FBL fan cooler

Auxiliary closed-loop cooling for industrial processes

FBL fan cooler typical installation including steal structure, ladder and handrails

What it's used for

The FBL fan cooler unit is an air-cooled heat exchanger that provides cost-effective auxiliary cooling of water or synthetic oils that circulate in a closed loop in power generation plants, pulp and paper plants and steel mills.

Design – key features and benefits

The heat transfer area of the FBL fan cooler consists of a finned coil, featuring large numbers of corrugated aluminium plates and copper or stainless steel tubes mounted transversely. These plates serve as both heat transfer fins and to hold the circulation tubes securely in position.

The tubes are expanded in order to provide a tight seal with the fins, and therefore ensure effective heat transfer and rigidity of the coil. Compared with traditional finned tubes, this design makes these units light in weight, compact and cost-effective in operation.

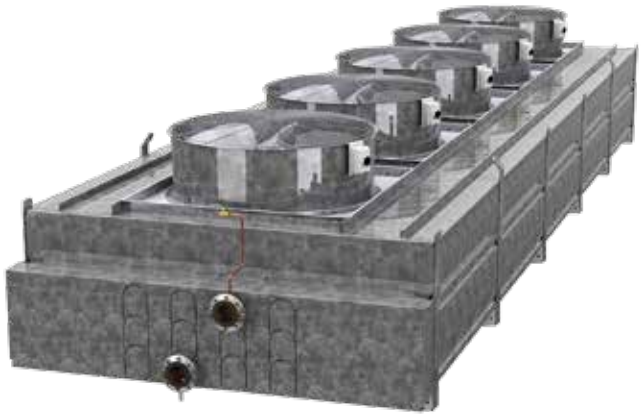
The fans are direct-driven by IEC international standard motors as standard, but other project-specific motor configurations are also available.

Frequency converters are one way to control the exact cooling capacity. Another very efficient way of ensuring full control of

Key benefits of FBL air-cooled heat exchangers:

- Cost-effective solution for key auxiliary cooling needs
- Modular design makes it easy to increase capacity
- Easy to adjust cooling output to exactly meet requirements, saving on operating costs
- Easy to install, with minimal costs
- Easy to service and maintain, with minimal costs

the cooling capacity in bigger installations with a large number of fan motors is with step control, switching some or all of the fans on and off, based on the cooling requirements at any given time.

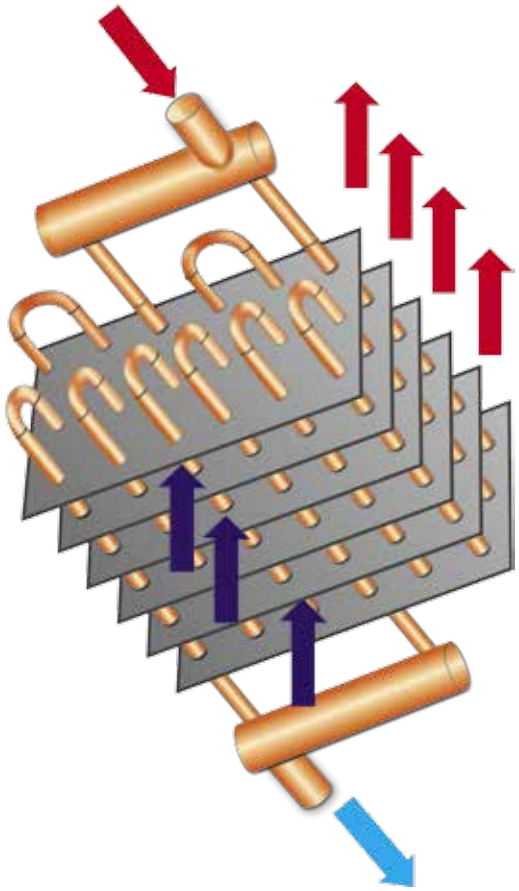


Smaller fans, standardized motors for lower operating costs
Compared with conventional fan coolers, Alfa Laval FBL fan coolers use smaller fans and smaller, standardized motors. This makes the fan motors light, interchangeable and easy to maintain.

The fans and motors can easily be serviced and swapped out, with no big cranes or gantries needed. The standardized motor configurations mean they can be sourced inexpensively, virtually anywhere in the world.

Because these direct-driven fans do not require gearboxes or belt drives, the only maintenance consists of lubrication of the fan bearing. Running without the output of one single small fan while such maintenance is being carried out has only very limited impact on overall cooling capacity.

How it works
The fans in the FBL fan cooler are placed on top of the unit, and the air flow is induced from the bottom. This configuration minimizes any risk of hot air recirculating, which would detract from cooling efficiency.



The modular design of FBL units makes it easy to increase cooling capacity if and when required. FBL fan coolers are designed for multiple installations with several units side by side. Depending on the conditions, one cooler bay can provide up to 4MW of cooling capacity.

Installation and maintenance
The design of FBL fan cooler units is optimized to save time and costs during transport as well as on-site assembly. FBL units of all sizes can be transported fully assembled in standard 40/45-foot containers or in appropriate seaworthy packaging. They are light and compact, taking up very little space in relation to their substantial cooling output. This provides savings on foundations and fittings, and on the equipment required for installation.

Each unit is fully assembled and tested before dispatch, so it can be installed as a “plug-and-play” solution when it arrives on site, saving on installation manpower requirements and commissioning time.

The rigidity of the unit means service staff can safely walk on the casing while carrying out any required maintenance. This design makes it easy to get at the fans and fan motors from the top, ensuring rapid, unobstructed maintenance. There is no need for bulky, difficult-to-manoeuvre service platforms, thus saving on time and costs.

Technical data

Pressure equipment certification
PED 2014/68/EU - Art 4.3
Design based on AD2000 or ASME VIII div.1

Design pressure
6–10 bar
Configurations with higher pressures are available on request

Design temperature
-60°C to 110°C

Standard materials

Pressure vessel and structure
Tube material
Copper
- Outside diameter 12 mm or 16 mm
- Thickness 0.35–0.5 mm

Stainless steel 304 or 316L
- Outside diameter 16 mm thickness 0.5 mm

Fin material
Aluminium
- Thickness 0.18 mm

Seawater-resistant aluminium (AlMg2.5)
- Thickness 0.18 mm

Epoxy-coated aluminium
- Thickness 0.18 mm

Copper
- Thickness 0.15 mm

Header material
Copper or stainless steel 304 or 316L
Tubular or openable type

Fin spacing
2.3–4 mm

Fin coating
Blygold, F-coat, Heresite

Casing
Hot-dip galvanized, aluzinc and zinc coated
Other materials and customized painting are available on request

Fan and electrical components

Number of fans
Maximum 7

Fan material
Glass-reinforced polyamide (PAG) or aluminium
Fan balancing in accordance with ISO1940

Fan sizes
1.2 m and 2 m

Fan motors
Built to IEC or special standards (NEMA, explosion-proof, nuclear standard, etc.)
Motor options include anti-condensation heaters, vibration sensors, PTC and klixon thermistors.

Electrical control and options
Terminal/junction box
Motor protective switch panel
Step control
Frequency control

Standard connections
Flanges EN 1092 or ANSI B16.5
PN10, PN16 or 150 lbs, higher on request

Size
DN65 (2.5 inches) to DN125 (5 inches)

Options
Dual coils for low-temperature and high-temperature cooling circuits

Hot-dip galvanized steel structure up to 6 m in height

Handrails and ladder