

Generator/Motor Cooler QLKE, QDKE, QDKR



General

The Generator/Motor Cooler QLKE, QDKE and QDKR is used for the cooling of air by means of circulating water. The cooler can be installed for either horizontal or vertical airflow. The cooler is equipped with removable headers that allow cleaning inside the cooler.

Labelling

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

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

EN

User's Guide

Translation of the original instructions

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 7,500 staff in 18 countries, Luvata works in partnership with customers such as Siemens, Toyota, CERN, Shaaz, and DWD International.

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.



Operating Pressure

- The cooler must only be used in a system that is rated for the max. working pressure MWP (MPa) and the maximum working temperature MWT (°C) specified on the rating plate on the cooler.
- The cooler can only be used within the operating values and environments that the supplier has recommended with respect to the gas- and liquid side



Assembly and connections

- The air cooler has to be secured to its location. The fixing points of the cooler are sufficiently stable to carry the dry weight of the cooler and the weight of the liquid in the cooler.
- The pipe connections on the heat exchanger must not be subjected to the weight of the connecting pipe system. Or the expansion forces of the pipe system.
- Loading and impacts may damage the cooler.
- Header bolts should be tightened prior to commissioning of the cooler. For tightening torque and the order in which they are to be tightened, see Figure 3, page 6.

The connections must be protected against impact, external strain and stress.

Storage

For storage longer than a month, the following applies:

- Spare coolers or coolers that have been dismantled need a protective cover over their finned surface to prevent personal injury or fin damage, as the finned surface has sharp edges.
- Coolers must be completely drained of water before they are stored to prevent freezing or corrosion damage inside the tubes. Both headers should be dismantled to make sure that the cooler has been completely drained of liquid.

Before commissioning (after storage)

Before commissioning tightness of the cooler has to be ensured. Gaskets shall be replaced according to page 6.

Lifting

Lifting is done according to label on cooler. Before lifting the cooler: Check that the lifting lugs are well tightened and are not damaged. Check that correct lifting equipment is used and that the lifting hooks are of the right size to fit the lifting lugs.

Cleaning

Only use environmentally friendly cleaning agents, which will not damage the heat exchanger.

Quality System

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.

Transport

The cooler is designed to withstand normal loads during transport. 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. 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.

Installation and pipe connections

The cooler must be permanently anchored and located to ensure necessary air supply. The cooler is equipped with lifting lugs.

The cooler can be installed for either horizontal or vertical airflow, see Figure 1. The standard cooler is designed with cross-flow water circuit. The direction of the airflow through the coil is therefore insignificant. The supply and return pipes leading to the cooler must be flushed before they are connected to the cooler.

When testing the pressure of the pipe system with cooler connected, the pressure may not exceed the test pressure specified on the rating plate on the cooler. Before commissioning the venting plugs should be loosened, so that existing air in the cooler and pipe system will be removed. In order to avoid that any remaining air in the pipe system stays in the cooler, venting should be done several times during the first period of operation.

Adjust the correct water flow. If the flow is too low there is risk of deposits accumulating inside the tubes. If the flow is too high there is risk of erosion.

If the QDKR double tube cooler is fitted with a leakage detector, the size G 1/4" upper air venting nipple must be removed to prevent exposing the detector system to an excessive pressure. The leakage detector should be fitted to the lowest nipple. We recommend tightening the header bolts before commissioning the cooler. Torque of bolts and the order in which they are to be tightened, see Figure 3, page 6.

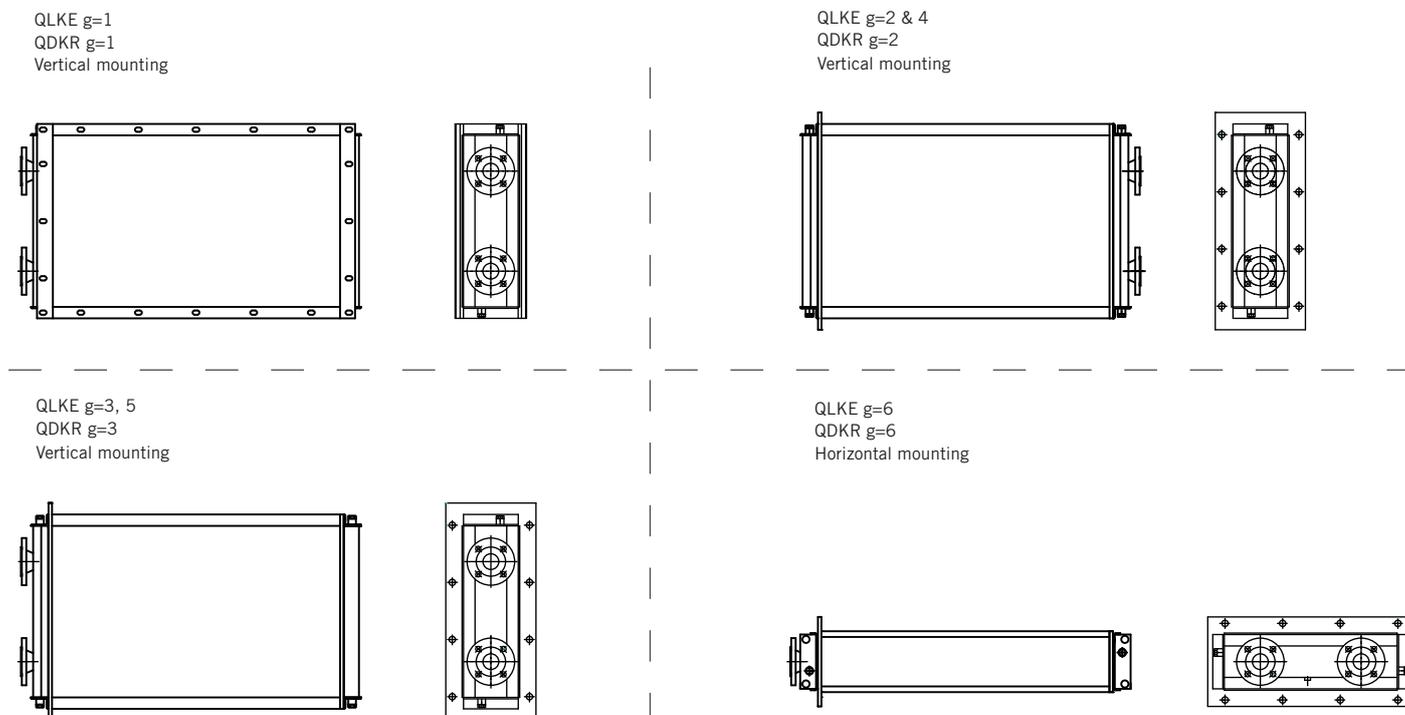


Figure 1. Horizontal and vertical mounting.

Installation

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

The principal parts of a Generator/Motor Cooler

1. Side panel
2. Finned body
3. Tube plate
4. Connection header
5. Return header
6. Venting plug
7. Drain plug
8. Connection for leak detector

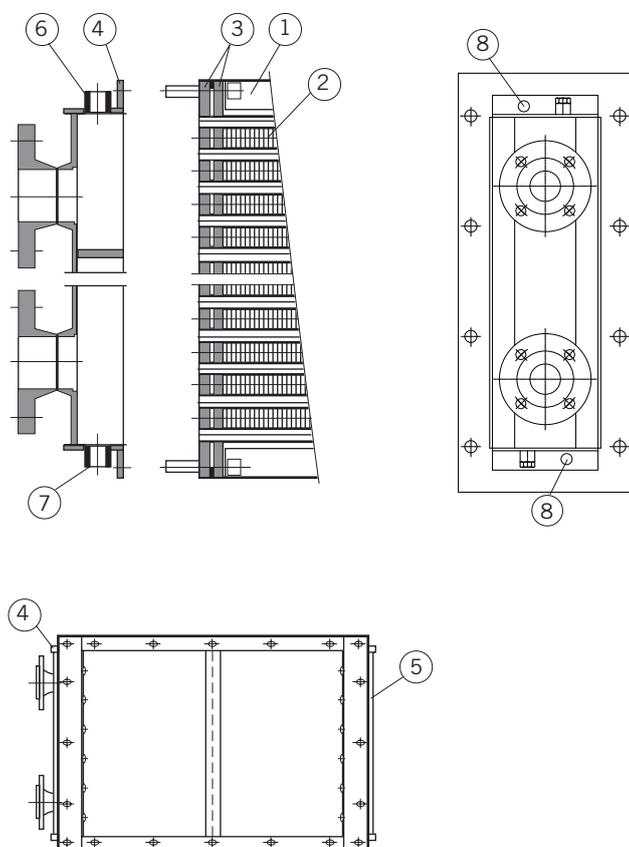


Figure 2. The principal parts of the Generator/Motor Cooler. .

Maintenance and Service

Coolers taken out of operation

If the cooler is drained without being removed from the system, the drain plug should not be refitted since the shut-off valves may leak and refill the cooler with liquid. If the system is inoperative for more than one month, the cooler should be completely emptied and cleaned to prevent corrosion in the tubes (see storage, page 2).

Maintenance

Contamination on the outside and/or inside of the cooler reduces its cooling capacity. The cooler must therefore be cleaned at regular intervals, depending on the constitution of the air and cooling water. The cooler should be inspected regularly (frequency adapted to cooler operating conditions).

Cleaning the inside of the tubes

The cooler can be cleaned internally by temporarily increasing the water flow, by adding a chemical cleaning agent to the liquid (provided that the agent isn't aggressive to the metals in the cooler) or mechanical cleaning. A cooler with copper alloy tubes can be cleaned chemically with Sulphur amino acid or Potassium hydroxide.

Mechanical cleaning:

1. Drain the cooler thoroughly and remove it from the motor or generator system, if necessary.
2. Mark the position of the headers to enable correct reassembly, and then remove the headers.
3. Use a QLKZ/QDKZ-08 brush to clean the inside of the finned tubes as you flush them with water.
4. Clean the sealing surface of the headers with ethanol and fit new QLKZ-01 Gaskets according to the instructions in Figure 3, page 6. The gasket is made of selfadhesive EPDM rubber. The U-strip on the partition wall is reusable if it is in good condition.
5. When refitting the headers, note how they are marked and refit them to their proper locations. Tighten according to the pattern in Figure 3, page 6.

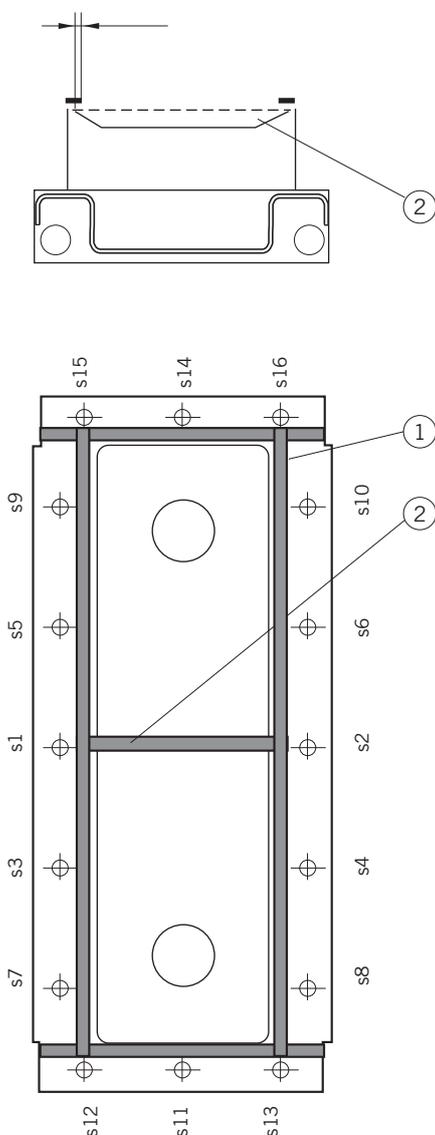
Cleaning the Air Side

1. The finned surface can be cleaned with steam, compressed air or water. Be careful to hold the nozzle perpendicular to the fins and not closer than 150 mm to prevent damaging the fins.
2. The finned surface can also be cleaned with hot water and environmentally compatible detergents. If detergent is used, make sure it does not harm materials constituting the cooler. The finned-tube body may not contain any traces of detergent after cleaning as remaining detergents will bind new dust. If fins are deformed after cleaning, use a fin comb made of Nylon to straighten them. The QLAZ-20 Fin Comb is available as an accessory.

Spare Parts

Luvata guarantee does not cover costs for coolers that are damaged due to improper installation or freezing. When ordering spare coolers, specify the production number and type number that appear on the data plate of the original cooler.

Maintenance and Service



Fitting the QLKZ-01 Replacement Gasket

1. Rubber gasket, 10 x 2 mm

(always to be replaced when dismantling the headers).

Fit the rubber gasket so that it borders on the screw holes. Stretch the gasket outward in the corners. The joint at the corners is made with overlapping.

2. Rubber U-strip

Cut the U-strip angled so that it follows the bending radius of the header. It should extend inward under the gasket.

When you refit the headers, tighten the bolts in the order indicated by s1, s2, s3...

Tightening torque after mounting: 70 Nm (7kpm).

Retightening of torque shall be done at least 24 h after initial mounting of headers: 70 Nm (7kpm).

Figure 3. Mounting of gaskets and tightening of bolts (torque 70 Nm) in the order indicated by s1, s2, etc.

! 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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