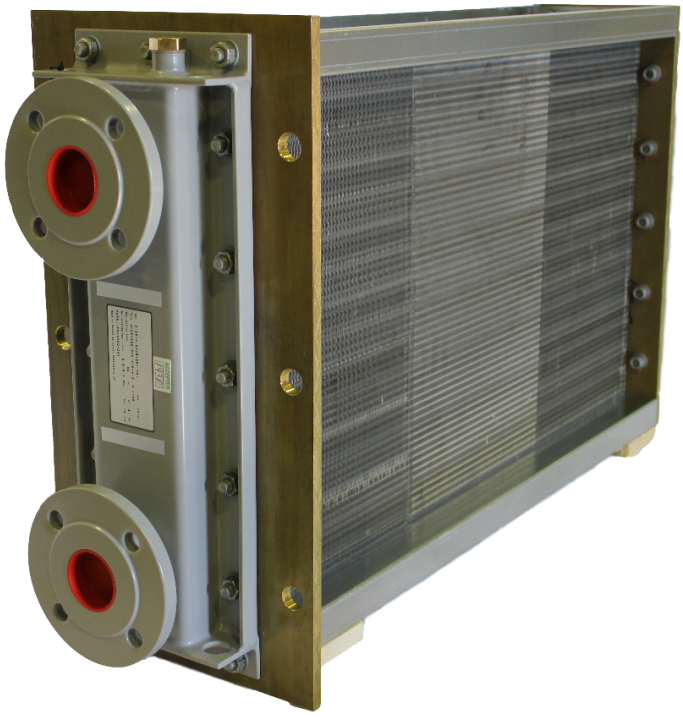
Technical Description

MODINE
Engineering a Cleaner, Healthier World

MOTOR/GENERATOR COOLER, SINGLE TUBE (QLKE, QDKE)

Modine designs and manufactures cleanable coolers for electrical motor and generator cooling, where untreated sea or lake water are often used. Today it's also common to use them with a glycol water where the cleanable design also offer a better possibility for repairing, for example in a ship. The motor/generator coolers are used for cooling air via circulating water and can be installed for either horizontal or vertical flow. The cleanable coolers have removable headers and can be designed with single or double tube, made of different materials depending on the corresponding water conditions. Based on water analysis, Modine can advise the best combination of materials for your cooler.



DESIGN

Due to requirements of mechanical cleaning, the coil body is fixed into tube plates with removable headers. The headers are fitted with partition walls to make the selected cross-flow circuit relative to the air flow. The headers are also equipped with drain- and venting plugs. The tubes are mechanically expanded into the fins to give absolute contact between the two materials that ensure the best heat transfer. The pitch between the fins is selected for the conditions of cooling duty and air pressure drop. The cooler is designed to withstand vibrations, shock loads and thermal movements. No external load is allowed on the cooler flanges. The cooler fulfills the requirements in PED 2014/68/EC.

STANDARD MATERIAL - SINGLE TUBE COOLER

Tubes
Copper, Copper/Nickel, Stainless Steel, Titanium
Fins
Aluminium, Copper
Tube plate
Brass, Stainless Steel, Titanium
Header
Rilsan® Coated Steel, Stainless Steel, Titanium
Frame Work
Galvanized Steel, Stainless steel

Our most common delivered single tube cooler QLKE, are provided with 1/2"-tubes. There is also an option with 15 mm-tubes, QDKE. The cooler can be internally cleaned by unbolting the removable headers, followed by mechanically brush the inside of the tubes. The customized brush can be ordered as an accessory.

TECHNICAL DATA	ii*=00	ii*=01	ii*=02	ii*=03
Max. Working Pressure:	0,6 MPa	0,8 MPa	1,0 MPa	1,5 MPa
Design Temperature:	99 °C	99 °C	99 °C	99 °C
Test Pressure:	0,9 MPa	1,2 MPa	1,5 MPa	2,25 MPa

*ii = pressure class, according to the code key.

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

ENG

CODE KEY - QLKE

QLKE-aaa-bbb-c-d-e-ff-g-h-ii

aaa = Length parallel with tubes (cm) 040 - 300 (every 10 mm valid)

bbb = Width perpendicular to tubes (cm) 030-140 (every 33,33 mm valid)

c = Number of tube rows 2, 3, 4, 5, 6

d = Fin pitch (mm)

Standard fin	Thick fin	Flat fin
0 = 1.8	5 = 1.8	A = 1.8
1 = 2.0	6 = 2.0	B = 2.0
2 = 2.5	7 = 2.5	C = 2.5
3 = 3.0	8 = 3.0	D = 3.0

e = Number of water passes 2, 4, 6, 8 (with exceptions)

_f = Material combination (tube, tube plate and fins)

_f	Tube	Tube plate	Fin
1f	Copper	Brass	Aluminium
2f	Copper nickel	Brass	Aluminium
3f	Titanium	Titanium	Aluminium
4f	Stainless steel	Stainless steel	Aluminium
5f	Titanium	Titanium	Copper
9f	Copper	Brass	Copper
0f	Copper nickel	Brass	Copper

f_ = Header material

f2 = Stainless steel
f3 = Rilsan coated carbon steel
f4 = Titanium

g = Installation type

1 = Duct installation, vertical mounting
2,4 = Hood installation, connection inwards, vertical mounting
3,5 = Hood installation, connection outwards, vertical mounting
6 = Hood installation, connection outwards, horizontal mounting

h = Connection flange

EN 1092-1 type 11*	EN 1759 type 11 (ASME B 16.5)**
1 = DN 32	6 = 1 1/4”
A = DN 40	B = 1 1/2”
2 = DN 50	7 = 2”
3 = DN 65***	8 = 2 1/2”
4 = DN 80	9 = 3”
5 = DN 100	0 = 4”

*** 4 mounting holes to fit against the old std. (DIN2633)

ii = Pressure class

00 = 0,6/0,9 Mpa	*(PN16) **(150lbs)
01 = 0,8/1,2 Mpa	*(PN16) **(150lbs)
02 = 1,0/1,5 Mpa	*(PN16) **(150lbs)
03 = 1,5/2,25 Mpa	*(PN40) **(150 or 300lbs depending on material)

CODE KEY - QDKE

QDKE-aaa-bbb-c-d-e-ff-g-h-ii

aaa = Length parallel with tubes (cm) 040 - 300 (every 10 mm valid)

bbb = Width perpendicular to tubes (cm) 030-140 (every 40 mm valid)

c = Number of tube rows 2, 3, 4, 5, 6

d = Fin pitch (mm)

Standard fin	Flat fin
0 = 1.8	A = 1.8
1 = 2.0	B = 2.0
2 = 2.5	C = 2.5
3 = 3.0	D = 3.0

e = Number of water passes 2, 4, 6, 8 (with exceptions)

_f = Material combination (tube, tube plate and fins)

_f	Tube	Tube plate	Fin
1f	Copper	Brass	Aluminium
2f	Copper nickel	Brass	Aluminium
9f	Copper	Brass	Copper
0f	Copper nickel	Brass	Copper

f_ = Header material

f2 = Stainless steel
f3 = Rilsan coated carbon steel
f4 = Titanium

g = Installation type

1 = Duct installation, vertical mounting
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ii = Pressure class

00 = 0,6/0,9 Mpa	*(PN16) **(150lbs)
01 = 0,8/1,2 Mpa	*(PN16) **(150lbs)
02 = 1,0/1,5 Mpa	*(PN16) **(150lbs)
03 = 1,5/2,25 Mpa	*(PN40) **(150 or 300lbs depending on material)
A0 = 0,6/0,9 Mpa for ff=_3&_5, acc API std	*(PN16) **(150lbs)
A1 = 0,8/1,2 Mpa, acc API std	*(PN16) **(150lbs)
A2 = 1,0/1,5 Mpa, acc API std	*(PN16) **(150lbs)
A3 = 1,5/2,25 Mpa, acc API std	*(PN40) **(150 or 300lbs depending on material)

Materials and Accessories QLKE, QDKE, Packing and Software Coils.

ACCESSORIES - QLKE AND QDKE SINGLE TUBE

QLKZ-01, gasket set, EDPM rubber
QLKZ-02, set of counter-flanges
QLKZ-03, fin structure protection guard, hot dip galvanized steel
QLKZ-04, a number of different vents/drains, 1/2” ball valve
QLKZ-06, set of sacrificial anodes
QLKZ-07, stainless steel nameplate
QLKZ-08, cleaning brush with rod. (QLKE)
QDKZ-08, cleaning brush with rod. (QDKE)
QLKZ-11, safety valve
QLKZ-15, connection with G 1/2” socket

More information about the accessories, can be found in our selection program Coils.

Set of counter-flanges, QLKZ-02-h-m.

Drain valve QLKZ-04-21.

PACKING

The motor/generator coolers can be delivered with different wood packing options depending on the specific transportation mode.

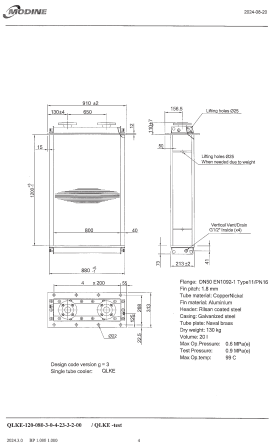
Standard wood packing.

COILS SELECTION SOFTWARE

The motor/generator cooler QLKE/QDKE is available in a wide range of configurations. Modines software Coils is used to select and size the correct cooler. It is a reliable and flexible software and generates a print-out of technical data and a dimensional drawing of the selected cooler. Some variables to be considered while sizing and selecting include:

- Cooling capacity
- Water flow rate and temperatures
- Air temperatures
- Water quality condition
- Cooler size
- Mounting alternatives
- Environmental conditions

Contact us and we can supply the Coils software or help you in selecting the optimal cooler.



Dimensional drawing.

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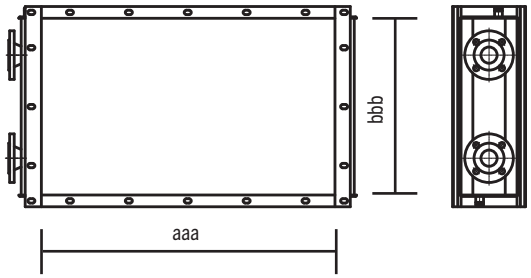
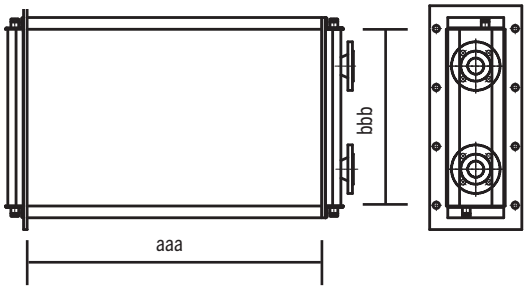
ATTACHMENT 1 - INSTALLATION TYPE (g)

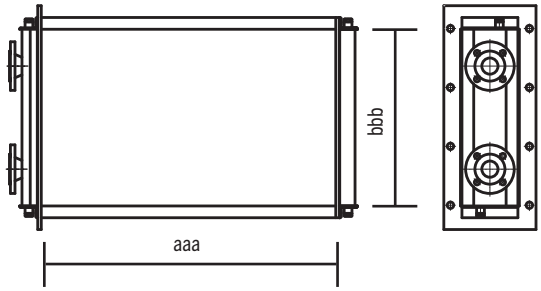
QLKE g=1
QDKE g=1
Vertical mounting
Duct installation



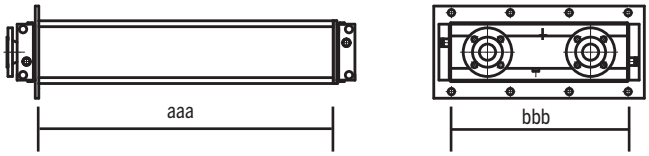
QLKE g=2 & 4
QDKE g=2
Vertical mounting
Hood installation



QLKE g=3, 5
QDKE g=3
Vertical mounting
Hood installation



QLKE g=6
QDKE g=3
Horizontal mounting
Hood installation



Contact us for more information.

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