PRECAUTIONS

Due to safety for the people working in the immediate area of the drycooler, certain precautions must be made.

- Normally you as customer have the noise level as a parameter, when dimensioning the drycooler. However, you still should be aware that the sound emanating from the drycooler might cause damage or inconvenience to some.
- Use only liquids specified for the drycooler.
- Be aware of the pressure in the drycooler. To high a pressure might result in damages!!
- The fans must under no circumstances be in operation without the fan guard being mounted. The electrical supply must be disconnected when the safety guard is removed.

Repairs

If the drycooler has to be repaired, **certain rules must be followed.**

- **It is dangerous** to put objects down to the motors and fans when operating, as well as leave objects there after repairs.
- When removing the guard, the electrical supply must be disconnected and the fans must be inert.
- Never braze or weld on the drycooler, as long as pressure still exists in the system and the drycooler contains fluid. Ensure that the dry cooler is disconnected from the rest of the system and empty for fluid before working on it.

flex coil a/s

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