BLAUAIR

Modular Air Handling Units

ETL LISTED C US Intertek

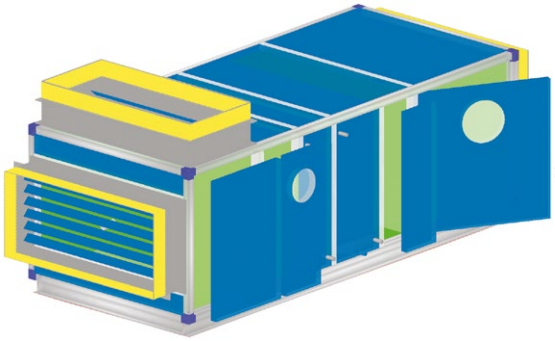
BLAUBERG NA

CONTENTS

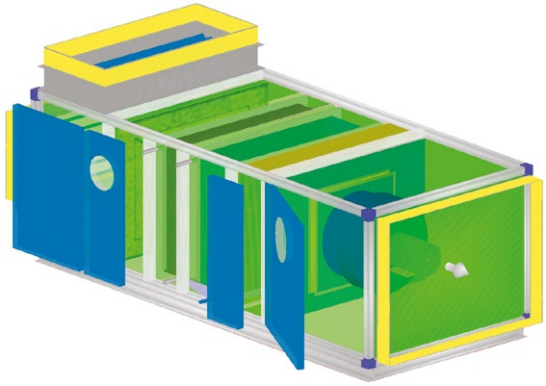
BlauAir air handling unit selection program

Advantages of the program

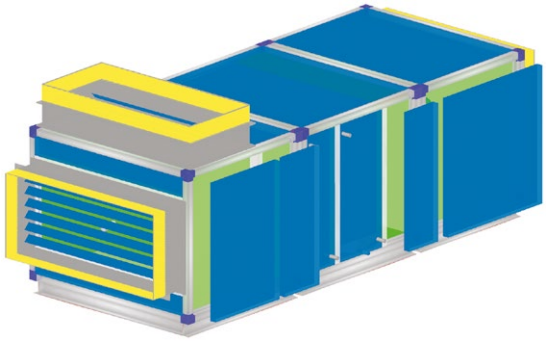
- The flexible system designed to create commercial offers in compl dance with the customer requirements.
- The flexible system allows to arrange sections in a non-standard wa ering all the design peculiarities.



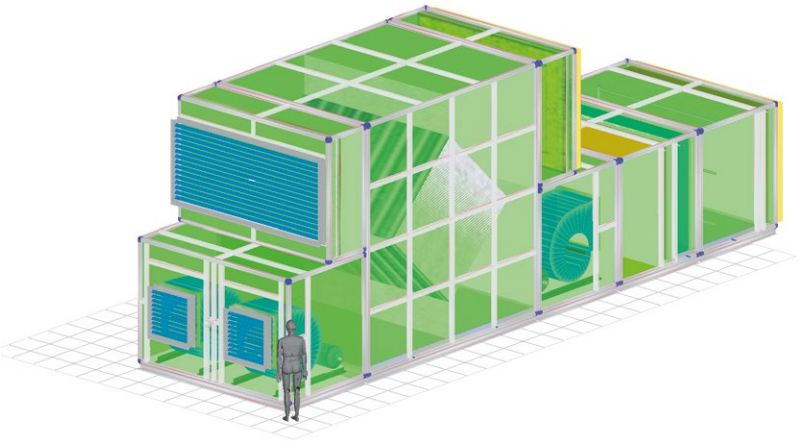
Example of an air supply unit arrangement with a mixing chamber



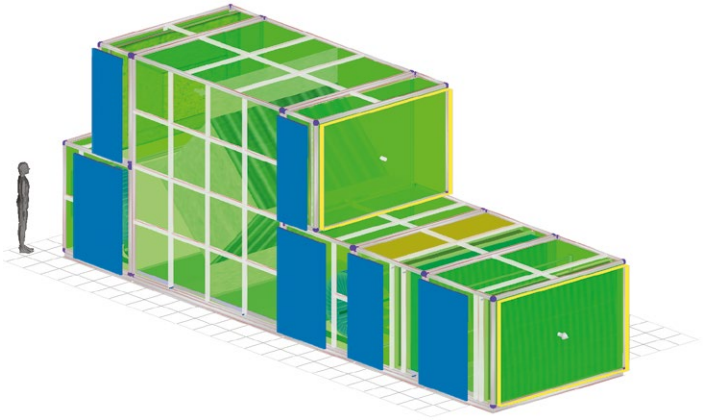
Single-unit design

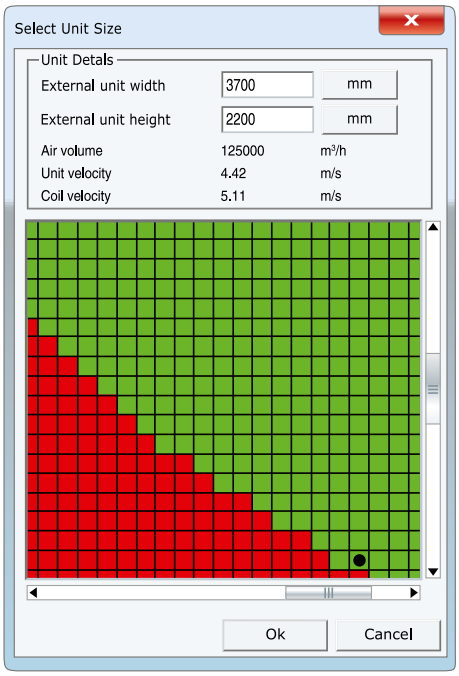


Combined design of separate sections



14 standard sizes
with a performance range from 888 CFM up to 75340 CFM





- Non-standard sizes are available upon request.
- Selection of functional elements, such as heat exchangers, filters, fans, standby motors, etc. is available.
- Detailed technical description of selected units, including fan curves and representation of processes as a Mollier diagram for heat exchangers.
- Integration with a CAD-system allows to generate a set of design documentation for automated manufacturing.
- Layouts of units and separate sections drawings is available in the following formats: .dwg, .dxf, .pdf.

Unit designation

Size

BLF/N/ L02 | BLF/N/ L03 | BLF/N/ L04 | BLF/N/ L06 | BLF/N/ L09 | BLF/N/ L12 | BLF/N/ L15

BLF/N/ L20 | BLN/L27 | BLN/L35 | BLL45 | BLL55 | BLL65 | BLL85

Service Access Side

- **L** — Left side
- **R** — Right side

Supply Units

- **SU** — Indoor mounting
- **SU/O** — Outdoor mounting

Exhaust Units

- **EXH** — Indoor mounting
- **EXH/O** — Outdoor mounting

Heat Recovery Units

Rotary Heat Exchanger

- **SE/R** — Indoor mounting
- **SE/R/O** — Outdoor mounting

Plate Heat Exchanger

- **SE/P** — Indoor mounting
- **SE/P/O** — Outdoor mounting

Separate sections

- **HW** — Water heater
- **HE** — Electric heater
- **CW** — Cooling section (water coil)
- **CDX** — Cooling section (evaporator)
- **F** — Pocket filter
- **FC** — Panel filter
- **EC** — Fan with EC motor
- **SRI** — Silencer
- **HU** — Humidifier
- **MC** — Mixing chamber
- **A** — Control system
- **IB** — Inspection block
- **D** — Air damper
- **UV** — UV-lamps
- **WH** — Galvanized weather protection hood
- **MB** — Base frame
- **EVA** — Flexible connection
- **RF** — Roof

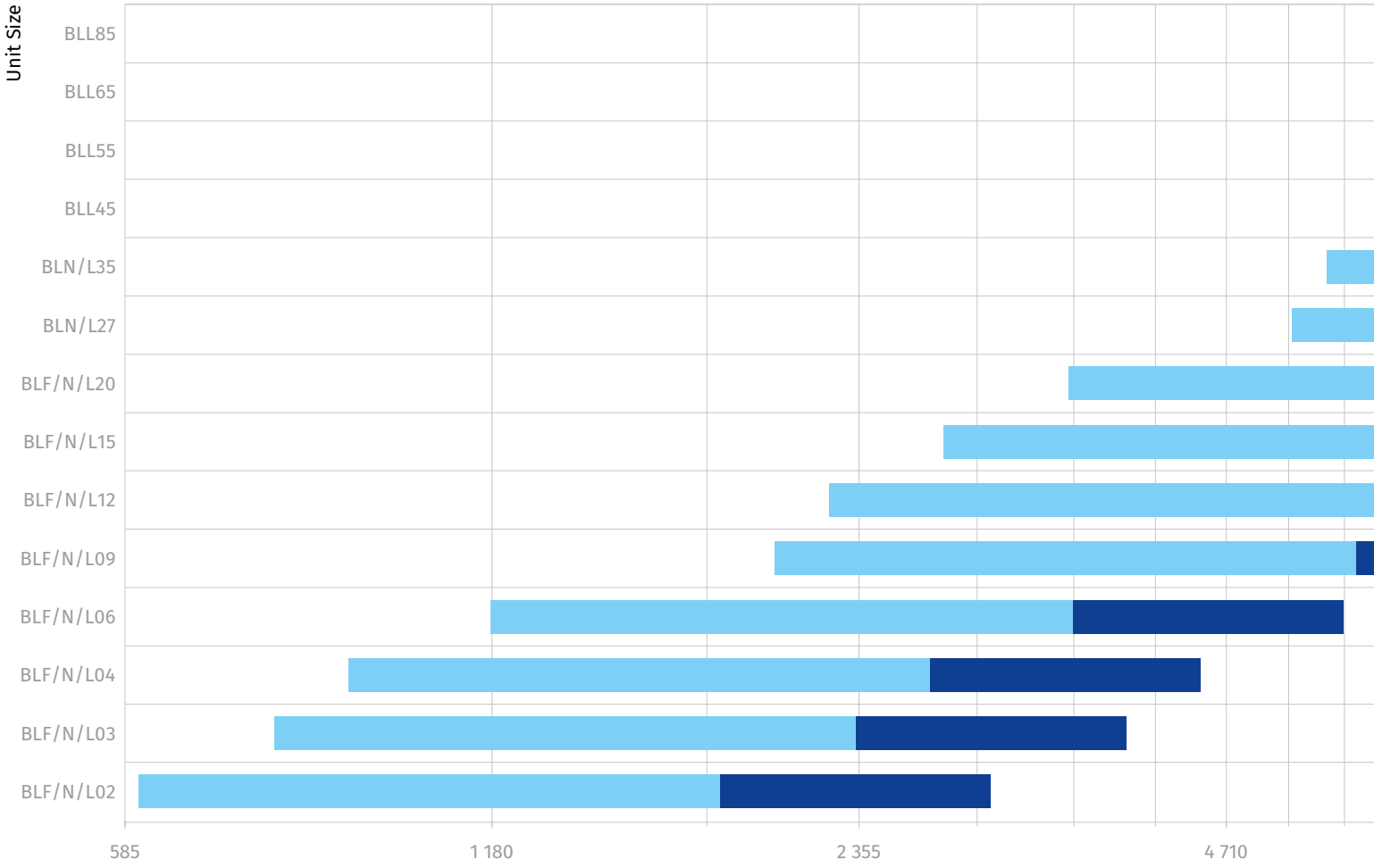
- **BLF** units have a frameless design
- **BLN** units have a self-support, frameless design with PVC profile system
- **BLL** units have a frame design (not Eurovent certified)

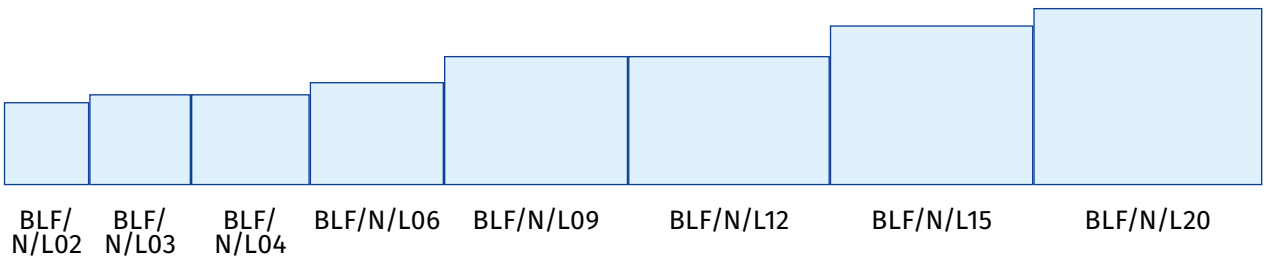
Unit's designation example

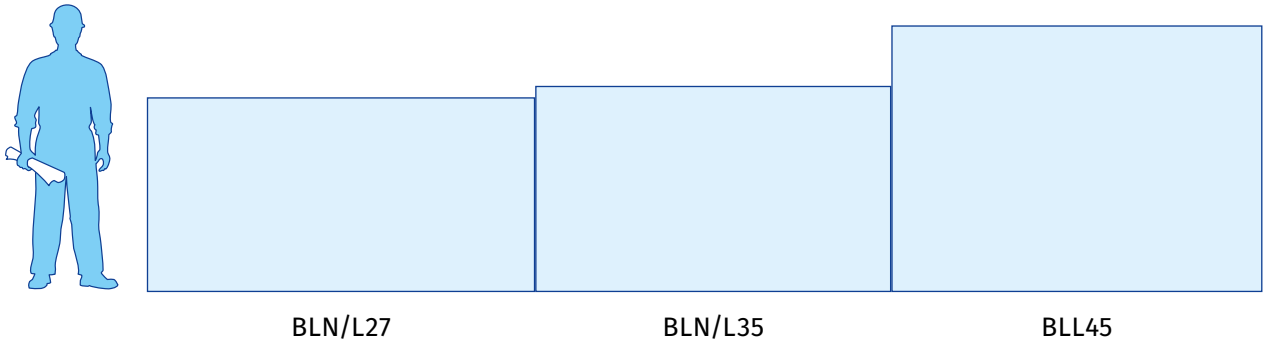
BLN09 L/SE/P/O-HW-CW-SRI
A heat recovery air handling unit for outdoor mounting equipped with a plate heat exchanger, a water heater, a cooling section and a silencer.
Total capacity: 5300 CFM. Service access side: left.

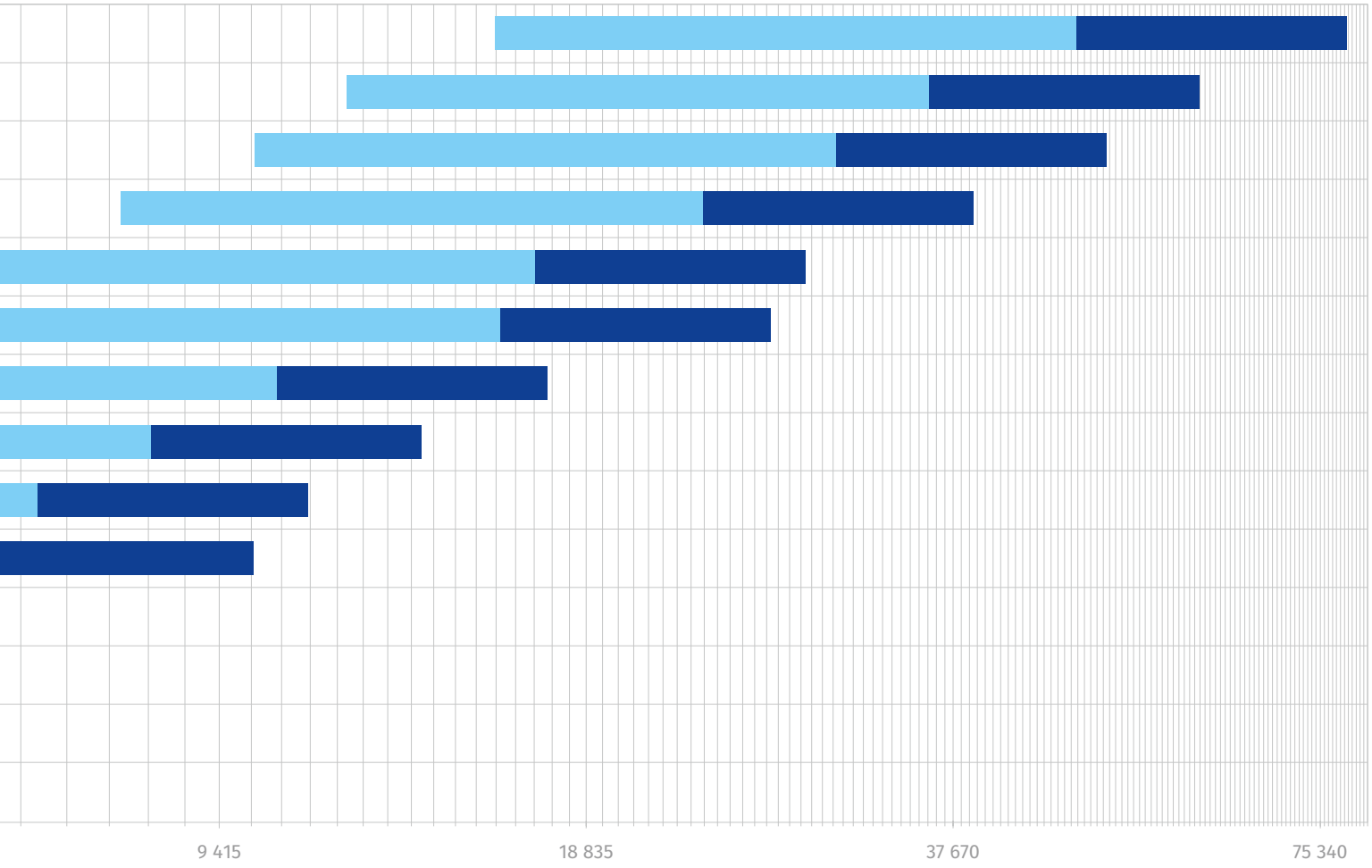
BLF15 R/SU/O-FC-HE-CDX-SRI-A
Air supply unit for outdoor mounting equipped with a panel filter, an electric heater, a cooling section and a silencer. Supplied with a high-tech control system.
Total capacity: 8830 CFM. Service access side: right.

Size selection









Unit size	BLF/N/ L02	BLF/N/ L03	BLF/N/ L04	BLF/N/ L06	BLF/N/ L09	BLF/N/ L12	BLF/N/ L15	BLF/N/ L20	BLN/L27	BLN/L35	BLL45	BLL55	BLL65	BLL85
Nominal air flow [CFM]	1180	1770	2355	3535	5300	7065	8830	11775	15895	20605	26490	32375	38260	50030
Cross section height [in]	19.7	21.7	21.7	24.8	31.1	31.1	38.6	42.5	45.7	48.8	63.5	74.8	74.5	86.6
Cross section width [in]	22.4	26.4	30.3	34.6	47.2	52.4	52.4	60.2	85.4	85.4	90.2	98.4	117.8	133.9

Casing types

- Unit casing provides thermal and sound insulation, as well as protection and resistance to external influence.
- BlauAir series are available in several casing types, general properties of which are:
  - High mechanical strength.
  - Corrosion resistance.
  - Thermal insulation.
  - Protection from thermal bridges.
- Mineral wool basalt fiber insulation with a density of 90 kg/m³ is applied for casings. Unlike other types of insulating materials, this one is completely non-flammable and environmentally friendly.

BlauAir series are available in several casing types

BLL*: FRAME DESIGN

BLF: FRAMELESS DESIGN

EUROVENT CERTIFIED PERFORMANCE
AHU N° 19.01.001
Range BLAUAIR Pro
www.eurovent-certification.com

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BLN: SELF-SUPPORT, FRAMELESS DESIGN

* Models so marked are not Eurovent certified

BLL*: frame design

The classic casing design, based on aluminum profile frame and joined by means of cast corners, provides high durability of the unit. Different frame thickness values should be used depending on the unit size.

Frame type	Recommended performance area	Aluminum profile thickness	Thermal insulation thickness
50-50	11770–26485 CFM	2"	2"
70-50	26485 CFM	2.75"	2"

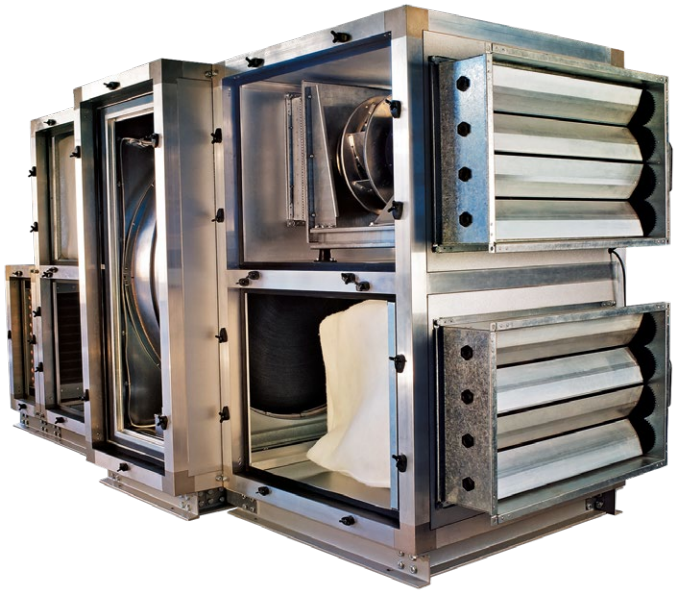
- Casing panels are made of steel sheets with a layer of thermal and acoustic insulation from mineral wool.
- Casing panel material varies depending on the unit application:

EXTERNAL PANEL SURFACE MATERIAL:

- Zinc-aluminium coating (standard);
- Galvanized steel with polymeric coating (high corrosion resistance);
- Galvanized steel (for indoor units).

INNER PANEL SURFACE MATERIAL:

- Zinc-aluminium coating (standard);
- Stainless steel (for hygenic units);
- Galvanized steel



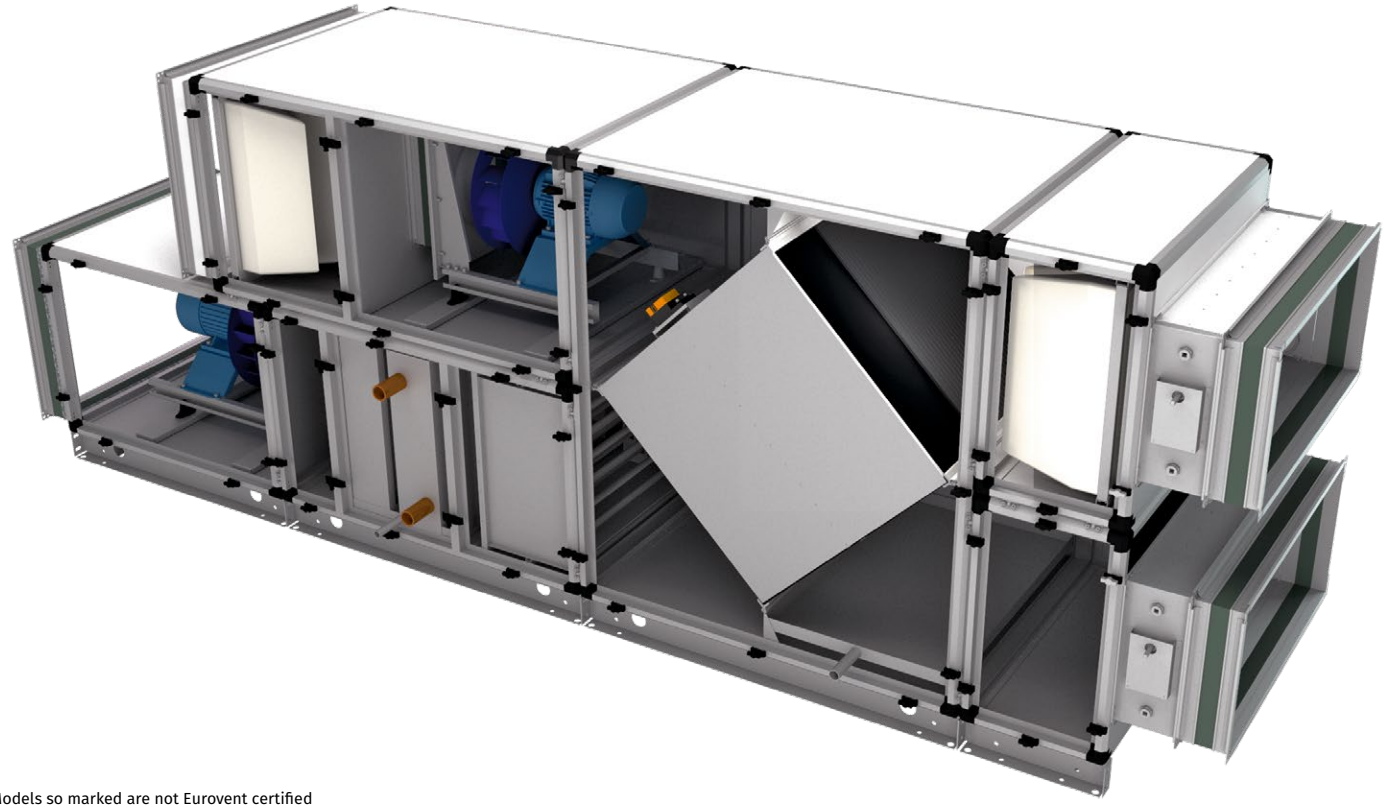
Classic unit design with 2"-thick zinc-aluminium panels covered in the 2" profile frame

OUTDOOR DESIGN:

The unit is additionally protected against precipitation exposure.

- Weather protection hoods are provided over the inlet and outlet spigots.
- Air damper actuators are supplied with protective visors.
- Flat or gable roof.
- An inspection window is supplied with a protective grille.
- The visor length is 11.8".
- All joints are sealed.

All these elements protect the unit against exposure to water, sand, leaves, etc.



* Models so marked are not Eurovent certified

BLF: frameless units (Eurovent approved)

- Frameless design casing system eliminates thermal brigdes, which tend to form in aluminum or steel frames. This significantly increases thermal resistance and reduces heat loss, especially for outdoor installation. It also prevents condensation on the surface when air cooling is on.
- Casing panels are made of sheet steel with a layer of 1.6" thermal and acoustic insulation from mineral wool.
- Casing material varies depending on unit application:

EXTERNAL PANEL SURFACE MATERIAL:

- Zinc-aluminium coating (standard);
- Galvanized steel with polymeric coating (high corrosion resistance);
- Galvanized steel (for indoor units).

INNER PANEL SURFACE MATERIAL:

- Zinc aluminium (standard);
- Stainless steel (for hygienic units);
- Galvanized steel.

BENEFITS OF FRAMELESS CASING:

- Better thermal resistance. Class T3, according to EN 1886.
- Protection from thermal bridges. Class TB4, according to EN 1886
- Higher mechanical strength. Class D1, according to EN 1886.
- Minimizing air leakage. Class L1, according to EN 1886.
- Lower weight of the unit.
- Suitable for outdoor installation.

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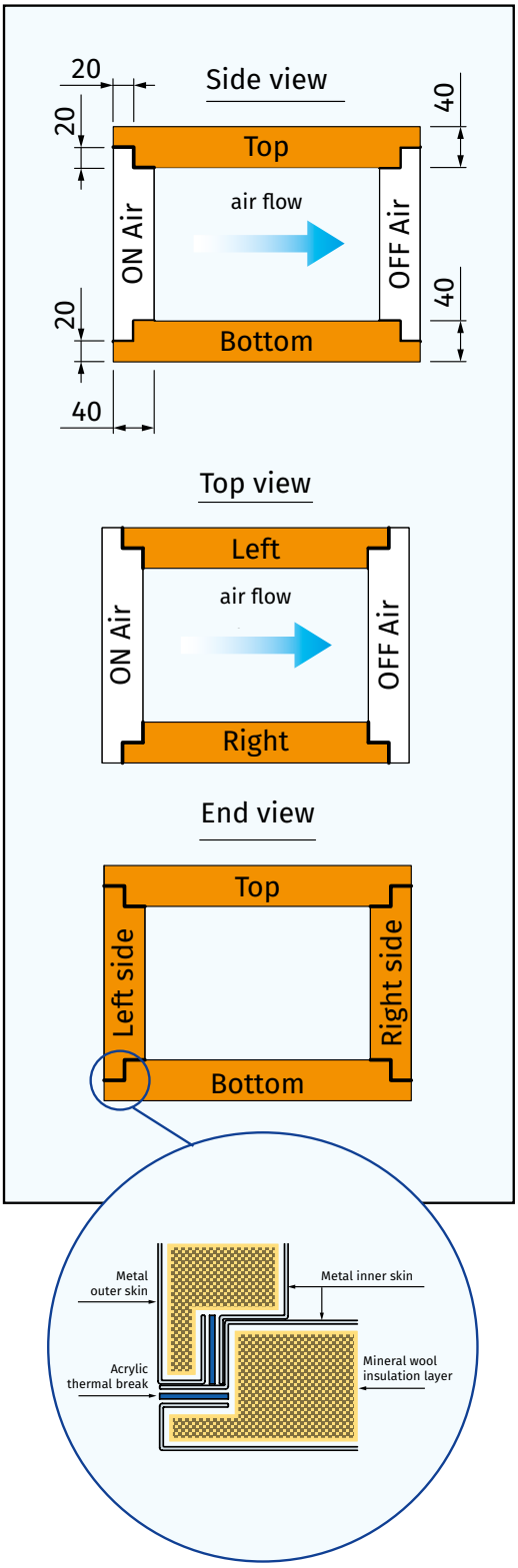

Frameless unit close up

Frameless casing connection

BLN: self-support, frameless, modular units

- Improved self-supporting, frameless, modular construction of the casing with PVC profile system, eliminates thermal bridges, reduces heat loss and decreases noise level.
- Casing panels made of sheet steel with a layer of 2" thermal and acoustic insulation from mineral wool.
- Casing material varies depending on unit application:

OUTER PANEL SURFACE MATERIAL:

- Zinc-aluminium coating (standard)
- Galvanized steel with polymeric coating (high corrosion resistance)
- Galvanized steel (for internal execution units)

INNER PANEL SURFACE MATERIAL:

- Zinc aluminium (Standard)
- Galvanized steel with polymeric coating
- Galvanized steel

BENEFITS OF FRAMELESS CASING:

- Better thermal resistance. Class T2, according to EN 1886.
- Protection from thermal bridges. Class TB3 according to EN 1886.
- Higher mechanical strength. Class D1, according to EN 1886.
- Minimizing air leakage. Class L1, according to EN 1886.
- Lower weight of the unit.
- Suitable for outdoor installation.

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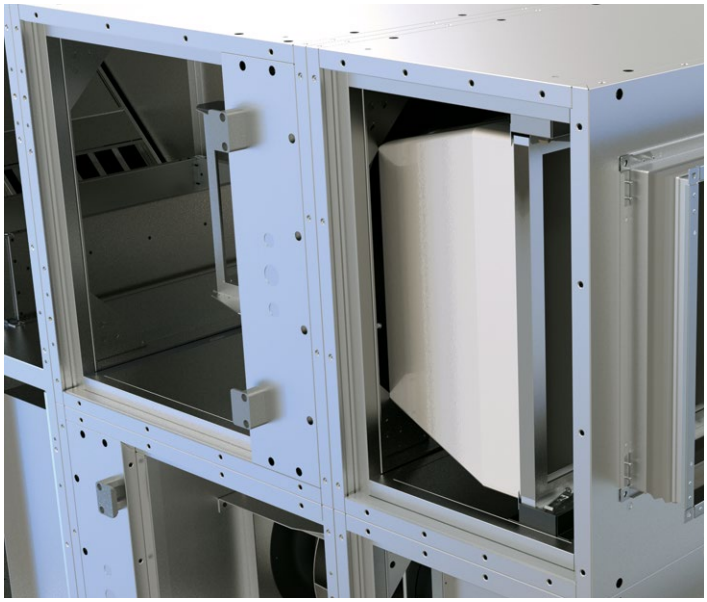
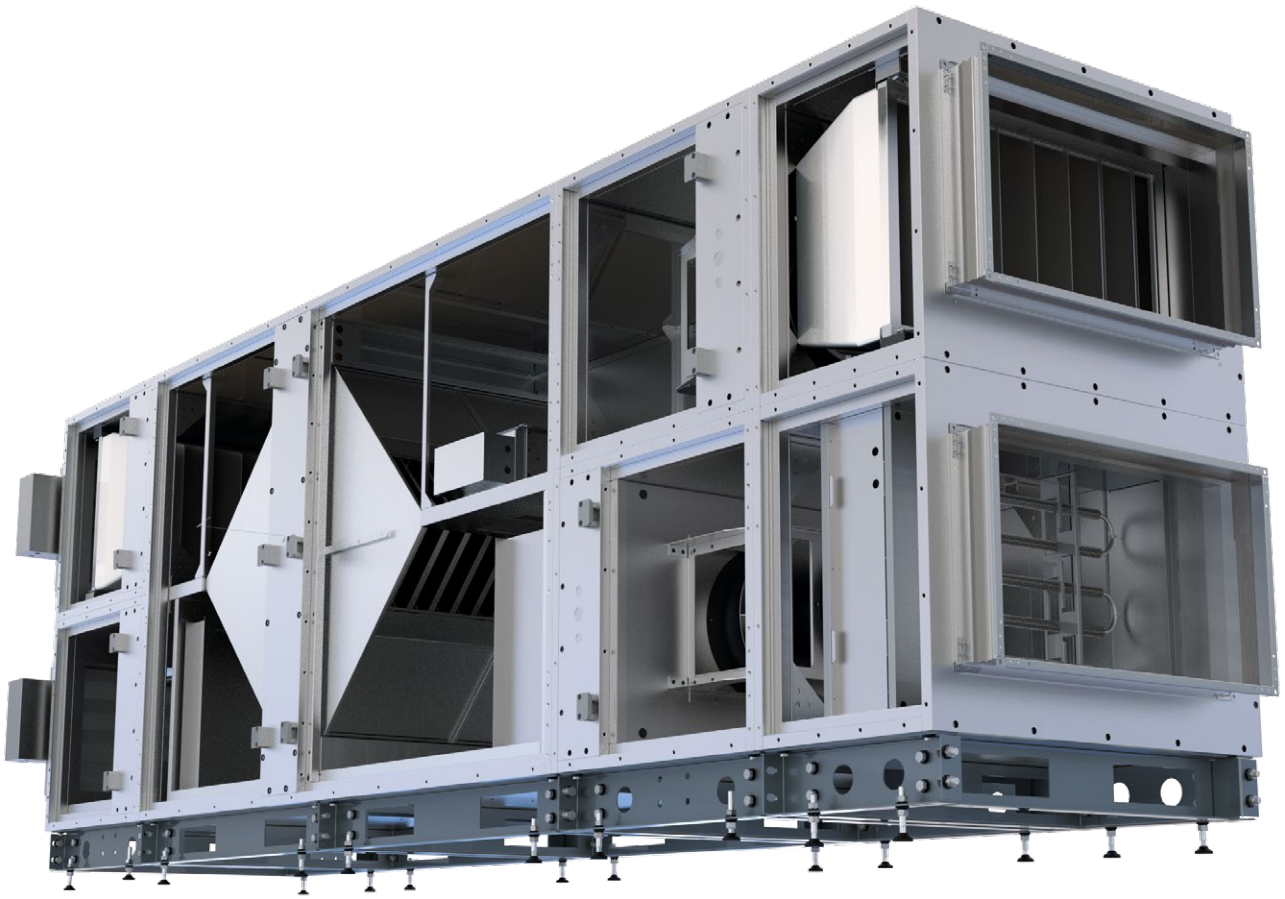


PVC profile system inside the unit casing



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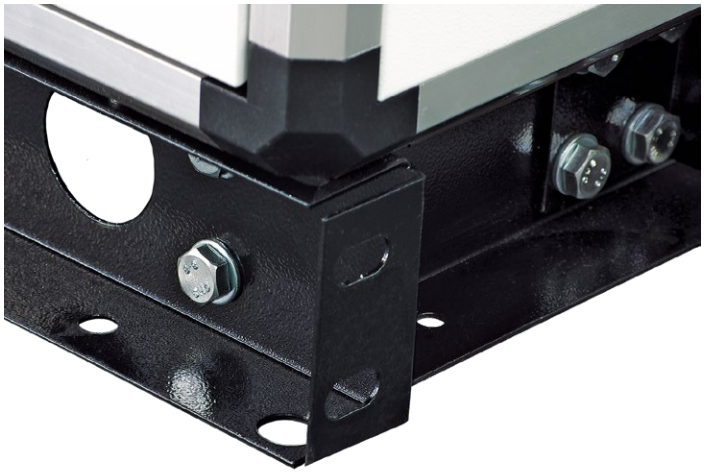
Base frame types

For both classic and frameless unit casing types, there are several types of base frame avaliable.

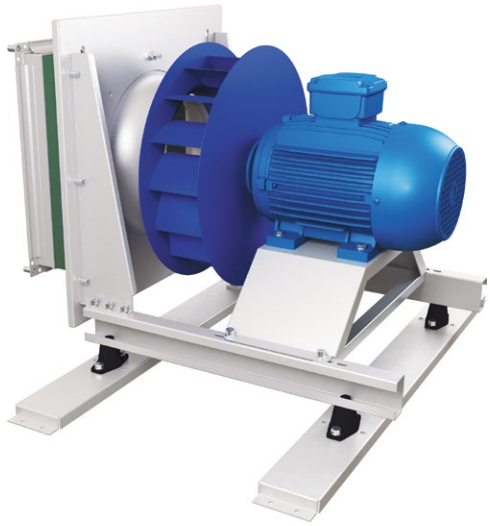
Type	Application
Adjustable legs made of 0.08” thick galvanized sheet steel	Single-deck units with air capacity up to 11770 CFM, or double-deck units – up to 8830 CFM
Solid base frame made of 0.08” thick galvanized sheet steel	Single-deck units with air capacity up to 20600 CFM, or double-deck units – up to 14715 CFM
Solid base frame made of 0.12” thick painted galvanized sheet steel	For units with maximum performance of up to 29430 CFM
Solid base frame made of 0.16” thick painted galvanized sheet steel	For units with maximum performance of up to 75340 CFM



Solid base frame

Adjustable legs

Sections



Fan section types:

- Plug fan with asynchronous motor (standard);
- Plug fan with an energy-saving electronically commutated motor (EC motor);
- Belt-driven fan in a spiral casing.

Fan sections are equipped with an inspection window.

PLUG FAN

Plug fans are used in case of low or medium air performance and pressure. The direct-driven motor and backward curved impeller ensure high performance, reliability and easy maintenance due to the absence of belt drive.
The impeller is made of durable composite material or sheet steel with protective polymer coating.
For correct fan operation, soft start, current protection and smooth speed control, it is recommended to use a variable frequency drive. It can be supplied loose or mounted inside the fan section as an option.
Motor and impeller are isolated from section housing with rubber anti-vibration mounts and flexible duct connectors.
The engine complies with energy efficiency classes IE1, IE2, and IE3, depending on the project requirements.

PLUG FANS WITH ENERGY-SAVING ELECTRONICALLY COMMUTATED MOTORS (EC MOTOR)

Electronically commutated direct current motors (EC motors) with an external rotor, equipped with a backward curved impeller, are used. Such motors are a cutting-edge solution for energy saving. EC motors are characterized by high performance throughout the whole range of rotation speed levels available. The advantage of an electronically driven motor is its high energy conversion efficiency (up to 90%).

SILENCERS:

- A silencer unit consists of easily removable sound-absorbing 3.9" thick panels, with the length of 23.6" or 47.2". Sound absorption is presented in accordance to ISO 7235.
- Sound absorbing panels are available in two variants: pointed, low-resistance and rectangular, with a larger area of sound absorption.
- Panels are made of high-density mineral wool with a protective felt cover.

DISTANCE BETWEEN THE PLATES:

- 3.9" (standard);
- 5.9" – lowered air pressure drop;
- 2.9" – increased sound reduction.

AIR FILTERS

Units include the following filter elements:

- Panel-type coarse filters, MERV6 and MERV8 class, in accordance to EN779. Filter depth is 2". Reinforced with a steel mesh. Panel frame is made of galvanized steel.
- Pocket filters with pocket depth of 11.8" and 23.6"; MERV6, MERV8, MERV10, MERV13 or MERV15 class in accordance to EN779.
- High-efficiency filters: EPA – filters (MERV16) and HEPA – filters of classes H12-H14, in accordance to EN1822.
- Filters based upon active carbon (unlike the filters of other types) are used to absorb unpleasant odor, gases and toxic vapors.

All filters have easily removable cassettes that can quickly and easily be replaced.

In case of two stages of filtration, the unit contains a compact section, in which panel and pocket filters are installed close to each other.

Electric heater

The section consists of electric tubular heating elements (heaters) with sufficiently many spiral fins, which are set into removable cassette frames made of galvanized steel.
Heaters are protected from overheating using thermal switches with automatic reset reaching the temperature of +122 °F (+50 °C) and with a manual reset reaching +194 °F (+90 °C). Heaters are grouped according to the "triangle" scheme, three heaters in each group. Groups of heaters are then connected in parallel into 380 V power supply network.

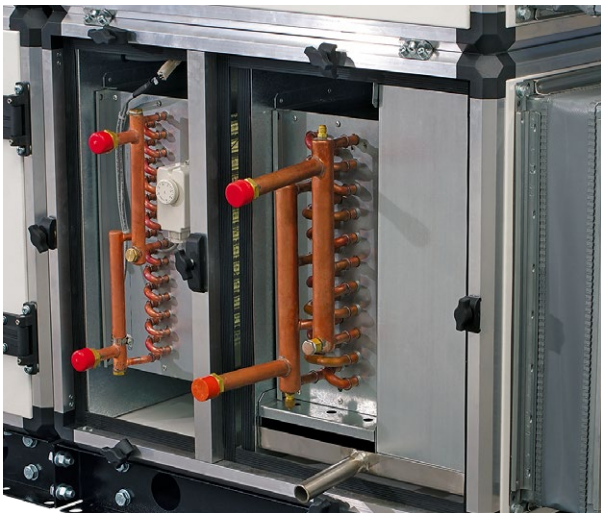
OPTION:
Unit with a built-in electric heater triac controller enables keeping the supply air temperature at a set level with accuracy of ±33.8 °F (±1 °C).

RECOMMENDED ACCESSORIES:
Fan pressure switch DTV 500 – additional protection from overheating in case of low air flow. The sensor can be pre-mounted inside the unit, or supplied loose as a separate item.
External Triac controller RNS provides smooth control of heaters up to 75 kW (25 kW triac + two steps to 25 kW).

Water cooling coil

The heat exchanger complies with EN 13053, EN 1216
The unit consists of copper tubes with aluminum finning.
The section is equipped with a removable drain pan.
For water or glycol mixtures up to 50 % glycol concentration.
Maximum working pressure of the cooling medium is up to 16 bar (1.6 MPa).
Drain and air release valves are provided for each coil.

RECOMMENDED ACCESSORIES:
Three-way valve with electric actuator.



DX cooling coil

Complies with EN 13053, EN 1216
Copper tubes with aluminum finning.
The section is equipped with a removable drain pan made of stainless steel.
For refrigerants R22, R407, R410A, and others.
Drain and air release valves are provided for each coil.

Water heating coil

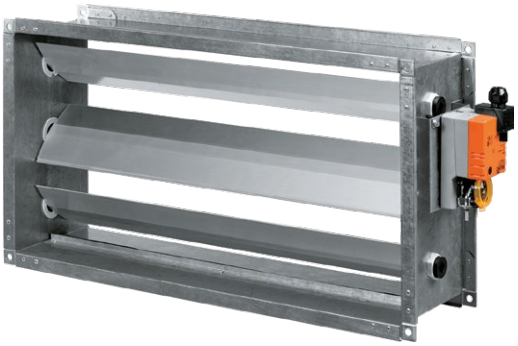
All heaters comply with the standards EN 13053, EN 1216. Heat exchanger consists of copper tubes with aluminum finning.
Maximum temperature of heat transferring medium: 302 °F (150 °C).
For water or glycol mixtures up to 50% glycol concentration.
Maximum operating pressure of the heat transferring medium is up to 16 bar (1.6 MPa).
Drain and air release valves are provided for each coil.

Rotary heat exchanger

A rotary heat exchanger is a rotating cylinder, filled with layers of corrugated aluminum ribbon. The ribbon is placed so, as to enable supply and extract air flows to pass through it. As a result, the ribbon is heated and cooled in turns, thus conveying heat and moisture from the warm air flow to the cold one.
The advantages of a rotary regenerator are: high efficiency, keeping comfortable humidity and low risk of frosting.
Rotary regenerators in BlauAir units are of two types:
Condensation type (standard);
Enthalpy type. The additional hygroscopic coating is applied to the tape, which provides additional moisture transfer from one stream to another. This feature is especially useful when using a rotor in summer in combination with the air conditioning system.

Plate heat exchanger

A plate heat exchanger is a unit, transferring heat from the exhaust air flow to the outdoor supply air flow.
Heat exchanger is made of profiled aluminum plates, packed with elastic heat-resistant sealant. The sealing provides a reliable separation of supply and exhaust air, preventing ingress of moisture, dirt and microorganisms between flows.
To avoid frosting, the heat exchanger provides active protection by means of bypass.
The drain pan is installed under the heat exchanger.



Air dampers

Louver shutters are made of aluminum profile.
The dampers can be mounted inside, or outside of the section. The frame around the perimeter of the damper is made of galvanized steel.
The rotation is provided by cog wheels made of polycarbonate. To be protected against external environmental influence, the wheels are set inside of a frame.
A square rod is provided for mounting an automatic actuator. If damper height is more than 47.2", two rods should be used. Airtightness class is 3, according to EN 1751.

OPTION: THE "NORTHERN" DESIGN

For the regions with the outside air temperature of -40 °F (-40 °C) and below, the dampers are supplied with an electric heater between the blades. Heating protects blades and cog wheels from icing.

RECOMMENDED ACCESSORIES – ELECTRIC ACTUATORS:

- Two-position control (ON/OFF) or smooth opening regulation from 0 to 100 % on signal 0...10 V from the automation system.
- The actuator with a return spring autonomously shuts the damper when power supply is off.

Flexible anti-vibration connectors

- Flexible connectors are two flanges interconnected with an antvibration element. The connectors are made of galvanized steel and polyethylene tape reinforced with polyamide fiber.

APPLICATION:

- Where the unit is connected to air ducts to reduce vibration in the air ducts.

Pressure switch DTV 500

- Pressure differential switch indicates an error in case of clogging of air filters, breaking of belts in centrifugal fans, low air flow through electric heaters, etc.

Thermal switch F3000

- Duct thermostat indicates the threat of freezing of unit elements, such as plate heat exchanger, liquid heating coil, etc.

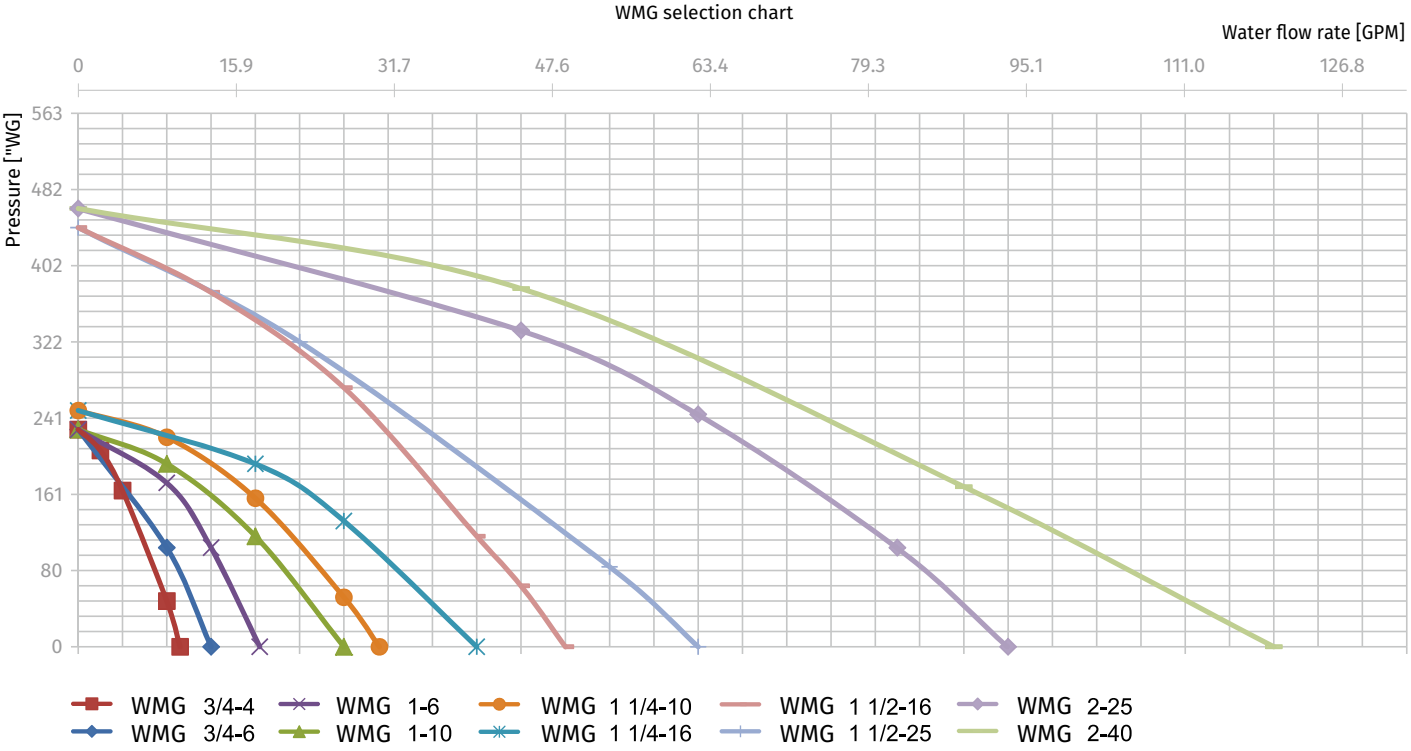
Variable frequency drive

Inverters provide smooth regulation, soft start, and active overheating protection of asynchronous fan motors.
Inverters can be supplied loose or mounted inside the fan section.
It is recommended to use VFD for both belt-driven and direct-driven free-pressure plug fans.

Water mixing set WMG

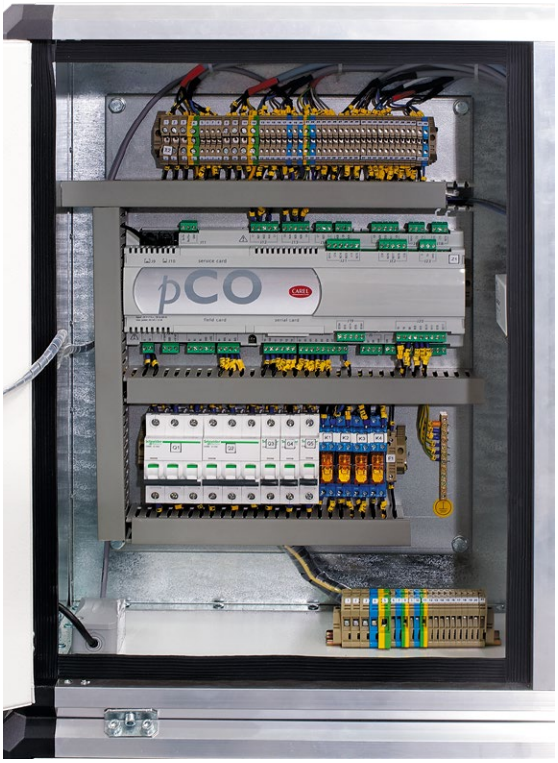
WMG is designated for regulating the heat transfer fluid parameters. WMG consists of a 3-way valve with a modulating electric actuator (0-10 V) and a circulation pump.

WMG selection chart



Technical data

	WMG 3/4-4	WMG 3/4-6	WMG 1-6	WMG 1-10	WMG 1 1/4-10	WMG 1 1/4-16	WMG 1 1/2-16	WMG 1 1/2-25	WMG 2-25	WMG 2-40
Circulation pump	DAB VA65/180		DAB A50/180XM		DAB A56/180XM		DAB BPH 120/250.40M		DAB BPH 120/280.50T	
Three-way valve with electric actuator	Belimo R317	Belimo R318	Belimo R322	Belimo R323	Belimo R329	Belimo R331	Belimo R338	Belimo R339G	Belimo R348	Belimo R349G
Electric actuator	Belimo LR24A-SR						Belimo NR24A-SR	Belimo SR24A-SR	Belimo NR24A-SR	Belimo SR24A-SR
Connection	Thread						Flange			
Three-way valve nominal diameter	DN 20	DN 20	DN 25	DN 25	DN 32	DN 32	DN 40	DN 40	DN 50	DN 50
Three-way valve Kvs	4	6.3	6.3	10	10	16	16	25	25	40



Control system

- BlauAir control system provides maximum reliability, easy operation and installation.

CONTROL SYSTEM IS AVAILABLE IN THREE VERSIONS:

- Based on a control board in a polymer casing, with external fan speed and electric heater controls;
- Based on a control board in a metal casing. Fan speed and triac electric heater controllers (if included) are installed inside the switchboard;
- Plug-and-play unit in a separate unit section. All control elements are pre-mounted inside the unit.

CONTROL BLOCK PROVIDES (DEPENDING ON MODEL) THE FOLLOWING FUNCTIONS:

- Power supply of all the unit elements.
- Active overload protection.
- Operation and error light signals.
- Starting and stopping the system.
- Water or electric heater control. The system includes the necessary external and supply air temperature sensors, water (glycol) heater frosting protection sensors, electric heater overheating protection (safety and emergency thermostats).
- Air blowing of electric heaters, water coils pre-heating during cold season.
- Water cooling coil mixing valve or condenser unit block control.
- Smooth bypass valve control of a plate heat exchanger (active frosting protection).
- Air damper actuator control.
- Smooth rotary heat exchanger VFD control.
- Air filters clogging alarm.
- Fan capacity control:
  - Smooth regulation via VFD, which provide soft start, fan stop and overheating protection;
  - Stair-step regulation, by an autotransformer;
  - Without regulation.
- Demand controlled ventilation via CO_2, temperature, RH level sensors, etc.
- Daily and weekly schedule.
- Air ventilation system shutdown on the fire alarm signal.
- Integration into building management systems by installing an additional interface unit.

Plug-and-play unit: full electric wiring

Additional option – full factory electric wiring includes:

- Installing air damper actuators. Routing of contacts from actuators to the terminal box.
- Installing differential pressure switches in filter sections. Installing a relay actuation threshold to the necessary level (final pressure drop according to the selection)
- Installing frost protection thermostats in water heating coils sections.
- Installing the VFD in the rotary heat exchanger section.
- Installing bypass damper actuators in the plate heat exchanger section.
- Routing all electric contacts in the electric heater sections.
- Routing all electric contacts in the fan sections.
- Installing and adjusting of all temperature and humidity sensors inside the unit.
- All the electric contacts are routed to the junction box, which is mounted in one of the sections.

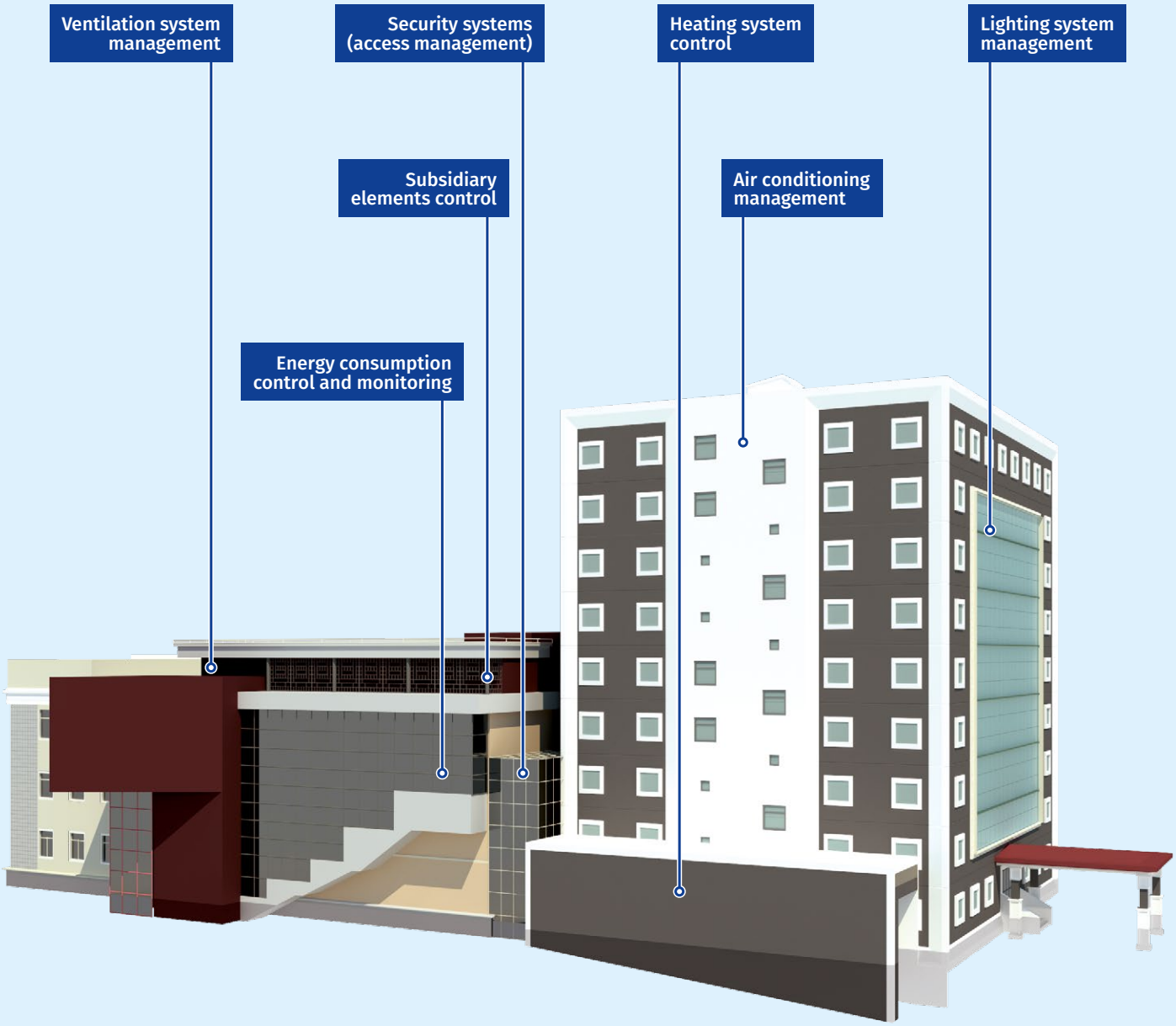
Plug-and-play option implies the possibility of shipment in separate sections. In this case joints and connection boxes are installed between the sections.

Building Management Systems

BlauAir units control system can be easily integrated into building management systems (SCADA, BMS, "smart house").
All the information processed by a programmable logic controller, is easily accessible via standard communication protocols:

- MODBUS TCP
- LON WORKS

Any other protocol can be used according to customer's choice and project requirements.



Inquiry form

Air handling units (AHU) are rather complicated pieces of equipment to specify and order, because a vast array of choices is available, and that is why there is no single number identifier (e.g., a "11770 CFM unit") that adequately describes a desired product.

CONSEQUENTLY, THE SELECTION OF THE UNIT YOU NEED CAN BE DONE BY ONE OF TWO OPTIONS:

- Use Blauberg AHU Selection program and send us the data file;
- Fill up and send us an inquiry form.

In addition to size and type, in order to provide you with the optimal solution, our engineers must properly determine an air handling unit's required supply air temperature and volume, outside air temperatures in summer and winter, air filtration rate, heating and cooling air capacities, humidification and dehumidification capacities, supply and exhaust air volume requirements, and required pressure capabilities of the fan(s). The more detailed information we receive, the better solution we can offer for your individual request.

BlauAir technical specification inquiry form

Company ..... /Building ..... Tel./Fax:

Contact person ..... E-mail:

Tel./Fax .....

E-mail ..... "....."....20.....

General

Unit: Exhaust ☐ Supply ☐ Supply & exhaust ☐ Supply & exhaust with heat recovery ☐

Mounting: Outdoor ☐ Indoor ☐ **Access side:** Left ☐ Right ☐

Supply & exhaust parts: Lineary ☐ Side by side ☐ One on the other ☐

Unit parameters	Supply	Exhaust
Capacity	..... CFM	..... CFM
Pressure (system resistance)	..... "WG	..... "WG

Air parameters		Winter	Summer
Supply	Inlet air temperature and relative humidity	..... °F ..... %	..... °F ..... %
	Outlet air temperature and relative humidity	..... °F ..... %	..... °F ..... %
Exhaust	Inlet air temperature and relative humidity	..... °F ..... %	..... °F ..... %
	Outlet air temperature and relative humidity	..... °F ..... %	..... °F ..... %

Sections required

Fan Belt - driven ☐ Plug fan ☐

Filter Supply MERV8 ☐ MERV13 ☐ Other .....
Exhaust MERV8 ☐ MERV13 ☐ Other .....

		Water	Electric
Heater ☐	Air temp. before / after	..... °F / ..... °F	
☐	Heater power	..... kWt	
Mixing set ☐	Water temp. before / after	..... °F / ..... °F	

		Water	Freon
Cooling section ☐	Air temp. before / after	..... °F / ..... °F	
☐	Heater power	..... kWt	
Mixing set ☐	Heat transferring medium temp. before / after	..... °F / ..... °F	

Heat exchanger ☐ ☐ Inlet temperature .... °F Outlet temperature .... °F
Plate ☐ ☐ Inlet humidity .... % Outlet humidity .... %
Rotary ☐ ☐ Efficiency .....

Silencer ☐ Supply ☐ 47.2" long ☐ Other .....
Exhaust ☐

Air damper ☐ Supply ☐ Exhaust ☐

Mixing section ☐ Circulating air .... %
Inlet air temperature .... °F
Inlet air humidity .... °F

Accessories: Flexible connection (inlet) ☐ Flexible connection (outlet) ☐ Mounting base frame ☐

Control system ☐

Additional information:

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