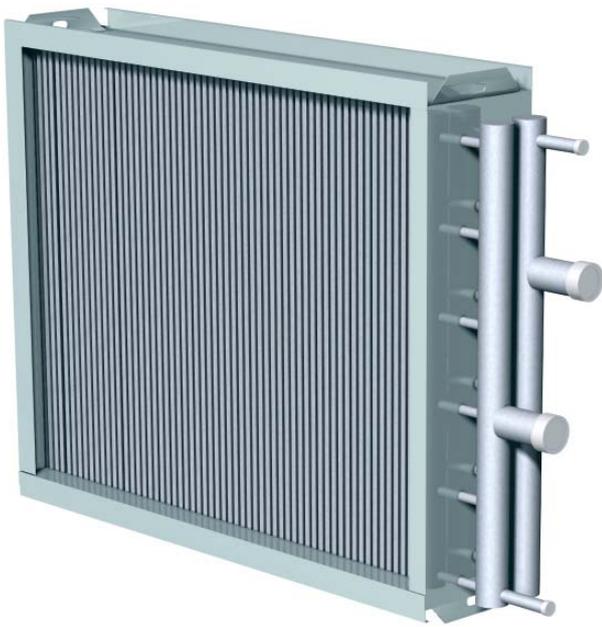


## Coils for Liquids, QLAK, QMXA, QMXF.



### General description

The coil is used to heat air using heat energy from the liquid supplied. The plates on the tubes give an increase in area on the outside which gives a balance in the heat transfer from the liquid to the air. The casing is made of galvanized sheet steel and conforms to tightness class B according to VVS AMA98/EN 1751.

**QMXF:** The heat exchanger is built up of electro-galvanized steel tubes and plates made of steel sheet coated with zinc and aluminium. The headers is made of rust painted steel. The core of the coil is manufactured of tubes that are mechanically expanded against the plates.

**QMXA:** The The heat exchanger is built up of electro-galvanized steel tubes with steel fins, hot-dip galvanized, in a single mechanical unit. The casing is made of galvanized sheet steel. The headers is made of rust painted steel.

**QLAK:** The heat exchanger consists of acid-proof steel tubes with aluminium fins. The standard of casing is galvanized steel plate. Connection chamber is made of stainless steel.

### Rating plate

The rating plate is placed on the connection side of the cooler and indicates the following:

- Order number
- Product code
- Max. working temperature
- Max. working pressure
- Test pressure
- Manufacturer
- Year of manufacture
- Dry weight
- Fluid volume

### About Luvata

Luvata is the leading international metals supplier of solutions, services, components and materials for manufacturing and construction. Luvata's solutions are used in industries such as power generation, architecture, automotive, transport, medicine, air-conditioning, industrial refrigeration, consumer products and construction. The company's continued success is attributed to its longevity, technological excellence and strategy of building partnerships beyond metals. Employing over 7500 staff in 18 countries, Luvata works in partnership with customers such as Siemens, Toyota, CERN, Shaaz, and DWD International.

# Product description, safety instructions and warnings

## General

- Read all the maintenance instructions before you begin handling this product.
- The cooler shall be installed at a location where it is out of reach of the general public.
- Permit only trained persons who have knowledge of the product and appropriate safety precautions to carry out any work on the cooler.



Never stand or walk on the cooler since this can result in personal injury or damage to the cooler.



Both the cooler and exhaust air can be hot when in use, which can cause personal injury.



The cooler must not be installed in environments where there is a risk of explosions.

## Lifting

Data about the dry weight of the heat exchanger is stated on the rating plate located on the heat exchanger's connection side. The heat exchanger is lifted using the lifting lugs as shown in Figure 1. Check the following before lifting:

- Lifting lugs are undamaged.
- Correct lifting equipment is used.
- Lifting equipment's hooks are designed for the lifting lugs.

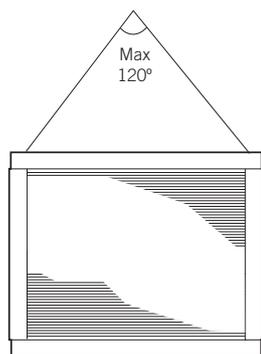


Figure 1. Lifting the heat exchanger.

## Operating pressure

The steam temperature must not exceed the maximum working temperature and the heat exchanger may only be used in a system which has been approved for the maximum working pressure indicated on the rating plate.

## Connections

The pipe couplings of the heat exchanger must not be forced to carry the dead weight of the external piping system. Also, they must be relieved of the expansion forces exerted by the piping system. The connections must be protected against impacts, external loads and other mechanical stress.

**NOTE!** Mechanical loads and impacts may damage the manifold header.

## Protection against frost expansion

When there is a risk of freezing and consequent tube damage, one of the two following measures must be taken:

- The coil must be filled with a suitable antifreeze medium. The liquid volume of the coil is stated on the rating plate which is located on the side of the coil with the connections.
- All the water must be drained from the pipes and the coil. The plugs on the coil should not be fitted until the system is again refilled with water. Compressed air should be blown into the coil to ensure it is properly emptied from water.

## Cleaning

Always use environmentally friendly cleaning agent, which will not damage the cooler.

## High temperatures

When the heat exchanger is in operation, its various parts may be hot. This includes manifolds and casing. The heated air leaving the coils may also be quite hot. Use gloves when contact with the heat exchanger.



On installations of the coil where the liquid medium is water and the water temperature can exceed 100 °C, great care must be exercised when opening vent valves and stop-cocks in the system. Serious personal injury can be caused by hot liquid or steam discharge. Luvata Söderköping AB is not responsible for the connection of the heat exchanger to the heating system or damage, that can occur due to incorrect planning, installation or maintenance of this system. Piping, valves, etc. must be dimensioned with regard to pressure drop and function and not based on the coil connection dimensions.

## Certification

Luvata Söderköping AB is certified according to the quality management system ISO 9001:2008 and according to the environment management system ISO 14001:2004.

# Installation

Also see the section safety instructions and warnings, page 2.

## At delivery

After unloading, carry out a visual inspection to make sure that the cooler hasn't been damaged during transport. It is very important to examine the finned surface of the heat exchanger, lifting lugs, headers and the tube bends on the backside of the coil. Any transport damage detected must be immediately reported to the shipper and to Luvata Söderköping AB. Make a note of the damage on the consignment note as well.

## Mounting

The coil must be mounted so it is properly secured. The pipe connections are equipped with thread connections for DN-32-50, the others are intended for welded connections. Flange connections can be supplied as an option. The connecting piping must be fixed as close to the coil as possible to ensure that the coil and pipe fittings are off-loaded from the own weight of the piping and the expansion forces.

## Inlet for heat carrier

The coil is normally equipped with signs to show how the water inlet and return pipes should be connected. If there are no such signs, the coil should be connected to the pipe system so that a counter-flow connection is achieved (i.e. the air and water flow in opposite directions, see Figure 2).

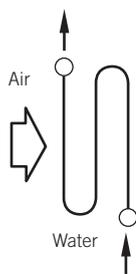


Figure 2. Counter-flow connection, diagrammatic sketch

## Freezing protection

- *Freezing protection on the liquid side*  
In cases when the coil is equipped with a nipple for attaching a sensor in one of the tubes, this possibility should be used in preference to freezing protection on the air side. If the sensor is positioned in or on the return pipe, it must be combined with a flow sensor that stops the fan, or alternatively closes the return air damper at the lowest allowable water flow.
- *Freezing protection on the air side*  
If the sensor can't be placed in a tube it should be installed on the hot air side of the coils (the air outlet side) in height with the second-lowest tube.

## Venting and draining

The water coil collection pipes are equipped with an air venting nipple and a draining nipple. The air must be properly vented from the system to ensure good functioning. When there is a risk of freezing, the coil should be completely drained, which is best done using compressed air.

## Dismounting

When removing the heat exchanger from the system, the coils must first be emptied of all liquid, see venting and draining.

**NOTE!** Any liquids potentially harmful to the environment must be collected in suitable containers and sent for disposal or recycling.



The heat exchanger must not be lifted before it has been emptied of all liquid.

## Storage

When storing a spare heat exchanger or a dismantled heat exchanger the fin surfaces must be protected to prevent personal injury or damage to the heat exchanger. The heat exchangers shall also be stored completely drained of water to prevent frost damage.

# Maintenance and service

The heat exchanger should be inspected regularly to prevent operating troubles. The following checks should be made:

1. Mountings - make sure no load-carrying screws or threads are damaged.
2. Fin structure - Check that it is clean and undamaged.

## Cleaning

Even a very effective air filter will let some dust particles through. A coating of dust on heat-exchanging surfaces will hinder the passage of air and slow down the transfer of heat. Therefore, the coils must be kept clean, and any one of the following methods (or a combination of several) is appropriate:

1. Vacuum cleaning.
2. Cleaning with compressed air.
3. Cleaning with steam.
4. Flushing or rinsing with water. With grease covered hot surfaces, first spray the entire heat exchanger with environmentally friendly solvent that is not aggressive to copper or aluminium at a low pressure.

High pressure wash with water after 10-12 minutes.

**Cleaning should be done against the normal direction of air flow.**

## Cleaning QLAK

**NOTE!** It is important to keep the nozzle square to the fin surface and no closer than 150 mm to prevent damage to the fins, see Figure 2.

Fins that have been deformed can be straighten with a fin comb (QLAZ-20) which can be ordered from your local dealer or Luvata Söderköping AB.

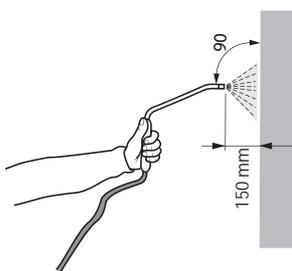


Figure 2. Cleaning the heat exchanger with water.

The fin structure must not contain any solvent residue after washing as the residue will help to bind new dust. After cleaning remove all fallen dust before starting the fan.

## Measures in the event of risk for freezing

If the water in the coil freezes, the pipes can burst which means the water can run out of the system and cause water damage.

A risk of freezing can occur in a ventilation system at low ambient temperatures in the following cases:

1. *The heating media has a high temperature.*

Risk of freezing particularly in the autumn and spring.

Adjust the feed temperature to suit the ambient temperature.

2. *Over-dimensioned coil.*

Lower the water temperature.

3. *Heat supply stops or is reduced.*

Outdoor air inlet should be closed in a safe way and all fans should be switched off.

Freezing damage as in points 1 and 2 depends on too low water flow and uneven temperature distribution across the coil. This can be avoided by equipping the core with its own circulation pump and circulation circuit.

**NOTE!** Open the return air damper if the heat input stops or is reduced. There can be an under-pressure in the premises even if the fans have stopped. Outdoor air can thus be sucked in through the coil and cause freezing damage. The anti-freezing protection thermostat must not be adjusted to so low a temperature that there is a risk of freezing. If the building is to be unheated for a longer period during the winter, all the water must be drained from the pipes and from the coil. The plugs on the core should not be fitted until the system is to be refilled with water. Use compressed air to blow out the coil and ensure it is entirely empty.

# Maintenance and service

## Repair work

Parts and material proposed by Luvata Söderköping AB must be used in order for the stated guarantee to apply. The guarantee does not apply to heat exchangers that have been damaged through incorrect installation, hammering or freezing.

If a heat exchanger has been damaged by hammering it must not be repaired as the coil may have permanent damage. A heat exchanger damaged due to freezing can possibly be repaired on recommendation from Luvata Söderköping AB. When ordering a spare heat exchanger, state the manufacturing number and the product code that are stated on the original heat exchanger's rating plate.

! Our products can be ordered with a variety of accessories as well as with other dimensions and materials than the standard.  
■ Contact us for more information.

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