AIR-TRANSFER

MODULAR AIR HANDLING UNITS

2024


AIR-TRANSFER

UNIT DESIGNATION

Size and casings

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

AVF/N/L20 | AVN/L27 | AVN/L35 | AVL45 | AVL55 | AVL65 | AVL85

Size depends on required air capacity

Service Acces 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 — Bag-type 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 — Weather hood galv
- MB — Base frame
- VVG — Flexible connection
- RF — Roof

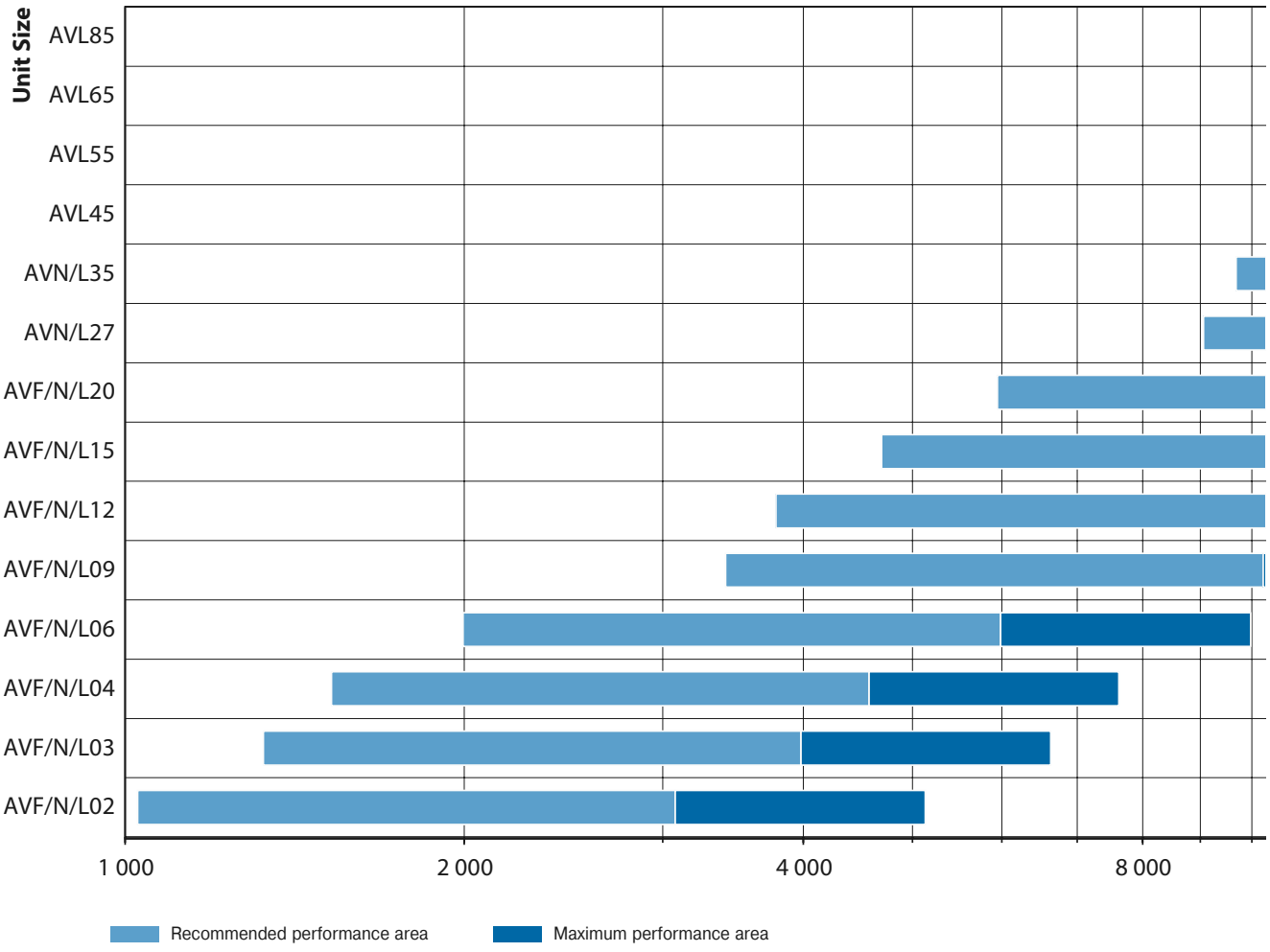
Unit's designation example

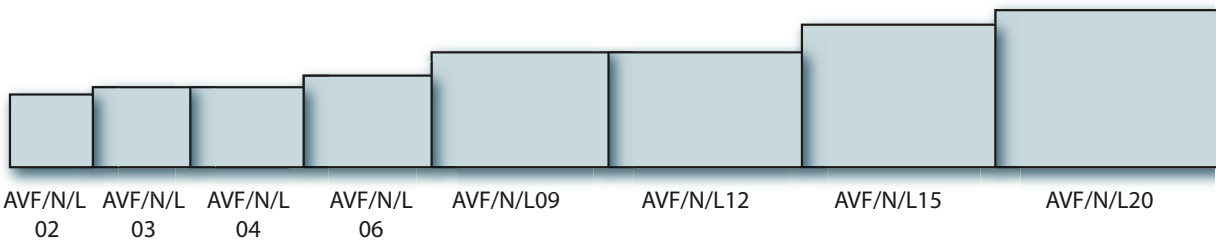
AVF units have frameless design.
AVN units have self-support, frameless design with PVC profile system.
AVL units have frame design (not Eurovent certified).

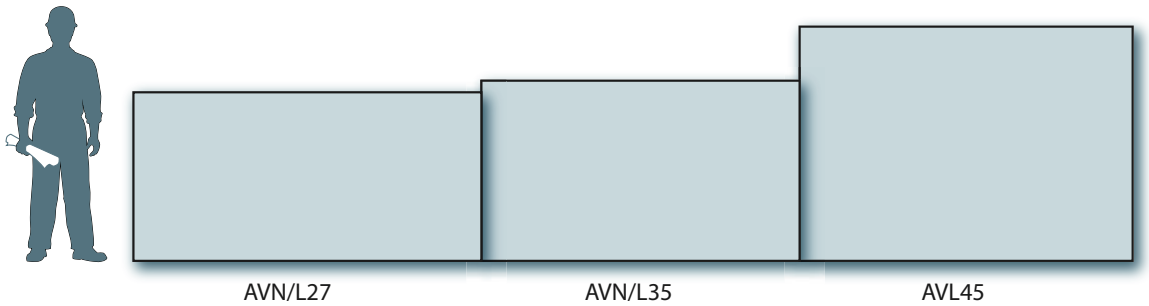
AVN 09 L/SE/P/O-HW-CW-SRI — A heat recovery unit for outdoor mounting equipped with plate heat exchanger, water heater, cooling section and silancer. Total capacity: 9000 m³/h. Service access side: left.

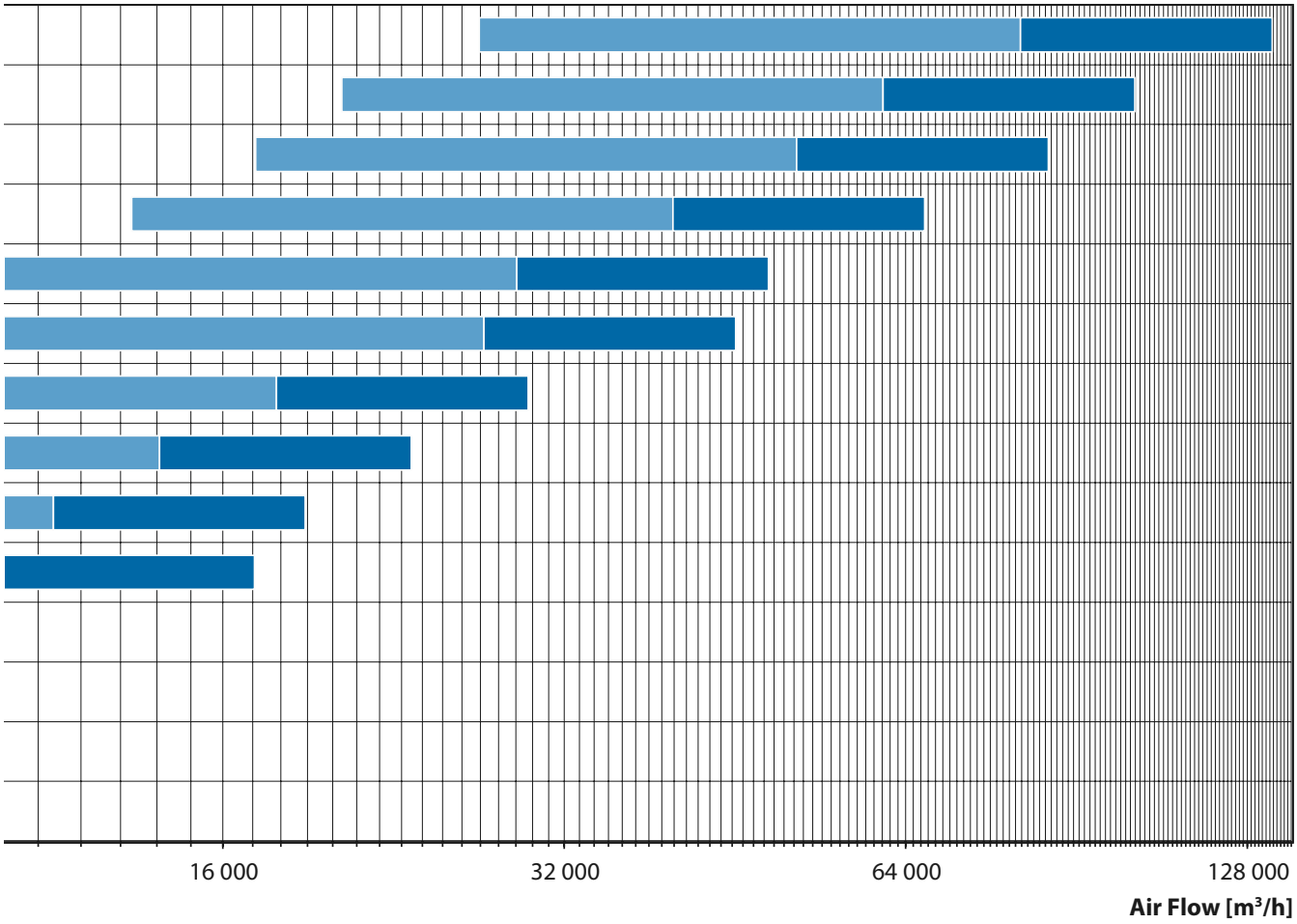
AVF 15 R/SU/O-FC-HE-CDX-SRI-A — Air supply unit for outdoor mounting equipped with a panel filter, electric heater, cooling section and silencer supplied with control system. Total capacity: 15000 m³/h. Service access side: right.

SIZE SELECTION

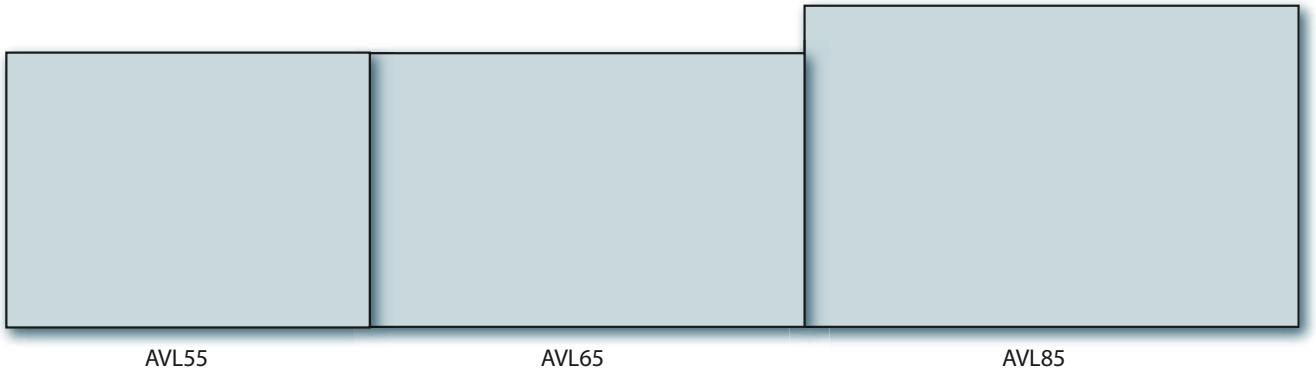








Unit size	AVF/N/L 02	AVF/N/L 03	AVF/N/L 04	AVF/N/L 06	AVF/N/L 09	AVF/N/L 12	AVF/N/L 15	AVF/N/L 20	AVN/L 27	AVN/L 35	AVL 45	AVL 55	AVL 65	AVL 85
Nominal air flow m³/h	2000	3000	4000	6000	9000	12000	15000	20000	27000	35000	45000	55000	65000	85000
Cross section hight (mm)	500	550	550	630	790	790	980	1080	1160	1240	1612	1900	1892	2200
Cross section width (mm)	570	670	770	880	1200	1330	1330	1530	2170	2170	2292	2500	2992	3400



CASING TYPES

Unit casing provides thermal and sound insulation, as well as durability and protection from external influence.

AT series are available in several types of casing, general properties of which are:

- High Mechanical strength.
- Corrosion Resistance.
- Thermal insulation.
- Protection from thermal bridges.

Increased fire resistance, high quality insulation materials. Mineral wool basalt fiber insulation with 90 kg/m^3 density. Unlike other types of insulating materials, this material is completely non-flammable and environmentally friendly.

AT series are available in several types of casing

FRAME DESIGN – AVL*

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Range ATx
www.eurovent-certification.com

FRAMELESS DESIGN – AVF

Self-support,frameless design – AVN

* Models so marked are not Eurovent certified

Frame design – AVL*

The classic casing design is based on aluminum profile frame, joined by means of cast corners, provides high durability of the unit. Different frame thickness should be used considering the table below:

Frame Type	Recommended area of performance	Aluminum profile thickness	Thermal insulation thickness
50-50	20000-45000 m³/h	50 mm	50 mm
70-50	more than 45000 m³/h	70 mm	50 mm

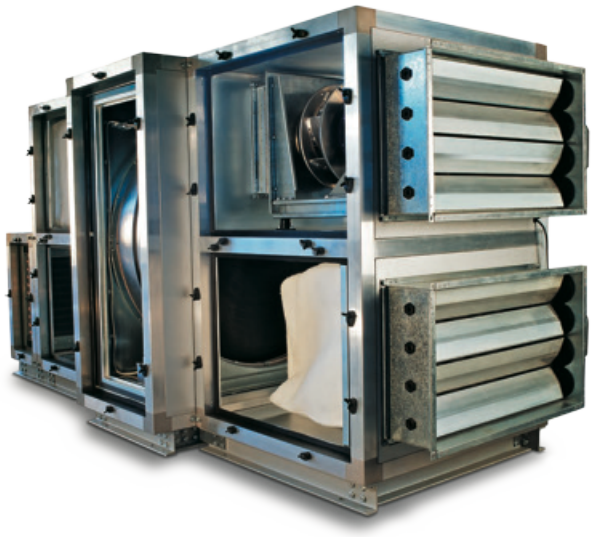
Casing panels are made of steel sheets with a layer of thermal and acoustic insulation from mineral wool.
Casing panel material varies depending on unit application:

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:

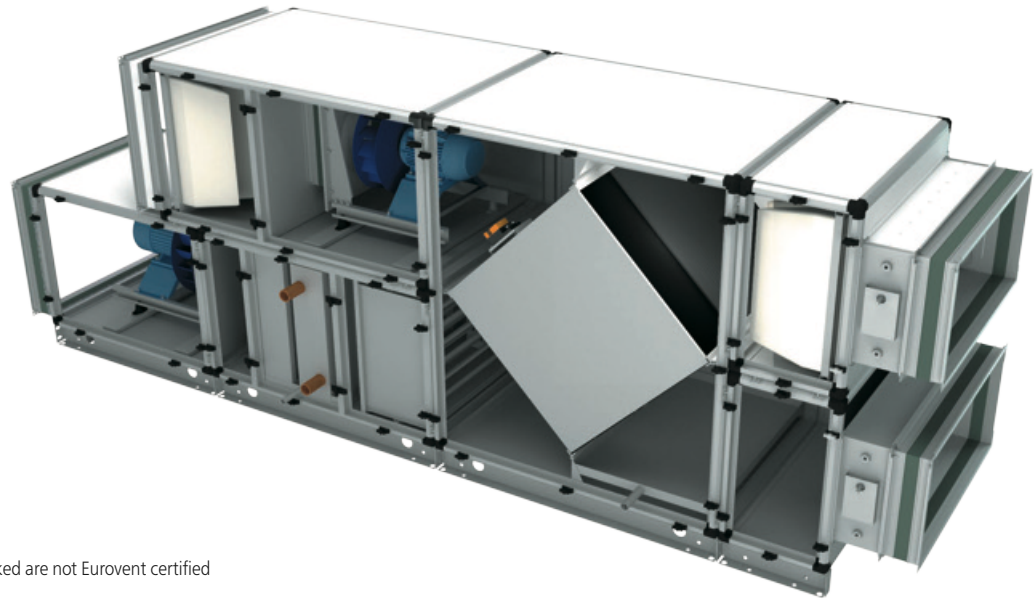
- Zinc-aluminium coating (standard)
- Stainless steel (for units in hygienic design)
- Galvanized steel



Classic unit design with 50 mm zink–aluminum panels in 50 mm frame with cast aluminum corners

EXTERNAL REALIZATION:

- The unit is additionally protected against atmospheric precipitation.
- Weather protection hoods are provided at the inlet and outlet air pipes.
- 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 300 mm.
- All joints are sealed.
- All these elements protect the unit against external influence of water, send, leaves, etc.



* Models so marked are not Eurovent certified

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Range x
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AVF – Frameless units – approved Eurovent

Frameless design casing system excludes thermal brigdes, usuall for aluminum or steel frame. This significantly increases thermal resistance and reduces heat loss, especially for outdoor installation. It also pre AT condensation on the surface when air cooling is on.
Casing panels made of sheet steel with a layer of 40 mm thermal and acoustic insulation from mineral wool.
Casing material varies depending on unit application:

Outer panel surface material:

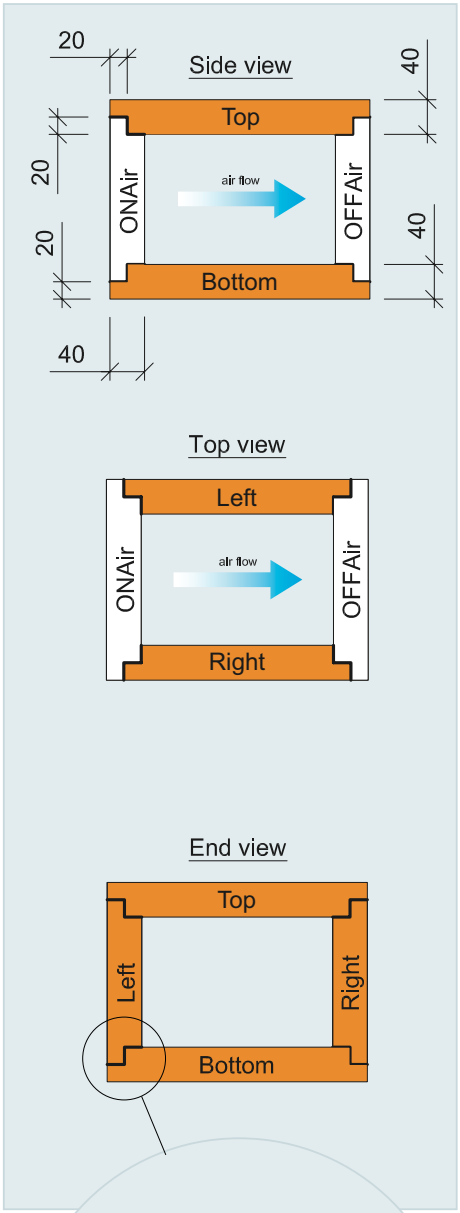
- Zinc-aluminium coating (standard)
- Galvanized steel with polymeric coating (high corrosion resistance)
- Galvanized steel (for internal execution units)

Inner panel surface material:

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

Benefits of frameless casing:

- Better thermal resistance. Class 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.



Frameless unite close up

Frameless casing connection

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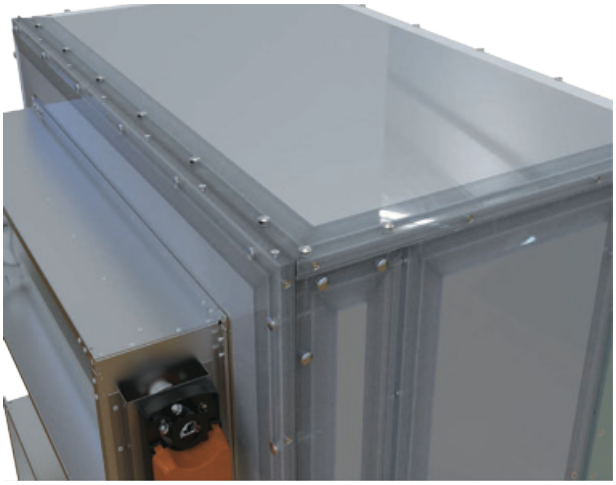
AVN – Self-support, frameless, modular units

Improved self-supporting, frameless, modular construction of the case with PVC profile system, eliminates thermal bridges, reduces heat loss and decreases noise level.
Casing panels made of sheet steel with a layer of 50 mm thermal and acoustic insulation from mineral wool.
Casing material varies depending on unit application:



PVC profile system inside the unit casing

Outer panel surface material:

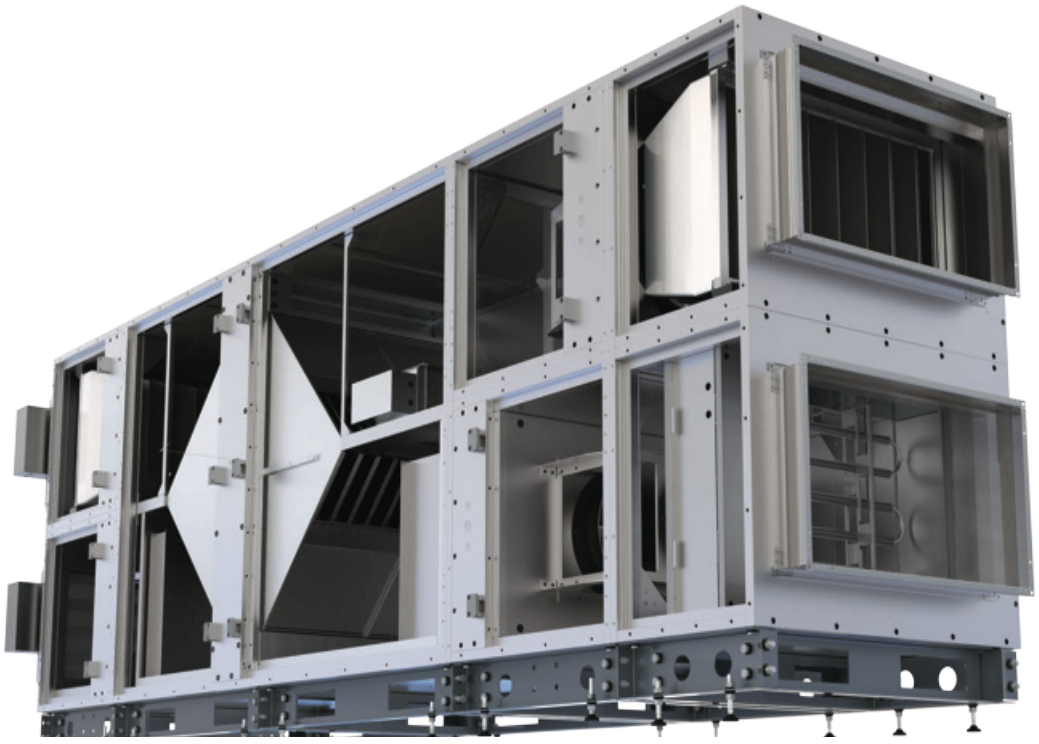
- Zinc-aluminium coating (standard)
- Galvanized steel with polymeric coating (high corrosion resistance)
- Galvanized steel (for internal execution units)

Inner panel surface material:

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

Benefits of frameless casing:

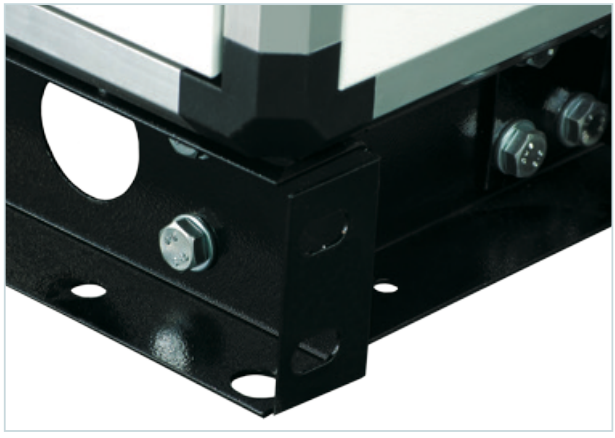
- Better thermal resistance. Class T2, according to EN 1886.
- Protection from thermal bridges. Class TB3 according to EN 1886.
- Higher mechanical strength. Class D1, according to EN 1886.
- Minimizing air leakage. Class L1, according to EN 1886.
- Lower weight of the unit.
- Suitable for outdoor installation.



Base frame types

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

Type	Application (approximately):
Adjustable legs made of 2 mm thick galvanized steel	Single-deck units with air capacity up to 20000 m^3/h, or double-deck units – up to 15000 m^3/h
Solid base frame made of 2 mm thick galvanized steel	Single-deck units with air capacity up to 35000 m^3/h, or double-deck units – up to 25000 m^3/h
Solid base frame made of 3 mm thick painted galvanized steel	For unit performance up to 50000 m^3/h
Solid base frame made of 4 mmthick painted galvanized steel	For unit performance up to 128000 m^3/h



Solid base frame

Adjustable legs

SECTIONS

Fan section types:

- Plug fan with asynchronous motor (standard)
- Plug fan with electronically commutated motor (EC motor)
- Belt driven fan in spiral casing
- Fan sections are equipped with inspection window.

Plug fan

Plug fans are used in case of low or medium air performance and pressure. Direct driven motor and backward curved impeller ensures high performance, reliability and easy maintenance due to the absence of belt drive.
The impeller is made of high-strength composite material or sheet steel with protective polymer coating.
For correct fan operation, soft start, active thermal protection and smooth speed control, it is recommended to use 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.
As an option fan can be provided in EX-proof execution.

Plug fans with electronically commutated motors (EC motor)

Plug fans with the EC motors are used for projects that require high energy efficiency. The advantages of this type of fan are: extremely low power consumption at any speed, no need for external speed control and compact size due to motor with external rotor.

Sound attenuators:

Silencer unit consists of easily removable sound-absorbing 100 mm thick panels, with the length of 600 mm or 1200 mm. Noise absorption in accordance to ISO 7235.
Sound absorbing panels have two types of execution: pointed with reduced resistance and rectangular with a larger area of absorption.
Panels are made of high density mineral wool with protection felt cover.

The distance between the plates:

- 100 mm (standard);
- 150 mm – lower air pressure drop;
- 75 mm – increased noise reduction.

Air filters

Units include the following filter elements:

- Panel-type pre filters, G3, and G4 class, in accordance to EN779. Filter depth 50 mm. Reinforced with steel mesh. Panel frame made of galvanized steel.
- Bag Filters with pocket depth of 300 and 600 mm, G3, G4, F5 (M5), F7 or F9 class in accordance to EN779.
- High Efficiency Filters: EPA – filters (E10-E11) and HEPA – filter classes H12-H14, in accordance with EN1822.
- A filter based on active carbon is used for absorption of substances, that can not be caught by other types of filters (like odors, gases and pairs of toxic substances).

All filters have easily removable cassettes that can quickly and easily be replaced.
In the case of two stages of filtration, unit contains a compact section in which panel and bag filters are installed close to each other.

Electric heater

Section consists of electric tubular heating elements (heaters) with spiral fins with heating capacity of 5 kW each. Heating elements in the required amount are set in a removable cassette frame of galvanized steel.
Heaters are protected from overheating by thermal switches with automatic reset at 50 °C and with a manual reset to + 90 °C. Heaters are grouped in «triangle» scheme, three heaters in each group. Groups of heaters are then connected in parallel into 380 V power supply network.

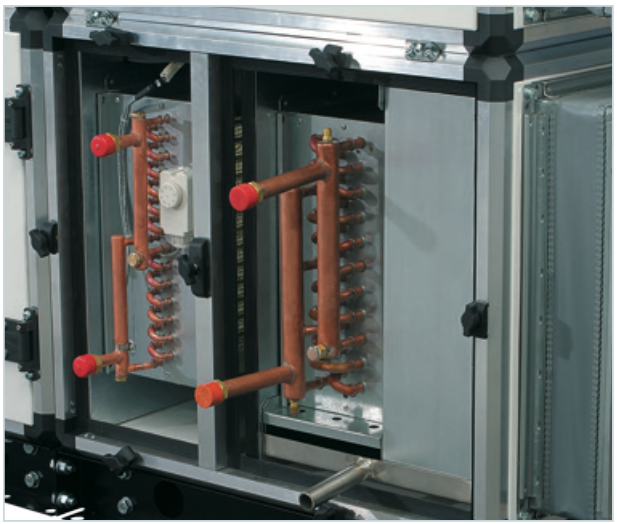
Option:

Unit with built-in electric heater triac controller allows keeping the supply air temperature on a set level with accuracy of ± 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 unit, or supplied loose as a separate item.
External Triac controller RNS - provides smooth control for heaters up to 75 kW (25 kW triac + two steps to 25 kW).

Water cooling coil



Heat exchanger complies with EN 13053, EN 1216
Unit consists of copper tubes with aluminum finning.
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 bleeder 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.
Section is equipped with a removable drain pan made of stainless steel.
For refrigerants R22, R407, R410A, and others.
Drain and air bleeder valves are provided for each coil.

LPHW heating coil

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

Recommended accessories:

Thermostat F3000 protects the heater from freezing. The thermostat can be pre-mounted on the coil, or supplied as a separate item.
Mixing set USWK.

Rotary heat exchanger

A rotary heat exchanger is a rotary honeycomb matrix with layers of aluminum ribbon, which is slowly rotated within the supply and exhaust air streams. As the wheel rotates, heat is picked up from the exhaust air stream in one half of the rotation and given up to the fresh air stream in the other half of the rotation. Thus waste heat energy from the exhaust air stream is transferred to the matrix material and then from the matrix material to the fresh air stream, raising the temperature of the supply air stream.
The advantages of a rotary regenerator are: high efficiency, keeping comfortable humidity and low risk of frosting.
Rotary regenerators in AT units made of two types:

- Condensation type (standard);
- Enthalpy type. The additional hygroscopic coating is applied on tape, which provides additional moisture transfer from one stream to another. This feature is especially useful when using a rotor in the summer in conjunction with the air conditioning system.

Plate heat exchanger

Heat exchanger where heat is transferred from the flow of exhaust air to the incoming air from the street.
Heat exchanger is made of profiled aluminum plates, packed with elastic heat-resistant sealant. The sealing provides a reliable separation of the supply and exhaust air, eliminating internal flows, and not allowing moisture, dirt, odors and microorganisms transfer between streams.
To avoid frosting heat exchanger provides active protection by means of the bypass channel.
Drain pan is installed under the heat exchanger.

Air dampers

Louver 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.
Rotating mechanism – cog wheels made of polycarbonate, mounted inside the frame, protected from external environment conditions. Square rod for automatic actuator. Two rods installed if damper height is more than 1200 mm. Air tightness class 3 according to EN 1751.
Option: «Northern» execution
For the regions with the outside air temperature below -40°C provided an electric heater between the blades. Heater protects blades and cogs from icing.

Recommended accessories: BELIMO electric actuators:

ON/OFF, or proportional 0 to 100% by 0 ... 10V signal from the automation system.
Actuator with spring return closes the damper when power supply is off.

Flexible anti-vibration insert

Flexible connectors are two flanges interconnected by antvibration material. The inserts are made of galvanized steel and polyethylene tape reinforced with polyamide textile cloth.
Apply:
In unit and air ducts connections to reduce vibration in the air ducts.

Outdoor version

Additional protection from precipitation is applied to unit construction in case of outdoor execution.

Weather hoods on the air inlets and outlets
Protective covers for air damper actuators
Flat or twin pitched roof

Protects the unit from external influences: water, sand, leaves, others. Visor is equipped with a protective grid. Hood length is 300 mm. All joints are sealed.

Electric heater controller RNS

Triac controller provides smooth regulation of electric coils heating power.

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 fluid freezing in water coils.

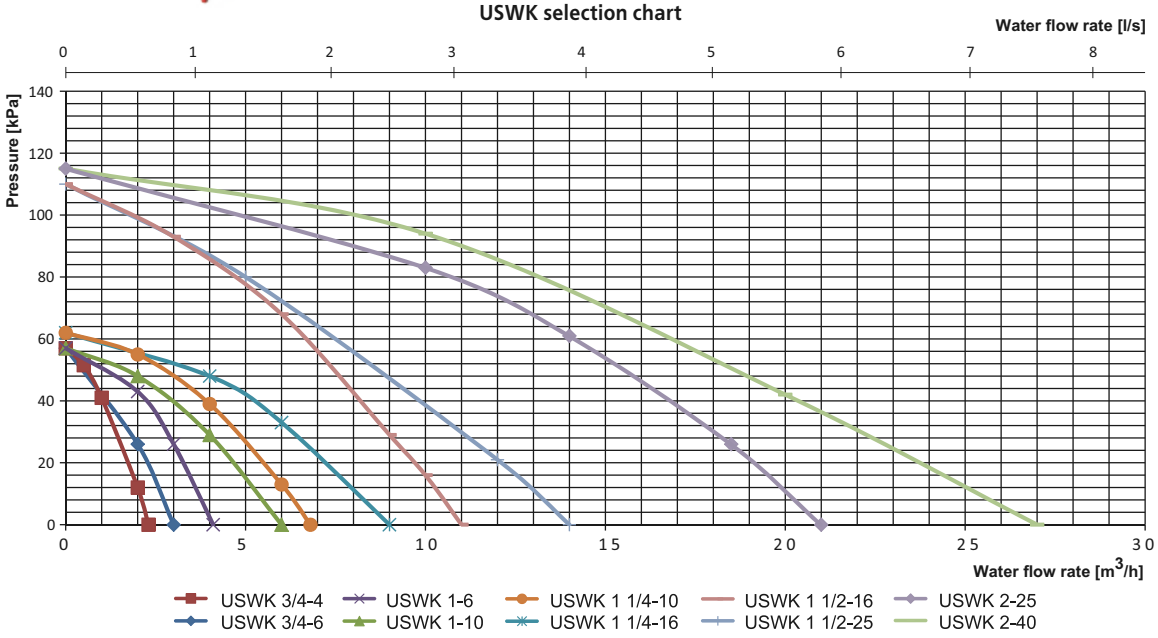
Variable frequency drive

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

Water mixing set USWK

USWK controls power of water heating and cooling coils by regulating the temperature of water on coil inlet. USWK consists of 3-way valve with modulating 0-10V actuator and circulation pump.

USWK selection chart



Technical data:

	USWK 3/4-4	USWK 3/4-6	USWK 1-6	USWK 1-10	USWK 1 1/4-10	USWK 1 1/4-16	USWK 1 1/2-16	USWK 1 1/2-25	USWK 2-25	USWK 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
Three-way valve 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 K_{vs}	4	6.3	6.3	10	10	16	16	25	25	40

Control system

AT control system provides maximum reliability, easy operation and installation.

Control system is available in three versions:

Control block in plastic casing, with external fan VFD and electric heater control;

Control block in metal casing. Fan speed and triac electric heater controllers (if included) are installed inside the switchboard;

Plug-and-play unit with all control elements 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.

Start and stop of 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, by VFD, which provide soft start, fan stop and overheating protection;
- Stair-step regulation, by an autotransformer;
- Without regulation.

Demand controlled ventilation, by CO_2, temperature, RH level sensors, etc.

Daily and weekly schedule.

Air ventilation system shut-down on the fire alarm signal.

Integration into building management systems through installation of one more interface unit.

Plug-and-play unit: full electric wiring:

Additional option – full electric wiring include:

- Installation of air damper actuators
- Installation and adjustment of pressure switches in filter sections.
- Installation and adjustment of thermostats and sensors on water heating coils;
- Installation of rotary heat exchanger VFD;
- Installation of bypass damper actuators on plate heat exchangers;
- Mounting triac controls on electric heaters;
- Installation and adjustment of fan VFD;
- Installation and adjustment of all temperature and humidity sensors inside the unit;
- Installation of control block with programmable controller inside the unit, or routing all electric contacts into a single contact block for simple connection to external control block (depending on customers needs).

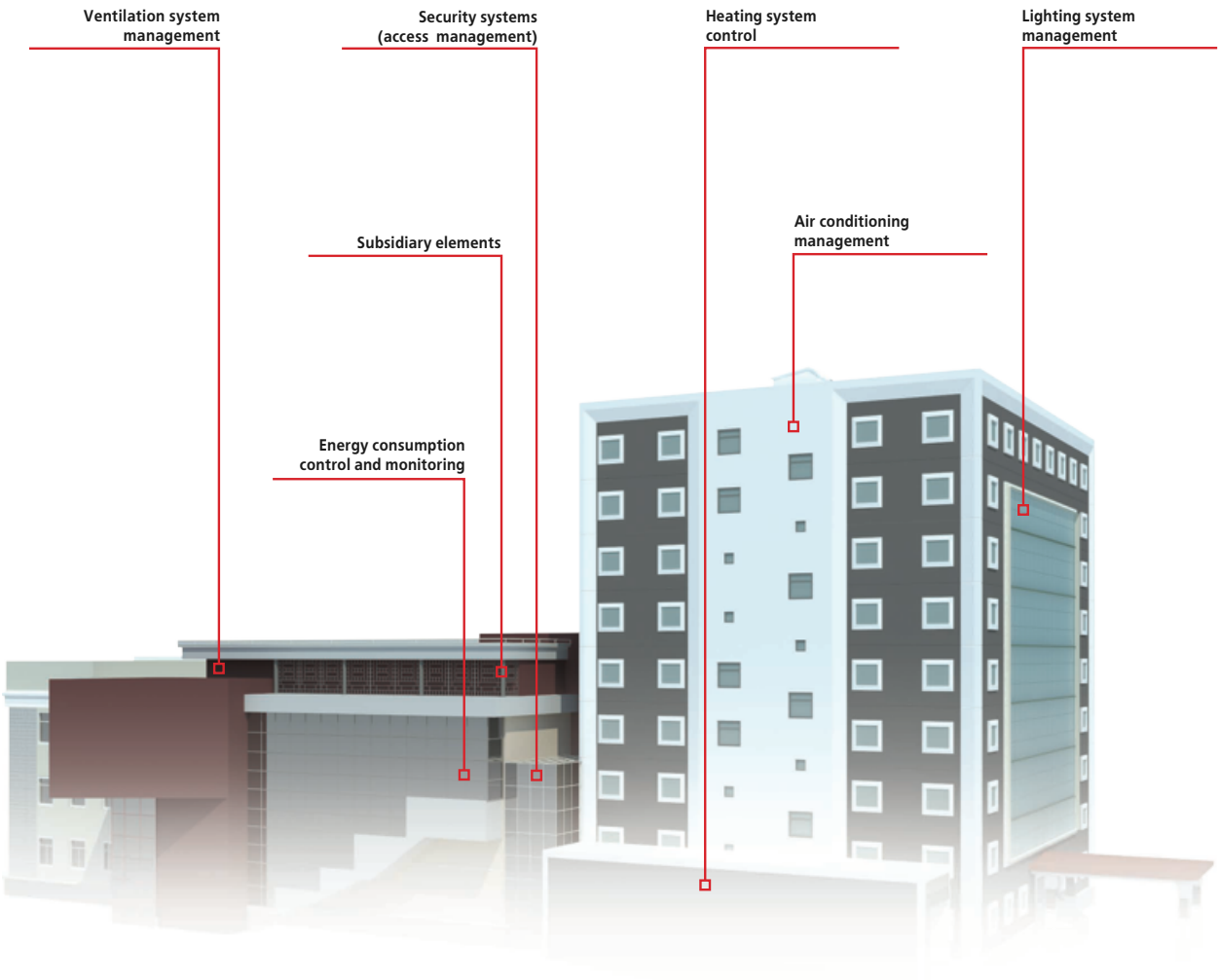
Plug-and-play option implies the possibility of shipment in separate blocks. In this case intermediate contact blocks are installed in places where blocks are joined.

Building Management Systems

AT 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 because there is no single- number identifier (e.g., a «20 000m³/h unit») that adequately describes desired product.

The selection of the unit you need can be done by one of two options:

Use AT Ahu Selection program and send us the data file;

Fill up and send us inquiry form.

In addition to size and type, in order to give you 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.

Air-Transfer technical specification data sheet

Company ..... /Building..... Tell

Contact person ..... E-mail:

Tell.....

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 other ☐

Capacity and pressure	Supply	Exhaust
Capacity	..... m^3/hour	..... m^3/hour
Pressure (system resistance)	..... Pa	..... Pa

Air parameters		Winter		Summer	
Supply	Outdoor air temperature and relative humidity	..... °C	..... %	..... °C	..... %
	Conditioned air temperature and relative humidity	..... °C	..... %	..... °C	..... %
Exhaust	Extract air temperature and relative humidity	..... °C	..... %	..... °C	..... %
	Exhaust air temperature and relative humidity	..... °C	..... %	..... °C	..... %

Sections required

Fan Belt - driven ☐ Plug fan ☐

Filter Supply G4 ☐ F7 ☐ Other ....
Exhaust G4 ☐ F7 ☐ Other ....

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

Cooling section ☐ Air temp before / after heater ..... °C/ ..... °C
Freon ☐ Heater power ..... kWt
Mixing set ☐ Water temp before / after heater ..... °C/ ..... °C

Heat recovery section ☐ ☐ Inlet temperature .... °C Outlet temperature .... °C
Plates ☐ ☐ Inlet humidity .... % Outlet humidity .... %
Rotor ☐ ☐ Efficiency .....

Silencer ☐ Supply ☐ 1200 mm long ☐; other .....
Exhaust ☐

Air damper ☐ Supply ☐ Exhaust ☐

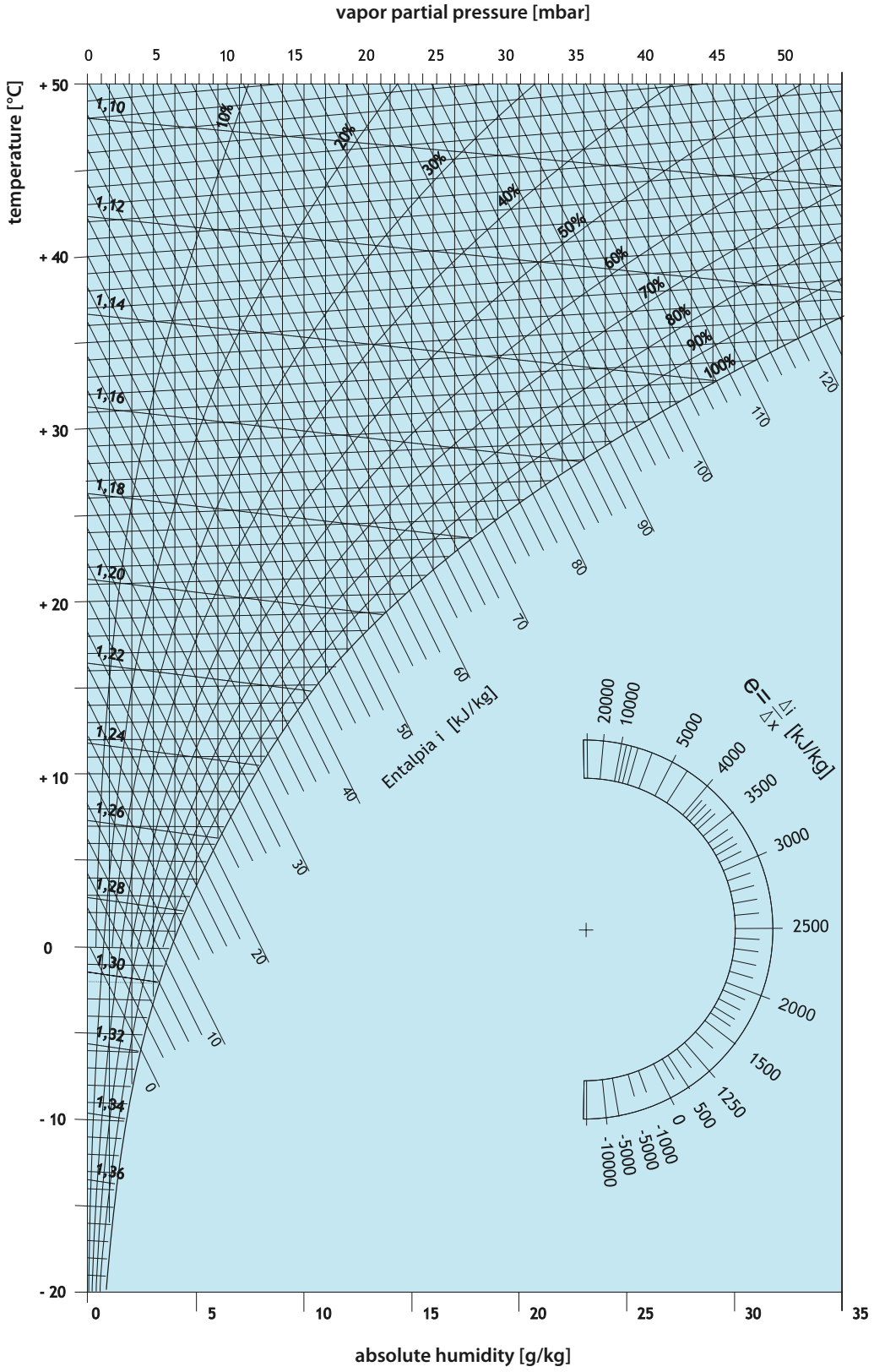
Mixing section ☐ Sirculating air ..... %
Inlet air temperature .... °C
Inlet air humidity .... °C

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

Controll system ☐

Additional information:

MOLLIER DIARGAM



AIR-TRANSFER

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2024-05