Alfa LU-VE in brief

Alfa LU-VE is a leading global provider of specialized products and engineered solutions.
Our equipment, systems and services are dedicated to helping customers optimize the performance of their processes. Time and time again.
We help our customers to cool products such as oil, water, chemicals, beverages, foodstuffs and pharmaceuticals.
Our worldwide organization works closely with customers to help them stay ahead.

How to contact Alfa LU-VE

Up-to-date Alfa LU-VE contact details for all countries are always available on our website alfa.luvegroup.com.

alfa.luvegroup.com

LU-VE GROUP
leadership with passion

100000294-02-EN 2001

Efficient design, optimized performance

AlfaBlue – Enhanced design for outdoor duty

AlfaBlue – Range

Enhanced design for outdoor duty

Introducing AlfaBlue, the new generation of heavy-duty condensers, gas coolers and liquid coolers for refrigeration and air conditioning applications, from Alfa LU-VE.

AlfaBlue delivers improved efficiency for optimal sustainability and performance. Developed with an application-led approach, the AlfaBlue range is available in a number of combinations, with dedicated selection software features that allow easy customization and integration.

Available for both vertical and horizontal airflow, AlfaBlue is suitable for exterior installation, with easy integration into any environment. The compact footprint of the unit makes it ideal for tight spaces. The modular range also features nestable mounting feet for easy installation and system customization. Furthermore, its unique lifting system, designed with four lifting points, offers the advantage of easier handling on-site.

AlfaBlue - At a glance

- Improved energy efficiency
- Nestable mounting feet in 3 different heights
- Each series is optimized according to refrigerants
- EC and AC fans
- Reliable performance, Eurovent certified
- Easy selection
- Rigorously tested against vibration, thermal expansion and external loads
- FEM tested against snow, wind and earthquake loads

AlfaBlue BC & BN

Condensers
AlfaBlue BC condensers are optimized for HFO, HFC and blends. The range also includes a dedicated series for propane (BCP), R410A (BCH) and ammonia (BN) with stainless steel tubing.

- Optimized for new refrigerants
- Reduced refrigerant charge thanks to low internal volume
- Sub cooling available

AlfaBlue BX

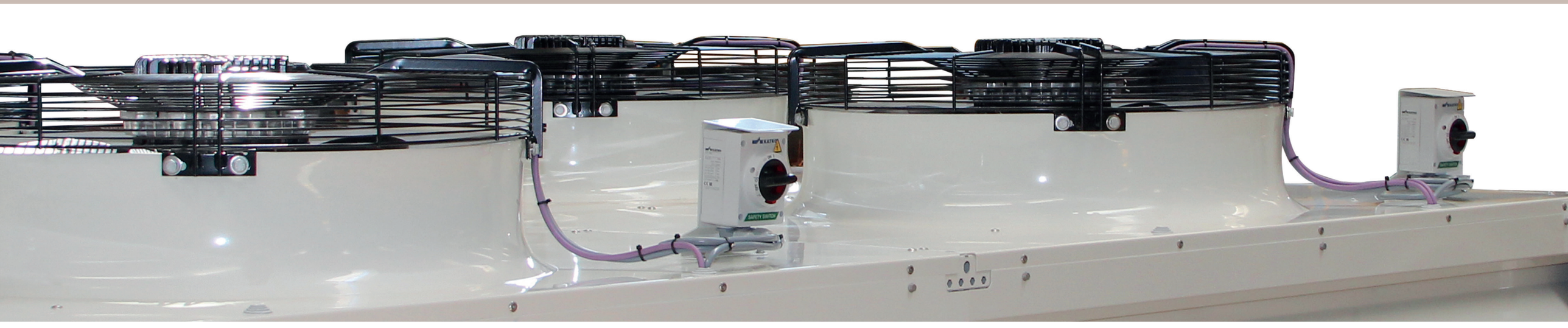
Gas coolers
AlfaBlue BX is designed and optimized specifically for CO_2 as a single refrigerant.

- Design pressure 120 bar
- Tested with dry nitrogen at 172 bar
- Connections available in copper or stainless steel

AlfaBlue BD

Liquid coolers
AlfaBlue BD industrial dry coolers are suitable for fluids in refrigeration and air conditioning installations, as well as for the closed-circuit cooling of various process liquids.

- Reliable performance
- Dedicated series for compressor oil coolers (BDO)
- Available with copper or stainless steel tubes



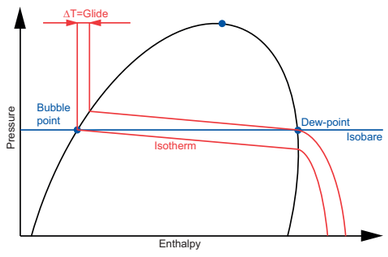
Compact and modular with increased capabilities

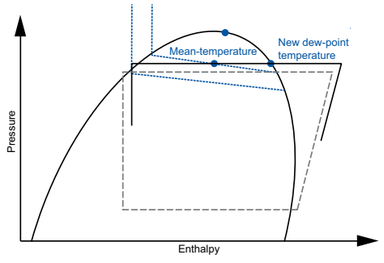
With the advantages of compact, modular design, a variety of fan sizes and combinations and nestable mounting feet, AlfaBlue offers a wide range of fully customized solutions.

Optimized for new refrigerants

The AlfaBlue BC series of condensers is optimized for new refrigerants (HFO & HFO/HFC blends). New refrigerants can display considerable temperature glide - the change in temperature at condensing or evaporating point between bubble-point and dew-point at constant pressure. This is caused by the variable composition of the refrigerant. The least volatile component condenses first at dew-point, while the temperature decreases, until the most volatile components condensate and no vapor is left at the so-called bubble-point.

Traditional condenser design is based on condensing temperature being the refrigerant dew-point temperature. This is however, only effective when used in combination with azeotropic or nearly azeotropic refrigerants. In the case of high glide refrigerants, a design based on the dew-point approach results in oversized units. To overcome this, the concept of mean condensing temperature defined as the mean between dew-point and bubble-point temperature has been introduced. A design based on the mean-temperature approach results in the same condenser size compared to azeotropic (glide-free) refrigerants, although with higher condensing pressures.





Future-proof and with modularity in mind, units in the AlfaBlue series are built for optimal performance, reduced refrigerant charge and are suitable for a variety of refrigerant applications. The result is the most effective condenser and liquid cooler platform, delivering improved performance and energy efficiency, combined with the most compact and modular design.

Application expertise

Alfa LU-VE application expertise enable us to create a platform with specially developed solutions for even the most common applications. In addition, the series features specific materials and design pressures, which have been selected to best fit the market's needs.

Easy tailoring

The versatility of AlfaBlue renders it ideal for any application. Thanks to its fully customizable, modular design concept and easy integration, units can be tailored to suit a wide range of environments and functions.

- Unit footprint doubles as input for selection software
- Nestable mounting feet available in 500, 850 and 1200 mm height
- High efficiency EC or AC fan motors
- Number of fan sizes and combinations available
- State-of the art electrical accessories
- Wide range of fin materials and anti-corrosion treatments

Improved capacity

For improved capacity, modules are tested in our thermal chamber. This testing enables us to provide modules with the ideal footprint and maximum capacity for any application. Factors such as: module size, type of tubes, coil pitch and the distance between the fan and heat exchanger are taken into account, to ensure optimal efficiency and capabilities.

Series	Refrigerant application	Design pressure	Tubes material
BC	HFO & HFC	33 bar	Copper
BCP	Propane	33 bar	Copper
BCH	R410A	45 bar	Copper
BN	Ammonia	30 bar	Stainless steel
BD	Water glycol	10 bar	Copper
BDY	Water glycol	10 bar	Stainless steel
BDO	Compressor oil cooler	30 bar	Copper
BX	CO_2	120 bar	Copper-iron alloy (K65)

Model	Module length [mm]	Module number for single row models				Module number for dual row models		
		BCM BCMP BCMH BNM	BDM BDMY	BDMO	BXM	BCD BCDP BCDH BND	BDD BDD6 BDDY	BXD
800s	1400	1-5	1-5	1-3	1-5	n.a.	n.a.	n.a.
800	1750	1-5	1-5	1-3	1-4	2-6	2-6	2-4
900	2100	1-4	1-6	1-3	1-4	2-5	2-6	2-4
1000	2100	1-4	1-6	1-3	1-4	2-5	2-6	2-4

AlfaBlue standard features

Easy lifting
Each model in the AlfaBlue series is fitted with four lifting points for easy and enhanced lifting and handling. Models with up to 3 modules are fitted with heavy duty eyebolts. Models with 4 to 6 modules are fitted with lifting stirrups.

Eyebolt: 1 to 3 modules

Lifting stirrups: 4 to 6 modules

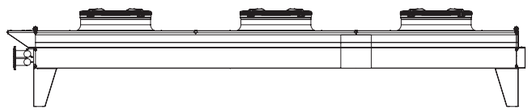
Design that's outside the box

Frame and casing
Constructed from heavy duty, corrosion resistant, pre-galvanized sheet steel. The casing is epoxy powder coated with white RAL9002 on both sides. Corrosion protective coating and alternative colour finishes are available upon request.

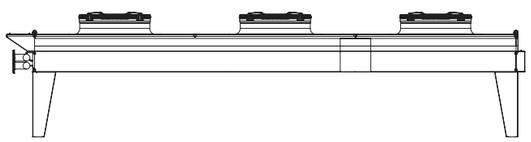
The frame construction of AlfaBlue provides high rigidity for protection against vibration and thermal expansion, rendering it ideal for industrial refrigeration installations.

- Heavy duty design with high corrosion resistance
- Easy installation and maintenance
- Construction provides protection against vibration and thermal expansion
- Made of pre-galvanized sheet steel
- Powder coated on both sides

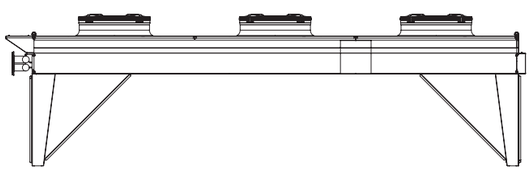
Mounting feet
When vertical airflow is selected, the AlfaBlue series features nestable mounting feet for vertical airflow installation. Feet are available in three different height options: 500 mm, 850 mm and 1200 mm.



Mounting feet: 500 mm



Mounting feet: 850 mm



Mounting feet: 1200 mm

You can trust Alfa LU-VE sound data

Complete units
Air heat exchangers sound power values are often supplied per fan. Alfa LU-VE, however, supplies reliable sound power data for the complete heat exchanger. Sound specification is crucial for air heat exchangers, since they are often used in areas with human presence, and adequate sound levels are required for compatibility with the surrounding environment. There are a few methods used in the refrigeration industry to address sound values, each with different specific advantages or disadvantages. The basic issue is whether to refer to sound power (LwA) or sound pressure (LpA).

Sound power L_wA
Sound power is the sound energy that is generated per time unit (W=Nm/s). Sound power is not dependent on the distance from the sound source and other situational circumstances, which makes it the only correct value to compare different sound sources.

Sound power cannot be measured directly (we measure the sound pressure Lp) so sound power is the result of a complex calculation involving many different parameters. Sound power values are usually given in dB(A).

Sound pressure L_pA
Sound pressure is the sound force/surface ($P=N/m^2$), the force N being the alternating pressure generated by acoustic oscillation of the air. Sound pressure values can be directly measured under laboratory conditions according to strictly formalized standards (free field conditions, fixed distances etc.). Sound pressure values are also given in dB(A). Sound pressure values for Alfa LU-VE air heat exchangers are calculated according to EN13487 in free field conditions.

Sound pressure values given in a brochure or data sheet are no clear indication of the actual sound characteristics in the working situation. There are numerous acoustic determinants to consider during actual operation of air heat exchangers, such as the number of reflection planes, the presence of additional units, and installation construction. This needs to be calculated based on the provided sound power values in combination with all relevant situational parameters. This is primarily a responsibility of the contractor or plant designer.

Reality based innovation

Enhanced design
The enhanced design of AlfaBlue offers greater capabilities. Improved features, such as optimized coil design, length of circuits based on refrigerants for condensers and a choice of louvered aluminium or industrial fins deliver increased performance and versatility.

The improved frame design has been specially developed to support and drive the thermal expansion of the heat exchanger. Both frame and casing are built for improved handling and installation, and to withstand extreme climate conditions.

- Selectable fin design
- Robust casing for safety and reliability
- Optimized circuit lengths based on refrigerants for condensers

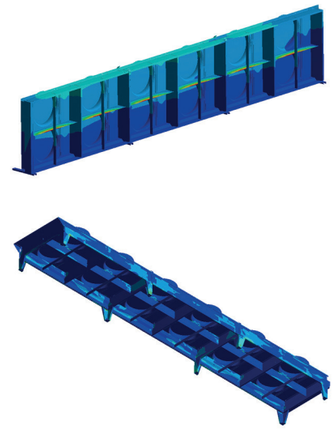
Reliable performance – Eurovent
Alfa LU-VE participates in the Eurovent Certify-all programmes for all products within our heat exchanger series. Eurovent is Europe's Industry Association for indoor climate (HVAC), refrigeration and process cooling. Eurovent certification programmes provide criteria for the rating of products, which includes evaluation of manufacturer's performance data by Eurovent and testing of selected units by independent laboratories. All models in the AlfaBlue series included in the Eurovent scope have been tested and have undergone checks by independent specialists, ensuring optimal reliability and accurate ratings for the following characteristics:

- Fan power output
- Energy ratio & energy class
- Air volume flow
- A-weighted sound power & pressure level

Tried and tested
Reliability is paramount. To ensure full reliability of Alfa LU-VE products, performance data and extensive testing, including regular performance checks of both existing product ranges and in-development products are carried out in Alfa LU-VE's R&D Thermal Laboratory. Our in-house testing facility is one of the best in the industry and complies with EN requirements. With two test plant rigs we are able to test HFC, HFO and blends and CO_2. Our second rig is specially designed to test CO_2 units for both air coolers and gas coolers up to the maximum thermal test pressure (120 bar) for total safety and reliability.

Alfa LU-VE's in-depth understanding of heat transfer technology ensures optimal design. All models within the new AlfaBlue range have been tested in our climatic chamber in temperatures between -40° C and 40° C, enabling us to develop a range of air-cooled condensers with the highest performance.

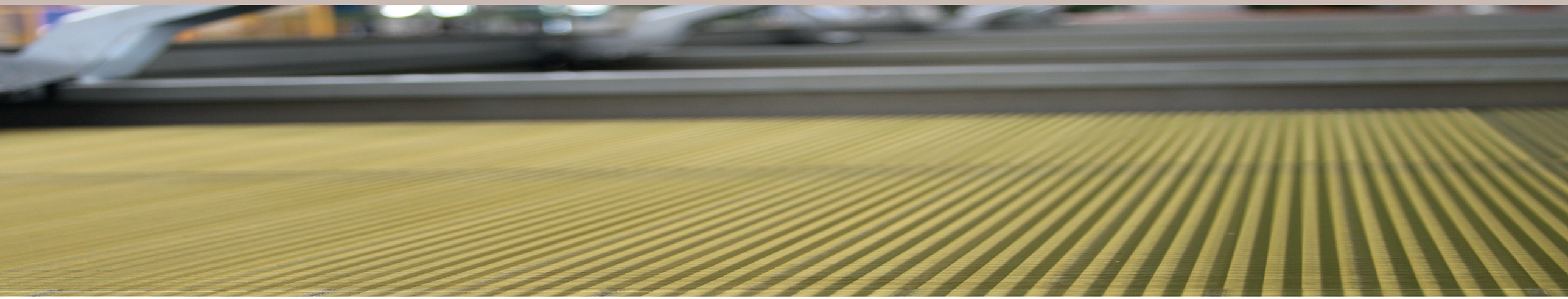
Tested against
- Vibration
- Noise
- Earthquake, snow and wind load through FEM analysis



B	D	M	Y	S	E	80	2	s	.2	A	D	6	CR	Feet	*	AL	2.1	SS	*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

1 AlfaBlue platform
2 Family: C=condenser, D=dry cooler, N=ammonia condenser, X=CO_2 gas cooler
3 Number of fan rows: M=1, D=2
4 Dedicated series: blank=default, Y=SS tubes, 6=5/8" Cu tubes, P=propane (R290), H=R410A, O=compressor oil cooler
5 Sound level: T=turbo, S=standard, L=low, Q=quiet, R=residential
6 EC fan: blank=AC fan, E=EC fan
7 Fan diameter: 80=800 mm, 90=910 mm, 100=1000 mm
8 Number of fans per row: 1 to 6
9 Short coil module: blank=default, s=short coil module
10 Version number
11 Tube rows code: A, B, C, D, E
12 Fan motor connection: D=delta, Y=star
13 Number of circuits (only for gas coolers and dry coolers)
14 Packing: P=pallet, PP=pallet with protection for headers and coil, CR=crate, SK=container skid
15 Feet=mounting feet supplied mounted (type of feet according to airflow selected), blank=mounting feet supplied loose
16 Electrical accessories
17 Fin material/coating: AL=aluminium, IF=industrial fins, SWR=seawater resistant fins, CU=copper, EP=epoxy coated alu, FC=F-coat
18 Fin spacing: 2.1, 2.3, 2.5, 3.0 mm
19 Tube material: CU=copper, SS=stainless steel, K65=copper K65
20 Options

Optional and on-demand features



Customized options for optimal performance

Thanks to a wide range of optional features, AlfaBlue can be easily customized and optimized to specification during the design process, for improved and efficient installation.

Mounting feet for vertical airflow
Improved easy-to-fit, nestable mounting feet, which are available in three different heights: 500 mm, 850 mm and 1200 mm.

Vibration dampers VD
Dampers provide passive isolation of fan vibrations and reduce noise transmission. Alfa LU-VE strictly recommends the installation of vibration dampers on all outdoor air heat exchanger equipment. Vibration dampers should be positioned between the unit feet and the mounting base.

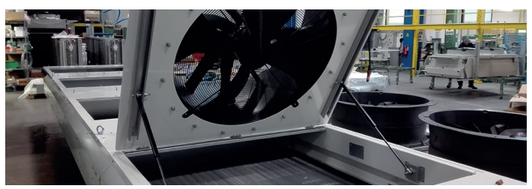
Sub-cooling circuit SC
The AlfaBlue series features a dedicated sub-cooling circuit, which can be calculated and selected in our selection software.

Spray Water Kit KW
The Spray Water Kit, developed by Alfa LU-VE, consists of a stainless steel pipe system fitted with several spraying nozzles that nebulize water, saturating the air next to the suction side of the coil. Its design is based on the Adiabatic Saturation concept. A smart solution for overcoming heat peaks; liquid coolers and condensers can be designed for lower entering air temperature, thus obtaining a smaller dimension unit with a smaller heat exchanger.

Upon request fan motor options
- 400 V/3 ph/60 Hz
- 480 V/3 ph/60 Hz
- Protection class IP55
- High temperature fan motor
- ATEX fan motor

Packing options
- Pallet P
  Wooden pallet suitable for lifting the unit with a forklift
- Protection Pallet PP
  Wooden pallet with protection for headers and coil. Available for dual fan row models
- Crate CR
  Wooden crate. Available for single fan row models
- Container skid SK

Hinged fan panels HF
Hinged fan panels for easy inspection, cleaning and maintenance.



Casing colour
By default, the AlfaBlue series comes in a white powder coated casing (RAL 9002). Alternative painted colour options are also available, upon request.

Corrosion-protective coatings
For installation in aggressive climates and environments, corrosion-resistant painted protective coatings are available: C4-H as optional, up to C5-H upon request.

Stainless steel tubes
Stainless steel tubes available as optional.

Coils for every application
The AlfaBlue series is available with a wide variety of coil and fin options to suit every application, ensuring optimal performance.

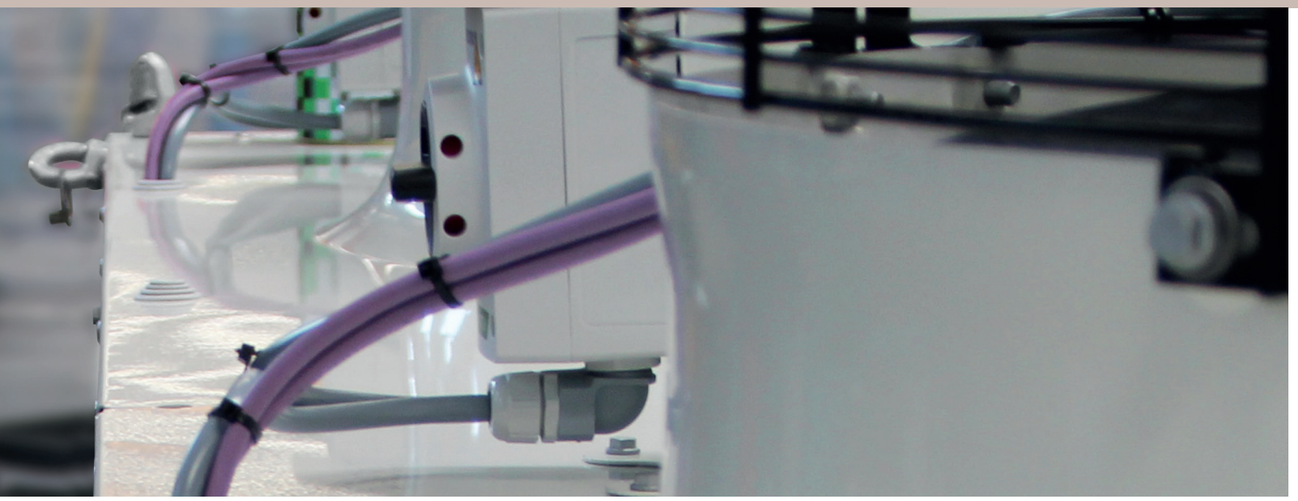
- Industrial fins IF
  For reduced fouling and optimal performance
- Seawater-resistant fins AlMg SWR
- Copper fins CU
- Epoxy coated fins EP
  Epoxy pre-painted aluminium fins
- F-coat FC
  Polyuretanic fin coating

Installation areas and suggested materials and treatments

Installation area		Coil			Casing	Electrical components	Fans	Note
		Fins	Treatment	Fin spacing				
Up to medium corrosivity areas	Urban and industrial atmospheres with moderate sulfur dioxide pollution. Coastal areas with low salinity.	Al	-	-	HDG painted	IP54	-	-
		Standard	Standard	Standard	Standard	Standard	Standard	
High corrosivity areas	Industrial polluted environments	Industrial fin +treatment	Epoxy coating	> 2.3 mm	C4-H coating	IP54	C4-H coating	Regular cleaning and maintenance required
			F-coat					
		Optional	Optional	Optional	Optional	Standard	Upon request	
	Coastal areas with moderate salinity	Industrial fin +treatment	Epoxy coating	> 2.3 mm	C4-H coating	IP54	C4-H coating	Regular cleaning and maintenance required
			F-coat					
		SWR	-					
		Optional	Optional	Optional	Optional	Standard	Upon request	
Very high corrosivity areas	Industrial areas with high humidity and aggressive atmosphere and coastal areas with very high salinity	Optional	Upon request	Optional	Upon request	Upon request	Upon request	Regular cleaning and maintenance required

To be used as quick reference, when in doubt please contact Alfa LU-VE.

Controls and electrical accessories



Enhanced electrical accessories

The AlfaBlue series features optimized controls and electrical accessories for both EC and AC fans, for greater performance and control.

EC and AC fans

Both options are available for all AlfaBlue units. EC motors are direct current motors, with electronics replacing collector and brushes. EC fan motors are equipped with integrated electronic commutation speed control. The result is a highly efficient and extremely compact speed controlled fan.

Benefits of EC fans compared to AC fans

- Absence of slip and friction losses
- Less noise
- Greater efficiency at any speed
- Lower power consumption
- Longer lifespan
- Fan speed independent of power supply frequency and number of poles
- Excellent electromagnetic compatibility (EMC) according to EN 50082-2, with no shielded motor cabling required

ErP
All Alfa LU-VE AC and EC fans comply with the Energy-related Products (ErP) directive.

ErP compliant

Electrical accessories for EC fans

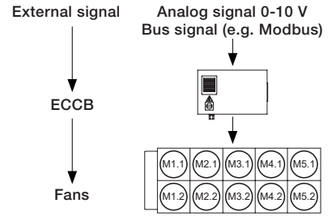
Switch SW
Wired to the fan, the safety switch is an on/off switch that allows easy maintenance. One fan may be switched off while the others continue, enabling continuous operation. Units feature one switch per fan.

Connection box CBP
Fans are wired to a connection box for common power connection (one per fan row) and the signal is wired to a different smaller connection box. EC fans are supplied connected and are provided with specific settings. The main input signal is 0–10 V from the customer.

Connection box and master controller CBM
Fans are wired to a connection box for common power connection (one per fan row). The fans are supplied connected and the master controller is provided within the scope of supply. The input signal for the fans is supplied by the master controller. Master controllers for EC fans are available in a variety of configurations.

Basic switchboard ECCB
ECCB is a basic switchboard, featuring a main switch and protection for each fan (circuit breakers). Terminals are available for input signal and cumulative fan alarm.

By default, fans are driven by a 0-10 V signal and can be monitored via Modbus. To drive fans via Modbus a dedicated setting is available on request. ECCB can be used in combination with the master controller for optimal control.



Master controller
The master controller features a signal converter which converts the probe signal to 0–10 V to drive the EC fans, enabling control. This solution includes additional features, such as: dual speed (night mode), unit remote on/off and spray system activation (on units where spray system is available).

Available configurations:

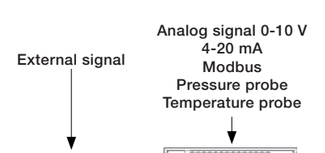
- Master controller for external customer signal
- Master controller and temperature probe (for liquid coolers)
- Master controller and pressure probe (for condensers)

The master controller can be supplied in combination with either CBM or ECCB. The control is managed by the master controller, while the CBM acts as the "power box". The ECCB acts as both a power box and protection for the unit.

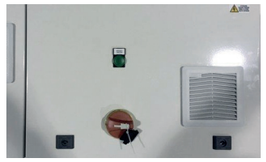
ICM premium controller
ICM is Alfa LU-VE's solution for complete fan management, developed in close cooperation with leading fan suppliers. It consists of a switchboard featuring a main switch, protection for each fan (circuit breakers) and a PLC with high level communication system. All fans come with Serial Modbus communication (0-10 V, temperature probe and/or pressure probe). An internal bus system enables it to be connected to any supervision network. ICM allows the heat exchangers to function independently or fully controlled via Modbus.

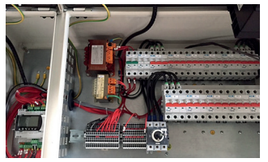
Available configurations:

- ICM for external customer signal **ICM**
- ICM with temperature probe for liquid coolers **ICMT**
- ICM with pressure probe for condensers **ICMP**



Terminals for cumulative fan alarm are available. Corrosion resistant metallic casing painted white (RAL9002) and a special solution for independent fan row management are also available upon request.



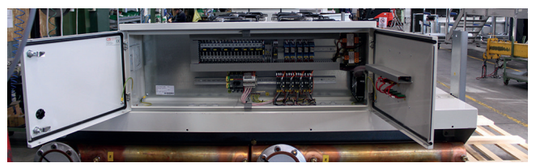


Electrical accessories for AC fans

Switch SW
Wired to the fan, the safety switch is an on/off switch that allows easy maintenance. One fan may be switched off while the others continue, enabling continuous operation of the unit. Units feature one switch per fan.

Connection box CB
Fans are wired to a connection box for common power connection (one per fan row).

Basic switchboard BS
Basic switchboard cabinet fitted with AC fan protection, main switch and terminals for fan alarm and input signal. The basic switchboard can be used in combination with the step controller.



Step controller BSP BST
The switchboard includes fan protection and an automatic multistage step controller, which allows control of the fluid outlet temperature (BST, for liquid coolers) or the refrigerant pressure (BSP, for condensers). On/off regulation of fans is according to the input signal.

Product selection and information

AlfaSelect Air

Our computer selection software, AlfaSelect Air, offers separate modules for mechanical and thermal configuration, as well as instant access to selection and pricing of optional extras. It also offers a fully sortable selection output, and an interface that offers multiple language options.

Data sheets

The AlfaSelect data sheet printout provides all relevant technical specifications for the selected cooler model, including detailed dimensional drawings.

- Thermal and air flow specification
- Mechanical configuration
- Pricing information
- Detailed dimensional drawings

Product information

Comprehensive product information is available at alfa.luvegroup.com including product leaflets, manuals, certificates and brochures. Our website also offers CAD drawings, high-resolution images and electrical connections available for download.

Selection features in AlfaSelect Air

For optimal heat exchanger configuration, AlfaSelect offers AlfaBlue-specific selection parameters:

- Maximum unit dimension
- Noise level
- Coil material
- EC or AC fans
- RPM modulation for EC fans
- Number of circuits (dry coolers and gas coolers)
- Power supply



Alfa LU-VE commercial air coolers

The Optigo range contains the following models: Optigo CS (low silhouette), Optigo CD (dual discharge) and Optigo CC and CCB (single discharge) air coolers for general application in cooling, freezing, storage, working and processing rooms.

A wide range of models are fitted with energy-efficient EC fans (as standard on the low silhouette range Optigo CS), making them especially suitable for refrigerated working, processing and storage rooms. Optigo offers dedicated ranges for HFO & HFC refrigerants, brine and CO_2 applications.





Alfa LU-VE industrial air coolers

The Arctigo industrial air cooler platform offers an extremely wide and flexible range of single (IS) and dual discharge (ID) industrial air coolers, shock cooling (IST), banana ripening (HRCD) and data center cooling (LSV). The Arctigo range offers a wide variety of cooler configurations and options.



Commercial condensers, gas coolers and liquid coolers

AlfaBlue Junior is a competitive gas cooler, condenser and liquid cooler platform. AlfaBlue Junior offers excellent performance, allowing easy installation on site and easy integration with other components. Highly efficient fan motors combine excellent sound characteristics and low energy consumption. The range includes: XG gas coolers specifically designed for CO_2 refrigerant systems, AG condensers and DG liquid coolers for commercial refrigeration and air-conditioning installations. The Alfa-V Single Row is designed to reject small to medium heat loads with a modest footprint in commercial refrigeration and air conditioning installations. It offers many features to meet the highest demands in state-of-the-art refrigeration installations.





Industrial liquid coolers

The Fincoil Solar, Alfa-V (VDD and and VLD) and Fincoil FBL ranges cover dry coolers for HVAC & REF applications, for heavy industrial cooling applications in process and power industries. AlfaBlue BO is a dedicated range for transformer oil cooling.

Our industrial liquid coolers are available with either copper or stainless steel tubing. We supply both standardized and fully customized industrial liquid coolers. The Alfa LU-VE industrial product portfolio includes a variety of design options and accessories.