

INDUSTRIAL VENTILATION

2017

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ABOUT BLAUBERG

Blauberg Ventilatoren is a future- and client-orientated company, which stands for innovative technology and timeless design for the ventilation industry. With a great range of the fans and ventilation accessories Blauberg is represented in more than 20 countries.

We are ready to offer you the most complete product range at the ventilation market, starting with domestic fans, including accessories for single-room ventilation with heat recovery and industrial fans and finishing with individually designed ventilation units and systems.



Due to our product diversity, we do our best to meet the individual needs of our clients in various countries with the best combination of price and quality.

Our philosophy is to cultivate long-term client relations and partnerships by high quality and reliability.

Blauberg Ventilatoren is always opened for the clients.

You are welcome to visit our attractive show room in the distribution center in Munich to evaluate the Blauberg program and to review the operating units. Registration at info@blaubergventilatoren.de





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INLINE MIXED-FLOW FANS

Turbo
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INLINE CENTRIFUGAL FANS

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Air capacity – up to 1700 m³/h

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INLINE CENTRIFUGAL FANS

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Air capacity – up to 5260 m³/h

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INLINE CENTRIFUGAL FANS WITH EC MOTOR

Centro-M EC
Air capacity – up to 1460 m³/h

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INLINE CENTRIFUGAL FANS

Centro-MZ
Air capacity – up to 1540 m³/h

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INLINE CENTRIFUGAL FANS

Box
Air capacity – up to 553 m³/h

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INLINE CENTRIFUGAL FANS

Box-R
Air capacity – up to 176 m³/h

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EXHAUST CENTRIFUGAL FANS

Box-D
Air capacity – up to 310 m³/h

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EXHAUST CENTRIFUGAL FANS

Extero
Air capacity – up to 710 m³/h

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SOUND-INSULATED INLINE MIXED-FLOW FANS

Iso-Mix
Air capacity – up to 1920 m³/h

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SOUND-INSULATED CENTRIFUGAL FANS

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SOUND-INSULATED CENTRIFUGAL FANS

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Air capacity – up to 16870 m³/h

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SOUND-INSULATED EC FANS WITH EC MOTOR

Iso-V EC
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SOUND-INSULATED CENTRIFUGAL FANS

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AXIAL INLINE FANS
Axis-F

 Air capacity – up to 11900 m³/h

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 Air capacity – up to 12200 m³/h

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Tower-V EC

 Air capacity – up to 11400 m³/h

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Tower-H

 Air capacity – up to 4700 m³/h

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ROOF CENTRIFUGAL FANS WITH EC MOTOR
Tower-H EC

 Air capacity – up to 11400 m³/h

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MULTI-SPEED SWITCHES

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WORLD OF VENTILATION

■ **Ventilation** means controllable indoor air exchange including removal of stale air and supply of fresh, normally prepared air to the premises.

Home dust, tobacco smoke, dust mites, household animals, consumer electronics, gas, finishing materials, carbon dioxide are only a few sources of indoor air pollution.

The absence of proper ventilation may be the reason of allergic and asthmatic diseases, spread of infection, attenuation of immunity, bad smells and mould in the room.

Quality indoor ventilation is the only solution that really helps you to prevent the above harmful factors. Efficient ventilation is ensured by a number of actions and equipment that arrange a working mechanical air exchange in various ventilation systems. Ventilation systems serve to create a human friendly environment that meets construction and manufacturing norms as well as architectural and storage requirements.

■ **Ventilation** is designed to maintain a basic healthy environmental quality and a pleasant indoor climate for human wellbeing.

□ **Oxygen-carbon dioxide rate.** We breathe in oxygen in and breathe out carbon dioxide. In enclosed spaces, the oxygen content in the air gradually decreases and the carbon dioxide increases. No air exchange produces a feeling of stagnation and stale air. No air exchange produces a feeling of stagnation and stale air. Healthy life activity requires 21% oxygen content in the surrounding environment. To keep the oxygen concentration on this level the air must be fully exchanged at least once per hour. Some specific applications may require an even higher air exchange rate.

□ **Maximum Allowable Concentrations of Harmful Substances in air.** A human being breathes in 20 m³ of air every day. Natural air saturated with ozone, ions and phytoncides is the most favourable environment for human wellbeing. High concentration of dust, gases, tobacco and other harmful substances is not only harmful but may lead to various chronic diseases.

□ **Smell.** A lack of balanced air circulation in the room causes high concentration of long-lasting smells which create discomfort, provoke allergy reactions and irritate nerves.

□ **Air humidity.** Indoor humidity misbalance makes it feel uncomfortable and escalates chronic obstructive airway and skin diseases. Depending on season and temperature the humidity level also has negative effects on the interior equipment and furniture. For example in winter when air is dry some wooden articles may dry up and humid air provokes swelling of wooden articles and mould formation.

□ **Air temperature.** The best temperature for human wellbeing is between 21 and 23 °C. Any temperature fluctuations or significant deviations with respect from this factor influence human health, physical and mental activity and provoke headaches.

□ **Air motion.** Uncontrollable and non-regulated air motion generates air draughts or lack of oxygen. These environments provoke respiratory diseases, rapid fatigability, unstable blood pressure, etc.

VENTILATION SYSTEM ARRANGING

The arrangement of an efficient ventilation system requires the ability to differentiate between various ventilation system types and their application as well as a correct equipment selection that matches the specific requirements.

■ **Ventilation systems are classified based on following parameters:**

□ **Air motion type:**

- natural (gravity) ventilation: In gravity systems air is moved due to inner and outer air density and temperature differences without any electric equipment (fans, electric motors);

- artificial (mechanical) ventilation: In mechanical systems air is moved by electric and mechanical equipment and devices (fans, electric motors, filters, air heaters) that provide air moving, cleaning, heating or cooling.

□ **Purpose:**

- supply ventilation: provides air supply and usually filtration and heating or cooling;

- exhaust ventilation: provides removal of extract of stale air from the room;

- air handling unit with heat recovery: efficient controllable ventilation system. Thermal extract air energy is used for warming up or cooling down the fresh intake air.

□ **Air exchange arranging:**

- local ventilation: designed for air supply

or air exhaust from limited local areas with high concentration of harmful substances, smells, etc.

- general exchange ventilation: designed for supply or exhaust ventilation in a premise.

□ **Design:**

- kit ventilation: professionally designed, full sized ventilation system that is assembled from various ventilation accessories;

- monoblock ventilation: supply or supply and exhaust ventilation systems that consist of separate components placed inside a relatively small noise- and sound-insulated casing; ready to use ventilation units.

Selection of required ventilation equipment is the next step for arrangement of a ventilation system. It is based on the following basic technical parameters:

- Volumetric air flow [m³/h].

- Operating pressure [Pa] and air speed inside air ducts [m/s].

- Permissible noise level [dB(A)].

- Electric heater power [kW].

■ **Basic rated technical characteristics for ventilation equipment selection.**

□ Volumetric air flow [m³/h].

Air volume required for air extract or air

supply. It is determined by concentration of harmful substances and smells, number of people, humidity and heat excess in the room. Every room requires a separate calculation of ventilated air based on previous researches or based on the air exchange rate.

■ **Calculation of volumetric air flow according to air exchange rate**

Air exchange rate is found experimentally for relatively non-polluted environments.

$$\dot{V} = V_R * A_{\text{exch}} / h \text{ [m}^3/\text{h]},$$

V_R : room volume, in m³;

A_{exch} : minimum air exchange rate 1/h, see table 3, air exchange rate.

■ **How to determine a room volume?**

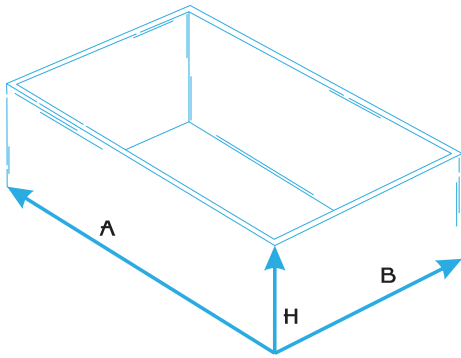
Calculate general volume in m³ with the below formula:

$$\text{Length x width x height} = \text{volume of a premise [m}^3]$$

$$A \times B \times H = V \text{ [m}^3]$$

Example: The room has 10 m length, 6 m width and 3.5 m height. To calculate the air volume required for ventilation of this room first calculate

the room volume: $10 \times 6 \times 3.5 = 210 \text{ m}^3$. After that determine the required air capacity for the fan using the table of recommended air exchange rate below.



■ Calculation of volumetric air flow as per number of people (DIN 1946 norms, part 2)

In areas with additional pollution sources (e.g. tobacco smoke), the volumetric air flow per person must be increased by $20 \text{ m}^3/\text{h}$ per person.

$$\dot{V} = A_{EP} * P \text{ [m}^3/\text{h]},$$

A_{EP} : air exchange rate per person;

P : number of people in the room

- $20\text{-}25 \text{ m}^3/\text{h}$ per each person with low physical activity

- $45 \text{ m}^3/\text{h}$ per each person with light physical activity

- $60 \text{ m}^3/\text{h}$ per each person with heavy physical activity

Table 1. Air exchange rate per one person depending on premise type (DIN 1946, part 2)

Premise type	m ³ /h per one person
Lecture hall	30
Big office	60
Exhibition hall	30
Festival hall	30
Café	40
Class room	30
Cinema hall	30
Recreation room (production facility)	30
Recreation room (medical station)	30
Hotel rooms	40
Conference halls	20
Museum	30
Small office	40
Dining room	30
Theatre, concert hall	20
Trade hall	20
Sport hall with spectators	30
Reading hall	20

■ Calculation of volumetric air flow as per maximum allowable concentrations of harmful substances in air

$$\dot{V} = \frac{K}{k_{\max} - k_a} \text{ [m}^3/\text{h]}$$

K : amount of pollutants per hour, in mg/h

k_{\max} : maximum permitted pollutant concentration, in mg/m³, see table 2

k_a : pollution concentration in supply air, in mg/m³ (clean supply air $k_a = 0$).

Table 2. Maximum allowable concentrations of some substances

Substance	cm ³ m ³	mg m ³
Nitric acid	10	25
Ammonia	50	35
Aniline	2	8
Asbestos dust	-	2
Acetone	1000	2400
Butane	1000	2350
Hydrazine	0.1	0.13
Iodine	0.1	1
Methanol	200	260
Nicotine	0.07	0.5
Ozone	0.1	0.2
Zinc oxide	-	5
PVC	3	8
Propane	1000	1800
Mercury	0.01	0.1
Lead	-	0.1
Formaldehyde	0.1	1.2
Chlorine	0.5	1.5
Chromates	-	0.1
CO	30	33
CO ₂	5000	9000
HCL	5	7
NO ₂	5	9
SO ₂ (H ₂ SO ₄)	2 (-)	5 (1)

■ Volumetric air flow required for removing humidity excess

$$\dot{V} = \frac{D}{(d_v - d_n) * \rho} \text{ [m}^3/\text{h]}$$

D : humidity emission [g/h];

d_v : humidity content in extract air [g water/kg air];

d_n : humidity content in supply air [g water/kg air];

ρ : air density [kg/m³] (at 20°C, $\rho = 1.205 \text{ kg/m}^3$);

■ Volumetric air flow required to remove heat excess

$$\dot{V} = \frac{\dot{Q}}{\rho * C_p * (t_v - t_n)} \text{ [m}^3/\text{h]}$$

\dot{Q} : heat emission in the room [kW];

t_v : room temperature [°C];

t_n : supply air temperature [°C];

ρ : air density [kg/m³] (at 20°C, $\rho = 1,205 \text{ kg/m}^3$);

C_p : air heat capacity [kJ/kg*K] at 20°C; $C_p = 1,005 \text{ kJ/kg*K}$

Table 3. Air exchange rate:

Premise name	A _{exch} /h		
Domestic premises	Living room (flat or hostel)	3 m ³ /h per 1m ² of living area	
	Kitchen room (flat or hostel)	6-8	
	Bathroom	7-9	
	Shower room	7-9	
	WC	8-10	
	Residential laundry room	7	
	Dressing room	1.5	
	Storeroom	1	
	Garage	4-8	
	Cellar	4-6	
Large and industrial premises	Theatre, cinema halls, conference halls	20-40 m ³ per one person	
	Office	5-7	
	Bank	2-4	
	Restaurant	8-10	
	Bar, café, beer hall, billiard room	9-11	
	Professional kitchen in café or restaurant	10-15	
	Supermarket	1.5-3	
	Drugstore (trade area)	3	
	Garage and car repair shop	6-8	
	Public WC	10-12 (or 100 m ³ per 1 toilet pan)	
	Dance hall, disco	8-10	
	Smoking room	10	
	Server room	5-10	
	Sport hall	No less than 80 m ³ per one sportsman and no less than 20 m ³ per one viewer	
	Hair dresser's	Up to 5 working places	2
		5 working places and more	3
		Warehouse	1-2
		Laundry	10-13
		Swimming pool	10-20
		Industrial paint workshop	25-40
Machine workshop		3-5	
School class	3-8		

Operating pressure [Pa] and air speed inside the air duct [m/s].

Operating pressure and air speed are calculated based on an air duct design diagram. This diagram is then further worked out as air distribution network of the ventilation system. The required pressure for various ventilation systems is generated by the fan and is calculated on the basis of diameter and length of the system components, number of bends and reducers as well as type of air distribution devices. The more elements the systems consists of, the longer the distribution net and the more bends and reducers the higher the required fan pressure.

Air speed also depends on the air duct diameter. Static pressure created by a fan determines air motion in the system that has some air resistance. Large air duct diameter and high air speed increase air resistance and provoke pressure loss. These factors must be considered while selecting ventilation equipment.

Recommended air speed in air ducts:

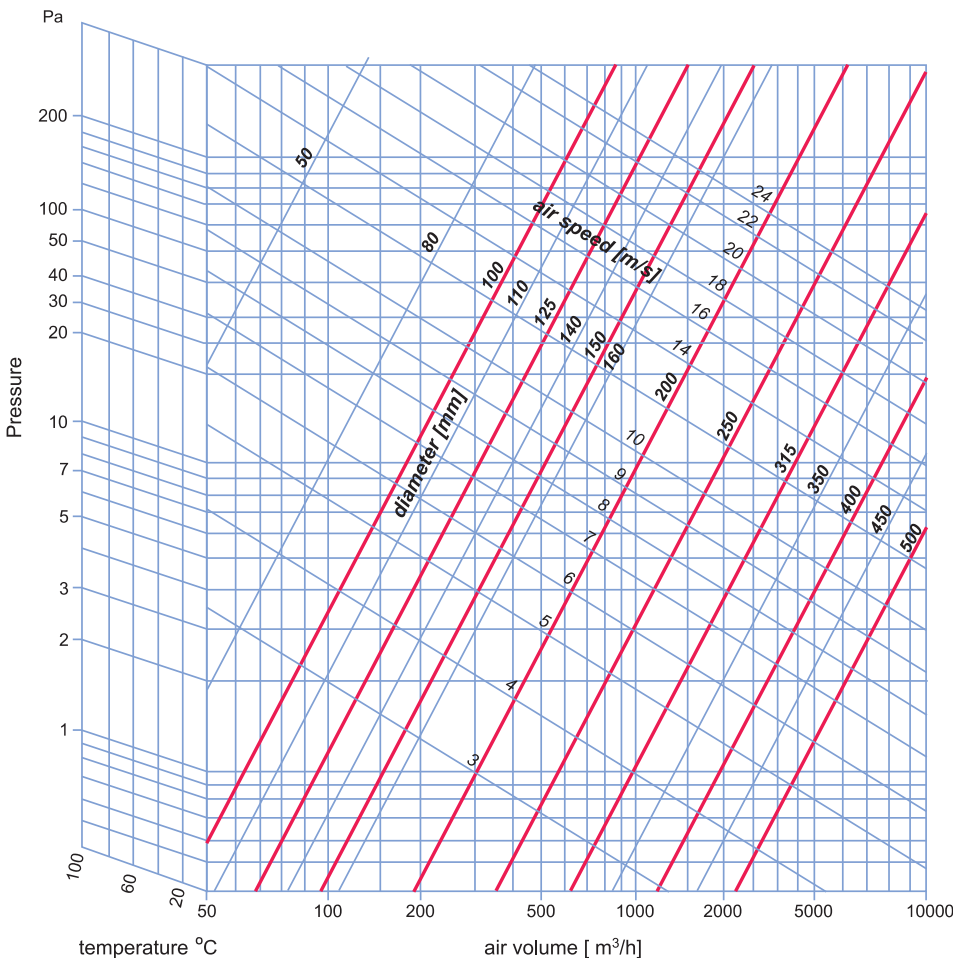
Type	Air speed [m/s]
Main air ducts	6 - 8
Branches	4 - 5
Air distribution ducts	1.5 - 2
Supply ceiling grilles	1 - 3
Exhaust grilles	1.5 - 3

Calculation of air speed in air ducts:

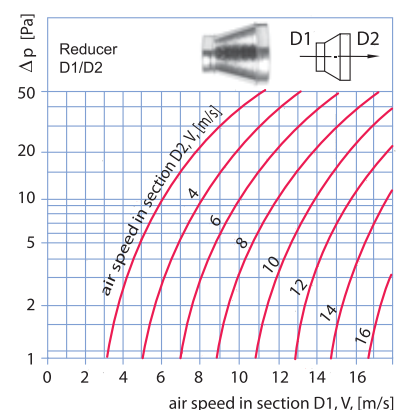
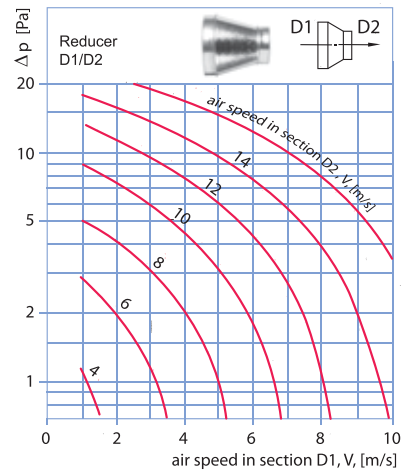
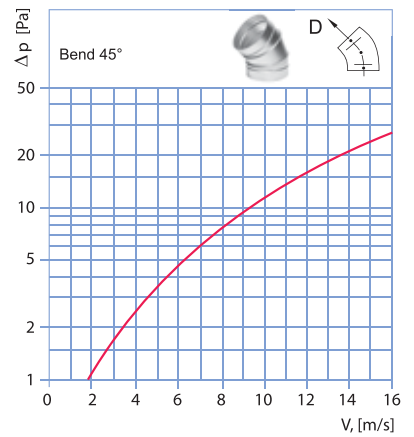
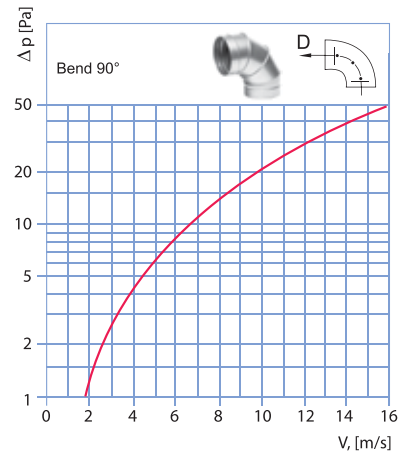
$$V = \frac{\dot{V}}{3600 \cdot A} \quad (\text{m/s})$$

\dot{V} : volumetric air flow [m³/h];
A: air duct cross section area, m²;

Diagram of pressure loss per 1 m of stretched air duct



Air resistance of shaped elements in the network



■ Electric heater power [kW].

Air heater is used in supply ventilation system for heating of supply air during cold seasons. Electric heater power is calculated on basis on ventilation system capacity, required supply air temperature and minimum outdoor temperature. Supply air temperature must be no less than +18 °C. Electric heater power is calculated as follows:

$$Q = \frac{\dot{V} \cdot \rho \cdot C_p \cdot (t_v - t_n)}{3600} \quad [\text{kW}]$$

\dot{V} : volumetric air flow [m³/h]

t_v : indoor air temperature [°C]

t_n : outdoor air temperature [°C]

ρ : air density [kg/m³]; at 20 °C, $\rho = 1.205 \text{ kg/m}^3$

C_p : air heat capacity [kJ/kg·K], at 20°C,
 $C_p = 1.005 \text{ kJ/(kg·K)}$

The minimum outdoor air temperature depends on the climate zone and is calculated as the average temperature of the coldest five day period of the coldest month at 01 pm.

While selecting the electric heater consider some limitations:

□ Single-phase (220 V) or three-phase (380 V) voltage. If electric heater power is above 5 kW it requires three-phase voltage. In any case 3-phase voltage is preferable because it has lower operating current.

□ Maximum permissible current. Current consumption of the electric heater is calculated as follows:

$$I = \frac{P}{U}$$

I : maximum permissible current [A];

P : electric heater power [W];

U : power voltage [V];

The maximum supply air temperature attained with the electric heater is calculated as follows:

$$\Delta t = \frac{3600 \cdot Q}{\dot{V} \cdot \rho \cdot C_p} \quad (^\circ\text{C})$$

\dot{V} : volumetric air flow [m³/h]

ρ : air density [kg/m³]; at 20 °C,
 $\rho = 1.205 \text{ kg/m}^3$

C_p : air heat capacity [kJ/kg·K], at 20°C,
 $C_p = 1.005 \text{ kJ/(kg·K)}$

Q : electric heater power [kW]

□ The water heater is designed for warming up air in duct ventilation systems. The heater is installed directly into the air duct. Water and freeze-resistant mixtures are used as heat carriers.

1. Provide at least minimum required air speed;
2. Provide air temperature and return water protection;
3. Provide fan switching off, closing of air damper and opening of regulating damper in case of protection actuation.

■ Permissible noise level [dB(A)]

The fan itself is the basic noise source. Air flow speed also influences the noise level in the ventilation system.

Noise produced by fans and ventilation system components is spread along air ductworks and

penetrates into rooms through air distribution devices.

The generated noise level can be reduced by selecting a silent model among other models with similar technical parameters or by installing silencers.

Ventilation systems are designed with respect to acoustic calculation aimed at:

- determination of octave band frequency in rated points;
- determination of required reduction of octave band frequency by correlation with permissible values according to acting norms.

Table 4. Noise level value depending on noise source

dBA	Characteristics	Acoustic source
0	no audible noise	
5	nearly not audible	
10		low leaves rustling
15	hardly audible	leaves rustling
20		human whisper (above 1 m distance)
25		human whisper (1 m distance)
30	quiet	whisper, wall clock ticking
35		standard sound level for residential premises from 23.00 till 07.00
40	well audible	low conversation
45		ordinary speech
50		standard sound level for residential premises from 07.00 till 23.00
55	definitely audible	ordinary conversation
60		conversation, typing
65		Standard for A office premises (EN)
70		Office standard
75	noisy	loud conversation (1 m)
80		several loud conversations (1 m)
85		shout, laughter (1m)
90		shouting, operating motorcycle with a silencer
95		loud shouting, operating motorcycle with a silencer
100	extremely noisy	Loud shouts, freight car (7 m)
105		moving subway train (7 m)
110		Orchestra, subway car (close), thunder
115		Maximum permissible sound pressure for headphones of a personal stereo (according to European norms)
120		inside an airplane manufactured before 1980
130		helicopter
135	almost intolerable	helicopter
140		sandblaster (1 m)
145	pain threshold	pneumatic hammer (1 m)
150		starting air plane

FAN TYPES

A fan is a mechanical device designed for air transportation along ventilation air ductworks.

Based on design and operating logic the fans are classified as follows:

- axial fans;
- mixed-flow fans (centrifugal and axial);
- centrifugal (radial);
- tangential (diametral).

An axial fan consists of a wheel made of cantilevered blades (impeller) that are fixed on the hub at an angle to the rotation level. The wheel is located in a cylindrical casing. Impeller normally is placed directly on the electric motor axis.

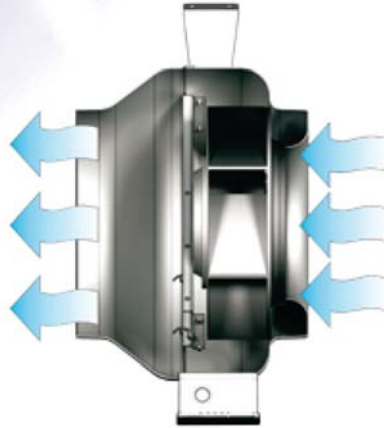
As the impeller is set into motion air is trapped between the blades and is moved axially. Almost no air is moved radially. Axial fans have high efficiency as compared to radial and diametral fans. Such fans are normally used for transport of large air volumes at low air resistance in the system.



These fans are used for air supply and exhaust routed through free openings or in assembly with air ducts laid horizontally, max. 3 m with low air resistance in the system.

Mixed-flow fans (centrifugal and axial) – Mixed-flow fans are designed for air transport with high air pressure along the motor axis. The air is moved by the turbine and not by impeller. Each turbine is individually balanced on the electric motor shaft. That provides an exceptionally low noise level much less than that of axial or centrifugal fans. **Mixed-flow fans are widely used** in ventilation systems combined with round ducts for air supply and exhaust in large-scale

stretched air ducts with high air resistance in the network. These fans are suitable for mounting directly on exhaust air ducts.



Centrifugal fans consist of a bladed impeller located inside a spiral casing. The impeller is a hollow cylinder with mounted blades that are circumferentially fixed with disks. The hub in the centre of the disks is designed for the impeller fixation on the shaft.

As the impeller is set into motion air is trapped into the air passages between its blades, is moved radially toward the impeller periphery and gets pressed. Centrifugal force pushes air into the spiral casing and further toward the supply vent.

Depending on the fan application area its blades are forward- or backward curved.



The number of blades is varying depending on the fan type and application. Centrifugal fans

with backward curved blades save up to 20 % electric energy. High overload capability is another important advantage.

Smaller impeller diameter, compact fan size, lower rotation speed and low noise level are the advantages of radial fans with forward curved blades. Air capacity and pressure characteristics are similar to those of the fans with backward curved blades.

Centrifugal fans are used for air supply and exhaust in ventilation systems with stretched air ducts with high air resistance in the system.



Tangential fans consist of a drum impeller with forward curved blades. The fan casing is equipped with a spigot on the intake side and with a diffuser on the outlet side. Tangential flow fans are featured with higher air resistance parameters as compared to other fan types, in particular, they form a flat uniform wide air flow. Easy space-saving assembly allows various employment and ventilation in a wide range of application.

These fan models are rarely used in ventilation systems. However they are quite popular in various assembled ventilation and air conditioning units, including fan coils, indoor units of split systems, air curtains, etc.

According to application modifications the fans are classified for:

- multi-port fans;
- duct fans;
- roof fans.

Multi-port fans are centrifugal exhaust fans with a specially designed casing that has several connection points for connection of air ducts that extract air from various zones, i.e. from a ventilation air duct, room or even a part of a small premise.

These fans are the ideal solution for premises where air needs to be extracted from several places through a single extract main air duct. Multi-port exhaust fans are used for optimization of air ductwork layout, minimizing the need of expensive fittings and are suitable for connection with single-type flexible air ducts.



may be made of special plastic, galvanized steel or combined. Due to compact sizes the inline fans are suitable for installation directly into air ductworks, ventilation and air conditioning systems or suspended behind false ceiling or in specially designed vertical cabinets.



fans are designed for outdoor application and are exposed to weather factors they must meet special moisture and dust resistance requirements. Roof fans are made either of high quality steel covered with epoxy corrosion resistant coating or galvanized steel.



□ **Inline fans** are designed for mounting inside a round or rectangular ventilation air duct. These fans are installed on a shaft in combination with a motor in one casing and require mounting of vibration absorbing connectors. Multi-port fans have axial, multi-blade or centrifugal design, both forward and backward curved blades, single- and double-inlet. The casing of inline fans

The fan is suitable for horizontal, vertical or tilt installation. The basic advantages of inline fans are related to its compact size and high performance.

□ **Roof fans** are installed directly on the roof, are fitted with a special base for long service life and weather resistance. As roof

Roof fans have general ventilation modifications as well as special heat-resistant modifications for high temperature applications, i.e. for air extract from chimney or gas boilers.

FAN MOTORS

The motors are powered by direct or alternating current.

A direct current motor is powered by a direct power supply.

An alternating current motor is powered by an alternating power supply.

Alternating current motors are the most widely used motors because the basic electric grid in the country has alternating power supply.

Alternating current motors have two types:

Synchronous electric motors are alternating current motors with a rotor that rotates synchronously with a magnetic field;

Asynchronous electric motors are alternating current motors with the magnetic field frequency exceeding the motor rotation speed.

Nowadays the asynchronous electric motors find wide application.

□ **Asynchronous electric motors** consist of two basic components, the stator and the rotor. The stator is a fixed motor component. On the inner side the stator has some slots for laying of three-phase cable winding that is powered by three-phase current. The rotor is a rotating part of the motor and also has slots for inserting the cable winding. The rotor and the stator are assembled of separate 0.35 - 0.5 mm thick electrotechnical steel pressed plates. Separate plates are insulated from each other with a varnish layer. The air gap between the stator and the rotor is kept as low as possible: 0.3 - 0.35 mm for low capacity machinery and 1-1.5 for more powerful machinery. Depending on the rotor design the asynchronous motors are available in short circuit modification and phased modifications. Short circuit motors are the most widely used motors because of their

simple design and easy operation. The three-phase stator winding is inserted inside the slots and consists of a number of interconnected coils. Each coil consists of one or several turns which are insulated against each other and against the slot walls.

The asynchronous electric motor with short circuit rotor has the following advantages:

- Permanent speed at various loads.
- Resistance to short-term mechanical overloads.
- Easy structure.
- Easy start-up.
- Higher $\cos \varphi$ and efficiency compared to electric motors with phased rotor.

□ **The design of the asynchronous electric motor with external rotor** is similar to that of the standard asynchronous electric motor.

The only difference is the position of the rotor. The electric rotor motor is located inside the stator winding and the stator with turns is located in the electric motor center. This configuration provides a compact size of the ventilation unit. The electric motor shaft is carried by ball bearings fixed inside the stator and the impeller is fixed in the rotor casing. Such a design



Advantages of the asynchronous electric motor with external rotor:

- Long service life.
- Light weight and small overall dimensions.
- Easy assembly and installation.
- Aligned impeller and electric motor.
- Regulated air capacity.
- Low energy demand during start-up.

□ **The electric motor with high-efficient EC motor** is a synchronous direct current motor driven by an electronic commutating unit (controller). It has no friction and wearing parts as a collector or brushes, unlike the standard motor. The function of these parts is performed with the maintenance-free electronic circuit of the EC controller.

The EC technology is the state-of-the-art method for arrangement of energy saving and high efficient ventilation. The energy demand of EC motors is by 50 % less as compared to standard motors and efficiency reaches 90 %.

These new electric motors are featured with high performance, low noise level and controllable total speed range. The electronic EC-controller enables some other smart functions, e.g. fan control according to measured temperature, pressure and other parameters.

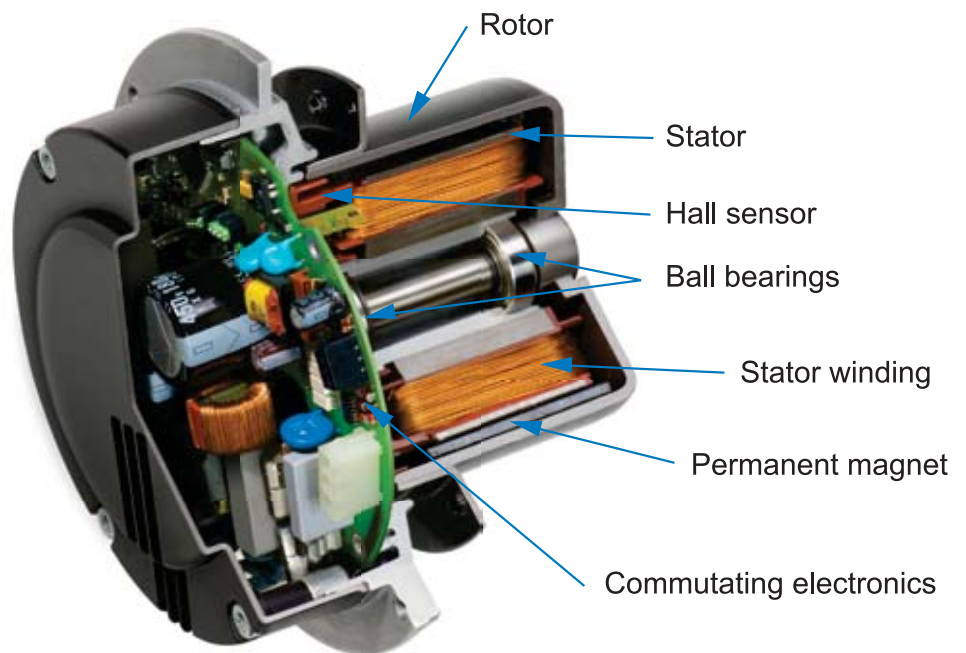
A unique software ensures high control accuracy

for fans integrated into a single network. Parameters of a single fan integrated into a common network may be centrally corrected to match the ventilation system parameters. All the system parameters are displayed online on a computer. This enables programming individual operation modes of each fan in the system. This technology enables also programming custom-made settings to meet individual customer requirements.

Advantages of EC motors:

- Efficient performance at any rotation speed of the fan, including very low speed.
- Low heat emission.
- Small overall dimensions of the unit due to external rotor design.
- Maximum fan rotation speed does not depend on frequency in the grid. The fan is suitable for connection both to 50 Hz and 60 Hz power mains.
- High efficiency at low rotation speed.
- Energy demand is by 1/3 less as compared to standard motors.
- Data interchange between PC and fan for parameter setting and control.
- Integration of all fans into a unified system and their centralized control.

provides air cooling of the electric motor which makes it applicable for a wide temperature range. The electric motors are assembled with the impellers and are subjected to static and dynamic balancing in compliance with DIN ISO 1940. The motors have an integrated overheating protection with automatic restart. All the motors have 100 % controllable speed range. Speed control is performed with a transformer or electronic devices. Explosion-proof motors are controlled exclusively by transformers within 25 % up to 100% of the rated voltage range. Speed control is performed by voltage change whereas the frequency in the grid remains the same. The electric motor speed is smoothly decreased as power voltage drops or is increased as power voltage rises. The motor can also be controlled with a frequency converter.



FAN SPEED CONTROL

■ The need to control speed, i.e. regulate air capacity in the ventilation system arises due to fluctuations of heat emission, concentration of harmful substances, humidity level, etc. Fan speed control is required for systems with variable air exchange and is performed with a speed controller.

All the motors have a 100 % controllable speed range by transformer and electronic devices. The explosion-proof motors are controlled exclusively by transformers from 25 % up to 100% of the rated voltage. Speed control is performed due to voltage change whereas the frequency in the grid remains the same. The electric motor speed is smoothly decreased as power voltage drops or is increased as power voltage rises. The motor can also be controlled with a frequency converter.

Power regulation of ventilation units and speed control respectively provides the following benefits:

- Comfortable fan capacity mode.
- Energy saving operation mode.

The rotation speed control as a way of regulating the fan air capacity is one of the most efficient solutions to increase the fan performance. The fan power consumption drops in direct proportion to rotation speed in third power:

$$\frac{P_L}{P_{L,0}} = \left(\frac{n}{n_0}\right)^3$$

P: electric power [W, kW].

The amount of saved power depends on performance data of the motor and the control unit.

- Noise level decrease.

The fan parameters match optimally during the

fan speed control. This results in significant noise level reduction. The noise level is calculated as follows:

$$\Delta L \approx 50 L_g \left(\frac{n}{n_0}\right) \text{ dB}$$

(n_0 : Rated speed)

L: power / sound volume [dB(A)]

□ Conformity to the fan operation conditions and technical parameters (air quality deterioration, humidity increase, variable number of people, etc.).

■ Depending on the controller type the fans have the following air capacity controls:

- Thyristor control.
- Transformer control.
- Frequency control.

□ **The thyristor controllers** are designed for smooth manual regulation of the fan speed and accordingly the air capacity. They are used for fans with asynchronous electric motors and are featured with high control accuracy and efficiency. Operating supply voltage 230 V (~ 1, 50Hz). Several fans may be controlled by a single controller if the total fan current does not exceed the rated controller current. The speed controller provides smooth air capacity regulation from 0 to 100 %. In case of low speed operation the fan may produce increased noise. For that reason a thyristor speed controller is used for ventilation systems with no special requirements to the noise level. The bearings in low voltage motors have a shorter service life. The recommended control speed range for the thyristor speed controllers is from 60 to 100 % of rated voltage.

□ **Transformer control.**

Transformer controllers are designed for speed control of voltage controlled motors by altering the voltage supplied (five units). The operation of transformer speed controllers is based on the use of five-stage autotransformers for regulation of the motor power voltage. Frequency in the grid remains the on the same level. Several fans may be controlled by a single controller if the total fan current does not exceed the rated controller current. In case of a transformer speed controller application the motor does not generate increased noise in the lower speed range. The bearings in low voltage motors have shorter service life. The recommended voltage control range is up to 45 % of the rated frequency value for single-phased motors and up to 55% of the rated frequency value for three-phased motors.

□ **Frequency control.**

Frequency controllers are designed for smooth start-up or speeding down, speed altering, regulation of air capacity and protection of asynchronous electric motors due to generation of a required frequency at the outlet of the voltage converter. The converter consists of an electric drive and a control component. The electric drive of the frequency converter consists of separate control circuits comprising a thyristor or a transistor that operate in electronic key mode. A microprocessor is the core of the control component. It provides control of power electronic keys and has many other supplementary functions, i.e. control, diagnostics, protection.

IP CODE SYSTEM

When selecting the required equipment and determining its location the equipment's ingress protection rating must match the operating conditions. Any electric appliance must always meet two protection demands:

- electric safety for the user and service personnel;
- protection of the inner electronic components

against environmental impact.

The degree of mechanical protection provided by casings of electric appliances is classified according to international dust- and humidity-protection standard "International Protection" ("Internal protection") and is marked with the letters "IP" followed by two digits. The first digit shows protection degree against penetration of

mechanical objects and touch to live parts and the second digit shows protection against liquid penetration. Each product has a respective marking on the casing, i.e. IPX4 or IP65.

Characteristics of ingress protection are shown in tables 5 and 6.

Table 5. Protection rating against penetration of solid particles and touch to live parts.

First digit	Protection characteristics	Description
x	No special protection	Open design, no protection from dust and touch to live parts.
1	Protection from large objects	Protection from OBJECTS EQUAL TO OR GREATER THAN 50 mm and accidental hand touch to live parts.
2	Protection from medium objects	Protection from OBJECTS EQUAL TO OR GREATER THAN 12 mm and fingers touch to live parts.
3	Protection from small objects	Protection from OBJECTS EQUAL TO OR GREATER THAN 2.5 mm and entry by tools, wires or fingers.
4	Protection from sand	Protection from OBJECTS EQUAL TO OR GREATER THAN 1 mm and entry by tools, wires or fingers.
5	Protection from dust	Minor quantities of dust can penetrate the casing which does not disturb the rated operation. Full protection against touch to current-carrying parts.
6	Full protection from dust	No dust penetration inside the casing.

Table 6. Protection rating against ingress of liquids.

Second digit	Protection characteristics	Description
x	No special protection	Open design, no protection from water sprays.
1	Protected against vertically dripping water	Water drops dripping vertically do not damage equipment.
2	Protected against direct sprays up to 15 deg from vertical	Water drops falling vertically at 15° do not damage equipment.
3	Protected against direct sprays up to 60 deg from vertical	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.
4	Protected against direct sprays from all angles	Water splashing against the enclosure from any direction shall have no harmful effects for the equipment in the casing.
5	Protected against low-pressure water jets	Water projected by a nozzle against the enclosure from any direction causes no harmful effects for the equipment in the casing.
6	Protected against high-pressure water jets	Water projected in powerful jets against the enclosure from any direction causes no harmful effects for the equipment in the casing.
7	Protection against temporary immersion	No ingress of water in harmful quantity when the equipment is immersed in water.
8	Protection against complete, continuous submersion in water	The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer.

GENERAL INFORMATION

BLAUBERG ventilation products are featured with traditional German quality and high technology. Since many years BLAUBERG preserves a flawless reputation that is acknowledged by worldwide experts.

The BLAUBERG production facilities allow to manufacture the complete ventilation product range and ensure full matching and compatibility of all the turn-key ventilation system components. Ongoing implementation of new technologies and innovative solutions lead BLAUBERG products to a state-of-the-art and popular level.

BLAUBERG products main advantages:

- reliability;
- high quality;
- state-of-the-art;
- innovative;
- fully equipped;
- easy maintenance.

❑ **Read the user manual carefully** before operating any BLAUBERG products. Be sure that the operating mode and environmental conditions match the equipment parameters. Do not operate the equipment if it does not match the required operating conditions because it violates safety requirements.

❑ **The BLAUBERG fans are equipped** with various motors, including synchronous and asynchronous motors, AC, DC and EC motors. All the motors are durable and reliable, fitted with thermostats for overheating protection and distinguished by efficient operation and low noise level. The motors are made of aluminium or cast iron, they are fully enclosed and have a suitable ingress protection.

❑ **Data on voltage**, frequency, current, rated motor power, ingress protection and electric connection recommendations are stated in the technical parameters for each product. The stated data meet standard operating requirements under air density $p = 1.2 \text{ kg/m}^3$, temperature $T = 20 \text{ }^\circ\text{C}$ and power frequency 50 Hz. Follow the manufacturer's data on a priority basis while connecting the equipment to power mains. Depending on operating and environmental conditions some deviations are possible within permissible limits.

❑ **Connect the unit to power mains** with respect to the wiring diagram stated in the operation manual and valid electrical codes. The motor is protected against overload and phase loss by emergency shutdown, overheat thermostats or full safety protection devices on each contact and in every rotation speed range. The selection of the emergency switch must be in compliance with manufacturer's guidelines. Failure to comply with the manufacturing requirements may result in equipment malfunction and void the manufacturer warranty.

❑ Standard fans are **designed for operation** in moderately polluted and humid-laden environments without aggressive substances. The operating temperature range is from $-30 \text{ }^\circ\text{C}$ up to $+40 \text{ }^\circ\text{C}$. Contact the manufacturer and be advised prior to use of ventilation equipment in any specific environment that does not meet the standard requirements.

❑ BLAUBERG thyristor and transformer speed controllers are used for **fan power regulation**. The BLAUBERG motor parameters match the impeller parameters to provide maximum

efficiency both for permanent and controllable speed mode.








❑ The casings used for enclosure of the BLAUBERG ventilation units are made of plastic, aluzinc, aluminium or steel. Depending on the model type the casing may have a polymeric coating, weather resistant coating or a thermal- and sound insulation of mineral wool. Depending on application the ventilation units may be equipped with electric heaters or water heaters with integrated overheating thermostats, units for energy recovery (recuperators), filters of required purification class and by-pass ducts and dampers. All the appliances have fixing elements for easy mounting and hinged panels for easy servicing.

❑ **The warranty period** for BLAUBERG equipment is 12 months from delivery date. The warranty scope is stated in the delivery terms. Unauthorized design modification, disregard of installation and connection recommendations will void all manufacturer's warranty obligations.

❑ **The present product** catalogue is a promotional material. BLAUBERG Company reserves all the rights to modify the present catalogue.

CERTIFICATION

Various series of the products are marked with the following check symbols:

	CE marked equipment means that the products are manufactured in compliance with quality and safety standards provided by EU regulations for this product type (stamped by the manufacturer).		Mark of conformity to the Ukrainian Quality Standards and electrical safety issued by Ukrtest.
	Mark of conformity to the European Quality Standards and electrical safety issued by Association for Technical Inspection (Technischer Überwachungsverein, Germany).		Mark of conformity of the products liable to obligatory certification in the DSTR system as well as acting technical norms and standards in the Russian Federation.
	Mark of conformity to the Quality Standards and electrical safety adopted in Poland, issued by the Polish center for testing and certification PCBC.		Insulation class: double insulation.
	Mark of conformity to the Quality Standards and electrical safety adopted in Slovakia, issued by the Slovak center for testing and certification PCBC.	IP 34	Ingress Protection Rating (refer tables 1, 2, 5, 6).



Inline mixed-flow fans

Turbo

Air capacity – up to 1750 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- Mounting in kitchens, bathrooms and other humid premises.
- Ventilation air ducts requiring high pressure, powerful air flow and low noise level.
- Compatible with Ø 100 up to 315 mm round air ducts.

Design

- Casing made of low-flammable polypropylene.
- Ventilation unit with terminal box. Can be turned to any position.
- Special casing design permits easy dismantling of the impeller and motor block for fan servicing without dismantling the air duct.

Motor

- Double-speed single-phase motor on ball bearings.
- Equipped with thermal overload protection.

Speed control

- The built-in switch (option **US**) or external switch for multi-speed fans (available upon separate order) are used to select one of two capacity modes.
- Smooth speed control is possible with a built-in speed controller (option **FR**) or an external thyristor speed controller (available upon separate order).

Mounting

- Due to compact design the fan is the ideal solution for mounting in limited spaces, including space behind a false ceiling.
- The fan can be installed in any section of the ventilation system from intake to the end of the ductworks.
- Wall or ceiling mounting with a mounting plate.

- TD** – mounting kit for installation of one diameter fans in parallel (for boosting capacity)



- TL** – mounting kit for installation of one diameter fans in series (for boosting pressure).



■ Modifications and options

- **T** – adjustable run-out timer regulated from 2 to 30 minutes.
- **US** – three-position speed switch integrated in the fan.



- **FR** – built-in smooth speed controller from 0 to 100 %. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**FR1**).



- **G** – smooth speed controller with an electronic thermostat and an external temperature sensor that is fixed on 4 m power cable. The fan is

supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**G1**).



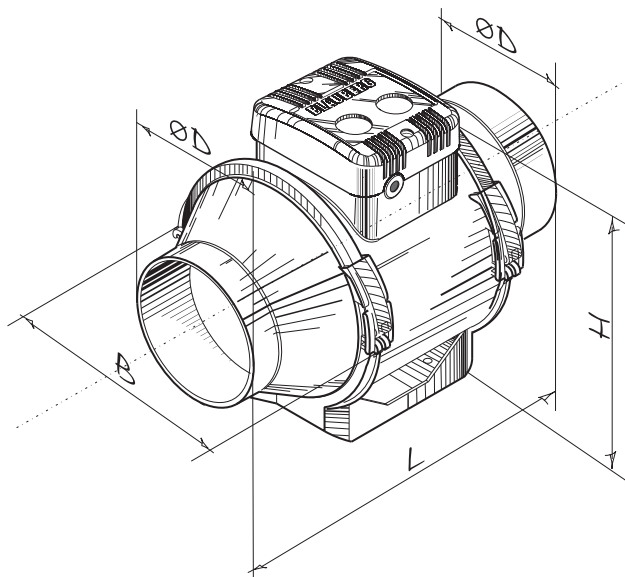
- **GI** – smooth speed controller with an electronic thermostat and a temperature sensor integrated into the air duct. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**GI1**).
- The options **G** and **GI** are used for automatic speed control depending on indoor temperature. The best ventilation solution for premises requiring permanent temperature control as greenhouses, orangeries, etc.

- **W** – the fan is equipped with a pre-wired power cable and IEC plug as a standard. Modification with a standard electric plug is available (**W1**).
- **max** – high-powered motor.

■ Overall dimensions

Type	Dimensions [mm]					Weight [kg]
	∅D	∅D1	B	H	L	
Turbo 100	97	164	196	241	303	1.68
Turbo 125	123	164	196	241	258	1.79
Turbo 150	148	187	220	251	289	3.18
Turbo 160	158	187	220	251	289	3.23
Turbo 200	199	209	239	261	295.5	3.8
Turbo 250	247	257	287	323	383	7.83
Turbo 315	310	323	362	408	445	11.7

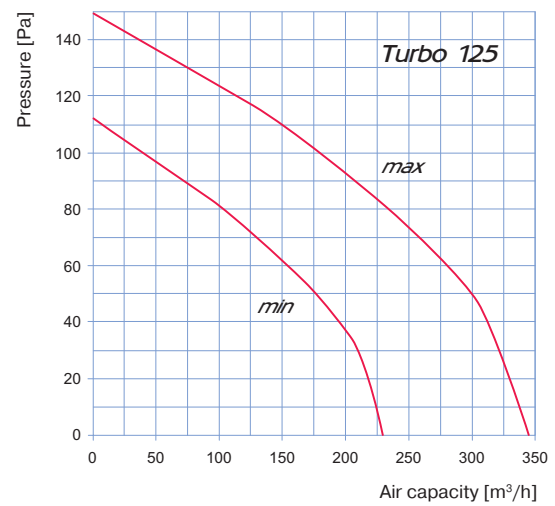
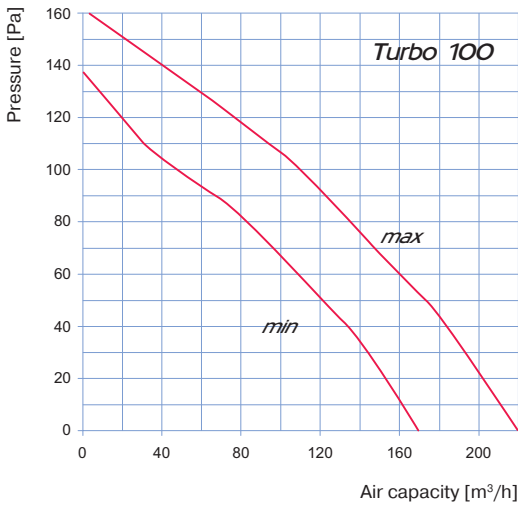
ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m³/h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR



Specifications

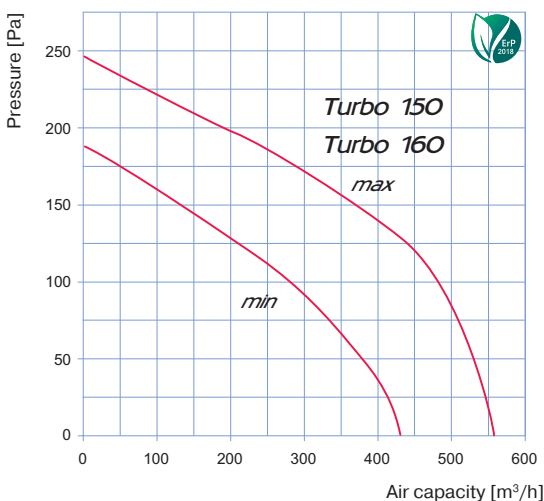
Parameters	Turbo 100*		Turbo 125*		Turbo 150* Turbo 160*	
	min	max	min	max	min	max
Speed	min	max	min	max	min	max
Voltage [V / 50 /60 Hz]	1 ~ 230		1 ~ 230		1 ~ 230	
Power [W]	23	25	25	29	42	50
Current [A]	0.10	0.11	0.11	0.13	0.19	0.22
Maximum air capacity [m ³ /h]	170	220	230	345	430	560
RPM [min ⁻¹]	1980	2545	1535	2265	1940	2620
Sound pressure level at 3 m distance [dBA]	27	32	29	34	37	46
Max. operating temperature [°C]	60		60		60	
SEC class	-		-		B	
Ingress protection rating	IPX4		IPX4		IPX4	

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.






Sound power level, A-weighted	Hz	Sound power level, A-filter applied								Sound pressure level at 3 meters, A-filter applied LpA, [dB(A)]	Sound pressure level at 1 meter, A-filter applied LpA, [dB(A)]	
		Octave frequency band, Hz										
		Gen.	63	125	250	500	1000	2000	4000			8000
Min speed												
L _{WA} to inlet	dB(A)	54	16	28	51	45	49	41	35	24	33	43
L _{WA} to outlet	dB(A)	53	15	27	50	44	48	40	35	23	32	42
L _{WA} to env.	dB(A)	48	11	23	44	40	43	36	31	21	27	37
Max speed												
L _{WA} to inlet	dB(A)	64	23	35	61	58	56	48	43	30	43	53
L _{WA} to outlet	dB(A)	63	22	34	60	57	55	48	42	29	42	52
L _{WA} to env.	dB(A)	56	17	29	53	51	50	43	38	26	36	46

Sound power level, A-weighted	Hz	Sound power level, A-filter applied								Sound pressure level at 3 meters, A-filter applied LpA, [dB(A)]	Sound pressure level at 1 meter, A-filter applied LpA, [dB(A)]	
		Octave frequency band, Hz										
		Gen.	63	125	250	500	1000	2000	4000			8000
Min speed												
L _{WA} to inlet	dB(A)	54	26	38	52	50	44	38	27	17	34	44
L _{WA} to outlet	dB(A)	54	25	37	51	49	43	38	28	18	33	43
L _{WA} to env.	dB(A)	49	21	32	46	45	40	35	25	16	29	39
Max speed												
L _{WA} to inlet	dB(A)	60	20	31	57	51	51	50	39	27	39	49
L _{WA} to outlet	dB(A)	59	20	31	56	51	51	49	39	26	38	48
L _{WA} to env.	dB(A)	54	16	27	51	46	47	45	36	24	34	44

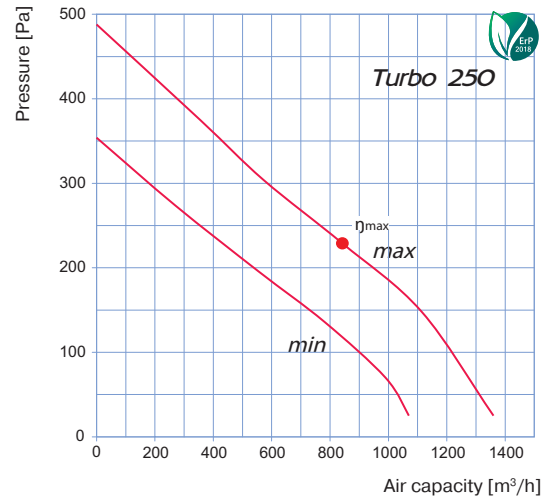
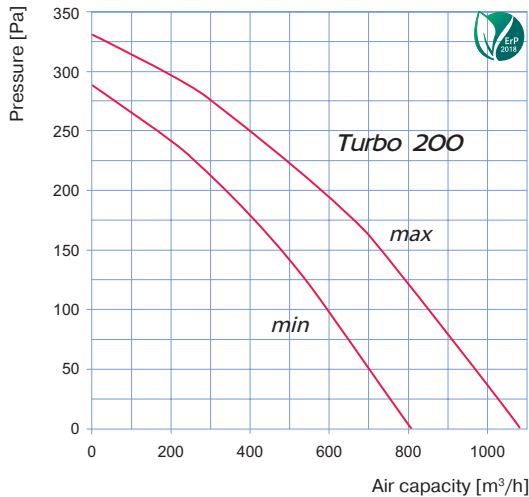


Sound power level, A-weighted	Hz	Sound power level, A-filter applied								Sound pressure level at 3 meters, A-filter applied LpA, [dB(A)]	Sound pressure level at 1 meter, A-filter applied LpA, [dB(A)]	
		Octave frequency band, Hz										
		Gen.	63	125	250	500	1000	2000	4000			8000
Min speed												
L _{WA} to inlet	dB(A)	64	26	38	63	55	56	51	41	27	44	54
L _{WA} to outlet	dB(A)	64	25	37	62	54	55	50	40	27	43	53
L _{WA} to env.	dB(A)	54	18	30	52	46	47	43	35	23	34	44
Max speed												
L _{WA} to inlet	dB(A)	75	33	44	71	67	65	70	56	42	54	64
L _{WA} to outlet	dB(A)	74	32	43	70	65	64	70	54	42	54	64
L _{WA} to env.	dB(A)	64	24	35	59	56	55	60	47	35	43	53

Specifications

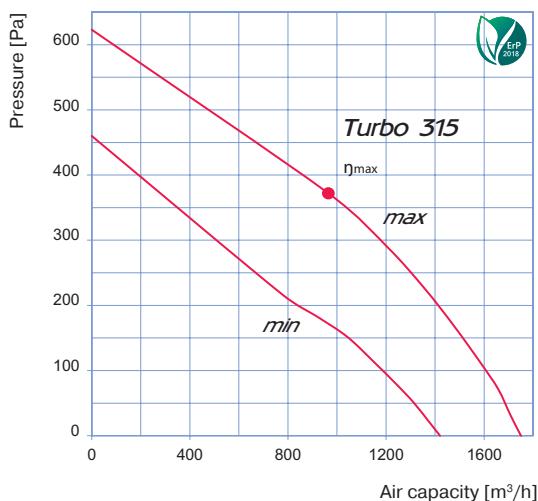
Parameters	Turbo 200* 		Turbo 250 		Turbo 315 	
	min	max	min	max	min	max
Speed						
Voltage [V / 50 /60 Hz]	1 ~ 230		1 ~ 230		1 ~ 230	
Power [W]	76	108	125	177	227	315
Current [A]	0.34	0.48	0.54	0.79	0.99	1.42
Maximum air capacity [m³/h]	805	1080	1070	1360	1420	1750
RPM [min ⁻¹]	1915	2380	1955	2440	2115	2505
Sound pressure level at 3 m distance [dBA]	45	52	47	55	47	56
Max. operating temperature [°C]	60		60		60	
SEC class	B		-		-	
Ingress protection rating	IPX4		IPX4		IPX4	

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound power level, A-weighted	Hz	Sound power level, A-filter applied								Sound pressure level at 3 meters, A-filter applied	Sound pressure level at 1 meter, A-filter applied	
		Octave frequency band, Hz										
		Gen.	63	125	250	500	1000	2000	4000			8000
Min speed												
L _{WA} to inlet	dB(A)	73	36	49	64	65	69	67	56	42	52	62
L _{WA} to outlet		71	35	47	63	64	67	66	56	42	51	61
L _{WA} to env.		60	24	36	50	52	55	54	46	34	39	49
Max speed												
L _{WA} to inlet	dB(A)	78	38	50	69	70	74	73	65	51	57	67
L _{WA} to outlet		77	36	49	68	69	72	72	63	49	56	66
L _{WA} to environment		65	26	38	55	57	60	60	53	41	44	54

Sound power level, A-weighted	Hz	Sound power level, A-filter applied								Sound pressure level at 3 meters, A-filter applied	Sound pressure level at 1 meter, A-filter applied	
		Octave frequency band, Hz										
		Gen.	63	125	250	500	1000	2000	4000			8000
Min speed												
L _{WA} to inlet	dB(A)	78	46	53	71	73	74	68	57	45	58	68
L _{WA} to outlet		78	45	52	71	73	73	68	56	44	57	67
L _{WA} to env.		68	36	43	60	62	64	59	49	38	47	57
Max speed												
L _{WA} to inlet	dB(A)	88	51	58	73	85	82	78	67	55	67	77
L _{WA} to outlet		87	50	57	72	84	81	77	66	54	66	76
L _{WA} to environment		76	41	48	62	73	70	67	58	47	55	65



η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
31.6	A	Static	50.1	No	0.173	0.78	842	229	2430	1

Sound power level, A-weighted	Hz	Sound power level, A-filter applied								Sound pressure level at 3 meters, A-filter applied	Sound pressure level at 1 meter, A-filter applied	
		Octave frequency band, Hz										
		Gen.	63	125	250	500	1000	2000	4000			8000
Min speed												
L _{WA} to inlet	dB(A)	80	35	50	69	76	77	72	61	47	60	70
L _{WA} to outlet		79	34	49	68	75	75	71	60	46	59	69
L _{WA} to env.		69	27	40	58	64	66	62	53	40	49	59
Max speed												
L _{WA} to inlet	dB(A)	86	39	55	72	80	82	78	69	54	65	75
L _{WA} to outlet		85	38	55	71	79	81	78	68	53	64	74
L _{WA} to environment		74	29	45	61	68	70	67	59	46	53	63

η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
32	A	Static	47.7	No	0.318	1.42	965	372	2450	1



Inline centrifugal fans

Centro

Air capacity – up to 1700 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- Mounting in kitchens, bathrooms and other humid premises.
- Compatible with Ø 100 up to 315 mm round air ducts.

Design

- High-quality durable plastic casing.
- Aerodynamically shaped casing.
- Airtight mounting box.
- Centro 150 is compatible with 150 and 160 mm air ducts.

Motor

- Single-phase external rotor motor with a centrifugal impeller with backward curved blades.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.
- Some standard sizes have high-powered motors (**Centro max**).
- For ventilation of premises with high requirements to noise level low-noise modifications are available (**Centro L**)

Speed control

- Smooth speed control with a built-in electronic speed controller (option **FR**).
- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- Due to compact design the fan is the ideal solution for mounting in limited spaces.
- Any mounting position.
- Wall or ceiling mounting with fixing brackets supplied as a standard or with a wire frame **Halter Centro** (available upon separate order).
- Flexible air ducts are fixed on fan spigots with clamps.



Modifications and options

- **FR** – built-in smooth speed controller from 0 to 100 %. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**FR1**).





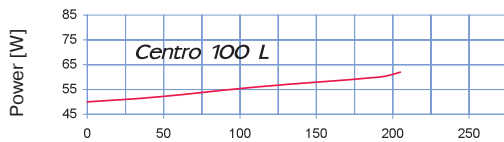
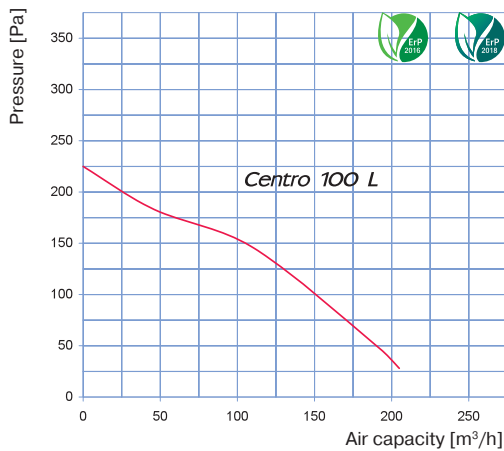
- **max** – high-powered motor.
- **L** – low-powered motor.
- **G** – smooth speed controller with an electronic thermostat and an external temperature sensor that is fixed on 4 m power cable. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**G1**).



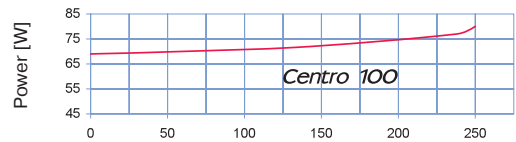
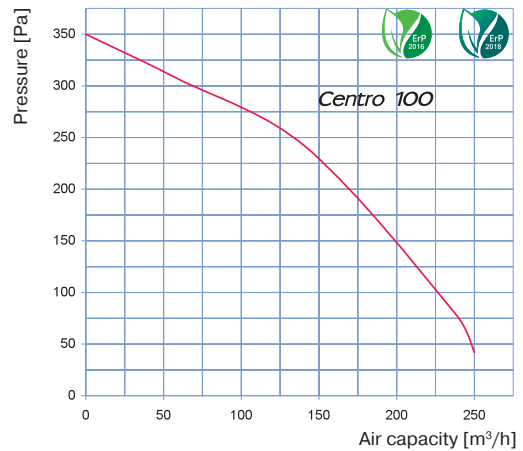
- **G1** – smooth speed controller with an electronic thermostat and a temperature sensor integrated into the air duct. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**G11**).
- **W** – the fan is equipped with a pre-wired power cable and IEC plug as a standard. Modification with a standard electric plug is available (**W1**).

Specifications

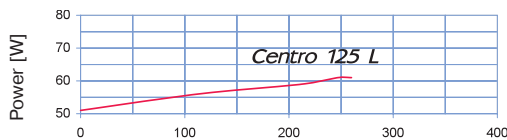
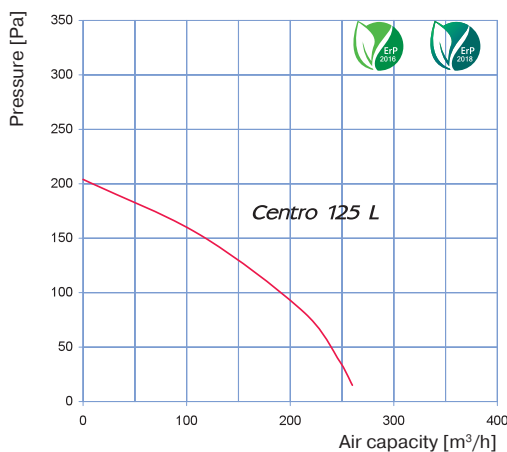
Parameters	Centro 100 L 	Centro 100 	Centro 125 L 	Centro 125 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	62	80	61	79
Current [A]	0.38	0.34	0.38	0.34
Maximum air capacity [m ³ /h]	205	250	260	355
RPM [min ⁻¹]	2650	2820	2610	2800
Sound pressure level at 3 m distance [dBA]	36	46	36	46
Max. operating temperature [°C]	-25 +55	-25 +55	-25 +55	-25 +55
SEC class	C			B
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



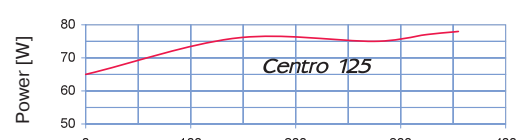
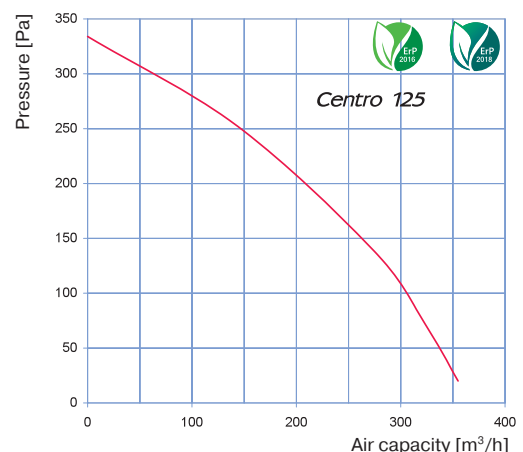
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	62	51	59	58	57	50	46	42	28
L _{WA} to outlet, [dBA]	67	54	63	61	59	50	47	42	33
L _{WA} to environment, [dBA]	55	21	15	24	37	42	41	31	19



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	71	51	65	70	66	60	57	53	38
L _{WA} to outlet, [dBA]	75	51	68	70	68	66	57	57	42
L _{WA} to environment, [dBA]	62	44	63	57	40	25	4	17	23



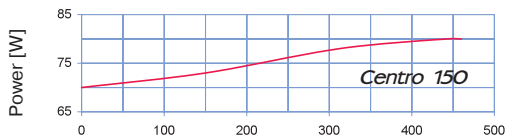
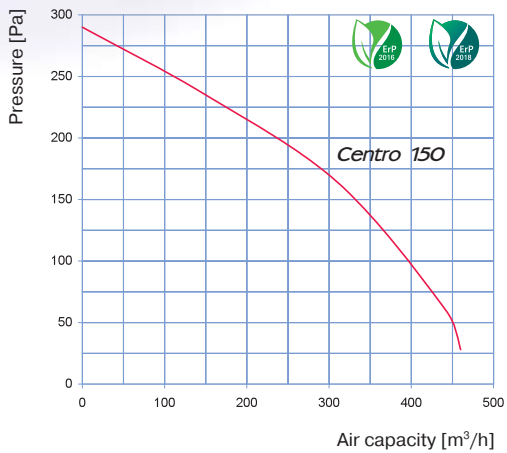
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	58	34	51	53	53	49	47	37	30
L _{WA} to outlet, [dBA]	61	37	53	57	62	51	48	39	31
L _{WA} to environment, [dBA]	66	48	63	61	41	32	13	30	26



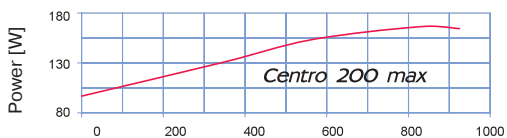
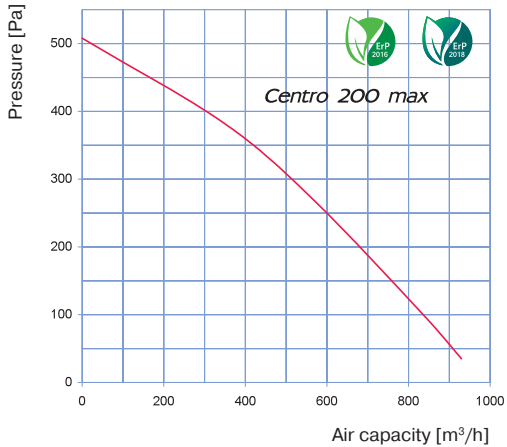
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	74	55	65	66	70	63	61	52	40
L _{WA} to outlet, [dBA]	77	58	65	71	75	69	61	53	44
L _{WA} to environment, [dBA]	63	51	60	58	44	35	19	30	25

Specifications

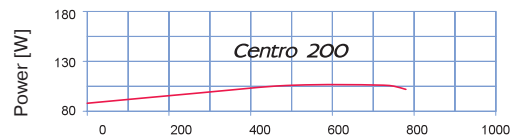
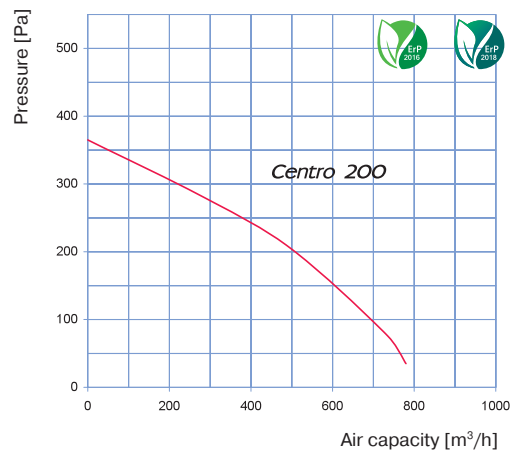
Parameters	Centro 150 	Centro 200 	Centro 200 max 	Centro 250 L 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	80	107	173	108
Current [A]	0.35	0.47	0.76	0.47
Maximum air capacity [m ³ /h]	460	780	930	865
RPM [min ⁻¹]	2725	2660	2125	2560
Sound pressure level at 3 m distance [dBA]	46	48	51	51
Max. operating temperature [°C]	-25 +55	-25 +50	-25 +45	-25 +50
SEC class	B			
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



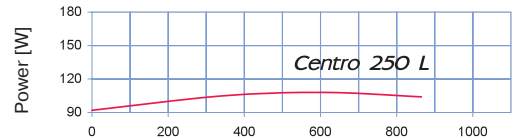
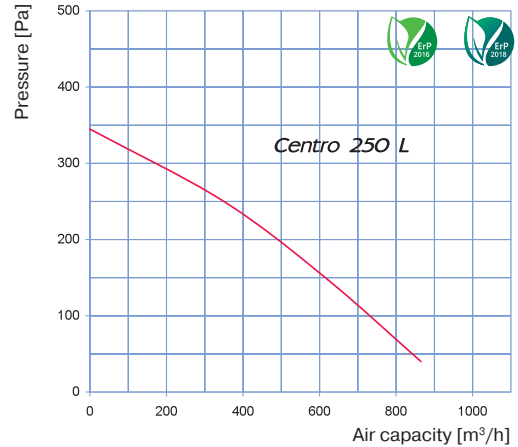
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	70	43	63	62	65	63	60	50	38
L _{WA} to outlet, [dBA]	76	44	69	63	71	65	64	54	41
L _{WA} to environment, [dBA]	62	40	62	53	35	17	15	29	23



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	75	51	69	72	71	67	60	60	51
L _{WA} to outlet, [dBA]	81	56	74	71	76	69	62	57	55
L _{WA} to environment, [dBA]	65	49	63	60	47	35	28	47	39






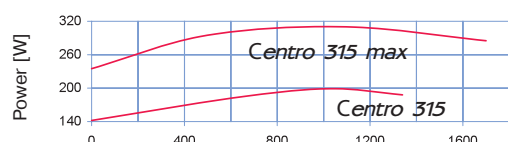
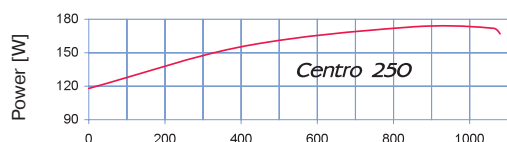
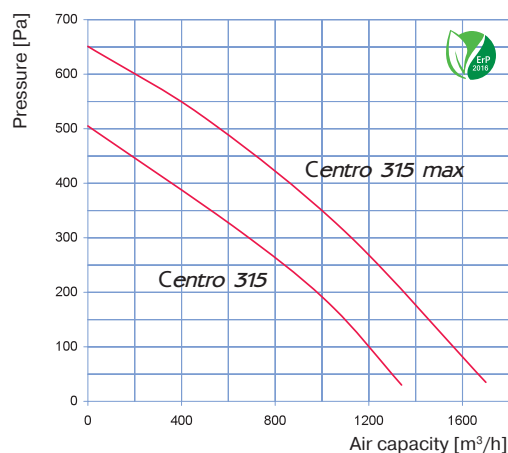
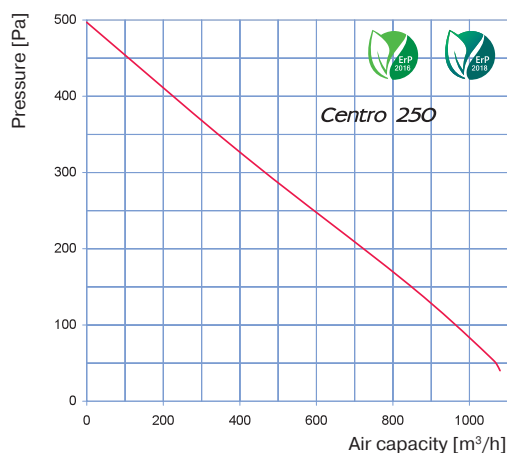
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	76	47	65	65	70	63	61	61	49
L _{WA} to outlet, [dBA]	81	53	66	71	73	65	68	63	51
L _{WA} to environment, [dBA]	64	45	62	59	48	34	26	45	39



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	68	46	59	62	65	60	59	64	53
L _{WA} to outlet, [dBA]	72	47	62	62	65	65	60	64	57
L _{WA} to environment, [dBA]	60	41	57	53	44	35	37	54	45

Specifications

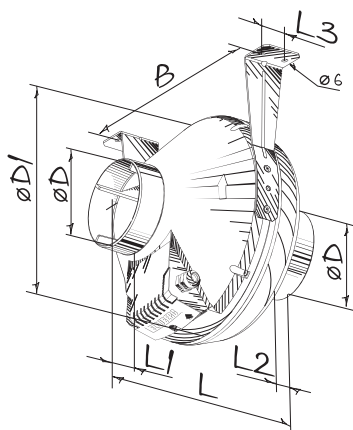
Parameters	Centro 250 	Centro 315 	Centro 315 max 
Voltage [V / 50 Hz]	230	230	230
Power [W]	173	200	310
Current [A]	0.76	0.88	1.36
Maximum air capacity [m ³ /h]	1080	1340	1700
RPM [min ⁻¹]	2090	2655	2590
Sound pressure level at 3 m distance [dBA]	50	50	53
Max. operating temperature [°C]	-25 +50	-25 +50	-25 +45
SEC class	B	-	-
Ingress protection rating	IPX4	IPX4	IPX4



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	75	59	64	69	68	66	62	53	46
L _{wA} to outlet, [dBA]	73	62	68	71	72	70	62	55	50
L _{wA} to environment, [dBA]	67	58	62	61	50	41	37	45	38

Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro 315									
L _{wA} to inlet, [dBA]	72	35	50	61	66	64	64	60	55
L _{wA} to outlet, [dBA]	71	40	57	68	71	65	63	57	57
L _{wA} to environment, [dBA]	58	38	51	56	53	44	51	50	49
Centro 315 max									
L _{wA} to inlet, [dBA]	75	57	68	71	71	69	66	61	59
L _{wA} to outlet, [dBA]	79	58	68	76	74	67	68	66	59
L _{wA} to environment, [dBA]	70	54	63	64	56	44	53	57	50

Overall dimensions



Type	Dimensions [mm]							Weight [kg]
	ØD	ØD1	B	L	L1	L2	L3	
Centro 100 L / Centro 100	100	250	270	230	30	27	30	2.08
Centro 125 L / Centro 125	125	250	270	220	30	27	30	2.20
Centro 150	150 / 160	300	310	286	30	30	30	2.45
Centro 200	200	340	354	276	30	30	40	3.00
Centro 200 max	200	340	354	276	30	30	40	3.00
Centro 250 L / Centro 250	250	340	354	265	30	30	40	4.30
Centro 315	315	400	414	276	40	55	40	4.85
Centro 315 max	315	400	414	276	40	55	40	4.85



Inline centrifugal fans

Centro-M

Air capacity – up to 5260 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- Direct mounting inside air ductworks.
- Compatible with Ø 100 to 450 mm round air ducts.

Design

- The casing is made of steel with a special polymer coating.
- Aerodynamically shaped casing.
- External terminal box for connection to power mains.

Motor

- Single-phase external rotor motor with a centrifugal impeller with backward curved blades.
- Equipped with ball bearings for longer service life.
- Overheating protection by built-in thermal switches with automatic restart.
- Dynamically balanced turbine.
- Some standard sizes have high-powered motors (**Centro-M max**).
- For ventilation of premises with high requirements to noise level low-noise modifications are available (**Centro-M L**).

Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- Any mounting position.
- The fans with the connecting diameter from 100 up to 315 mm are fixed to wall or ceiling with mounting brackets supplied as a standard.
- The fans with the connecting diameter from 355 up to 450 mm are fixed with mounting brackets fixed on the casing.
- Flexible air ducts are fixed on the fan spigots with clamps.



Modifications and options

- FR** – built-in smooth speed controller from 0 to 100 %. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**FR1**).



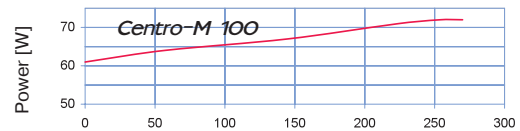
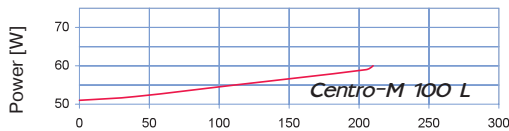
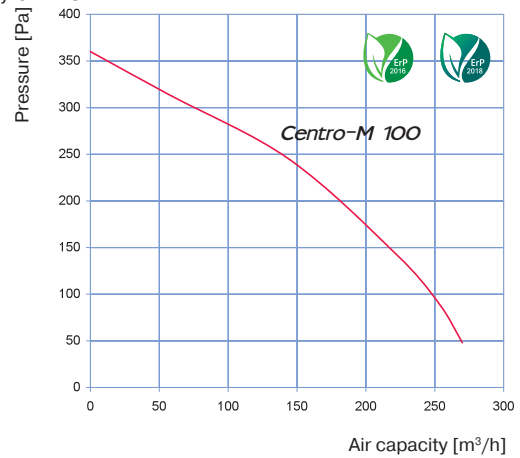
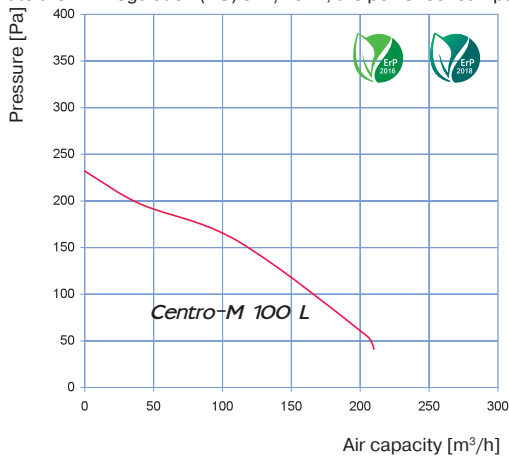
- G** – smooth speed controller with an electronic thermostat and an external temperature sensor that is fixed on 4 m power cable. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (**G1**).
- max** – high-powered motor.
- L** – low-powered motor.
- W** – the fan is equipped with a pre-wired power cable and IEC plug as a standard. Modification with a standard electric plug is available (**W1**).

ErP data	
Overall efficiency	η , (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Specifications

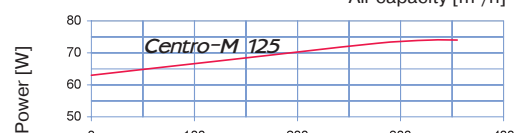
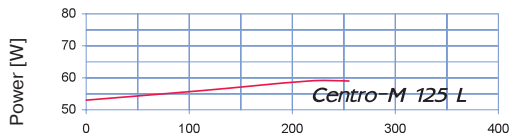
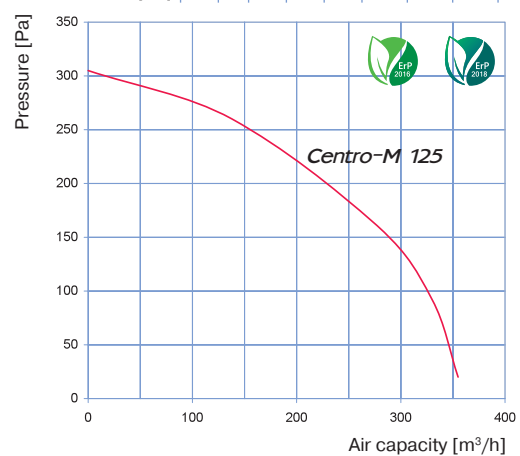
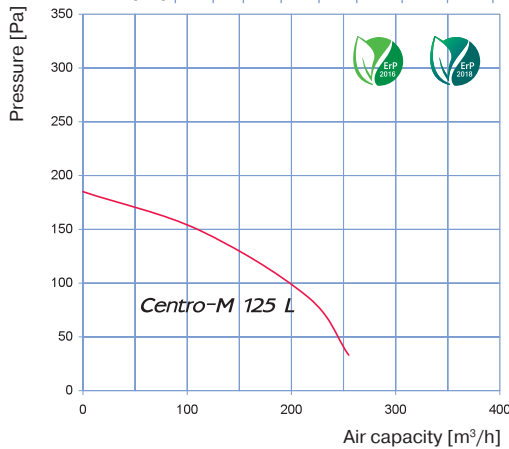
Parameters	Centro-M 100 L*	Centro-M 100*	Centro-M 125 L*	Centro-M 125*
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	60	73	60	75
Current [A]	0.37	0.32	0.37	0.33
Maximum air capacity [m ³ /h]	210	270	255	355
RPM [min ⁻¹]	2620	2830	2535	2800
Sound pressure level at 3 m distance [dBA]	36	47	36	47
Max. operating temperature [°C]	-25 +55	-25 +55	-25 +55	-25 +55
SEC class	C			
Ingress protection rating	IPX4	IPX4	IPX4	IPX4

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	64	48	57	57	59	51	47	40	28
L _{WA} to outlet, [dBA]	64	52	62	56	57	50	46	39	32
L _{WA} to environment, [dBA]	57	23	13	23	38	42	42	31	15





Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	73	47	63	67	68	60	55	54	38
L _{WA} to outlet, [dBA]	77	54	66	73	66	66	60	55	46
L _{WA} to environment, [dBA]	63	45	60	55	41	25	7	18	22



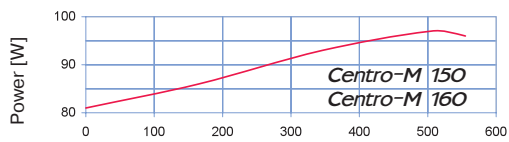
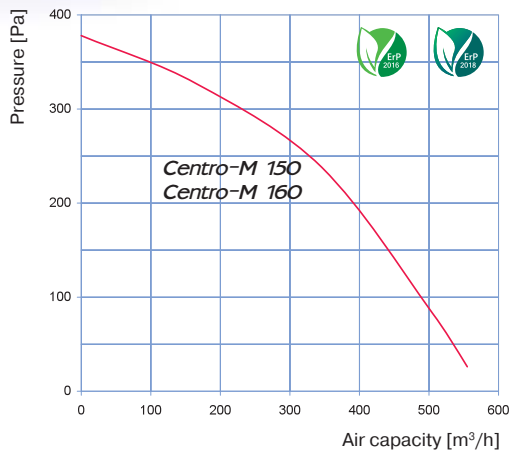
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	60	34	51	53	56	46	43	34	29
L _{WA} to outlet, [dBA]	62	33	52	59	58	51	49	41	32
L _{WA} to environment, [dBA]	65	44	61	59	43	30	17	30	28

Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	73	54	67	68	67	64	61	51	41
L _{WA} to outlet, [dBA]	76	57	69	68	72	71	65	57	45
L _{WA} to environment, [dBA]	62	51	61	60	46	36	22	31	27

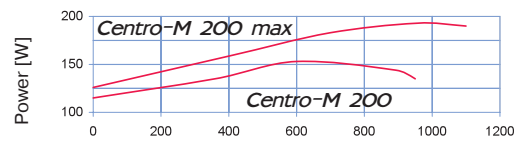
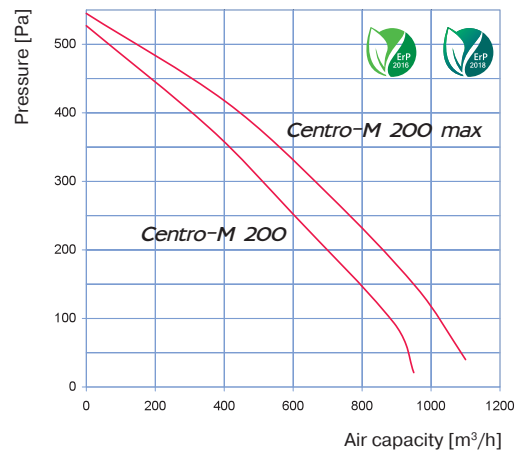
Specifications

Parameters	Centro-M 150* 	Centro-M 160* 	Centro-M 200 	Centro-M 200 max 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	98	98	154	193
Current [A]	0.43	0.43	0.67	0.84
Maximum air capacity [m ³ /h]	555	555	950	1100
RPM [min ⁻¹]	2705	2660	2375	2780
Sound pressure level at 3 m distance [dBA]	47	47	48	51
Max. operating temperature [°C]	-25 +55	-25 +55	-25 +50	-25 +45
SEC class	B			-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.







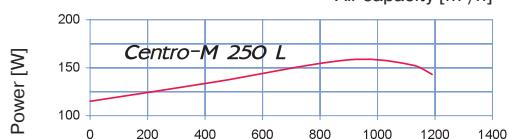
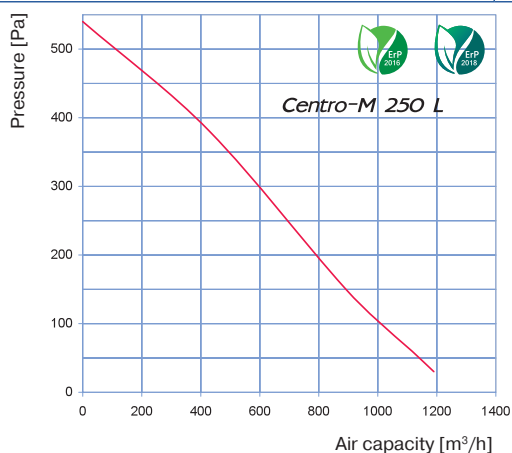
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro-M 150									
L _{WA} to inlet, [dBA]	72	45	65	62	67	59	59	49	38
L _{WA} to outlet, [dBA]	74	42	69	63	71	63	59	50	37
L _{WA} to environment, [dBA]	62	41	59	55	39	19	17	28	22
Centro-M 160									
L _{WA} to inlet, [dBA]	68	41	65	64	63	61	57	47	35
L _{WA} to outlet, [dBA]	70	47	67	68	66	64	60	51	41
L _{WA} to environment, [dBA]	60	40	61	55	39	18	16	28	22



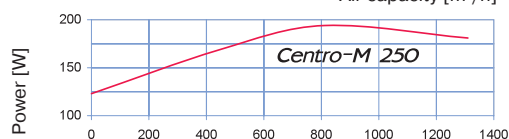
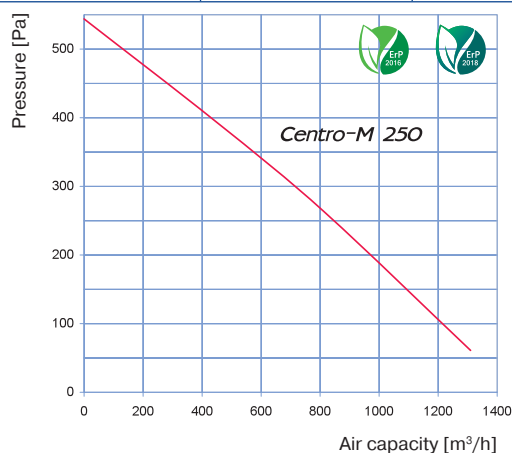
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro-M 200									
L _{WA} to inlet, [dBA]	75	47	68	65	72	65	61	59	49
L _{WA} to outlet, [dBA]	75	51	72	68	75	67	65	59	50
L _{WA} to environment, [dBA]	65	46	61	59	47	31	28	46	42
Centro-M 200 max									
L _{WA} to inlet, [dBA]	75	48	66	72	73	66	63	58	49
L _{WA} to outlet, [dBA]	78	51	70	74	71	64	64	60	53
L _{WA} to environment, [dBA]	66	49	64	60	45	35	28	46	41

Specifications

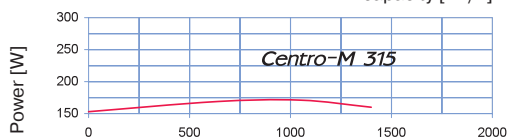
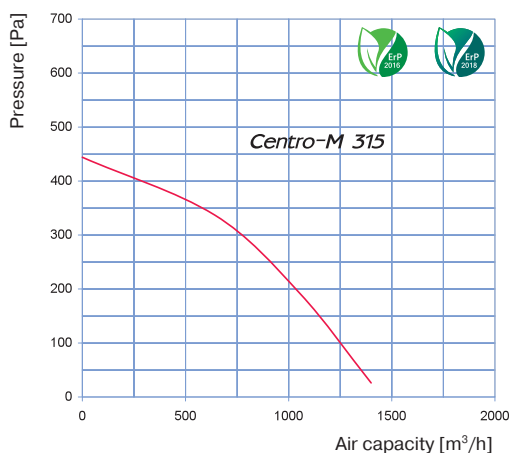
Parameters	Centro-M 250 L 	Centro-M 250 	Centro-M 315 	Centro-M 315 max 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	158	194	171	296
Current [A]	0.69	0.85	0.77	1.34
Maximum air capacity [m ³ /h]	1190	1310	1400	1880
RPM [min ⁻¹]	2315	2790	2600	2720
Sound pressure level at 3 m distance [dBA]	52	52	52	54
Max. operating temperature [°C]	-25 +50	-25 +50	-25 +50	-25 +45
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



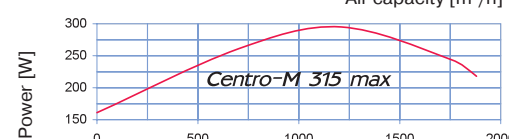
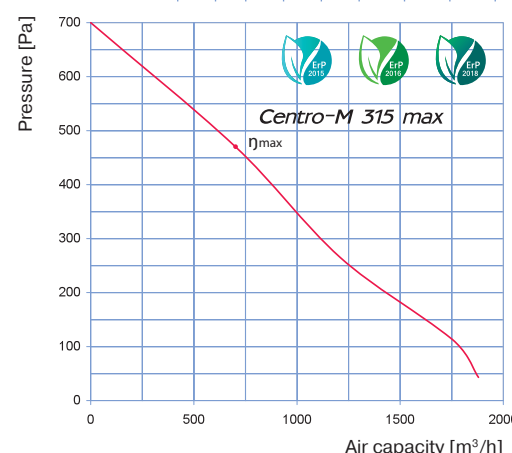
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	68	46	57	60	65	62	58	60	54
L _{WA} to outlet, [dBA]	75	44	59	64	65	67	65	68	59
L _{WA} to environment, [dBA]	60	44	57	52	47	36	39	51	45



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	75	60	68	65	67	66	60	53	48
L _{WA} to outlet, [dBA]	77	62	71	74	70	71	69	59	50
L _{WA} to environment, [dBA]	65	57	62	60	50	43	37	45	38






Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	71	35	51	61	69	66	62	59	56
L _{WA} to outlet, [dBA]	75	42	58	62	71	69	67	59	57
L _{WA} to environment, [dBA]	60	34	49	56	50	44	49	53	50

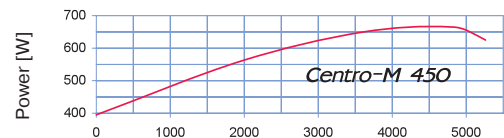
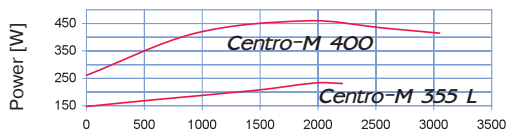
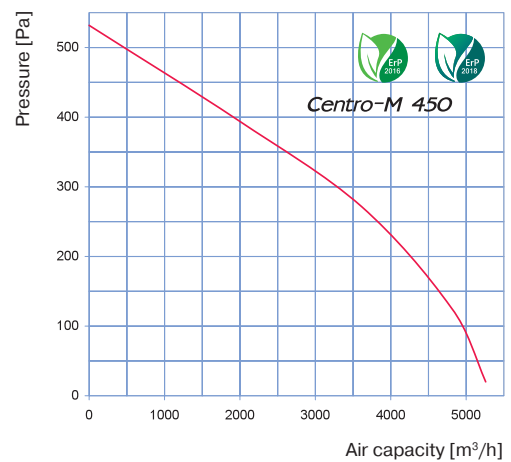
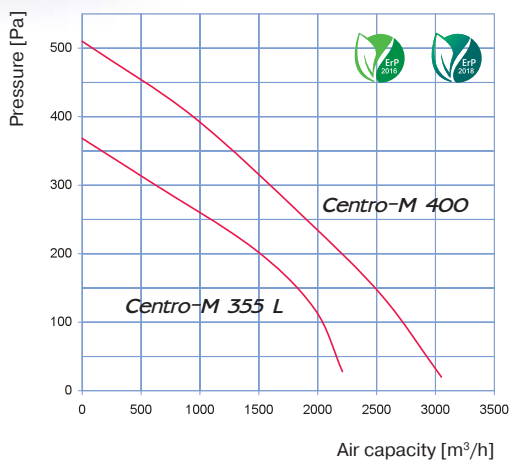


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	77	54	67	72	70	67	67	64	56
L _{WA} to outlet, [dBA]	81	54	71	72	71	69	72	64	60
L _{WA} to environment, [dBA]	68	56	66	62	57	47	54	55	51

η _a (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
46.9	A	Static	64.2	No	0.226	0.99	702	470	2780	1

Specifications

Parameters	Centro-M 355 L 	Centro-M 400 	Centro-M 450 
Voltage [V / 50 Hz]	230	230	230
Power [W]	233	460	665
Current [A]	1.06	2.23	2.89
Maximum air capacity [m ³ /h]	2210	3050	5260
RPM [min ⁻¹]	1375	1370	1265
Sound pressure level at 3 m distance [dBA]	58	61	65
Max. operating temperature [°C]	-25 +45	-40 +80	-40 +70
Ingress protection rating	IPX4	IPX4	IPX4

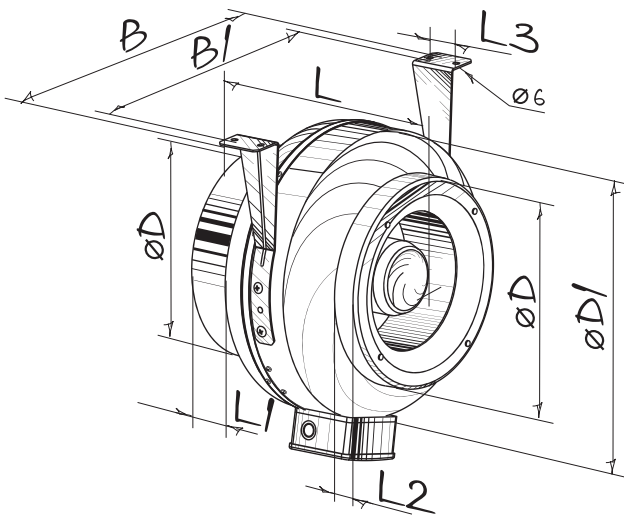


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro-M 355 L									
L _{WA} to inlet, [dBA]	66	54	49	56	63	61	58	56	46
L _{WA} to outlet, [dBA]	63	53	53	62	61	58	52	51	43
L _{WA} to environment, [dBA]	53	50	48	49	49	45	39	36	24
Centro-M 400									
L _{WA} to inlet, [dBA]	68	53	48	56	59	58	60	55	48
L _{WA} to outlet, [dBA]	65	52	55	62	62	58	56	51	41
L _{WA} to environment, [dBA]	56	47	47	49	47	43	42	37	25

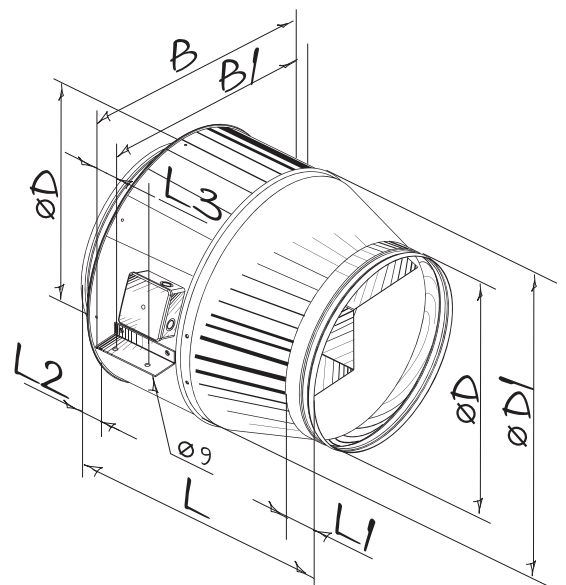
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro-M 450									
L _{WA} to inlet, [dBA]	64	51	50	55	60	60	60	53	44
L _{WA} to outlet, [dBA]	64	52	51	61	61	60	56	51	41
L _{WA} to environment, [dBA]	54	46	48	51	47	44	42	37	24

Overall dimensions

Type	Dimensions [mm]								Weight [kg]
	øD	øD1	B	B1	L	L1	L2	L3	
Centro-M 100 L	98	254	298	258	205	20	25	30	3.45
Centro-M 100	98	254	298	258	205	20	25	30	3.45
Centro-M 125 L	123	254	298	258	205	20	25	30	3.58
Centro-M 125	123	254	298	258	205	20	25	30	3.58
Centro-M 150	149	304	349	309	220	25	25	30	4.17
Centro-M 160	159	304	357	317	220	25	25	30	4.32
Centro-M 200	198	344	390	350	240	25	29	40	5.70
Centro-M 200 max	198	344	390	350	250	25	29	40	5.70
Centro-M 250 L	248	344	390	350	249	25	31	40	5.09
Centro-M 250	248	344	390	350	249	25	31	40	5.09
Centro-M 315	314	404	454	414	260	25	40	40	7.30
Centro-M 315 max	314	404	454	414	288	25	40	40	7.30
Centro-M 355 L	353	460	522	522	506	60	60	70	18.80
Centro-M 400	398	570	663	634	570	60	60	70	25.10
Centro-M 450	448	608	700	670	644	60	60	80	27.26



Centro-M 100 – Centro-M 315



Centro-M 355 – Centro-M 450



Inline centrifugal fans with EC motor

Centro-M EC

Air capacity - up to 1460 m³/h



■ Use

- ❑ Supply and exhaust ventilation systems installed in various premises.
- ❑ Direct mounting inside air ductworks.
- ❑ For arranging energy-saving and controllable ventilation systems.
- ❑ Compatible with Ø 160 to 315 mm round air ducts.

■ Design

- ❑ The casing is made of steel with a special polymer coating.
- ❑ Aerodynamically shaped casing.
- ❑ External terminal box for connection to power mains.

■ Motor

- ❑ High-efficient direct current EC motor with external rotor and backward curved blades.
- ❑ EC technologies meet the latest requirements to arrange high-efficient energy saving ventilation.
- ❑ EC motors have energy demand by 35 % less as compared to standard motors and have efficiency up to 90 %.
- ❑ EC motors are featured with high performance, low noise level and well controllable total speed range.
- ❑ Overheating protection by built-in thermal switches with automatic restart.
- ❑ Dynamically balanced turbine.

■ Operation and speed control





- ❑ The fan is controlled with a 0-10 V external control signal, e.g. CDT E/0-10 speed controller for EC motors.
- ❑ The fan capacity is regulated by various parameters, including temperature level, pressure, smoke, etc.
- ❑ EC motor changes its rotation speed synchronously with the fluctuation of the control parameter to ensure the best suitable air flow.
- ❑ The fan is compatible with 50 and 60 Hz power mains with the same maximum speed.
- ❑ The parameters may be set and controlled due to data exchange between a PC and the fan.
- ❑ The fans can be integrated into a unified decentralized computerized network to adjust ventilation system with respect to specific user's demands.

■ Mounting

- ❑ Any mounting position.
- ❑ Fans are fixed to wall or ceiling with mounting brackets supplied as a standard.
- ❑ Flexible air ducts are fixed on the fan spigots with clamps.

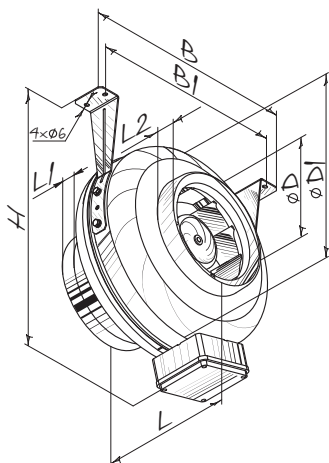
ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Specifications

Parameters	Centro-M EC 160* 	Centro-M EC 200* 	Centro-M EC 250 	Centro-M EC 315 
Voltage [V / 50 /60 Hz]	230	230	230	230
Power [W]	80	84	161	160
Current [A]	0.58	0.49	0.94	0.94
Maximum air capacity [m ³ /h]	660	840	1275	1460
RPM [min ⁻¹]	3250	2490	2700	2780
Sound pressure level at 3 m distance [dBA]	45	50	46	48
Max. operating temperature [°C]	-25 +60	-25 +60	-25 +60	-25 +60
SEC class	B		-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4

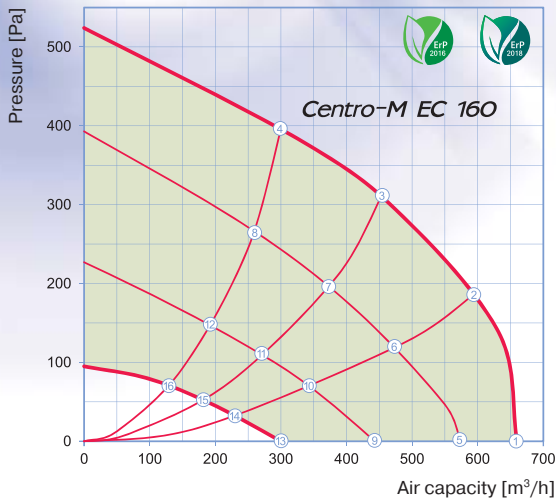
* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.

Overall dimensions



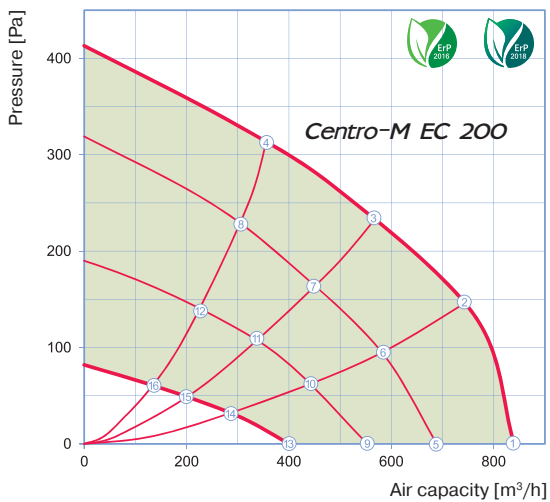
Type	Dimensions [mm]									Weight [kg]
	ØD	ØD1	H	B	B1	L	L1	L2	L3	
Centro-M EC 160	159	304	360	351	311	200	25	25	30	5.9
Centro-M EC 200	198	344	437	390	350	238	25	25	40	7.1
Centro-M EC 250	248	344	437	390	350	249	30	25	40	8.0
Centro-M EC 315	313	404	466	450	410	259	30	30	40	8.5

Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	68	42	61	58	64	56	56	46	37
L _{wA} to outlet, [dBA]	70	40	65	60	67	60	56	47	35
L _{wA} to environment, [dBA]	58	39	56	52	37	18	16	27	21

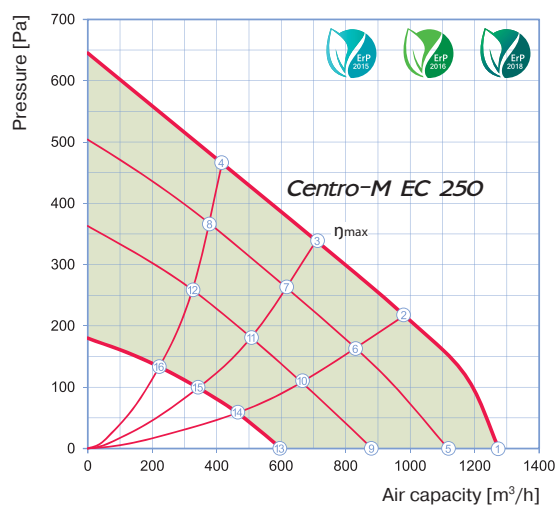
point	n, (min ⁻¹)	P, (W)
1	3260	70
2	3190	77
3	3130	80
4	3170	77
5	2610	36
6	2560	40
7	2500	41
8	2530	40
9	1960	15
10	1910	16
11	1880	17
12	1890	16
13	1310	4
14	1280	5
15	1250	5
16	1280	5



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	71	44	64	61	68	61	57	56	46
L _{wA} to outlet, [dBA]	71	48	68	64	71	63	61	56	47
L _{wA} to environment, [dBA]	61	43	57	56	44	29	26	43	39

point	n, (min ⁻¹)	P, (W)
1	2780	64
2	2630	75
3	2510	84
4	2520	83
5	2220	33
6	2090	39
7	2000	43
8	2010	42
9	1670	14
10	1560	16
11	1500	18
12	1510	18
13	1110	4
14	1060	5
15	1000	6
16	1010	6

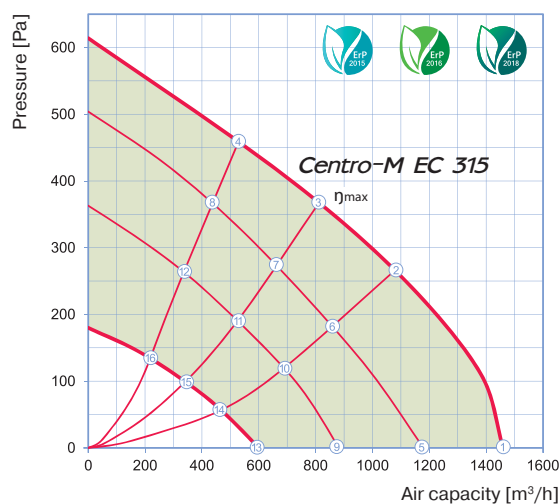
Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	71	57	64	61	63	62	57	50	45
L _{wA} to outlet, [dBA]	73	58	67	70	66	67	65	56	47
L _{wA} to environment, [dBA]	61	54	58	57	47	40	35	42	36

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
48.1	A	Static	67	Yes	0.161	0.94	708	338	2610	1

point	n, (min ⁻¹)	P, (W)
1	2760	123
2	2670	146
3	2610	161
4	2680	146
5	2460	88
6	2380	106
7	2340	116
8	2400	105
9	2000	53
10	1960	62
11	1940	69
12	1965	61
13	1380	22
14	1360	25
15	1350	28
16	1360	25



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	67	33	48	57	65	62	58	56	53
L _{wA} to outlet, [dBA]	71	40	55	58	67	65	63	56	55
L _{wA} to environment, [dBA]	57	32	46	53	47	41	46	50	47

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
48.1	A	Static	67	Yes	0.161	0.94	708	338	2610	1

point	n, (min ⁻¹)	P, (W)
1	2750	121
2	2660	145
3	2600	160
4	2670	145
5	2450	85
6	2370	103
7	2330	112
8	2390	101
9	1990	49
10	1950	61
11	1930	65
12	1955	60
13	1370	21
14	1350	22
15	1340	25
16	1350	24



Inline centrifugal fans

Centro-MZ

Air capacity – up to 1540 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- The best solution both for humid indoor premises and outside areas
- Compatible with Ø 100 up to 315 mm round air ducts.

Design

- Galvanized steel casing.
- Aerodynamically shaped casing.
- External terminal block for power supply.

Motor

- Single-phase external rotor motor with a centrifugal impeller with backward curved blades.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.
- For ventilation of premises with high requirements to noise level low-noise modifications are available (**Centro-MZ L**).

Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

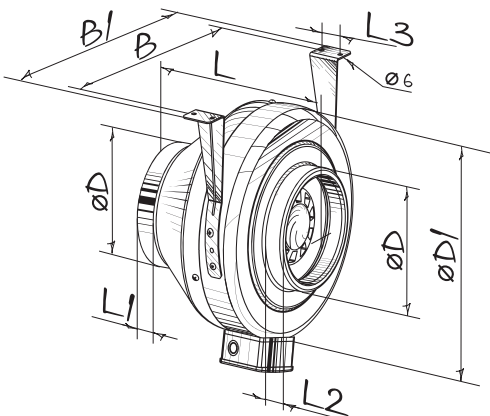
Mounting

- Any mounting position.
- Wall or ceiling mounting with fixing brackets supplied as a standard.
- Flexible air ducts are fixed on fan spigots with clamps.

Modifications and options





- max** – high-powered motor.
- L** – low-powered motor.
- W** – the fan is equipped with a power cord and a socket or plug (**W1**).

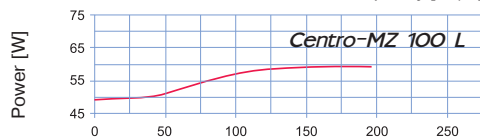
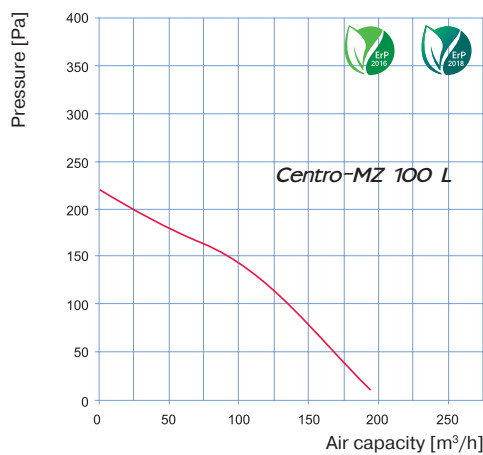
Overall dimensions



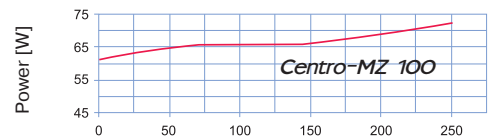
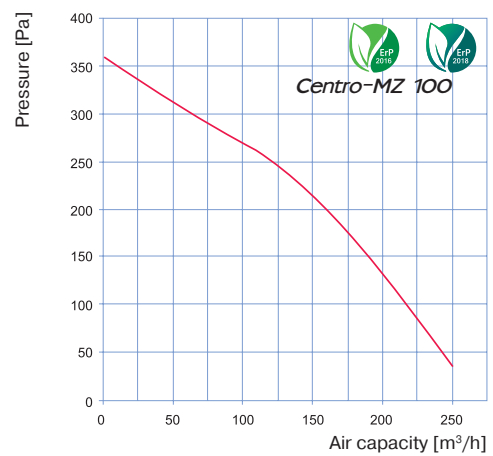
Type	Dimensions [mm]								Weight [kg]
	øD	øD1	B	B1	L	L1	L2	L3	
Centro-MZ 100 L	98	237	253	293	202	23	22	30	3.16
Centro-MZ 100	98	237	253	293	202	23	22	30	3.16
Centro-MZ 125 L	123	237	253	293	202	23	22	30	3.16
Centro-MZ 125	123	237	253	293	202	23	22	30	3.16
Centro-MZ 150	148	278	294	334	200	25	23	30	3.42
Centro-MZ 160	158	278	294	334	200	25	23	30	3.44
Centro-MZ 200 L	198	332	340	380	245	25	29	40	5.43
Centro-MZ 200	198	332	340	380	245	25	29	40	5.43
Centro-MZ 250 L	249	332	340	380	213	25	29	40	5.25
Centro-MZ 250	249	332	340	380	213	25	29	40	5.25
Centro-MZ 315 L	313	402	410	450	308	33	55	40	6.57
Centro-MZ 315	313	402	410	450	308	33	55	40	6.57

Specifications

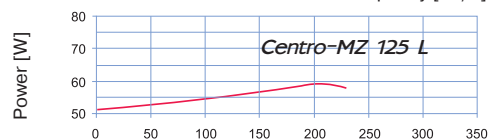
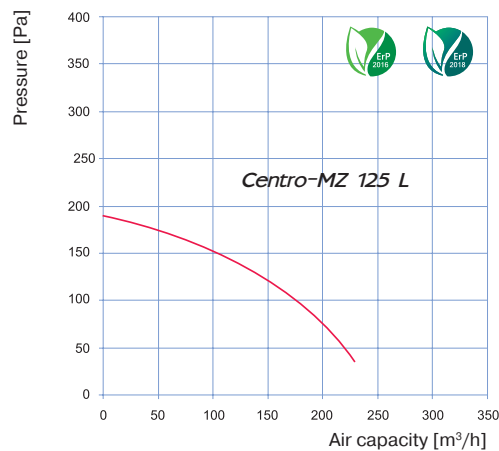
Parameters	Centro-MZ 100 L 	Centro-MZ 100 	Centro-MZ 125 L 	Centro-MZ 125 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	60	72	60	78
Current [A]	0.37	0.32	0.37	0.34
Maximum air capacity [m ³ /h]	195	250	230	330
RPM [min ⁻¹]	2670	2820	2605	2820
Sound pressure level at 3 m distance [dBA]	35	46	35	46
Max. operating temperature [°C]	-25 +55	-25 +55	-25 +55	-25 +55
SEC class	C			
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



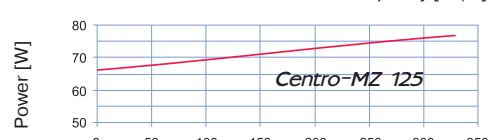
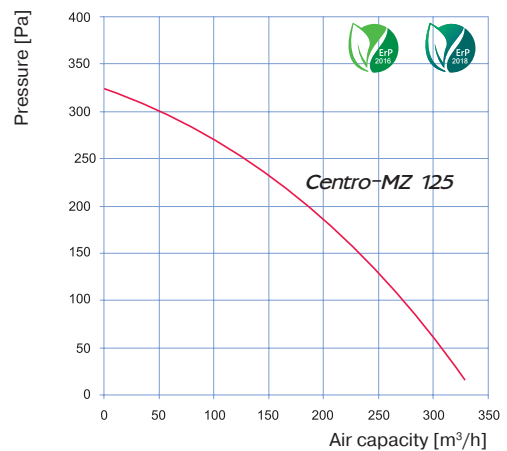
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	63	51	57	56	57	51	46	40	29
L _{WA} to outlet, [dBA]	65	54	62	58	61	57	50	45	33
L _{WA} to environment, [dBA]	55	19	14	21	34	42	41	29	17



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	47	67	68	67	60	54	53	42
L _{WA} to outlet, [dBA]	73	56	67	72	66	63	58	57	42
L _{WA} to environment, [dBA]	64	43	60	57	41	24	6	17	24







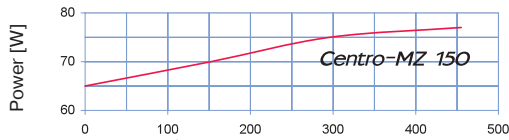
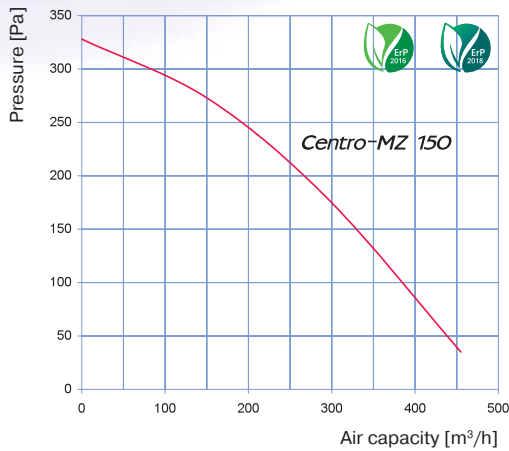
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	59	31	52	54	53	49	46	35	30
L _{WA} to outlet, [dBA]	61	35	53	56	60	51	49	35	34
L _{WA} to environment, [dBA]	64	46	60	59	43	33	15	30	28



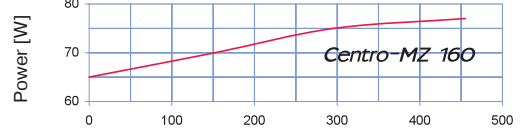
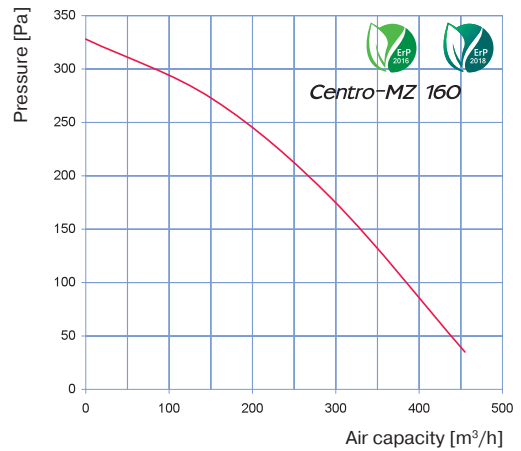
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	75	56	63	68	69	64	61	52	41
L _{WA} to outlet, [dBA]	75	58	71	74	72	65	65	56	47
L _{WA} to environment, [dBA]	64	52	64	59	48	36	23	30	27

Specifications

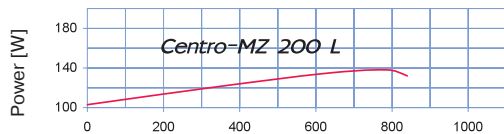
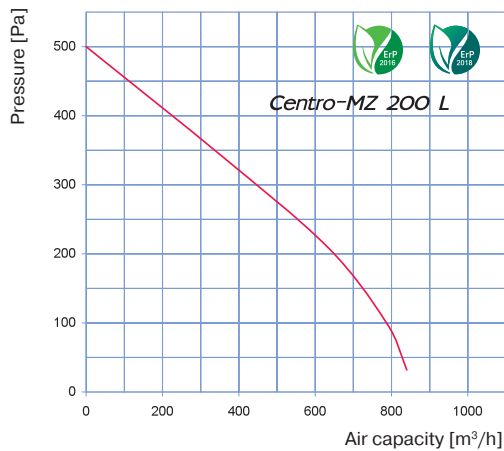
Parameters	Centro-MZ 150 	Centro-MZ 160 	Centro-MZ 200 L 	Centro-MZ 200 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	75	78	139	157
Current [A]	0.33	0.34	0.61	0.69
Maximum air capacity [m ³ /h]	455	455	840	1000
RPM [min ⁻¹]	2770	2760	2790	2740
Sound pressure level at 3 m distance [dBA]	46	46	48	50
Max. operating temperature [°C]	-25 +55	-25 +55	-25 +50	-25 +45
SEC class	B			
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



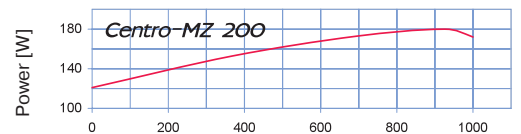
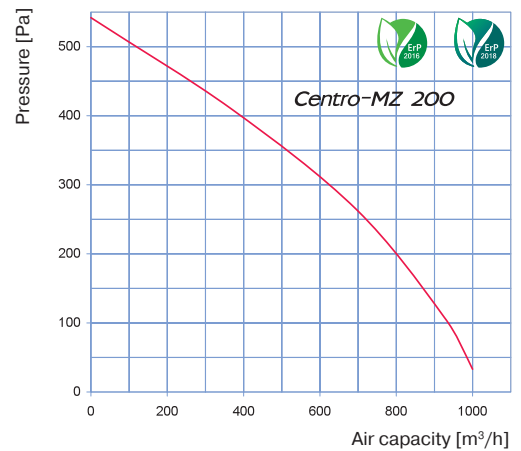
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	42	65	64	64	61	60	48	38
L _{WA} to outlet, [dBA]	73	47	68	66	69	64	59	47	41
L _{WA} to environment, [dBA]	63	41	59	54	37	18	17	29	22



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	42	67	66	63	61	58	48	35
L _{WA} to outlet, [dBA]	72	46	69	65	68	64	63	50	40
L _{WA} to environment, [dBA]	60	41	60	53	36	20	18	30	24







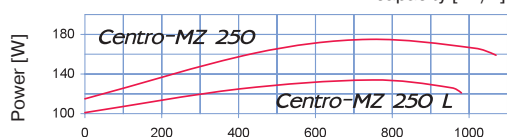
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	76	47	68	65	70	67	59	58	50
L _{WA} to outlet, [dBA]	76	49	71	69	72	63	63	60	53
L _{WA} to environment, [dBA]	64	46	61	57	48	32	27	48	42



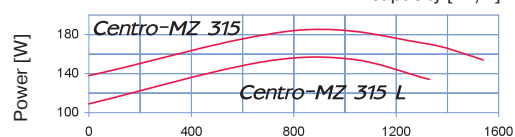
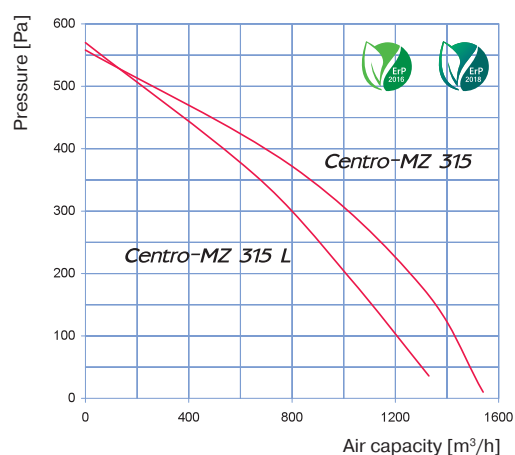
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	73	51	66	68	71	67	64	58	52
L _{WA} to outlet, [dBA]	79	51	73	69	74	67	65	60	50
L _{WA} to environment, [dBA]	68	47	64	64	46	32	30	44	42

Specifications

Parameters	Centro-MZ 250 L 	Centro-MZ 250 	Centro-MZ 315 L 	Centro-MZ 315 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	134	152	151	185
Current [A]	0.59	0.66	0.66	0.81
Maximum air capacity [m ³ /h]	980	1070	1330	1540
RPM [min ⁻¹]	2785	2765	2680	2730
Sound pressure level at 3 m distance [dBA]	51	52	52	53
Max. operating temperature [°C]	-25 +50	-25 +50	-25 +50	-25 +45
SEC class	B		-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro-M 250 L									
L _{wA} to inlet, [dBA]	69	46	59	61	65	62	58	60	54
L _{wA} to outlet, [dBA]	74	49	59	63	66	67	62	64	56
L _{wA} to environment, [dBA]	60	42	54	54	44	37	37	52	45
Centro-M 250									
L _{wA} to inlet, [dBA]	75	60	66	67	67	67	63	56	45
L _{wA} to outlet, [dBA]	76	60	73	71	69	65	66	59	46
L _{wA} to environment, [dBA]	65	58	62	60	47	43	40	47	36



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Centro-M 315 L									
L _{wA} to inlet, [dBA]	70	35	53	61	65	67	61	58	56
L _{wA} to outlet, [dBA]	74	41	54	64	73	70	65	62	60
L _{wA} to environment, [dBA]	59	35	49	53	50	46	51	50	50
Centro-M 315									
L _{wA} to inlet, [dBA]	77	53	66	71	69	68	66	63	60
L _{wA} to outlet, [dBA]	78	58	71	74	72	71	71	63	63
L _{wA} to environment, [dBA]	70	55	66	61	57	48	54	56	51



Inline centrifugal fans

Box

Air capacity – up to 553 m³/h



Use

- Supply and exhaust ventilation systems installed in small premises.
- Mounting in limited space.
- Compatible with \varnothing 100 up to 160 mm round air ducts.

Design

- Compact steel casing covered with special polymer coating.
- Casing height from 110 up to 175 mm depending on the modification.
- Aerodynamically shaped casing.
- External terminal block for power supply.
- A hinged cover plate provides easy access to the motor with no need to dismantle the fans and air ducts.
- Connecting spigots are equipped with rubber seals.

Motor

- Single-phase external rotor motor with a centrifugal impeller with backward curved blades.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.

Speed control

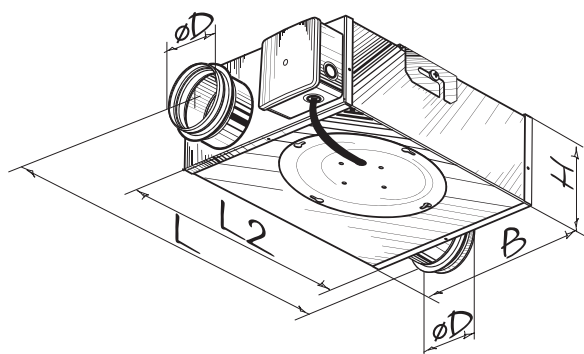
- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- Due to compact design the fan is the ideal solution for mounting in limited spaces, including the space behind false ceiling.
- Any mounting position.
- Wall or ceiling mounting with a fixing bracket supplied as a standard.
- Flexible air ducts are fixed on fan spigots with clamps.







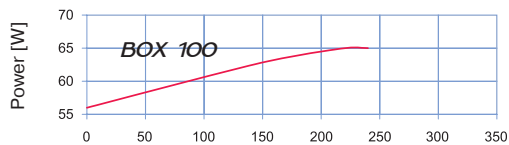
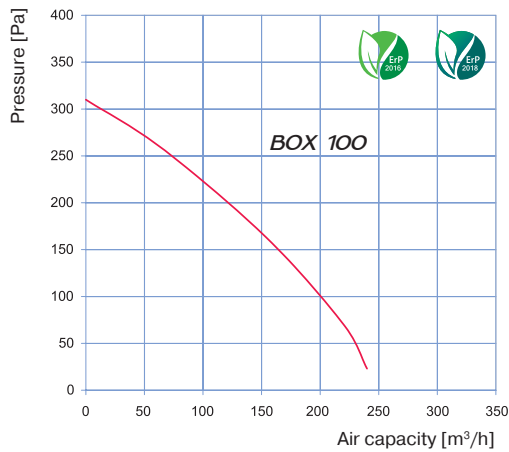
Overall dimensions



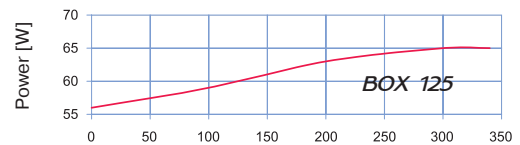
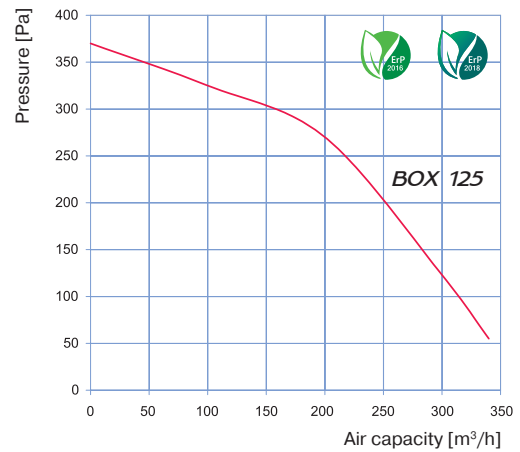
Type	Dimensions [mm]					Weight [kg]
	\varnothing D	B	H	L	L2	
Box 100	99	252	133	420	321	4.65
Box 125	124	252	133	420	321	4.55
Box 150	149	300	170	480	382	6.35
Box 160	159	300	170	480	382	6.6

Specifications

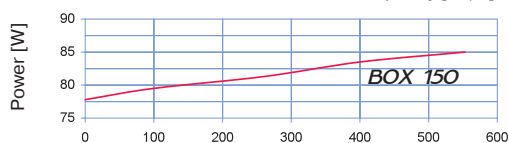
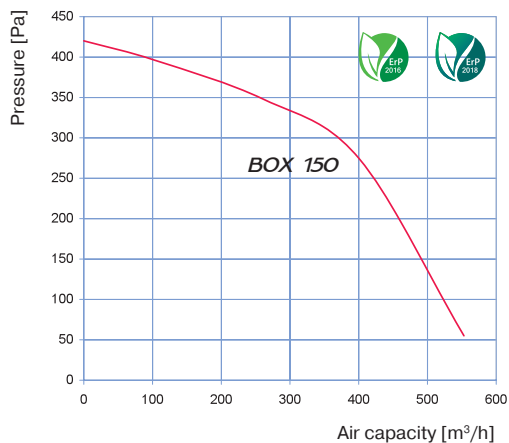
Parameters	Box 100 	Box 125 	Box 150 	Box 160 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	58	58	85	85
Current [A]	0.26	0.26	0.38	0.38
Maximum air capacity [m ³ /h]	240	340	553	553
RPM [min ⁻¹]	2500	2500	2600	2600
Sound pressure level at 3 m distance [dBA]	47	48	50	50
Max. operating temperature [°C]	-25 +50	-25 +50	-25 +40	-25 +40
SEC class	C	B		
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



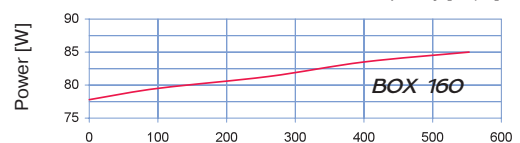
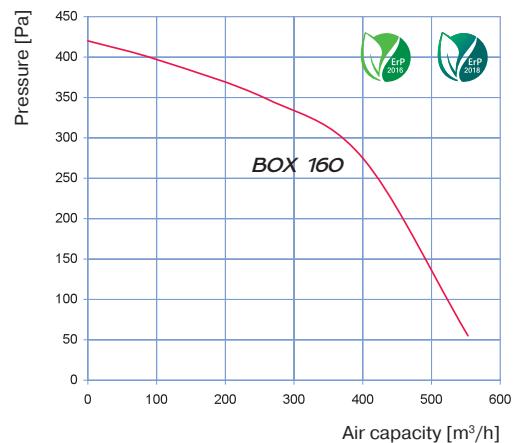
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	58	53	55	53	51	51	54	53	48
L _{WA} to outlet, [dBA]	66	51	51	54	56	64	61	56	52
L _{WA} to environment, [dBA]	51	38	37	42	43	46	41	40	32



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	63	53	51	56	56	53	54	51	49
L _{WA} to outlet, [dBA]	65	49	49	59	57	62	61	56	53
L _{WA} to environment, [dBA]	48	38	40	42	41	43	42	37	33



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	62	51	51	58	56	54	54	52	51
L _{WA} to outlet, [dBA]	66	45	46	60	56	61	61	55	54
L _{WA} to environment, [dBA]	49	36	38	44	44	42	41	38	35



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	64	52	51	59	57	54	55	54	50
L _{WA} to outlet, [dBA]	69	47	46	58	59	65	61	57	55
L _{WA} to environment, [dBA]	52	40	37	42	43	44	43	36	33



Inline centrifugal fans

Box-R

Air capacity – up to 176 m³/h



■ Use

- Supply and exhaust ventilation systems installed in small premises.
- High-pressure inline fan for ventilation systems installed in multi-level buildings and premises.
- Mounting in limited space.
- For multipoint exhaust ventilation from several premises.
- Compatible with Ø 80 up to 100 mm round air ducts.

■ Design

- Steel supercompact casing covered with special polymer coating.
- Minimum casing height is only 90 mm.
- Aerodynamically shaped casing.
- External terminal block for power supply.
- Swivel cover provides easy access to the motor.
- Various casing modifications include from 1 to 6 suction spigots.
- Connecting spigots are equipped with rubber seals.

■ Motor

- Single-phase three-speed external rotor motor with a centrifugal impeller made of galvanized steel.
- Impeller with forward curved blades for high pressure in the ductwork system.
- The turbine is designed to maintain permanent air flow irrespective of air resistance fluctuations in the ductworks.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.

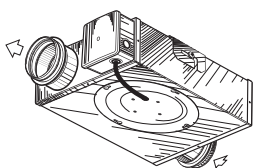
■ Speed control

- Automatic fan speed control as a function of air resistance in the ductwork system provides permanent air flow rate.
- Three-button speed switch provides manual speed control. Available upon order.
- Smooth or step speed control with a thyristor or autotransformer speed controller (available upon order) connected to the maximum speed terminal of the motor.

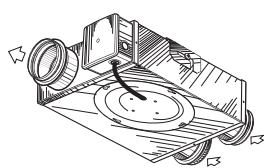
■ Mounting

- Due to compact design the fan is the ideal solution for mounting in limited spaces, including the space behind false ceiling.
- Any mounting position.
- Wall or ceiling mounting with a fixing bracket supplied as a standard.
- Flexible air ducts are fixed on fan spigots with clamps.

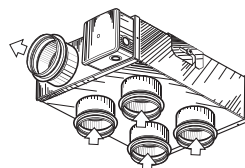
■ Modifications:



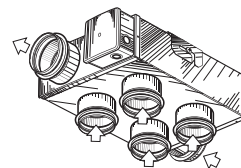
1 suction pipe
Ø80 or 100 mm



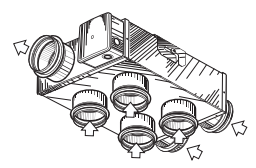
2 suction pipes
Ø80 or 100 mm



4 suction pipes
Ø80 or 100 mm





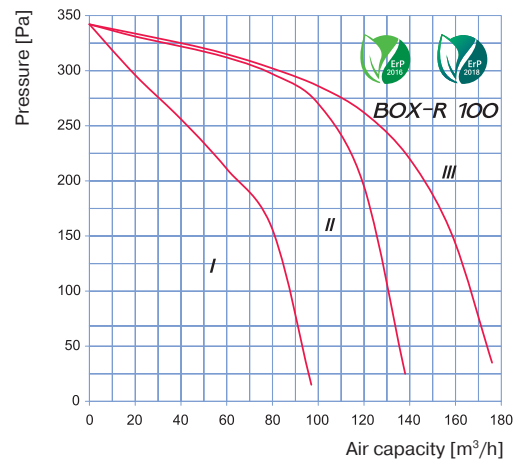
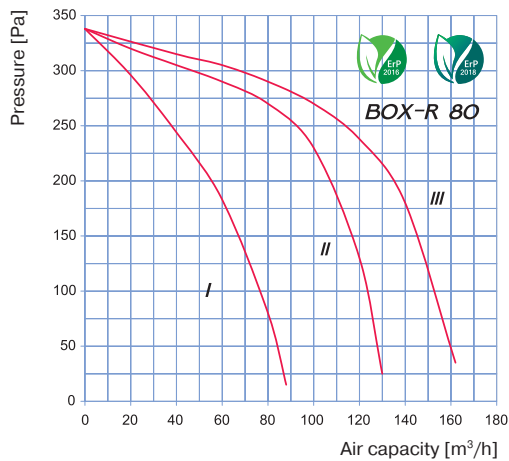
5 suction pipes
Ø80 or 100 mm



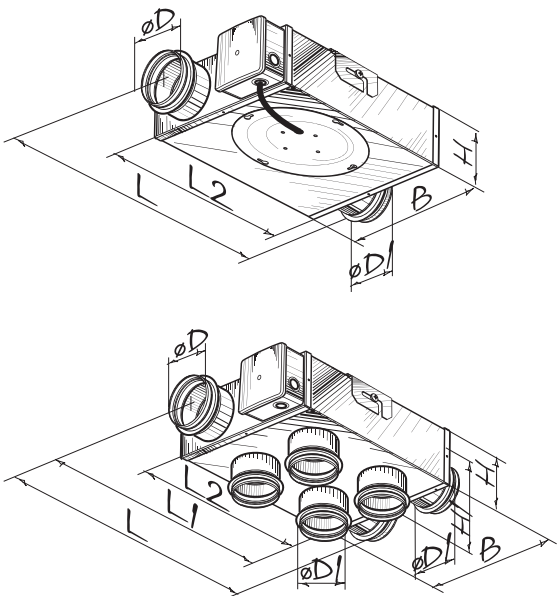
6 suction pipes
Ø80 or 100 mm

Specifications

Parameters	Box-R 80 			Box-R 100 		
	1	2	3	1	2	3
Speed						
Voltage [V / 50 Hz]	230	230	230	230	230	230
Power [W]	20	26	45	20	26	45
Current [A]	0.32	0.34	0.4	0.32	0.34	0.4
Maximum air capacity [m ³ /h]	88	130	162	97	138	176
RPM [min ⁻¹]	1400	1800	2600	1400	1800	2600
Sound pressure level at 3 m distance [dBA]	32	35	43	33	36	44
Max. operating temperature [°C]	50	50	50	50	50	50
SEC class	C					
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4



Overall dimensions



Type	Dimensions [mm]								Weight [kg]
	øD	øD1	B	H	H1	L	L1	L2	
Box-R 80	79	79	260	90	-	352	-	253	3.2
Box-R 80/80x2	79	2x79	260	90	-	352	-	253	3.1
Box-R 80/80x4	79	2x79	260	90	150	-	302	253	3.4
Box-R 80/80x5	79	5x79	260	90	150	352	-	253	3.5
Box-R 80/80x6	79	6x79	260	90	150	352	-	253	3.6
Box-R 100	99	99	260	110	-	352	-	253	3.2
Box-R 100/80x2	99	2x79	260	110	-	352	-	253	3.1
Box-R 100/80x4	99	4x79	260	110	170	-	302	253	3.1
Box-R 100/80x5	99	5x79	260	110	170	352	-	253	3.7
Box-R 100/80x6	99	6x79	260	110	150	352	-	253	3.6
Box-R 100/100x2	99	2x99	260	110	-	352	-	253	3.1
Box-R 100/100x4	99	4x99	260	110	170	-	302	253	3.4
Box-R 100/100x5	99	5x99	260	110	170	352	-	253	3.5
Box-R 100/100x6	99	6x99	260	110	170	352	-	253	3.5



Exhaust centrifugal fans

Box-D

Air capacity – up to 531 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- Mounting into suspended ceiling.
- Compatible with Ø 100, 125 and 150 mm round air ducts.

Design

- Compact galvanized steel casing.
- The front panel is made of ABS plastic and is equipped with a replaceable filter.
- The filter protects motor, impeller and air ducts against soiling.
- Fitted with a spring-loaded damper for back drafting prevention.
- Connecting spigot is equipped with rubber seal.
- External terminal block for power supply.

Motor

- Single-phase external rotor motor. Centrifugal impeller with backward curved blades.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.

Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- The fan is installed between ceiling and false ceiling by fixing brackets supplied as a standard.
- Power is supplied to the fan through an external terminal box.
- Flexible air duct is fixed on fan spigot with a clamp.

Modifications and options

- L – low-powered motor.

Overall dimensions

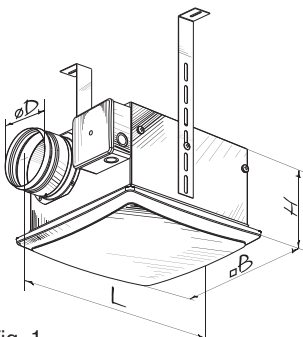


Fig. 1

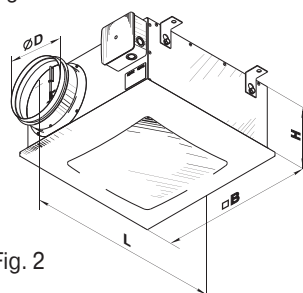





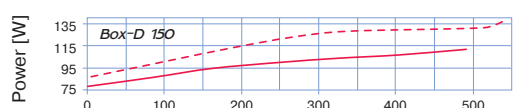
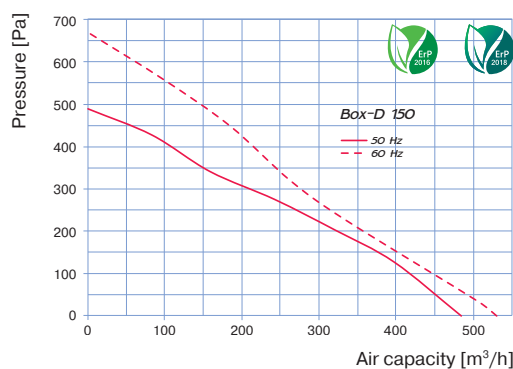
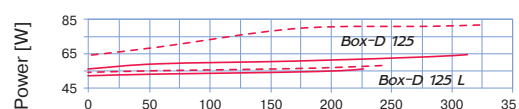
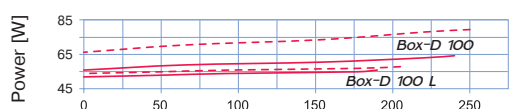
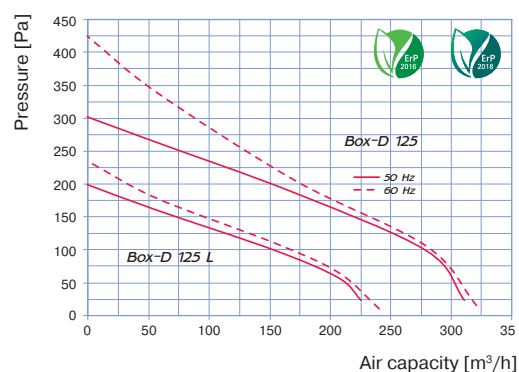
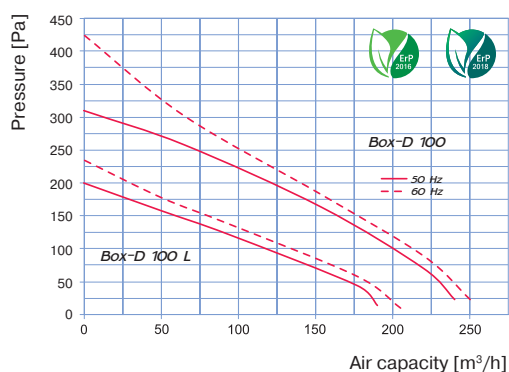


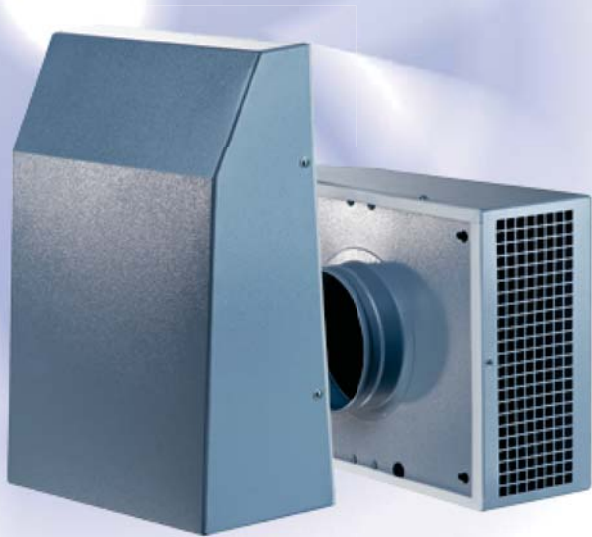
Fig. 2

Type	Dimensions [mm]				Weight [kg]	Fig.no.
	$\varnothing D$	B	H	L		
Box-D 100 L	100	240	160	305	2.9	1
Box-D 100	100	240	160	305	3.2	1
Box-D 125 L	125	240	160	305	2.9	1
Box-D 125	125	240	160	305	3.2	1
Box-D 150	149	355	180	419	6.5	2

Specifications

Parameters	Box-D 100 L 		Box-D 100 		Box-D 125 L 		Box-D 125 		Box-D 150 	
	1 ~ 230		1 ~ 230		1 ~ 230		1 ~ 230		1 ~ 230	
Voltage [V]	1 ~ 230		1 ~ 230		1 ~ 230		1 ~ 230		1 ~ 230	
Frequency [Hz]	50	60	50	60	50	60	50	60	50	60
Power [W]	56	58	61	79	56	58	61	81	112	136
Current [A]	0.34	0.35	0.26	0.35	0.34	0.35	0.26	0.36	0.5	0.6
Max. air capacity [m³/h]	190	205	240	250	225	240	310	320	485	531
RPM [min ⁻¹]	2300	2570	2500	2730	2300	2570	2500	2740	2465	2550
Noise level at 3 m [dBA]	42	43	47	48	43	44	48	49	52	53
Transported air temperature [°C]	-25..+45		-25..+50		-25..+45		-25..+50		-25..+50	
SEC class	C									-
Protection rating	IPX4		IPX4		IPX4		IPX4		IPX4	





Exhaust centrifugal fans

Extero

Air capacity – up to 710 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- External wall mounting from outside.
- Compatible with Ø 100 up to 200 mm round air ducts.

Design

- Steel casing with a special polymer atmospheric resistant coating.
- Specially designed casing protects motor against direct sprays of water.
- Vertical air exhaust downwards through a protecting screen against birds and rodents.
- Back side has a special sealant for tight contact and adaption to the wall.
- Connecting spigot is equipped with rubber seal.

Motor

- Single-phase external rotor motor with a centrifugal impeller with backward curved blades.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.

Speed control

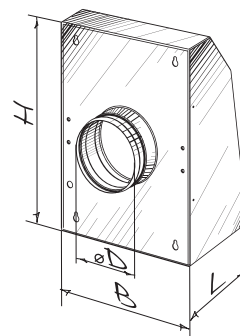
- Smooth or step speed control with a thyristor or autotransformer speed controller (available upon order) connected to the maximum speed terminal of the motor.

Mounting

- Vertical mounting on external walls of buildings and premises.
- Flexible air duct is fixed on fan spigot with a clamp.
- The fan with connected air duct is fixed at the wall on a mounting plate. Power supply through the external terminals. After mounting of the ventilator a protection cover is mounted over the mounting plate.

Overall dimensions

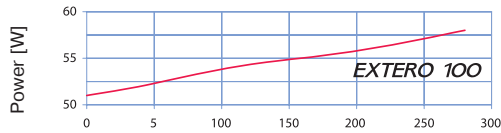
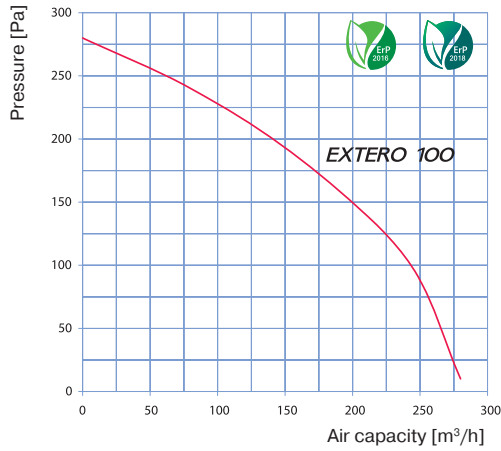
Type	Dimensions [mm]				Weight [kg]
	øD	B	H	L	
Extero 100	99	260	355	138	4.1
Extero 125	124	260	355	138	4.1
Extero 150	149	300	400	138.2	4.5
Extero 160	159	300	400	138.2	4.5
Extero 200	199	300	400	138.2	4.5



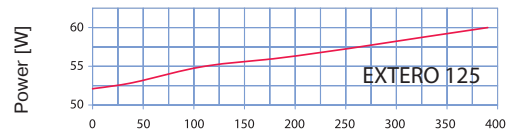
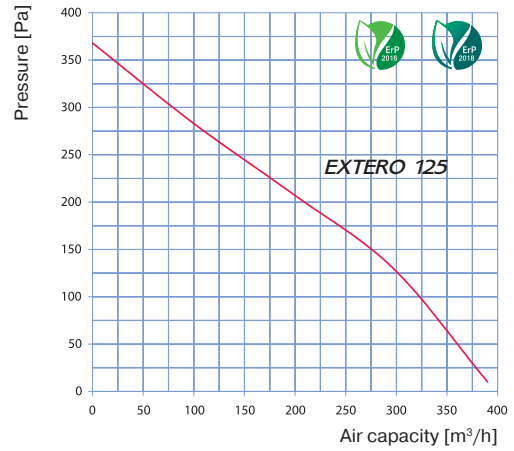
Specifications

Parameters	Extero 100	Extero 125	Extero 150	Extero 160	Extero 200
Voltage [V / 50 Hz]	230	230	230	230	230
Power [W]	58	60	100	102	104
Current [A]	0.26	0.27	0.43	0.44	0.45
Maximum air capacity [m ³ /h]	280	390	600	650	710
RPM [min ⁻¹]	2500	2500	2600	2600	2600
Sound pressure level at 3 m distance [dBA]	54	54	58	60	62
Max. operating temperature [°C]	55	55	55	55	55
SEC class	C				
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4

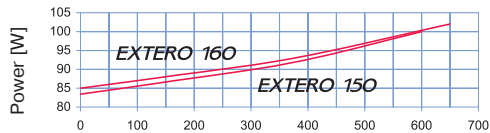
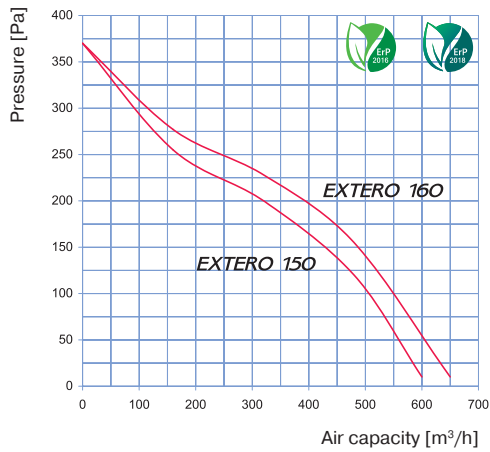
Specifications



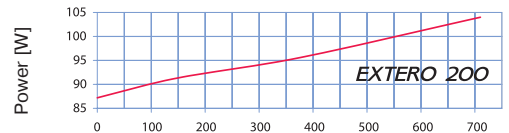
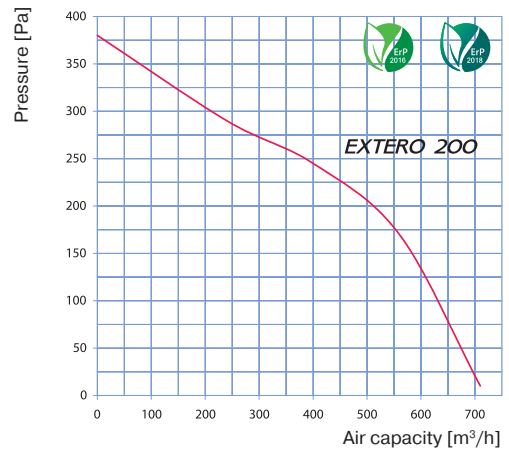
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	60	46	52	58	58	58	51	40	28
L _{WA} to environment, [dBA]	58	39	40	49	55	60	56	43	35



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	58	48	54	59	56	57	52	42	29
L _{WA} to environment, [dBA]	59	41	41	52	55	58	54	46	35



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
EXTERO 150									
L _{WA} to inlet, [dBA]	57	45	53	54	57	56	46	38	19
L _{WA} to environment, [dBA]	56	48	38	48	52	54	49	39	32
EXTERO 160									
L _{WA} to inlet, [dBA]	55	44	54	55	58	54	46	36	18
L _{WA} to environment, [dBA]	54	46	39	49	51	53	49	42	31



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	59	48	55	50	58	58	48	41	23
L _{WA} to environment, [dBA]	55	47	39	51	55	53	52	38	33



Sound-insulated inline mixed-flow fans

Iso-Mix

Air capacity – up to 1920 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises with high requirements to the noise level.
- For ventilation air ducts requiring high pressure, powerful air flow and low noise level.
- Compatible with Ø 100 up to Ø 315 mm air ducts.

Design

- The casing is made of polymer-coated steel, internally filled with 50 mm mineral wool thermal- and sound-insulating layer.
- Special inner perforation of the casing and sound-insulating material are designed for wide-frequency sound absorbing.
- Mixed-flow impeller made of high-quality plastic.
- The diffuser, the specially profiled impeller and directing vanes provide high performance and powerful pressure combined with low noise operation.
- External airtight terminal block on the fan casing for power supply.
- Mounting brackets on the fan casing for mounting to the floor, to the wall or ceiling.

Motor

- Double-speed single-phase high-efficient motor with low energy demand on ball bearings.
- Overheating protection by built-in thermal switches.
- Motor ingress protection rating IPX4.

Speed control

- Speed selection with a built-in speed switch (US option) or an external multi-speed switch (special accessory).
- Smooth speed control is possible either with an integrated speed switch (FR option), an external thyristor or transformer speed controller (special accessory) when connected to the maximum speed terminal.

Mounting

- Due to its compact design the fan is the ideal solution for mounting in limited spaces.
- The fan is suitable for mounting in any section of the ventilation system from intake to the end of the ductwork.
- Wall or ceiling mounting with a special mounting plate on the fan casing.

Modifications and options

- **T** – adjustable run-out timer regulated from 2 to 30 minutes.
- **US** – three-position speed switch integrated in the fan.

- **FR** – built-in smooth speed controller from 0 to 100 %. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (FR1).



- **G** – smooth speed controller with an electronic thermostat and an external temperature sensor that is fixed on 4 m cable. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (G1).

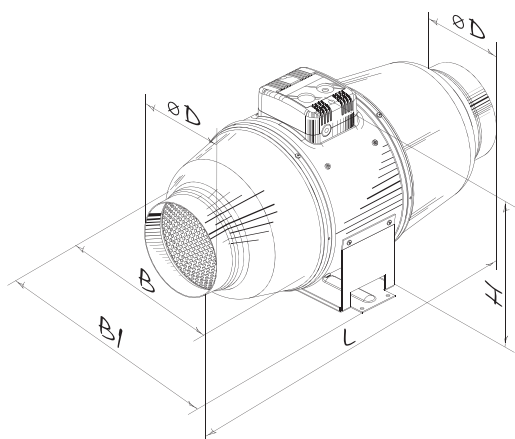


- **GI** – smooth speed controller with an electronic thermostat and a temperature sensor integrated into the air duct. The fan is supplied with a pre-wired power cable with IEC plug as a standard. The cable modification with a standard electric plug is also available (GI1). G and GI options enable automatic speed control depending on indoor temperature. The best solution for ventilation of premises with permanent temperature control, e.g. greenhouses.

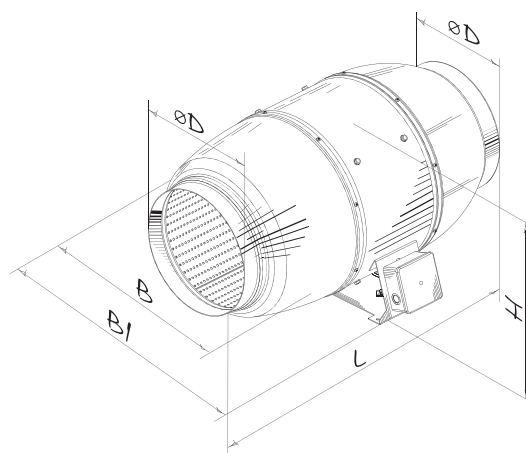
- **W** – pre-wired power cable and IEC plug as a standard. Modification with a standard electric plug is available (W1).

Overall dimensions

Type	Dimensions [mm]					Weight [kg]
	∅D	B	B1	L	H	
Iso-Mix 100	98	214	243	505	251	4.6
Iso-Mix 125	123	214	243	474	251	4.6
Iso-Mix 150	148	247	273	579	263	6.1
Iso-Mix 160	159	281	327	566	284	6.3
Iso-Mix 200	198	293	386	550	295	8.0
Iso-Mix 250	248	358	445	658	360	15.0
Iso-Mix 315	313	432	520	780	434	25.0



Iso-Mix 100 – Iso-Mix 150



Iso-Mix 160 – Iso-Mix 315

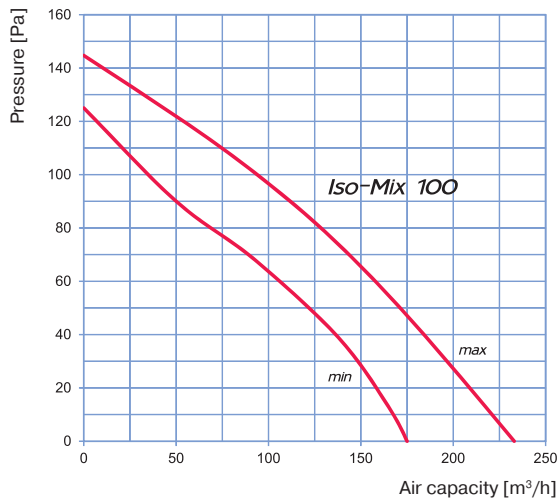
ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Specifications

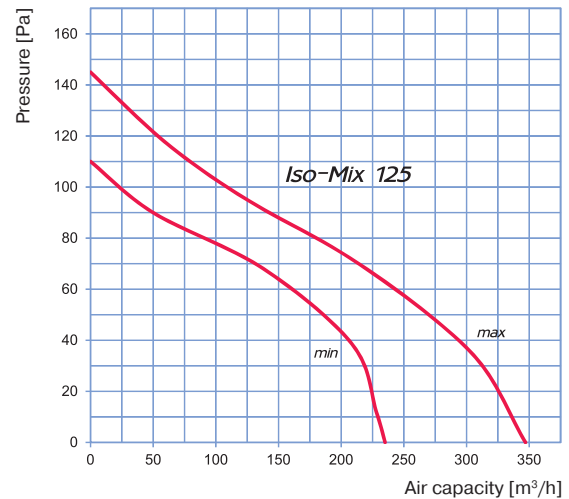
Parameters	Iso-Mix 100*		Iso-Mix 125*		Iso-Mix 150* Iso-Mix 160*	
	min	max	min	max	min	max
Speed						
Voltage [V / 50 /60 Hz]	1 ~ 230		1 ~ 230		1 ~ 230	
Power [W]	24	26	25	29	45	52
Current [A]	0.10	0.11	0.11	0.13	0.20	0.23
Maximum air capacity [m³/h]	175	233	235	347	410	550
RPM [min ⁻¹]	2015	2610	1660	2315	1985	2640
Sound pressure level at 3 m distance [dBA]	24	29	23	28	26	33
Max. operating temperature [°C]	60					
SEC class	-		-		C	
Ingress protection rating	IPX4		IPX4		IPX4	



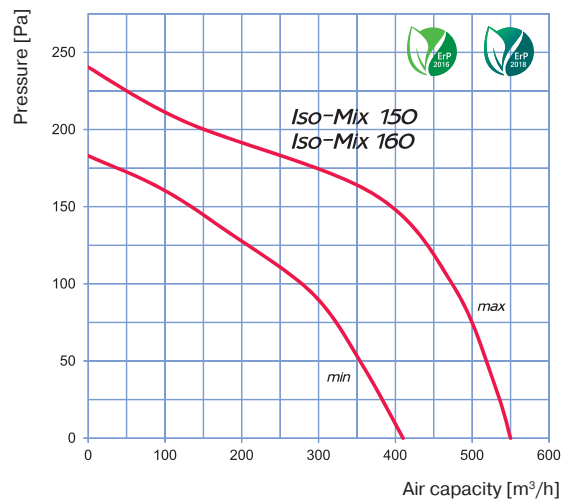
* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	42	19	18	29	35	39	39	31	24
L _{WA} to outlet, [dBA]	45	20	19	30	38	42	35	35	23
L _{WA} to environment, [dBA]	34	15	14	17	25	29	21	22	14






Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	47	19	21	35	38	42	41	35	28
L _{WA} to outlet, [dBA]	46	21	24	35	39	41	43	37	29
L _{WA} to environment, [dBA]	35	17	20	23	27	28	22	21	15

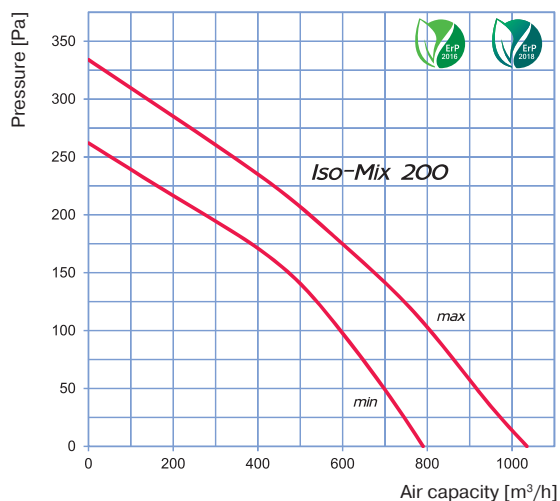


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	61	25	33	49	55	53	55	53	39
L _{WA} to outlet, [dBA]	59	35	36	51	55	55	55	50	42
L _{WA} to environment, [dBA]	39	19	22	39	35	36	33	24	21

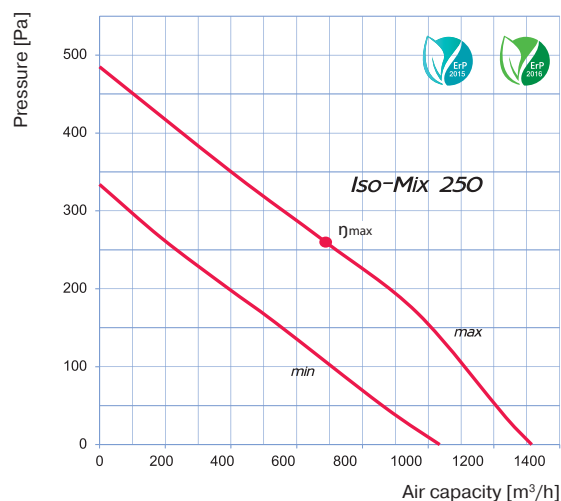
Specifications

Parameters	Iso-Mix 200* 		Iso-Mix 250 		Iso-Mix 315 	
	min	max	min	max	min	max
Speed						
Voltage [V / 50 /60 Hz]	1 ~ 230		1 ~ 230		1 ~ 230	
Power [W]	78	110	127	178	213	313
Current [A]	0.35	0.49	0.52	0.79	0.93	1.41
Maximum air capacity [m³/h]	790	1035	1035	1315	1510	1920
RPM [min ⁻¹]	2000	2460	1960	2460	2120	2620
Sound pressure level at 3 m distance [dBA]	31	36	34	38	36	40
Max. operating temperature [°C]	60					
SEC class	C		-		-	
Ingress protection rating	IPX4		IPX4		IPX4	

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.

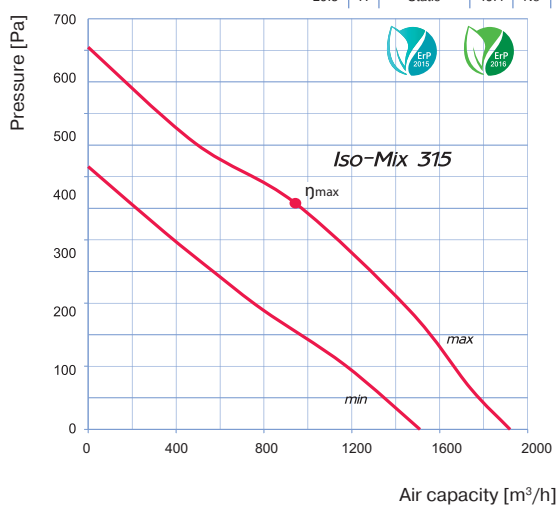


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	62	26	38	54	57	58	55	52	48
L _{WA} to outlet, [dBA]	65	28	42	48	62	60	62	50	44
L _{WA} to environment, [dBA]	45	22	30	31	38	41	42	29	22



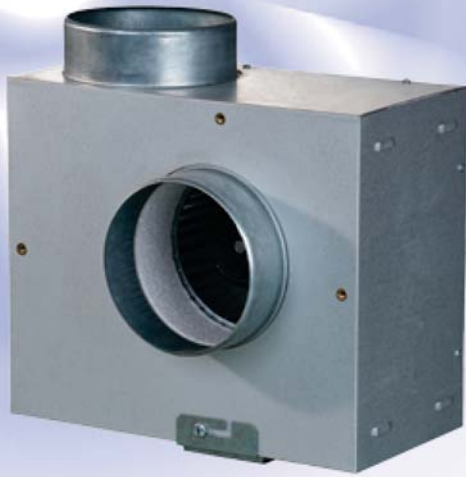
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	65	29	41	57	60	61	58	55	51
L _{WA} to outlet, [dBA]	75	31	45	58	65	73	65	53	47
L _{WA} to environment, [dBA]	55	25	33	48	41	53	49	41	29

η _i (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
29.5	A	Static	49.4	No	0.172	0.78	688	260	2440	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	35	47	62	61	64	67	58	55
L _{WA} to outlet, [dBA]	75	40	53	69	69	70	65	55	51
L _{WA} to environment, [dBA]	58	25	32	41	51	55	52	49	37

η _i (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
30.9	A	Static	46.7	No	0.31	1.4	943	358	2590	1



Sound-insulated centrifugal fans

Iso

Air capacity – up to 2140 m³/h



■ Use

- ❑ Supply and exhaust ventilation systems installed in premises with high requirements to the noise level.
- ❑ Compatible with Ø 100 up to 315 mm round air ducts.

■ Design

- ❑ Aluzinc casing internally filled with thermal and sound-insulating layer of foamed polystyrene.
- ❑ Connecting spigots are equipped with rubber seals.
- ❑ The fan is equipped with a power cord for standard size 100-250 or a terminal block for standard size 315.

■ Motor

- ❑ Two- or four-pole asynchronous motor with external rotor and centrifugal impeller with forward curved blades.
- ❑ Equipped with ball bearings for longer service life.
- ❑ Integrated thermal protection with automatic restart.
- ❑ Dynamically balanced turbine.

■ Speed control

- ❑ Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

■ Mounting

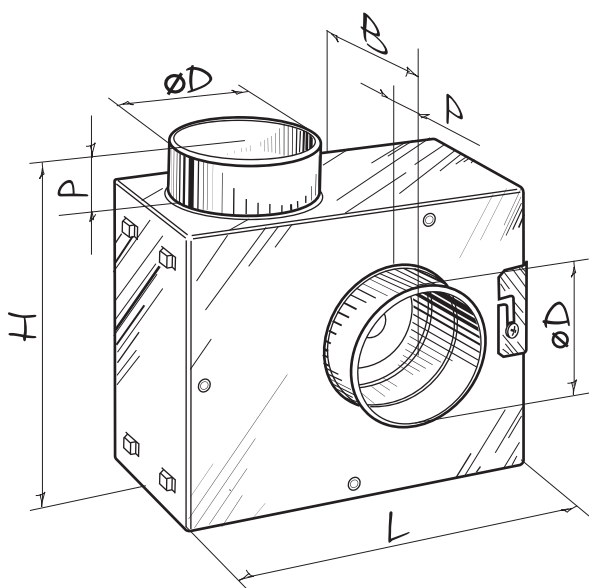
- ❑ Mounting in any position.
- ❑ Fixed to wall or ceiling with a fixing bracket supplied as a standard.
- ❑ Flexible air ducts are fixed on fan spigots with clamps.

■ Modifications and options

- ❑ **G** – temperature and speed controller with external temperature sensor fixed on 4 m cable. The fan is equipped with a power cord with a socket or a plug (**G1**).
- ❑ **GI** – temperature and speed controller with a sensor built into the fan casing. The fan is equipped with a power cord with a socket or plug (**GI1**). G and GI options are used for automatic speed control depending on indoor temperature. The best ventilation solution for the premises requiring permanent temperature control as greenhouses, orangeries, etc.
- ❑ **W** – the fan is equipped with a power cord and a socket or plug (**W1**).

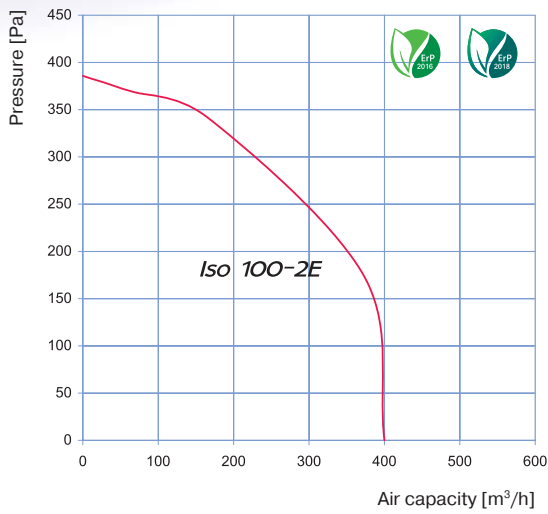
■ Overall dimensions

Type	Dimensions [mm]					Weight [kg]
	∅D	B	H	L	P	
Iso 100-2E	99	184	308	310	48	4.22
Iso 125-2E	123	204	308	310	48	4.57
Iso 150-2E	148	231	343	358	48	6.28
Iso 160-2E	158	231	343	358	48	6.28
Iso 200-4E	198	282	408	445	48	8.25
Iso 250-4E	248	330	500	525	48	10.50
Iso 315-4E	314	392	495	535	48	17.0

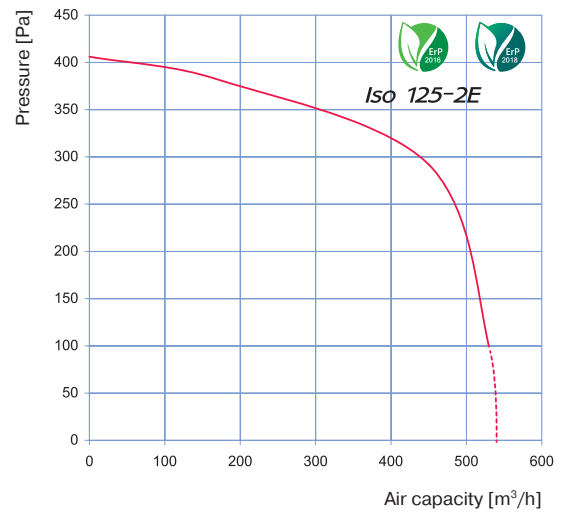


Specifications

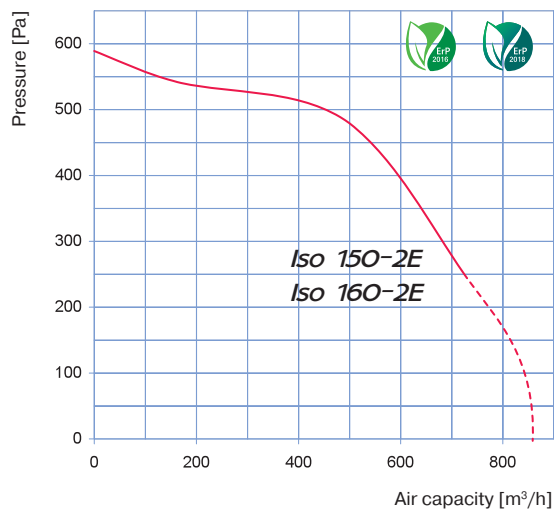
Parameters	Iso 100-2E 	Iso 125-2E 	Iso 150-2E 	Iso 160-2E 
	Voltage [V / 50 Hz]	230	230	230
Power [W]	115	120	260	260
Current [A]	0.51	0.52	1.16	1.16
Maximum air capacity [m ³ /h]	400	530	730	730
RPM [min ⁻¹]	2650	2650	2600	2600
Sound pressure level at 3 m distance [dBA]	36.1	38.3	39.4	37.9
Max. operating temperature [°C]	-25 +40	-25 +40	-25 +40	-25 +40
SEC class	C			
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	47	44	41	42	37	35	35	30	29
L _{WA} to outlet, [dBA]	50	45	41	41	37	35	31	30	28
L _{WA} to environment, [dBA]	43	39	36	37	31	30	28	25	22



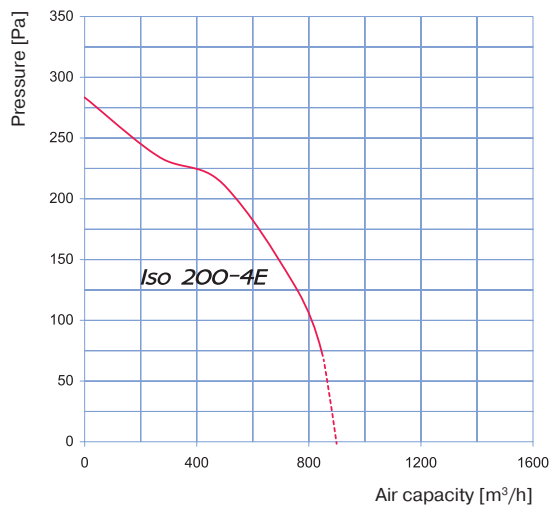
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	48	45	44	46	37	39	33	30	25
L _{WA} to outlet, [dBA]	50	45	43	47	39	39	33	29	27
L _{WA} to environment, [dBA]	45	40	39	41	34	33	27	23	22



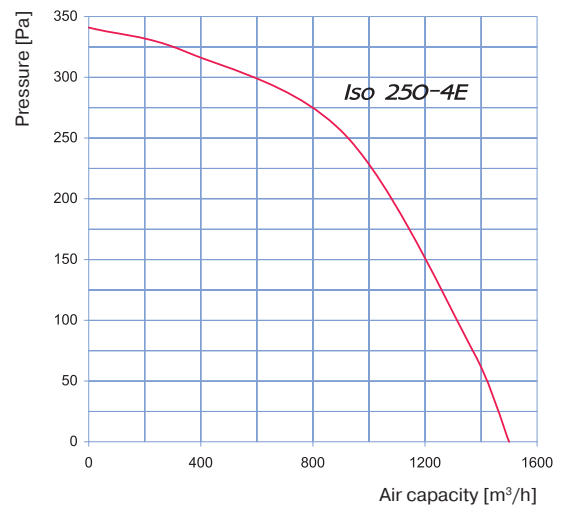
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Iso 150-2E									
L _{WA} to inlet, [dBA]	55	42	52	50	40	35	28	25	21
L _{WA} to outlet, [dBA]	55	43	51	48	40	34	29	23	23
L _{WA} to environment, [dBA]	50	39	48	44	35	30	25	20	17
Iso 160-2E									
L _{WA} to inlet, [dBA]	56	44	51	48	38	33	29	24	22
L _{WA} to outlet, [dBA]	54	42	51	50	37	31	30	25	25
L _{WA} to environment, [dBA]	49	37	47	43	34	28	25	20	18

Specifications

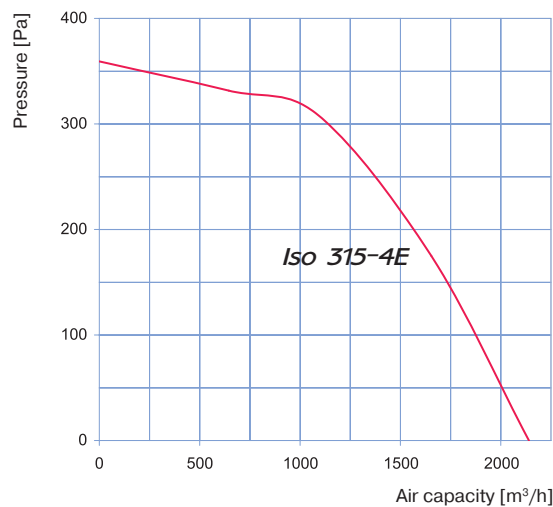
Parameters	Iso 200-4E	Iso 250-4E	Iso 315-4E
Voltage [V / 50 Hz]	230	230	230
Power [W]	110	395	570
Current [A]	0.45	1.98	2.48
Maximum air capacity [m ³ /h]	850	1500	2140
RPM [min ⁻¹]	1300	1330	1325
Sound pressure level at 3 m distance [dBA]	29.1	35.5	43.7
Max. operating temperature [°C]	-25 +40	-25 +40	-40 +55
Ingress protection rating	IPX4	IPX4	IPX4



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	43	39	38	38	31	29	20	17	14
L _{WA} to outlet, [dBA]	43	36	38	34	34	27	23	18	18
L _{WA} to environment, [dBA]	38	33	35	31	27	22	16	13	11



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	44	41	43	40	32	24	27	24	21
L _{WA} to outlet, [dBA]	46	41	45	38	32	26	29	22	18
L _{WA} to environment, [dBA]	41	35	38	33	27	21	24	18	15



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	45	41	42	39	29	25	25	27	25
L _{WA} to outlet, [dBA]	48	43	46	40	35	26	30	20	19
L _{WA} to environment, [dBA]	44	36	39	31	25	22	25	18	17



Sound-insulated centrifugal fans

Iso-B

Air capacity – up to 2150 m³/h



■ Use

- ❑ Supply and exhaust ventilation systems installed in premises with high requirements to the noise level.
- ❑ Compatible with Ø 100 up to 315 mm round air ducts.
- ❑ Suitable for limited mounting space.

■ Design

- ❑ Galvanized steel casing internally filled with 30 mm thermal- and sound-insulating layer made of non-flammable foamed polyurethane.
- ❑ Connecting spigots are equipped with rubber seals.
- ❑ Fixing brackets for easy mounting.

■ Motor

- ❑ Two-pole external rotor asynchronous motor with centrifugal impeller and backward curved blades.
- ❑ The motor is installed on specially designed vibration-damping mounts to absorb vibration and noise.
- ❑ Equipped with ball bearings for longer service life.
- ❑ Integrated thermal protection with automatic restart.
- ❑ Dynamically balanced turbine.

■ Speed control

- ❑ Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

■ Mounting

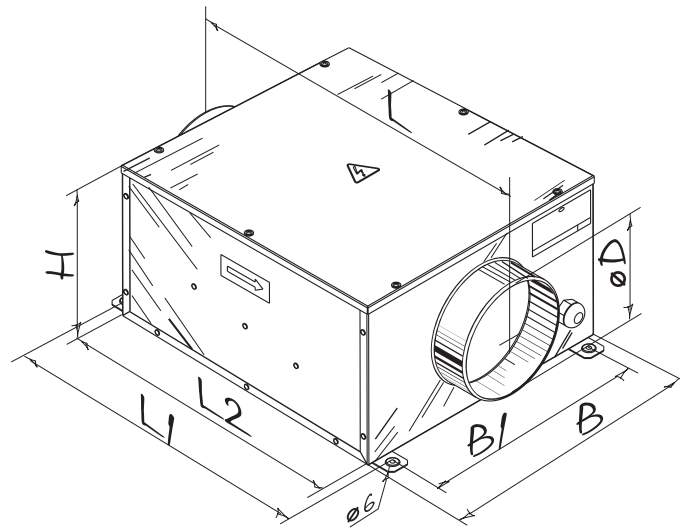
- ❑ Mounting in any position.
- ❑ Fixed to wall or ceiling with a fixing bracket supplied as a standard.
- ❑ Flexible air ducts are fixed on fan spigots with clamps.
- ❑ Power is supplied through an external terminal box

■ Modifications and options



- ❑ **G** – temperature and speed controller with external temperature sensor fixed on 4 m cable. The fan is equipped with a power cord with a socket or a plug (**G1**).
- ❑ **G1** – temperature and speed controller with a sensor built into the fan casing. The fan is equipped with a power cord with a socket or plug (**G11**). G and G1 options are used for automatic speed control depending on indoor temperature. The best ventilation solution for the premises requiring permanent temperature control as greenhouses, orangeries, etc.
- ❑ **W** – the fan is equipped with a power cord and a socket or plug (**W1**).
- ❑ **max** – high-powered motor.

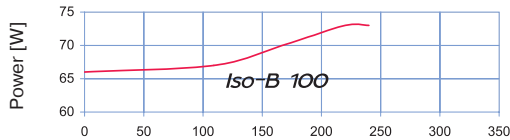
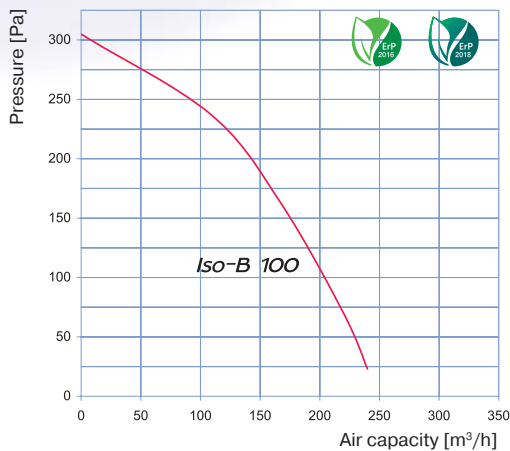
■ Overall dimensions

Type	Dimensions [mm]							Weight [kg]
	øD	B	B1	H	L	L1	L2	
Iso-B 100	99	322	280	192	447	380	350	5.4
Iso-B 125	124	322	280	192	447	380	350	5.4
Iso-B 150	149	352	310	212	477	410	380	6.4
Iso-B 160	159	352	310	212	477	410	380	6.4
Iso-B 200	199	432	368	287	588	506	480	10.0
Iso-B 200 max	199	432	368	287	588	506	480	12.0
Iso-B 250	249	432	368	287	588	506	480	12.5
Iso-B 315	314	502	438	397	648	566	540	15.5

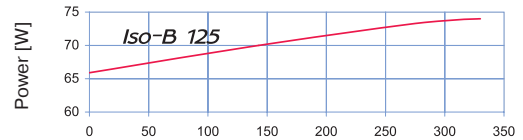
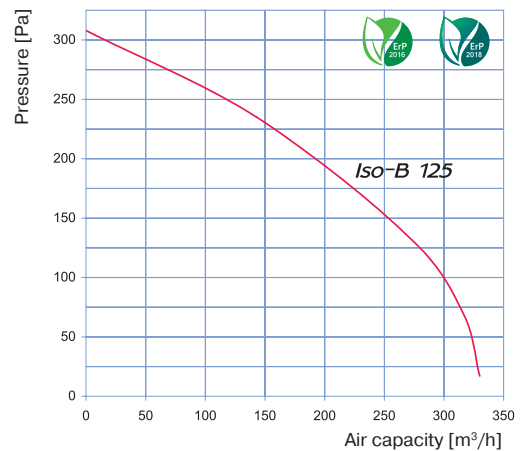


Specifications

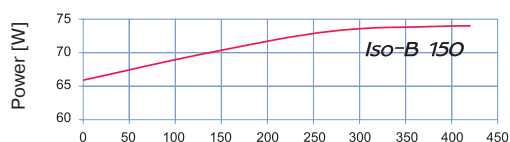
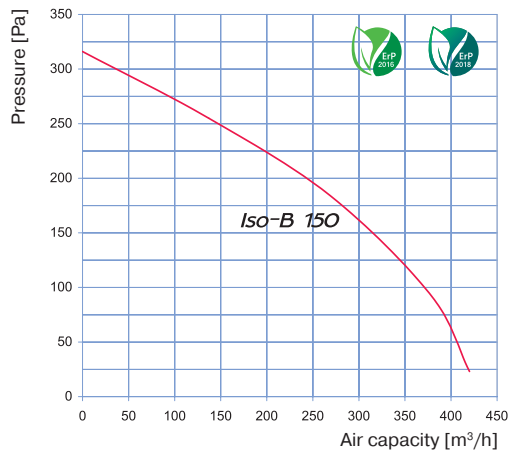
Parameters	Iso-B 100 	Iso-B 125 	Iso-B 150 	Iso-B 160 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	73	73	72	75
Current [A]	0.32	0.32	0.32	0.33
Maximum air capacity [m ³ /h]	240	330	420	420
RPM [min ⁻¹]	2560	2590	2600	2690
Sound pressure level at 3 m distance [dBA]	33	35	36	36
Max. operating temperature [°C]	-25 +55	-25 +55	-25 +55	-25 +55
SEC class	C			
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



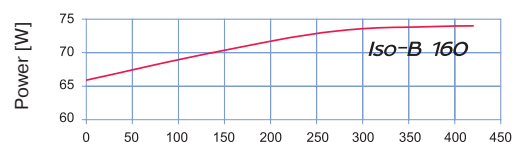
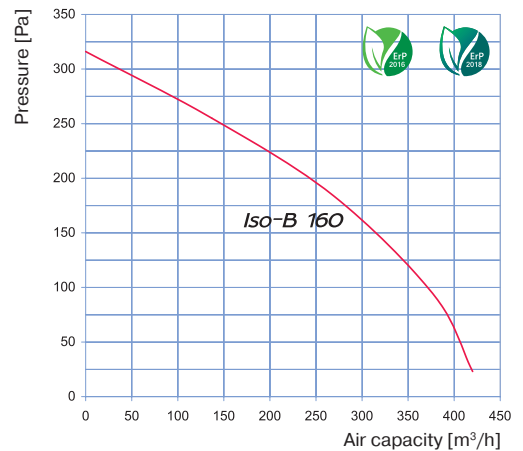
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	59	53	57	54	52	51	54	51	47
L _{WA} to outlet, [dBA]	68	49	50	53	56	66	63	56	54
L _{WA} to environment, [dBA]	40	27	29	32	31	34	29	29	20



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	64	51	51	54	56	54	55	53	51
L _{WA} to outlet, [dBA]	65	50	49	59	55	61	61	58	51
L _{WA} to environment, [dBA]	38	29	32	33	33	33	31	28	25







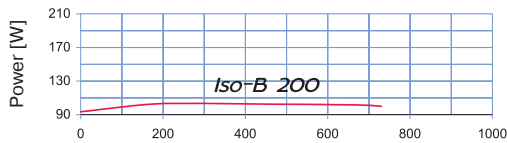
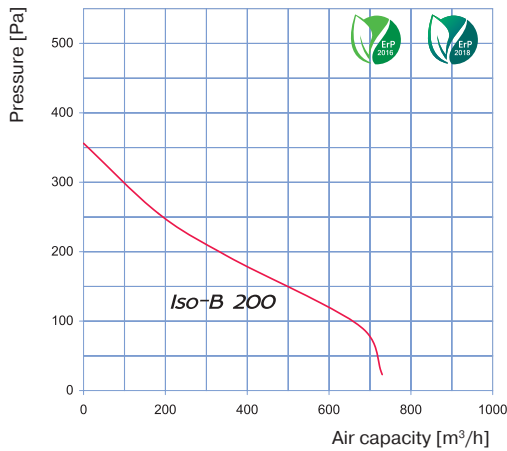
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	62	49	50	58	56	54	55	52	50
L _{WA} to outlet, [dBA]	66	43	44	59	55	62	60	55	53
L _{WA} to environment, [dBA]	41	26	30	35	34	34	30	26	25



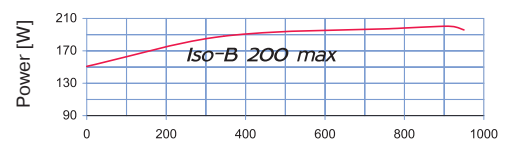
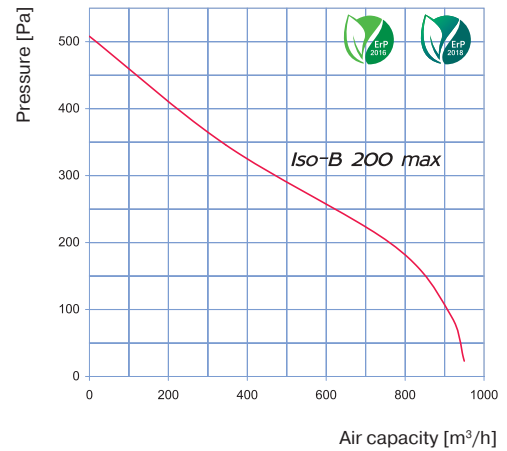
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	62	50	51	60	56	52	55	54	51
L _{WA} to outlet, [dBA]	68	48	47	57	60	67	63	59	56
L _{WA} to environment, [dBA]	41	28	26	32	33	36	34	25	23

Specifications

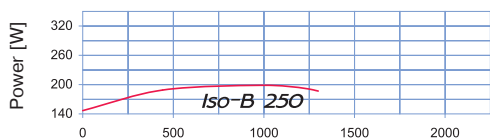
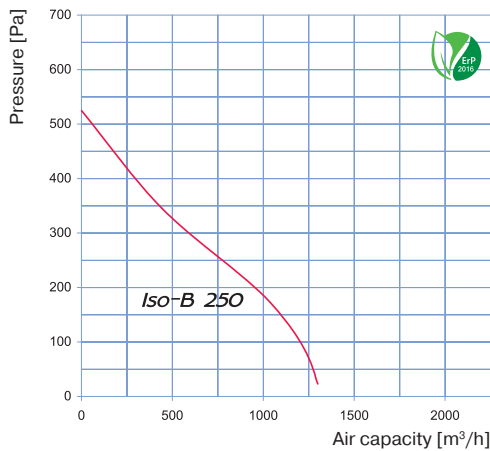
Parameters	Iso-B 200 	Iso-B 200 max 	Iso-B 250 	Iso-B 315 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	103	195	198	322
Current [A]	0.45	0.85	0.87	1.40
Maximum air capacity [m ³ /h]	730	950	1300	2150
RPM [min ⁻¹]	2550	2570	2420	2670
Sound pressure level at 3 m distance [dBA]	38	41	41	43
Max. operating temperature [°C]	-25 +50	-25 +45	-25 +50	-25 +45
SEC class	B		-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



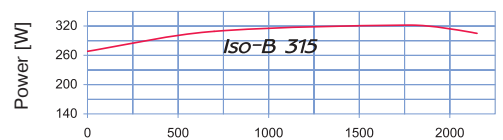
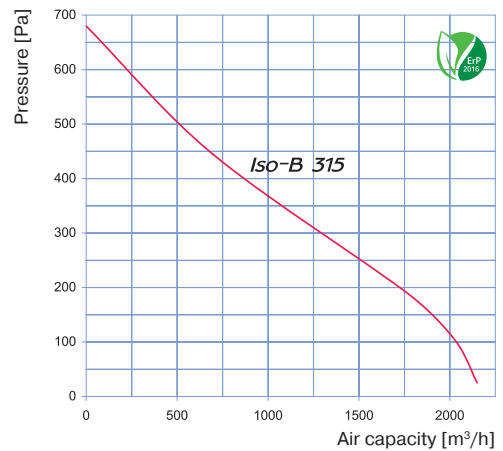
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	52	37	38	45	45	39	39	36	26
L _{WA} to outlet, [dBA]	67	49	46	55	64	59	60	53	41
L _{WA} to environment, [dBA]	43	33	35	33	38	25	31	25	25



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	53	41	43	53	51	47	44	44	36
L _{WA} to outlet, [dBA]	70	48	49	57	68	65	63	58	51
L _{WA} to environment, [dBA]	45	29	32	37	40	27	29	26	27



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	59	44	45	54	51	47	45	45	38
L _{WA} to outlet, [dBA]	74	51	51	62	70	67	64	61	55
L _{WA} to environment, [dBA]	46	33	36	41	42	30	26	23	27



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	59	45	47	56	47	48	50	44	40
L _{WA} to outlet, [dBA]	75	52	51	59	68	68	65	62	54
L _{WA} to environment, [dBA]	48	41	41	44	43	36	28	32	29



Sound-insulated centrifugal fans

Iso-V

Air capacity – up to 16870 m³/h



■ Use

- Supply and exhaust ventilation systems installed in premises with high requirements to the noise level.
- Various application possibilities due to a special transformable casing design.
- Suitable for use as separate components of air handling systems.
- Compatible with Ø 355 up to 710 mm round or 500x500 up to 1000x1000 mm rectangular air ducts.

■ Design

- Casing made of aluminium frame and removable aluzinc thermal- and sound-insulated double-skinned sandwich panels.
- Casing internally filled with 20 mm non-flammable mineral wool.
- Position of the removable panels can be adjusted to inline air flow or 90° angle air flow.
- Due to corrosion-resistant casing and thermal insulation the fan is suitable for external mounting.
- Square to square vibration absorbing connectors (**AKV** series) or square to round connector-reducers (**ARV** series) may be connected to the fan (available upon separate order).
- The round spigot of the **ARV** connector-reducer is rubber sealed for air tight connection.

■ Motor

- Two-, four- or six-pole asynchronous motor with external rotor and centrifugal impeller with backward curved blades.
- Single-phase (**E**) or three-phase (**D**) motor modifications.
- Equipped with ball bearings for longer service life.
- Overheating protection by built-in thermal switches with leaded outside terminals for connection to external protecting controls.
- The thermal switch terminal leads are designed for connection to respective circuit of the overload relay or respective terminals of the autotransformer or thyristor speed controller.

- The model **Iso-V 355 4E** incorporates thermal switches with automatic restart.
- Dynamically balanced turbine.

■ Speed control

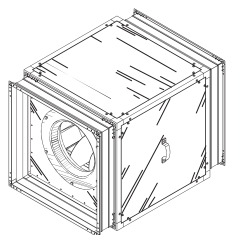
- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

■ Mounting

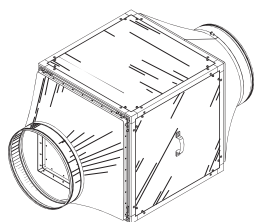
- The fan is mounted with rectangular or round air ducts.
- Connected to air ducts with flexible vibration-absorbing connectors or connecting reducers of respective diameters.
- Power is supplied to the fan through an external terminal box.
- The fans can be installed in any mounting position with respect to air flow direction in the system. While mounting provide enough servicing space.
- In case of outdoor mounting the fan may be equipped with the upper protecting cover (**RSD-IV** series) or the outer hood (**AH-IV** series) to be installed at air inlet/outlet.

■ Modifications and options

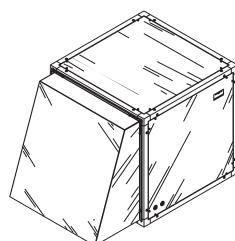
- **max** – high-powered motor.



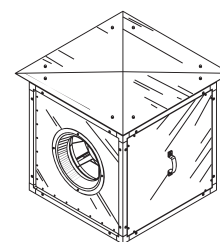
Iso-V fan with vibration-absorbing flexible connectors **AKV** series



Iso-V fan with connecting reducers **ARV** series



Iso-V fans with **AH-IV** outer hood

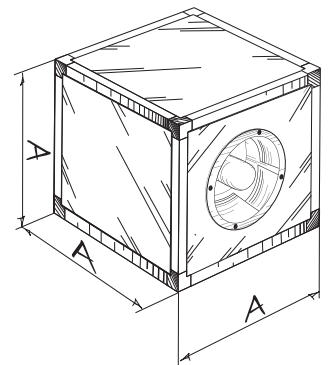


Iso-V fans with **RSD-IV** protecting cover

ErP data	
Overall efficiency	η_s (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

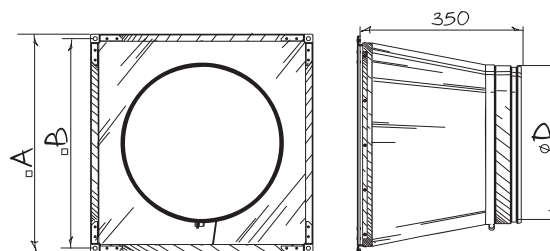
Fan and accessories overall dimensions

Type	Dimensions [mm] A	Weight [kg]	Options			
			ARV connector-reducer	AKV vibration absorbing connector	RSD-IV protecting cover	AH-V outer hood
Iso-V 355 4E	500	25	ARV 355	AKV 500	RSD-IV 315-355	AH-IV 315-355
Iso-V 355 4D	500	25				
Iso-V 400 4E	670	39	ARV 400	AKV 670	RSD-IV 400-500	AH-IV 400-500
Iso-V 400 4D	670	39				
Iso-V 450 4E	670	43	ARV 450	AKV 670	RSD-IV 400-500	AH-IV 400-500
Iso-V 450 4D	670	43				
Iso-V 500 4E	670	52	ARV 500	AKV 670	RSD-IV 400-500	AH-IV 400-500
Iso-V 500 4D	670	56				
Iso-V 560 4D	800	99	ARV 560	AKV 800	RSD-IV 560-630	AH-IV 560-530
Iso-V 560 6D	800	86				
Iso-V 630 4D	800	102	ARV 630	AKV 800	RSD-IV 560-630	AH-IV 560-530
Iso-V 630 4D max	800	100				
Iso-V 630 6D	800	98	ARV 630	AKV 800	RSD-IV 560-630	AH-IV 560-530
Iso-V 710 6D	1000	136				



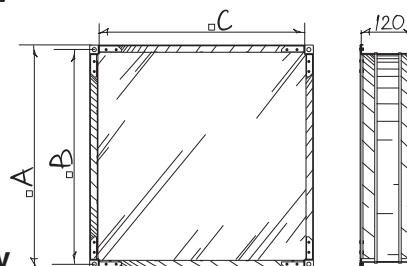
Iso-V

Type	Dimensions [mm]		
	A	B	∅D
ARV 355	490	470	355
ARV 400	660	640	400
ARV 450			450
ARV 500	790	770	500
ARV 560			560
ARV 630	990	970	630
ARV 710			710

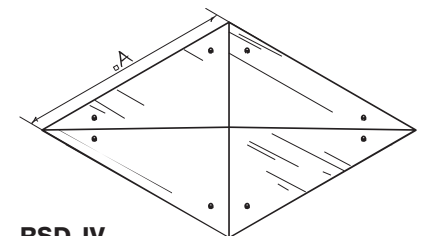


ARV

Type	Dimensions [mm]		
	A	B	C
AKV 500	490	470	445
AKV 670	660	640	615
AKV 800	790	770	745
AKV 1000	990	970	945

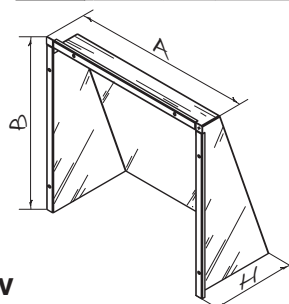


AKV



RSD-IV





Type	Dimensions [mm]			Weight [kg]
	A	B	H	
AH-IV 315-355	478	458	225	3.2
AH-IV 400-500	648	628	321	6
AH-IV 560-630	778	758	421	9.1
AH-IV 710	978	958	421	12.0

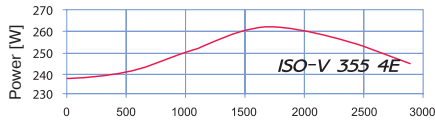
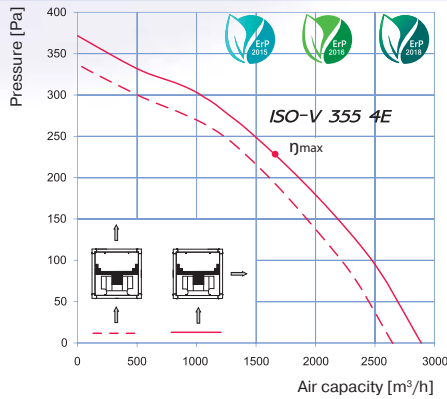


AH-IV

Type	Dimensions [mm]		Weight [kg]
	A		
RSD-IV 315-355	600		2.3
RSD-IV 400-500	770		4.65
RSD-IV 560-630	900		7.65
RSD-IV 710	1100		11.4

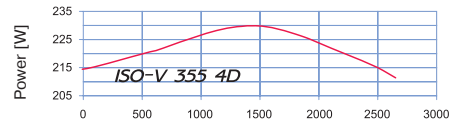
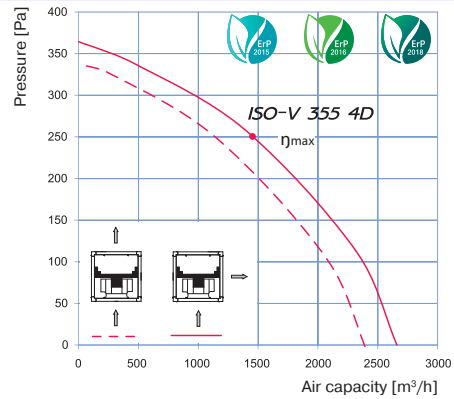
Specifications

Parameters	Iso-V 355 4E 	Iso-V 355 4D 	Iso-V 400 4E 	Iso-V 400 4D 	
Voltage [V / 50 / 60 Hz]	1 ~ 230	3 ~ 400	1 ~ 230	3 ~ 400 Δ	3 ~ 400 Y
Power [W]	245	230	480	515	385
Current [A]	1.12	0.52	2.40	1.41	0.70
Max. air flow at air flow direction [m ³ /h]:					
– perpendicular air flow	2890	2660	3750	3950	3340
– direct air flow	2650	2380	3535	3740	3110
RPM [min ⁻¹]	1420	1400	1370	1415	1235
Sound pressure level at 3 m distance [dBA]	54	53	51	51	47
Max. operating temperature [°C]	-25 +50	-25 +70	-40 +80	-40 +60	-40 +80
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	



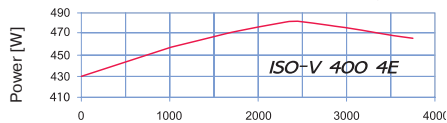
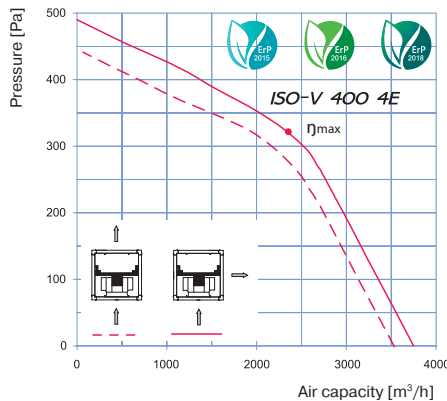
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	70	55	58	61	63	62	60	52	47
L _{WA} to outlet, [dBA]	68	57	59	62	65	63	62	55	47
L _{WA} to environment, [dBA]	62	51	51	54	58	55	55	48	40

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
40.8	A	Static	57.4	No	0.262	1.19	1670	226	1365	1



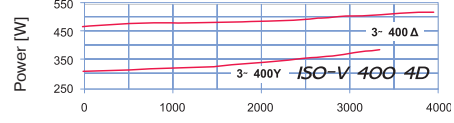
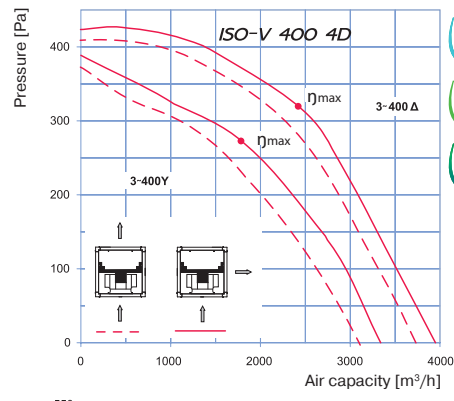
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	68	54	57	61	63	62	59	52	46
L _{WA} to outlet, [dBA]	70	55	61	61	65	66	59	54	47
L _{WA} to environment, [dBA]	64	49	50	55	59	56	52	49	39

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
44.7	A	Static	61.9	No	0.230	0.52	1445	251	1350	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	60	62	66	66	64	65	58	51
L _{WA} to outlet, [dBA]	74	61	63	68	71	68	67	58	53
L _{WA} to environment, [dBA]	56	43	47	47	52	49	48	42	33

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
44.4	A	Static	58.3	No	0.480	2.4	2350	320	1370	1







Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	73	57	63	64	67	68	62	59	52
L _{WA} to outlet, [dBA]	74	60	63	65	69	66	67	61	51
L _{WA} to environment, [dBA]	54	43	44	49	50	51	47	42	36

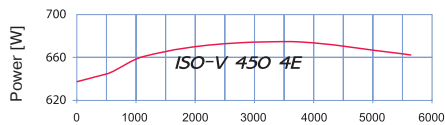
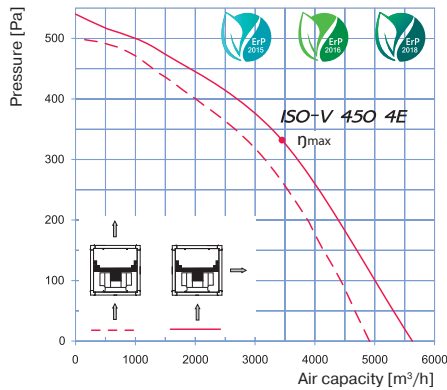
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
44.8	A	Static	58.6	No	0.488	1.22	2425	318	1420	1

3 ~ 400Δ – delta connection										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
41.0	A	Static	56.5	No	0.335	0.56	1789	271	1390	1

3 ~ 400Y – star connection										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
41.0	A	Static	56.5	No	0.335	0.56	1789	271	1390	1

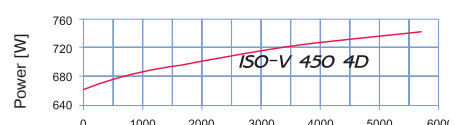
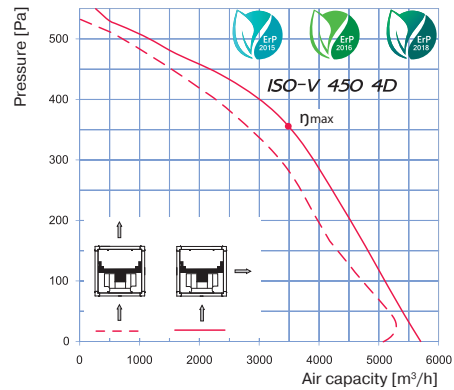
Specifications

Parameters	Iso-V 450 4E 	Iso-V 450 4D 	Iso-V 500 4E 	Iso-V 500 4D 
Voltage [V / 50 / 60 Hz]	1 ~ 230	3 ~ 400	1 ~ 230	3 ~ 400
Power [W]	680	740	1300	1430
Current [A]	3.00	1.50	5.70	3.00
Max. air flow at air flow direction [m ³ /h]:				
– perpendicular air flow	5630	5700	7330	7940
– direct air flow	4930	5080	6680	7200
RPM [min ⁻¹]	1250	1350	1320	1375
Sound pressure level at 3 m distance [dBA]	53	54	55	58
Max. operating temperature [°C]	-40 +70	-40 +80	-20 +50	-40 +80
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



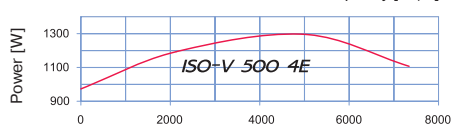
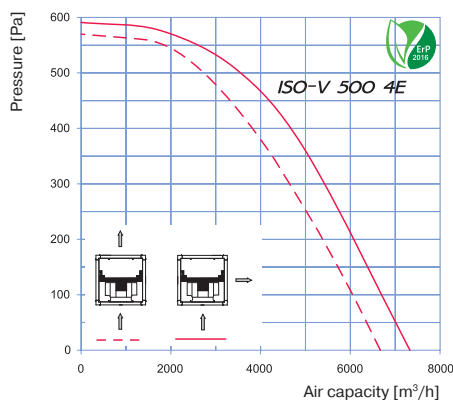
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	76	62	64	67	68	69	66	63	53
L _{WA} to outlet, [dBA]	76	63	66	70	71	69	66	63	57
L _{WA} to environment, [dBA]	57	44	48	52	56	53	50	47	38

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
44.7	A	Static	61.9	No	0.230	0.52	1445	251	1350	1

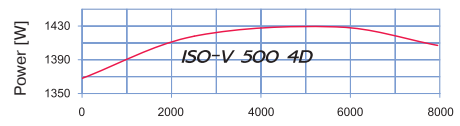
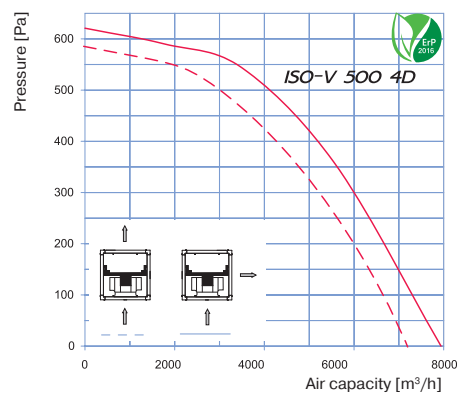


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	76	61	65	67	68	68	66	50	55
L _{WA} to outlet, [dBA]	75	63	67	69	70	72	68	63	54
L _{WA} to environment, [dBA]	61	46	47	52	52	51	51	44	36

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
48.5	A	Static	60.5	No	0.720	1.4	3490	353	1350	1





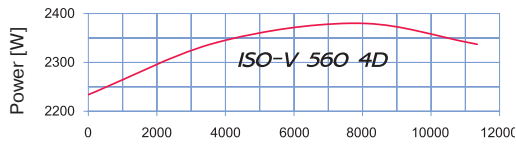
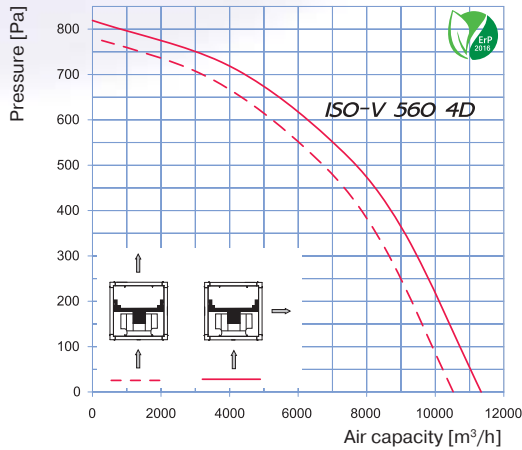
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	81	65	70	73	74	75	69	65	57
L _{WA} to outlet, [dBA]	81	68	72	74	76	75	71	69	61
L _{WA} to environment, [dBA]	65	52	53	56	57	56	55	51	40



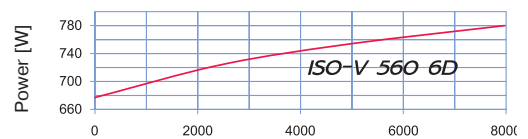
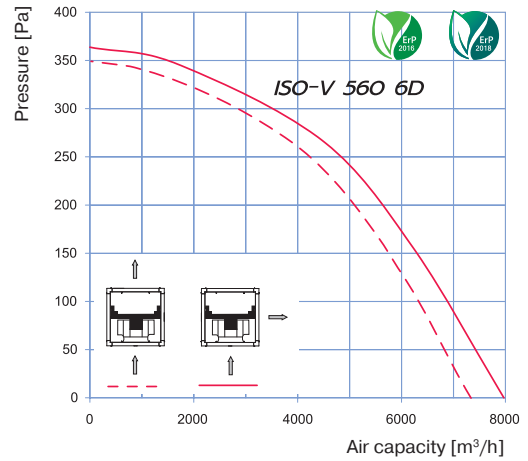
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	77	66	67	71	71	74	71	65	55
L _{WA} to outlet, [dBA]	79	69	67	73	76	74	73	68	59
L _{WA} to environment, [dBA]	61	52	54	54	56	55	54	51	44

Specifications

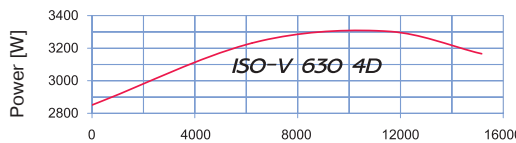
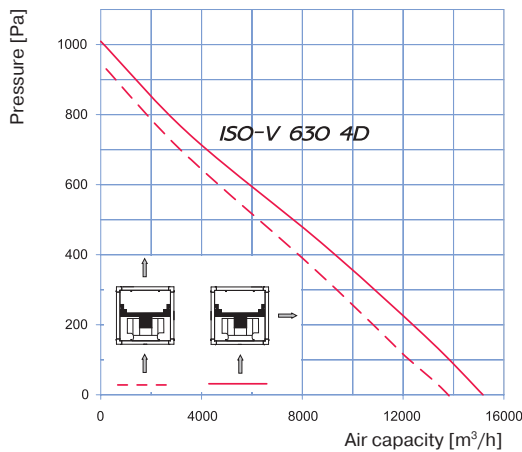
Parameters	Iso-V 560 4D 	Iso-V 560 6D 	Iso-V 630 4D	Iso-V 630 4D max
Voltage [V / 50 / 60 Hz]	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400
Power [W]	2380	780	3310	4250
Current [A]	5.00	1.70	6.20	7.55
Max. air flow at air flow direction [m ³ /h]:				
– perpendicular air flow	11340	7970	15170	16870
– direct air flow	10490	7330	13740	14930
RPM [min ⁻¹]	1365	885	1170	1300
Sound pressure level at 3 m distance [dBA]	56	49	67	69
Max. operating temperature [°C]	-40 +60	-40 +55	-40 +35	-40 +60
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



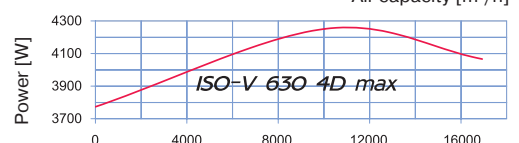
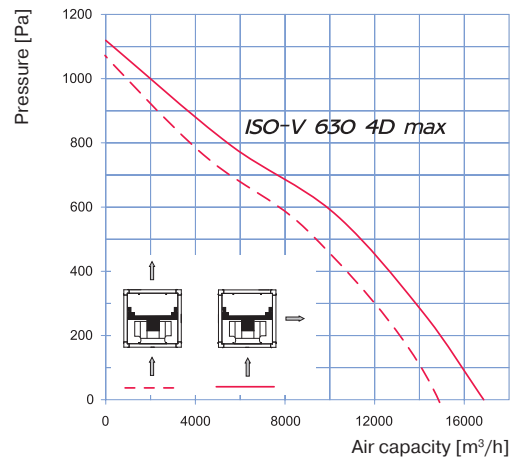
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	80	66	67	73	75	73	69	67	58
L _{WA} to outlet, [dBA]	80	67	71	73	77	74	73	65	61
L _{WA} to environment, [dBA]	63	53	55	59	57	60	53	49	41



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	59	57	64	67	67	62	56	49
L _{WA} to outlet, [dBA]	70	58	61	66	68	65	65	60	51
L _{WA} to environment, [dBA]	56	44	43	48	52	50	46	41	33





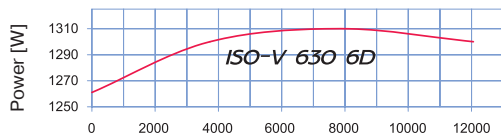
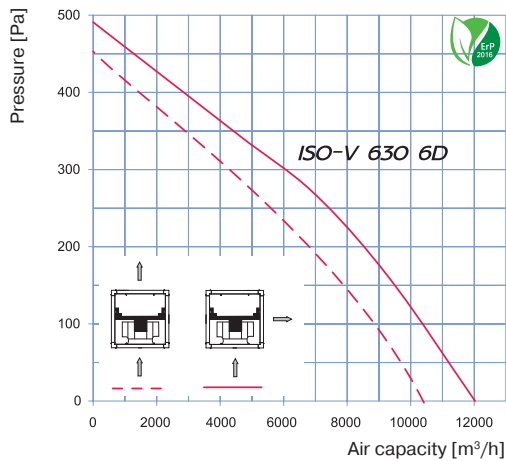
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	85	76	78	80	80	83	78	75	68
L _{WA} to outlet, [dBA]	88	76	76	84	86	82	78	77	67
L _{WA} to environment, [dBA]	76	64	65	67	73	68	69	62	53



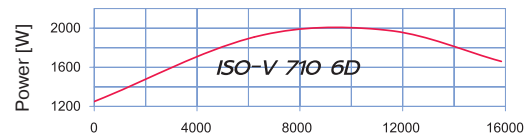
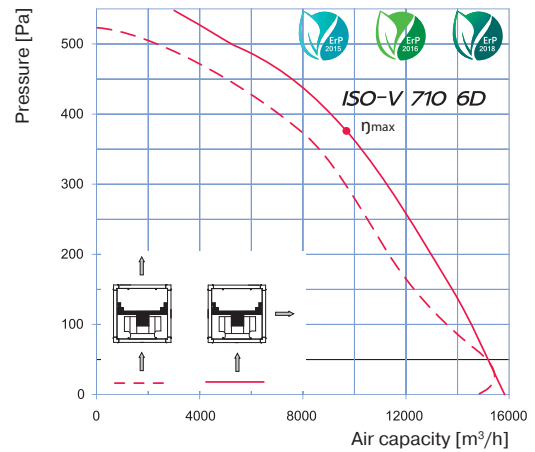
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	85	76	77	81	83	82	77	72	68
L _{WA} to outlet, [dBA]	89	77	78	81	85	84	80	73	68
L _{WA} to environment, [dBA]	78	65	65	70	71	70	69	62	54

Specifications

Parameters	Iso-V 630 6D 	Iso-V 710 6D 
Voltage [V / 50 / 60 Hz]	3 ~ 400	3 ~ 400
Power [W]	1310	2000
Current [A]	2.80	3.90
Max. air flow at air flow direction [m ³ /h]:		
– perpendicular air flow	12030	15830
– direct air flow	10440	14880
RPM [min ⁻¹]	880	890
Sound pressure level at 3 m distance [dBA]	55	59
Max. operating temperature [°C]	-40 +60	-20 +40
Ingress protection rating	IPX4	IPX4



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	74	61	63	70	70	69	64	60	50
L _{wA} to outlet, [dBA]	76	65	64	71	73	69	68	60	54
L _{wA} to environment, [dBA]	61	50	51	53	56	56	52	47	40



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	79	64	66	71	74	72	71	67	58
L _{wA} to outlet, [dBA]	80	67	70	76	74	76	72	67	57
L _{wA} to environment, [dBA]	68	53	58	61	64	62	56	53	47

η _v (%)	MC	EC	N		VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
			60.5	No							
48.5	A	Static	60.5	No	No	0.720	1.4	3490	353	1350	1



Sound-insulated fans with EC motor

Iso-V EC

Air capacity – up to 16740 m³/h



Use

- Supply and exhaust ventilation systems installed in premises with high requirements to the noise level.
- A perfect solution for various ventilation system configurations due to a special transformable casing design.
- Suitable for use as a component of a modular air handling unit.
- For arranging energy-saving and controllable ventilation systems.
- Compatible with Ø 315 up to 630 mm round air ducts or 500x500 up to 800x800 mm rectangular air ducts.

Design

- Casing made of aluminium frame and removable aluzinc thermal and sound-insulated double-skinned sandwich panels.
- Casing internally filled with 20 mm non-flammable mineral wool.
- Position of the removable panels can be adjusted to inline air flow or 90° angle air flow.
- Due to corrosion-resistant and thermally insulated casing the fan is suitable for external use.
- The fan is compatible with square to square vibration absorbing connectors (**AKV** series) or square to round connector-reducers (**ARV** series), both available upon separate order.
- The round spigot of the **ARV** connector-reducer is rubber sealed for air tight connection.

Motor

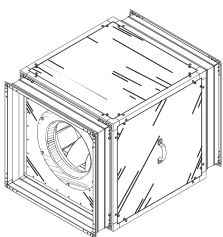
- High-efficient direct current EC motor with external rotor and backward curved blades.
- EC technologies meet the latest requirements to arrange high-efficient energy saving ventilation.
- Equipped with ball bearings for longer service life.
- Overheating protection by built-in thermal switches with automatic restart.
- Dynamically balanced turbine.

Operation and speed control

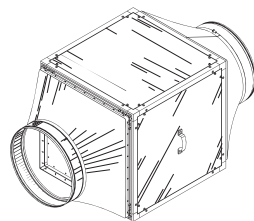
- The fan is controlled with a 0-10 V external control signal, e.g. CDTE/0-10 speed controller for EC motors.
- The fan capacity is regulated by various parameters, including temperature level, pressure, smoke, etc.
- EC motor changes its rotation speed synchronously with the fluctuation of the control parameter to ensure the best suitable air flow.
- The fan is compatible with 50 and 60 Hz power mains with the same maximum speed.
- The parameters may be set and controlled due to data exchange between a PC and the fan.
- The fans can be integrated into a unified decentralized computerized network to adjust ventilation system with respect to specific user's demands.

Mounting

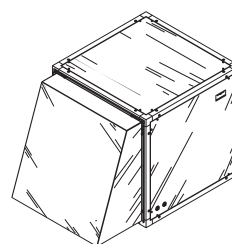
- Compatible both with square and round air ducts.
- Connection to air ducts through flexible vibration absorbing connectors or connector-reducers of a matching section.
- External terminal box for connection to power mains.
- Mounting in any position in compliance with the air flow direction. Maintenance space must be provided.
- In case of outdoor mounting the fan may be equipped with the upper protecting cover (**RSD-IV** series) or the outer hood (**AH-IV** series) to be installed at air inlet/outlet.



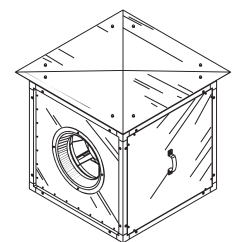
Iso-V EC fan with vibration-absorbing flexible connectors **AKV** series



Iso-V EC fan with connecting reducers **ARV** series



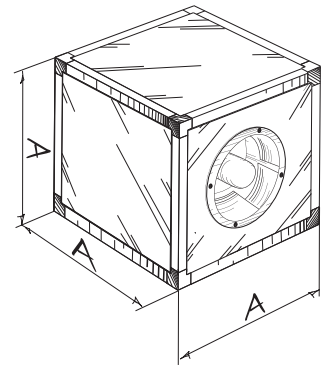
Iso-V EC fans with **AH-IV** outer hood



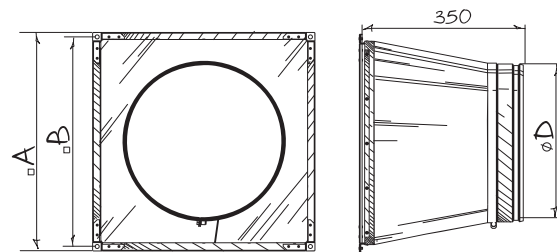
Iso-V EC fans with **RSD-IV** protecting cover

Fan and accessories overall dimensions

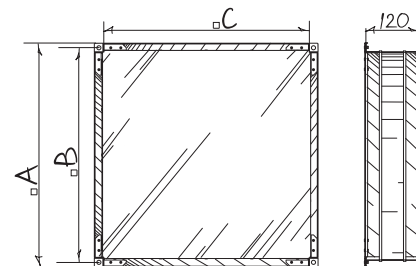
Type	Dimen- sions [mm]	Weight [kg]	Options			
	A		ARV connector- reducer	AKV vibration absorbing connector	RSD-IV protecting cover	AH-IV outer hood
Iso-V EC 315	500	25	ARV 315	AKV 500	RSD-IV 315-355	AH-IV 315-355
Iso-V EC 355	500	25	ARV 355			
Iso-V EC 400	670	39	ARV 400	AKV 670	RSD-IV 400-500	AH-IV 400-500
Iso-V EC 450	670	39	ARV 450			
Iso-V EC 500	670	43	ARV 500			
Iso-V EC 560	670	43	ARV 560	AKV 800	RSD-IV 560-630	AH-IV 560-630
Iso-V EC 630	670	52	ARV 630			


Iso-V EC

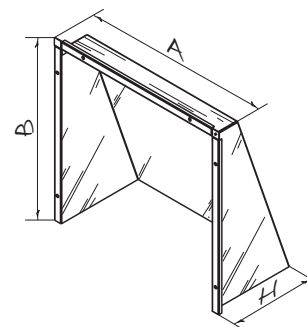
Type	Dimensions [mm]		
	A	B	∅D
ARV 315	490	470	315
ARV 355	490	470	355
ARV 400	660	640	400
ARV 450			450
ARV 500			500
ARV 560	790	770	560
ARV 630			630


ARV

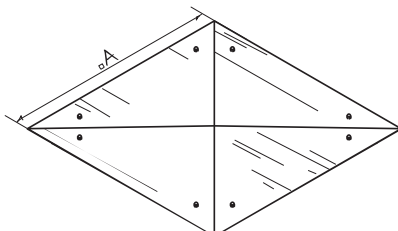
Type	Dimensions [mm]		
	A	B	C
AKV 500	490	470	445
AKV 670	660	640	615
AKV 800	790	770	745


AKV

Type	Dimensions [mm]			Weight [kg]
	A	B	H	
AH-IV 315-355	478	458	225	3.2
AH-IV 400-500	648	628	321	6
AH-IV 560-630	778	758	421	9.1


AH-IV

Type	Dimensions [mm]	Weight [kg]
	A	
RSD-IV 315-355	600	2.3
RSD-IV 400-500	770	4.65
RSD-IV 560-630	900	7.65

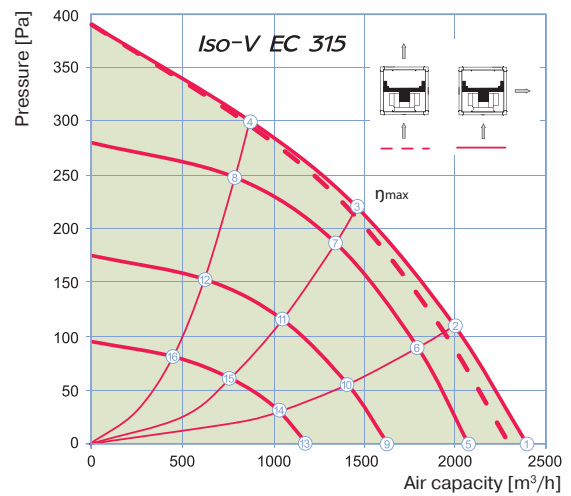

RSD-IV

ErP data	
Overall efficiency	η , (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Specifications

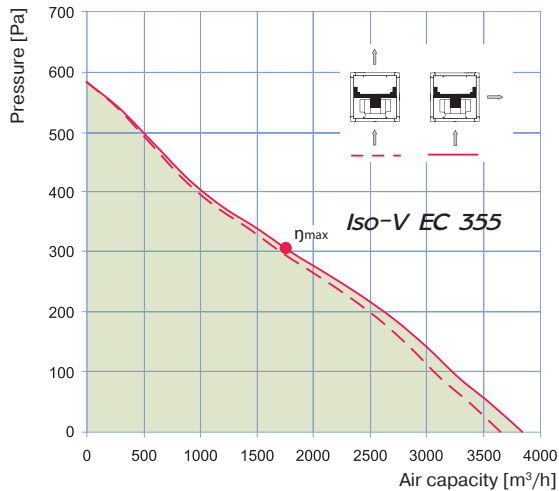
Parameters	Iso-V EC 315	Iso-V EC 355	Iso-V EC 400	Iso-V EC 450
Voltage [V / 50 / 60 Hz]	1 ~ 230			
Power [W]	150	250	500	750
Current [A]	1.23	1.1	2.2	3.3
Max. air flow at air flow direction [m ³ /h]:				
– perpendicular air flow	2370	3830	5660	6800
– direct air flow	2252	3639	5377	6460
RPM [min ⁻¹]	1600	1450	1500	1440
Sound pressure level at 3 m distance [dBA]	35	44	39	50
Max. operating temperature [°C]	-40 +80	-25 +60	-25 +50	-25 +60
Ingress protection rating	IPX4	IPX4	IPX4	IPX4

Point	Power [W]		
	Iso-V EC 315	Iso-V EC 450	Iso-V EC 630
1	115	574	1779
2	137	750	2509
3	150	750	2750
4	137	750	2651
5	77	337	1060
6	102	458	1495
7	118	557	1648
8	102	502	1584
9	37	178	581
10	50	242	819
11	57	294	902
12	50	265	868
13	14	79	273
14	19	107	385
15	22	130	425
16	19	117	408



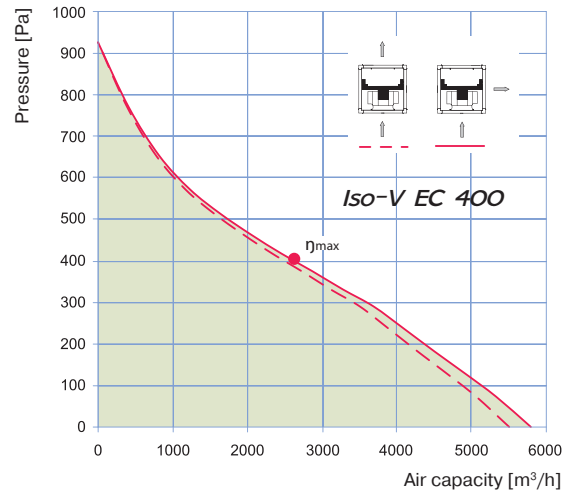
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	69	37	64	58	64	62	57	56	48
L _{wA} to outlet, [dBA]	73	49	71	62	65	65	60	56	47
L _{wA} to environment, [dBA]	56	29	52	46	49	49	45	34	27

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
61.3	A	Static	80.5	Yes	0.150	1.23	1455	223	1600	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	76	44	65	66	71	67	69	67	58
L _{wA} to outlet, [dBA]	77	44	70	67	71	71	70	67	59
L _{wA} to environment, [dBA]	64	61	54	53	55	52	54	51	36

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
59.4	A	Static	76.3	Yes	0.250	0.94	1680	312	1450	1

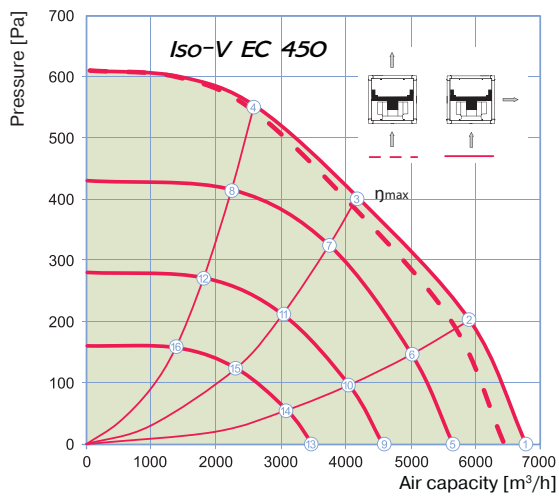


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	71	42	61	62	66	66	63	60	51
L _{wA} to outlet, [dBA]	75	50	68	64	68	69	66	61	53
L _{wA} to environment, [dBA]	60	32	52	53	49	55	52	44	31

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
58.4	A	Static	72.1	Yes	0.500	2.2	2558	403	1500	1

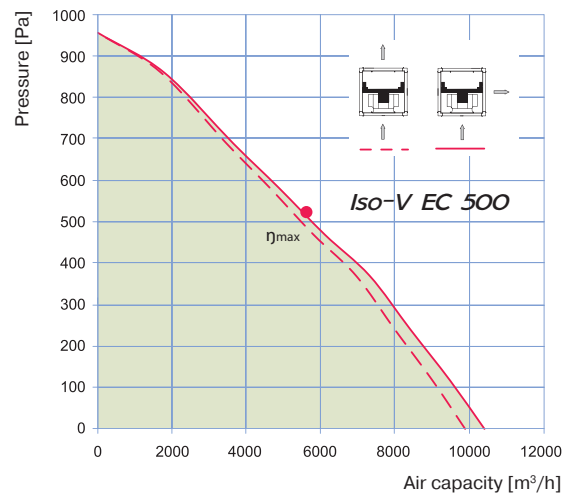
Specifications

Parameters	Iso-V EC 500	Iso-V EC 560	Iso-V EC 630
Voltage [V / 50 / 60 Hz]	3 ~ 400		
Power [W]	1320	2360	2750
Current [A]	2.1	3.65	4.3
Max. air flow at air flow direction [m ³ /h]:			
– perpendicular air flow	10450	13600	16740
– direct air flow	9928	12920	15903
RPM [min ⁻¹]	1350	1540	1300
Sound pressure level at 3 m distance [dBA]	45	50	50
Max. operating temperature [°C]	-25 +50	-25 +60	-25 +55
Ingress protection rating	IPX4	IPX4	IPX4



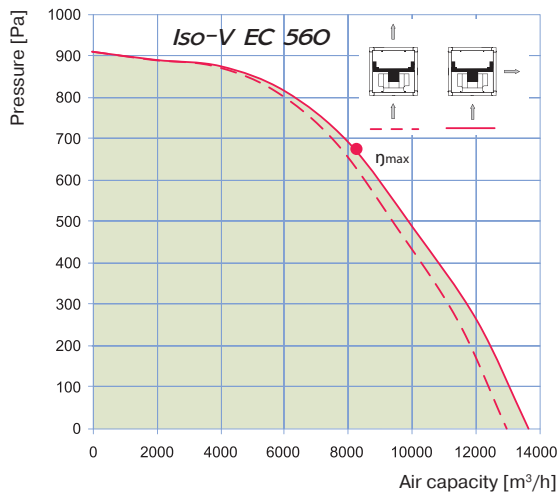
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	79	48	70	71	73	72	70	65	62
L _{WA} to outlet, [dBA]	83	70	76	72	76	78	75	69	64
L _{WA} to environment, [dBA]	71	33	68	63	61	61	58	53	44

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
64.2	A	Static	76	Yes	0.750	3.3	4195	405	1440	1



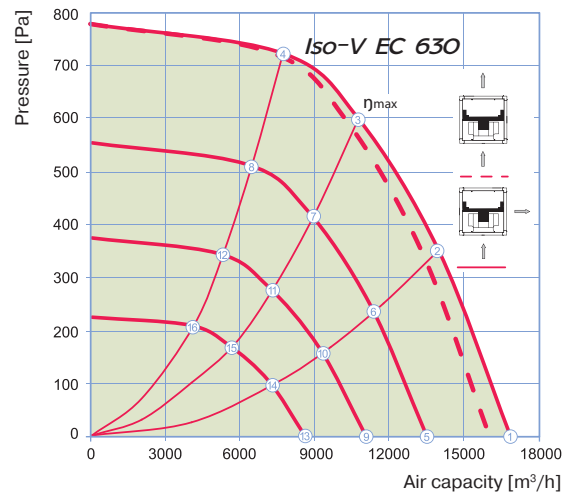
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	78	49	71	69	73	70	70	66	61
L _{WA} to outlet, [dBA]	81	51	70	71	76	75	72	68	64
L _{WA} to environment, [dBA]	66	36	54	62	60	57	57	52	40

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
54.2	A	Static	63.4	Yes	1.320	2.1	4723	534	1350	1



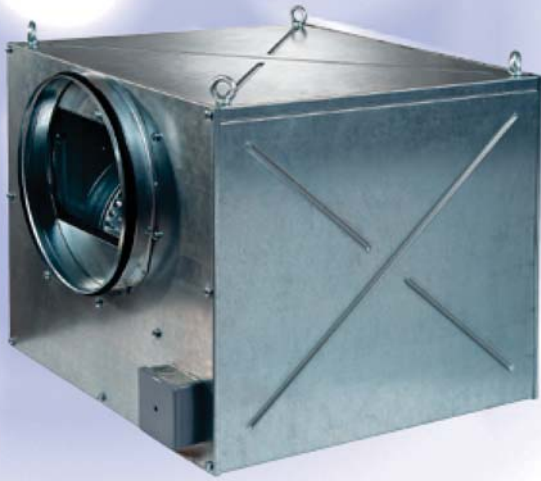
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	82	52	72	77	74	77	73	68	64
L _{WA} to outlet, [dBA]	78	58	70	71	72	72	67	65	59
L _{WA} to environment, [dBA]	71	41	67	63	63	61	60	50	40

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
67.8	A	Static	74.4	Yes	2.360	3.65	8250	684	1540	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	82	52	72	77	74	77	73	68	64
L _{WA} to outlet, [dBA]	78	58	70	71	72	72	67	65	59
L _{WA} to environment, [dBA]	71	41	67	63	63	61	60	50	40

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
67.2	A	Static	73.1	Yes	2.750	4.3	10850	601	1300	1



Sound-insulated centrifugal fans

Iso-ZS

Air capacity – up to 3930 m³/h



Use

- Supply and exhaust ventilation systems installed in premises with high requirements to the noise level.
- Compatible with Ø 250 or 315 mm round air ducts.

Design

- Galvanized steel casing internally filled with 30 mm thermal- and sound-insulating layer made of non-flammable foamed polyurethane.
- Connecting spigots are equipped with rubber seals.
- External terminal block for power supply.
- Lifting lugs facilitate hanging and transportation operations.
- Modifications with two Ø 250 mm suction spigots are available specifically for multi-port ventilation solutions (**Iso-ZS 315/2x250**).



Motor

- Four- or six-pole asynchronous motor with external rotor and double intake centrifugal impeller with forward curved blades.
- The motor is installed on specially designed vibration-damping mounts to absorb vibration and noise.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.

Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- Mounted with round air ducts.
- Suitable for installation in any mounting position with respect to air flow direction in the system, fixed with supports or brackets.
- Suspended to ceiling with mounting lugs.
- Flexible air ducts are fixed on fan spigots with clamps.

Modifications and options

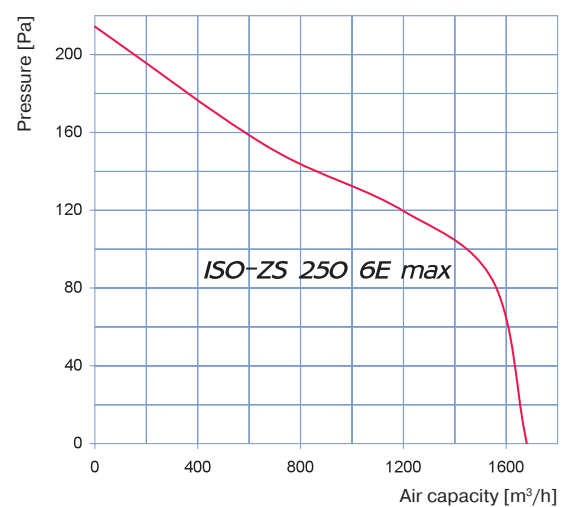
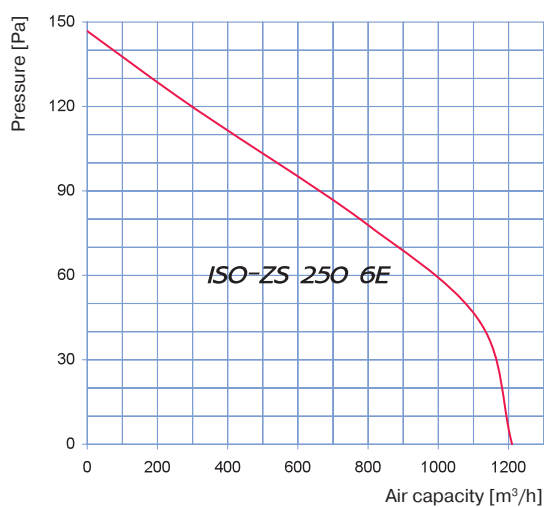
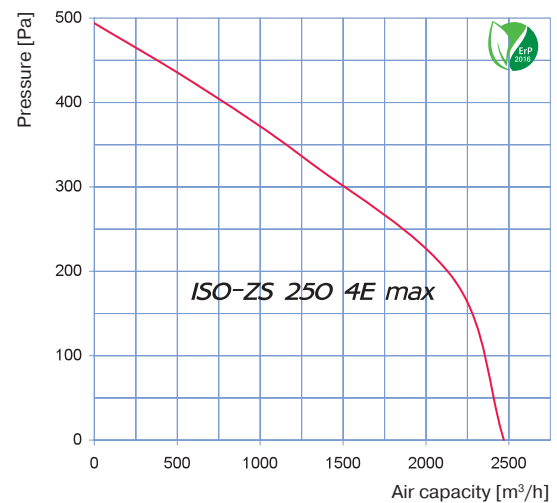
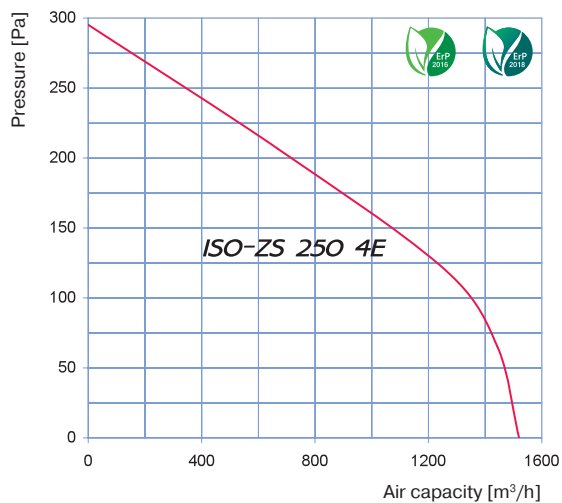
- G** – temperature and speed controller with external temperature sensor fixed on 4 m cable.
 - GI** – temperature and speed controller with a sensor built into the fan casing.
- G and GI options are used for automatic speed control depending on indoor temperature. The best ventilation solution for the premises requiring permanent temperature control as greenhouses, orangeries, etc.



- W** – the fan is equipped with a power cord and a socket or plug (**W1**).
- max** – high-powered motor.

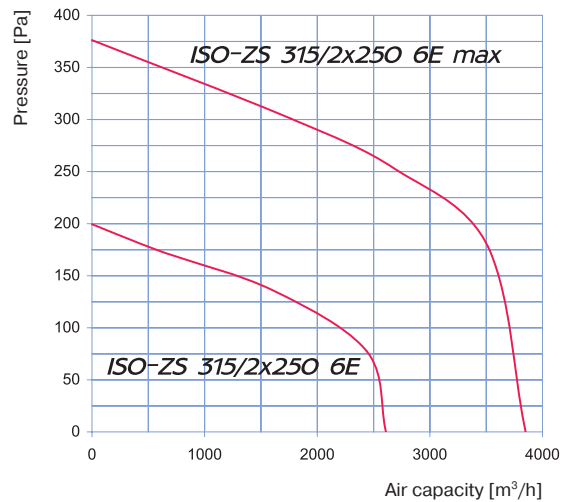
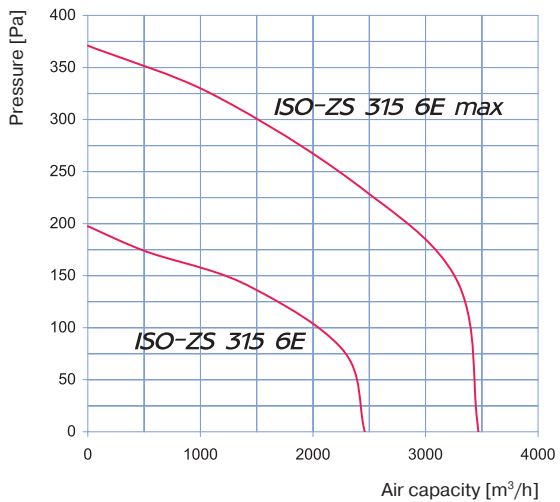
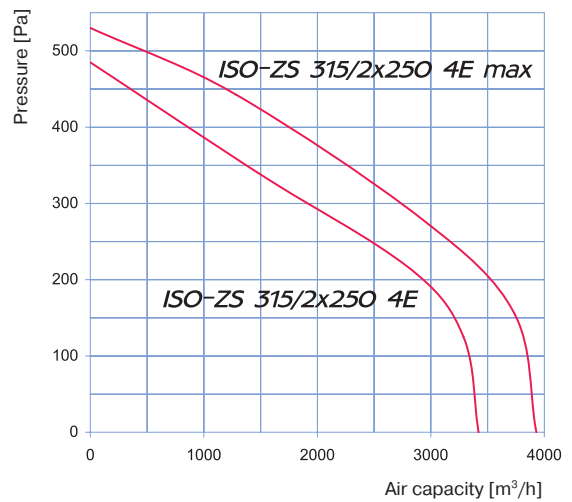
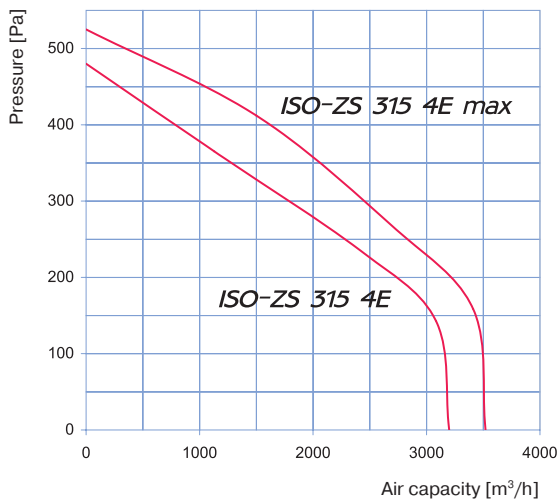
■ Specifications

Parameters	Iso-ZS 250 4E 	Iso-ZS 250 4E max 	Iso-ZS 250 6E	Iso-ZS 250 6E max
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	243	617	120	311
Current [A]	1.06	2.69	0.55	1.36
Maximum air capacity [m ³ /h]	1520	2470	1210	1680
RPM [min ⁻¹]	1320	1465	860	940
Sound pressure level at 3 m distance [dBA]	44	46	40	41
Max. operating temperature [°C]	-20...+50	-20...+50	-20...+50	-20...+50
SEC class	-	-	C	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



Specifications

Parameters	Iso-ZS 315 4E	Iso-ZS 315 4E max	Iso-ZS 315/2x250 4E	Iso-ZS 315/2x250 4E max
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	723	931	764	1066
Current [A]	3.15	4.18	3.36	4.78
Maximum air capacity [m ³ /h]	3200	3520	3420	3930
RPM [min ⁻¹]	1350	1430	1390	1455
Sound pressure level at 3 m distance [dBA]	45	47	45	47
Max. operating temperature [°C]	-20...+50	-20...+50	-20...+50	-20...+50
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



Specifications

Parameters	Iso-ZS 315 6E	Iso-ZS 315 6E max	Iso-ZS 315/2x250 6E	Iso-ZS 315/2x250 6E max
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	402	800	427	953
Current [A]	2.04	4.59	2.13	5.06
Maximum air capacity [m ³ /h]	2460	3470	2610	3850
RPM [min ⁻¹]	920	960	955	970
Sound pressure level at 3 m distance [dBA]	42	43	42	43
Max. operating temperature [°C]	-20...+50	-20...+50	-20...+50	-20...+50
Ingress protection rating	IPX4	IPX4	IPX4	IPX4

Overall dimensions

Type	Dimensions [mm]											Weight [kg]	Figure №
	∅D	∅d	B	B1	H	H1	H2	H4	L	L1	L2		
Iso-ZS 250 4E	248	20	453	400	433	298	216	470	568	470	400	30	1
Iso-ZS 250 6E	248	20	453	400	433	298	216	470	568	470	400	30	1
Iso-ZS 250 4E max	248	20	503	450	483	340	241	520	638	540	470	31.3	1
Iso-ZS 250 6E max	248	20	503	450	483	340	241	520	638	540	470	31.3	1
Iso-ZS 315 4E	313	20	600	550	500	340	251	537	680	580	510	33	1
Iso-ZS 315 6E	313	20	600	550	500	340	251	537	680	580	510	31	1
Iso-ZS 315 4E max	313	20	650	610	530	367	266	567	735	635	570	38	1
Iso-ZS 315 6E max	313	25	670	620	610	450	306	658	825	725	660	45	1

Type	Dimensions [mm]															Weight [kg]	Figure №
	∅D	∅D1	∅d	B	B1	B2	B3	H	H1	H2	H3	H4	L	L1	L2		
Iso-ZS 315/2x250 4E	313	248	20	600	550	171	431	500	340	176	326	537	680	580	510	33	2
Iso-ZS 315/2x250 6E	313	248	20	600	550	171	431	500	340	176	326	537	680	580	510	31	2
Iso-ZS 315/2x250 4E max	313	248	20	650	610	188	465	530	367	186	346	567	735	635	570	38	2
Iso-ZS 315/2x250 6E max	313	248	25	670	620	216	457	610	450	186	427	658	825	725	660	45	2

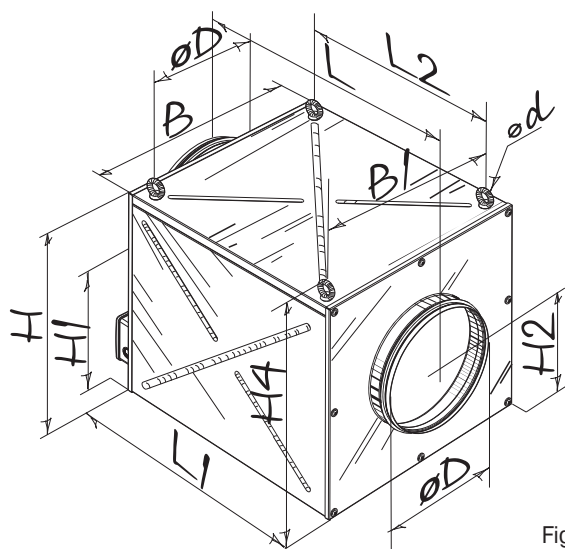


Fig.1

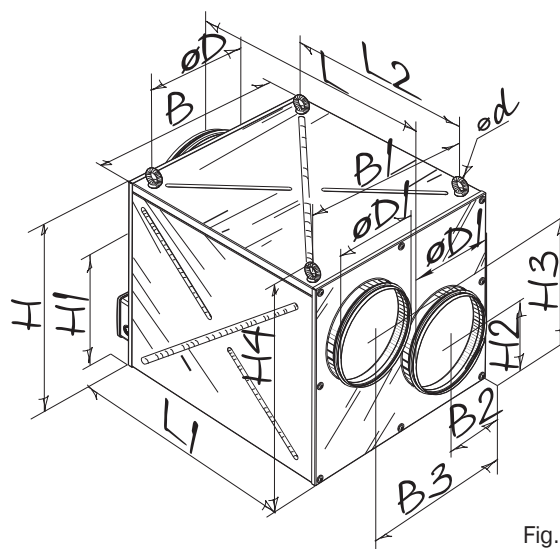


Fig.2



Sound-insulated fans

Iso-K

Air capacity – up to 3500 m³/h

Use

- Hot and highly polluted air extract up to 100 °C in high resistance condition.
- Extract systems installed in kitchens of various types.
- Ventilation for baking halls.
- Welding gas extract.
- The fans is available for round air ducts Ø 150, 160, 200 and 315 mm.

Design

- Galvanized steel casing internally filled with 50 mm thermal- and sound-insulating layer made of non-flammable mineral wool.
- The fan casing is installed on a supporting mounting frame with integrated vibration isolators.
- The swivel motor-impeller block is attached to the swivel door which facilitates the fan servicing.

Motor

- Single- or three-speed motor with with short circuit rotor and centrifugal impeller with forward curved blades.
- Galvanized steel impeller.
- Equipped with ball bearings for longer service life.
- Dynamically balanced turbine.

- F class motor winding insulation and IP54 ingress protection rating.
- Overheating protection by built-in thermal switches with leads for connection to external protection devices.

Operation and speed control

- Smooth or step-up speed control with an auto transformer or frequency inverter. Both available upon separate order).

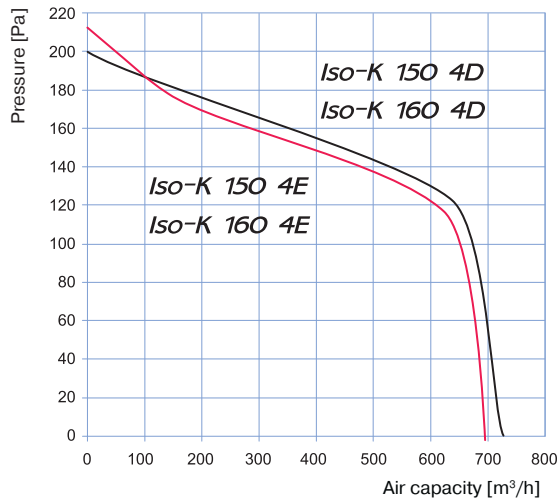
Mounting

- Compatible with round air ducts. The spigot diameter matches the standard air duct sizes.
- Mounting to the wall with the mounting angle bracket **KS-ISK**. Available upon separate order.
- External terminal box on the motor for connection to power mains.

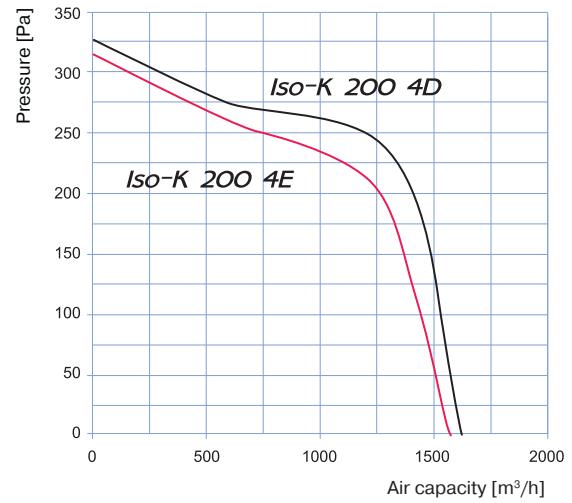
Specifications

Parameters	Iso-K 150 4E / Iso-K 160 4E	Iso-K 150 4D / Iso-K 160 4D	Iso-K 200 4E	Iso-K 200 4D	Iso-K 250 4E	Iso-K 250 4D
Voltage [V / 50 Hz]	1 ~ 230	3 ~ 380	1 ~ 230	3 ~ 380	1 ~ 230	3 ~ 380
Power [W]	180	180	550	750	1500	1500
Current [A]	1.7	0.6	3	2	11	3.4
Maximum air capacity [m ³ /h]	700	730	1600	1650	3400	3500
RPM [min ⁻¹]	1450	1455	1475	1465	1500	1470
Sound pressure level at 3 m distance [dBA]	41	41	45	45	51	51
Max. operating temperature [°C]	-20...+100	-20...+100	-20...+100	-20...+100	-20...+100	-20...+100
Ingress protection rating	IP54	IP54	IP54	IP54	IP54	IP54

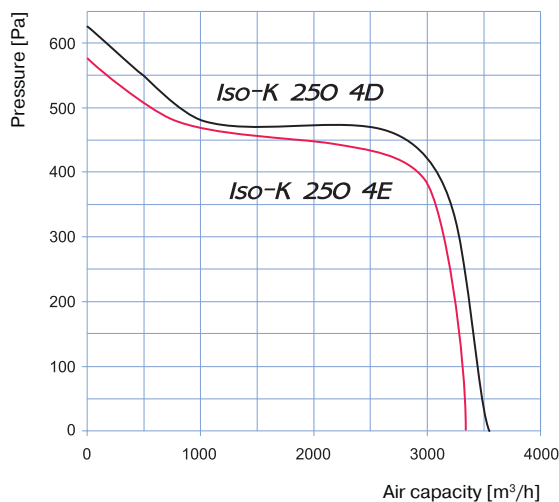
Specifications



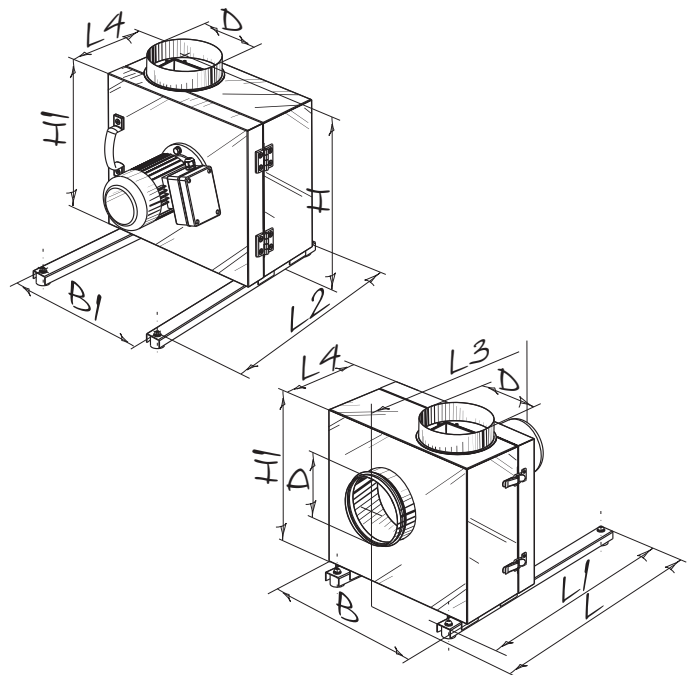
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Iso-K 150 4E / Iso-K 160 4E, Iso-K 150 4D / Iso-K 160 4D									
L_{WA} to inlet, [dBA]	76	68	70	72	62	59	63	57	61
L_{WA} to outlet, [dBA]	77	73	77	79	70	66	67	60	53
L_{WA} to environment, [dBA]	57	51	56	57	50	49	48	40	33



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Iso-K 200 4E, Iso-K 200 4D									
L_{WA} to inlet, [dBA]	79	71	75	75	66	62	65	58	64
L_{WA} to outlet, [dBA]	82	78	78	81	74	68	69	64	56
L_{WA} to environment, [dBA]	59	53	60	58	54	50	51	42	36



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Iso-K 250 4E, Iso-K 250 4D									
L_{WA} to inlet, [dBA]	82	75	79	80	71	65	68	63	65
L_{WA} to outlet, [dBA]	85	79	80	82	79	71	70	65	61
L_{WA} to environment, [dBA]	63	55	63	61	57	53	53	45	41



Overall dimensions

Type	Dimensions [mm]										Weight [kg]
	∅D	B	B1	H	H1	L	L1	L2	L3	L4	
Iso-K 150 4E	150	410	330	540	365	525	500	470	475	205	17.0
Iso-K 150 4D	150	410	330	540	365	525	500	470	475	205	17.0
Iso-K 160 4E	160	410	330	540	365	525	500	470	475	205	17.0
Iso-K 160 4D	160	410	330	540	365	525	500	470	475	205	17.0
Iso-K 200 4E	200	485	365	600	425	625	600	570	515	235	25.0
Iso-K 200 4D	200	485	365	600	425	625	600	570	515	235	25.0
Iso-K 250 4E	250	575	435	665	505	700	675	645	620	285	40.0
Iso-K 250 4D	250	575	435	665	505	700	675	645	620	285	40.0



Centrifugal fans

Helix

Air capacity – up to 2000 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- Suitable for use as ventilation or air conditioning system components.
- Compatible with round and rectangular air ducts.

Design

- Compact scroll casing is made of steel and is covered with a special polymer coating.
- The fan is equipped with a round intake flange and exhaust rectangular flange for connection to respective air ducts.
- External terminal block for power supply.
- The fans are equipped with fixing brackets to facilitate fastening at any level surface.

Motor

- Two- or four-pole asynchronous motor with external rotor and centrifugal impeller with forward curved blades.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.
- Dynamically balanced turbine.

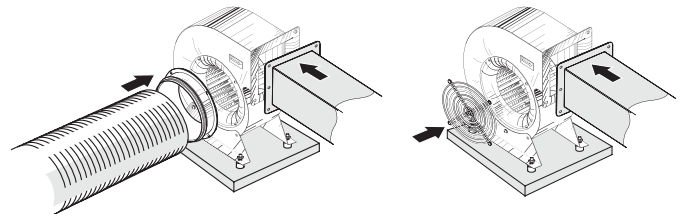
Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- The fan is designed for installation as a single unit or as a component unit of ventilation chambers or air conditioning units.
- The fan has a connection possibility for two air ducts, a rectangular discharge air duct through the flange on the casing as well as a round intake air duct through the connecting flange **FRZ-H**. Available upon separate order.

- In case of rectangular discharge air duct connection a discharge vent must be covered with the **SG-H** grille to protect the fan from foreign object ingress. Available upon separate order.



- The vibration isolators, either of rubber type **SI-G** are recommended for noise and vibration attenuation. Vibration isolators reduce dynamic loads on the fan, enhance reliability and durability of the ventilation equipment. The vibration isolators are attached through holes in the mounting pad. Available upon separate order.



SI-G

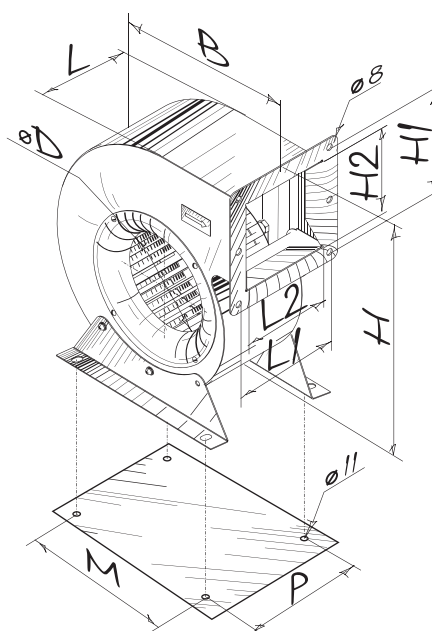
- Power is supplied to the fan through an external terminal box with sealed electric lead-in.

Selection table for accessories:

Type	Rubber anti-vibration mounts	Flange	Grille
Helix 140x60 2E	SI-G 8	FRZ-H 140	SG-H 140
Helix 160x62 2E		FRZ-H 160	SG-H 160
Helix 160x90 2E		FRZ-H 180	SG-H 180
Helix 180x92 4E		FRZ-H 200	SG-H 200
Helix 200x80 4E		SI-G 16	FRZ-H 225
Helix 200x102 4E	FRZ-H 250		SG-H 250
Helix 225x102 4E			
Helix 250x102 4E			
Helix 250x140 4E			

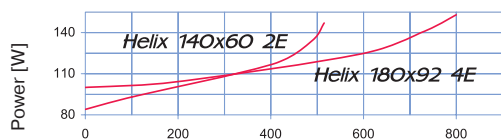
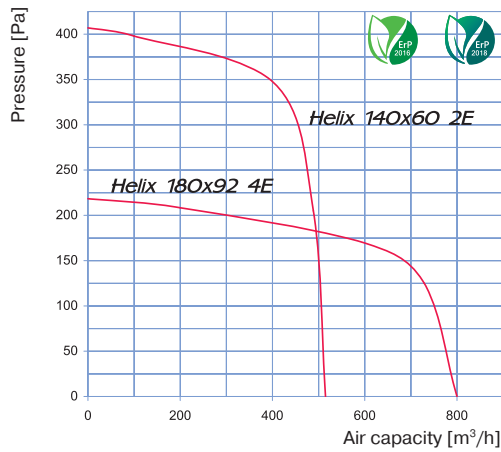
Overall dimensions

Type	Dimensions [mm]										Weight [kg]
	∅D	B	H	H1	H2	L	L1	L2	P	M	
Helix 140x60 2E	140	243	287	125	93	85	107	75	–	–	3.2
Helix 160x62 2E	160	277	324	136	106	89	112	82	–	–	4.2
Helix 160x90 2E	160	277	324	136	106	136	158	127	–	–	5.1
Helix 180x92 4E	180	311	360	150	120	145	166	137	–	–	6.5
Helix 200x80 4E	200	335	398	165	134	121	140	113	–	–	6.8
Helix 200x102 4E	200	335	398	165	134	157	175	148	–	–	7.3
Helix 225x102 4E	225	365	441	210	171	145	170	137	178	250	11.2
Helix 250x102 4E	250	410	485	230	191	165	190	157	198	270	16.3
Helix 250x140 4E	250	410	485	230	191	205	230	197	238	270	15.5

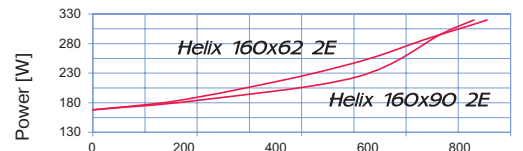
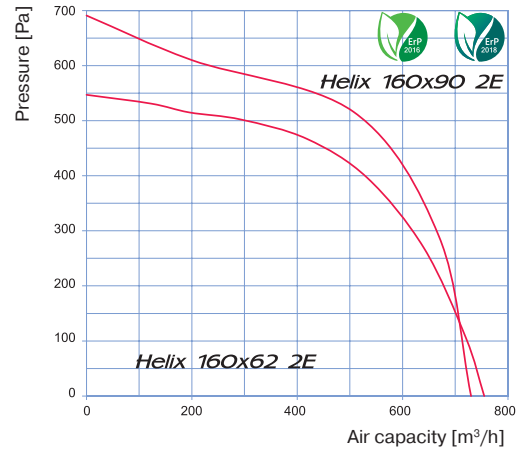


Specifications

Parameters	Helix 140x60 2E	Helix 160x62 2E	Helix 160x90 2E	Helix 180x92 4E	Helix 200x80 4E	Helix 200x102 4E	Helix 225x102 4E	Helix 250x102 4E	Helix 250x140 4E
Voltage [V / 50 Hz]	230	230	230	230	230	230	230	230	230
Power [W]	148	320	320	160	125	280	395	810	570
Current [A]	0.64	1.48	1.48	0.7	0.55	1.25	1.98	3.65	2.48
Maximum air capacity [m ³ /h]	515	755	730	800	730	1350	1480	2000	2000
RPM [min ⁻¹]	2820	2630	2745	1465	1430	1475	1330	1330	1310
Sound pressure level at 3 m distance [dBA]	68	70	70	62	63	65	69	63	60
Max. operating temperature [°C]	-25 +45	-25 +50	-25 +45	-25 +45	-25 +45	-25 +40	-40 +70	-40 +70	-40 +70
SEC class	C			B		-	-	-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

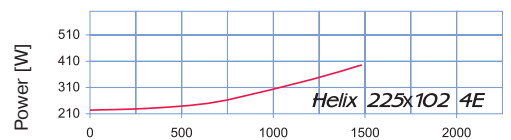
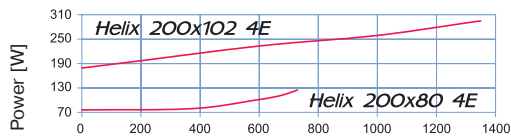
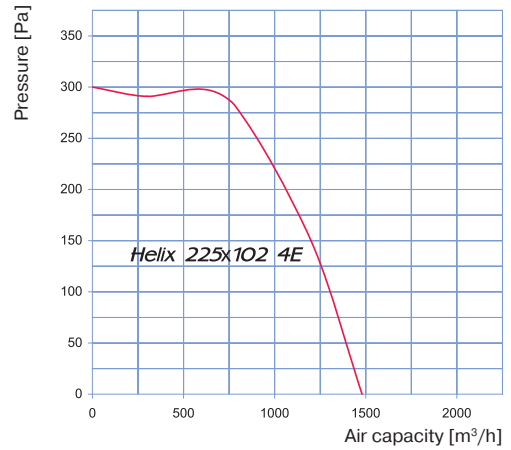
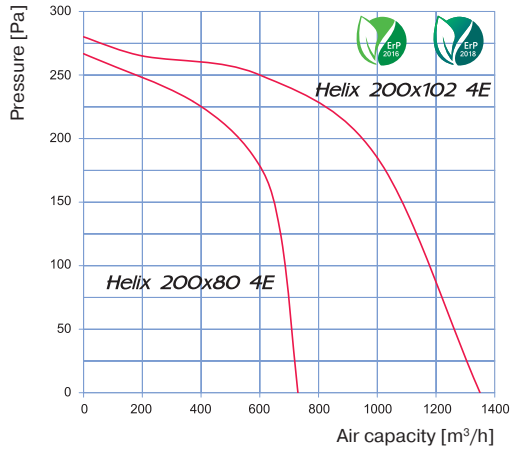


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Helix 140x60 2E									
L _{WA} to inlet, [dBA]	60	44	51	50	37	33	31	27	17
L _{WA} to outlet, [dBA]	58	45	53	44	43	38	31	26	19
L _{WA} to environment, [dBA]	50	41	48	44	35	31	24	20	15
Helix 180x92 4E									
L _{WA} to inlet, [dBA]	56	43	54	52	38	34	30	29	17
L _{WA} to outlet, [dBA]	56	46	55	45	42	35	30	27	21
L _{WA} to environment, [dBA]	52	39	47	46	35	28	24	18	17



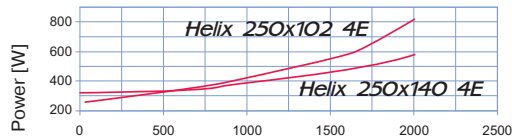
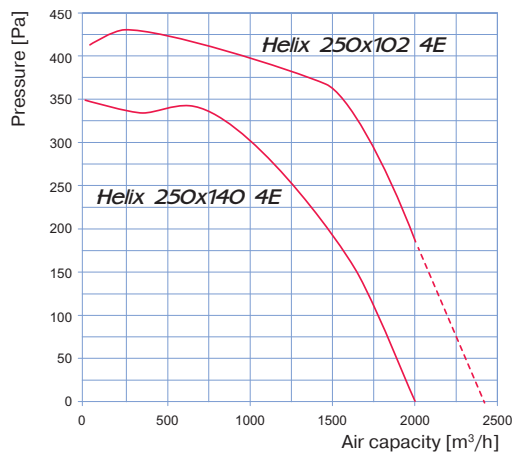
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Helix 160x90 2E									
L _{WA} to inlet, [dBA]	58	41	55	53	40	33	33	25	21
L _{WA} to outlet, [dBA]	57	45	56	46	43	36	30	26	21
L _{WA} to environment, [dBA]	51	39	48	45	36	32	25	20	17
Helix 160x62 2E									
L _{WA} to inlet, [dBA]	57	42	54	54	38	34	31	28	21
L _{WA} to outlet, [dBA]	57	46	57	45	42	38	31	26	20
L _{WA} to environment, [dBA]	49	37	48	42	33	29	25	19	16

Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Helix 200x102 4E									
L _{WA} to inlet, [dBA]	41	37	38	37	30	26	19	17	14
L _{WA} to outlet, [dBA]	42	40	41	36	36	25	16	17	18
L _{WA} to environment, [dBA]	37	32	35	29	26	20	16	11	11
Helix 200x80 4E									
L _{WA} to inlet, [dBA]	41	38	39	34	31	29	20	18	13
L _{WA} to outlet, [dBA]	44	40	40	36	34	25	20	16	17
L _{WA} to environment, [dBA]	37	33	37	30	25	21	16	13	13

Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	39	37	38	38	31	28	21	17	15
L _{WA} to outlet, [dBA]	44	37	41	38	34	27	16	17	19
L _{WA} to environment, [dBA]	37	31	33	31	25	20	17	13	11



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Helix 250x140 4E									
L _{WA} to inlet, [dBA]	44	44	42	36	31	22	29	21	19
L _{WA} to outlet, [dBA]	46	37	42	38	29	28	29	23	21
L _{WA} to environment, [dBA]	40	34	37	31	27	21	24	17	14
Helix 250x102 4E									
L _{WA} to inlet, [dBA]	48	45	43	35	34	27	28	25	22
L _{WA} to outlet, [dBA]	47	41	43	35	30	29	32	24	23
L _{WA} to environment, [dBA]	45	36	39	33	31	25	26	21	18



Centrifugal fans

S-Vent

Air capacity – up to 19 000 m³/h

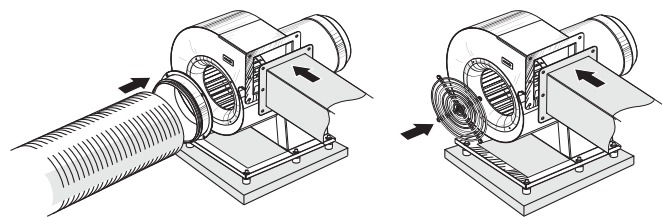


Use

- ❑ Exhaust ventilation systems installed in various premises.
- ❑ Suitable for use as a component of an assembled air handling or conditioning unit.
- ❑ Compatible with Ø 140 up to 500 mm round air ducts or 125x125 up to 800x800 mm rectangular air ducts.

Design

- ❑ Scroll casing is made of steel and is covered with a special polymer coating.
- ❑ The fan is equipped with a round intake flange and exhaust rectangular flange for connection to respective air ducts.
- ❑ The fan casing design provides several impeller rotating positions rightwards (R) or leftwards (L) with 45° angle pitch.
- ❑ The casing includes mounting brackets with a mount pad for to facilitate the fan installation to an even surface.



Motor

- ❑ 2-, 4-, 6- or 8-pole three-phase asynchronous motor with centrifugal impeller and forward curved blades.
- ❑ Galvanized steel impeller.
- ❑ Equipped with ball bearings for longer service life.
- ❑ Dynamically balanced turbine.
- ❑ IP54 ingress protection rating.



SI-G



SI-F

Speed control

- ❑ Smooth or step-up speed control with an external auto transformer or frequency inverter (both available upon separate order).

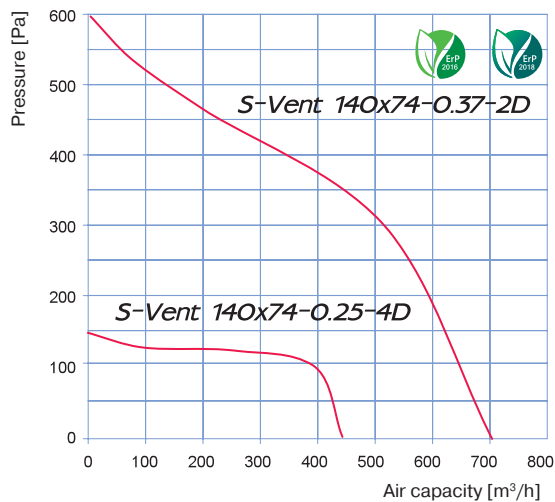
Mounting

- ❑ The fan is designed for installation as a single unit or as a component unit of ventilation chambers or air conditioning units.
- ❑ The fan has a connection possibility for two air ducts, a rectangular discharge air duct through the flange on the casing as well as a round intake air duct through the connecting flange **FRZ-SV**. Available upon separate order.
- ❑ In case of rectangular discharge air duct connection a discharge vent must be covered with the **SG-SV** grille to protect the fan from foreign object ingress. Available upon separate order.
- ❑ The vibration isolators, either of rubber type **SI-G** or spring-loaded type **SI-F**, are recommended for noise and vibration attenuation. Vibration isolators reduce dynamic loads on the fan, enhance reliability and durability of the ventilation equipment. The vibration isolators are attached through holes in the mounting pad. Available upon separate order.

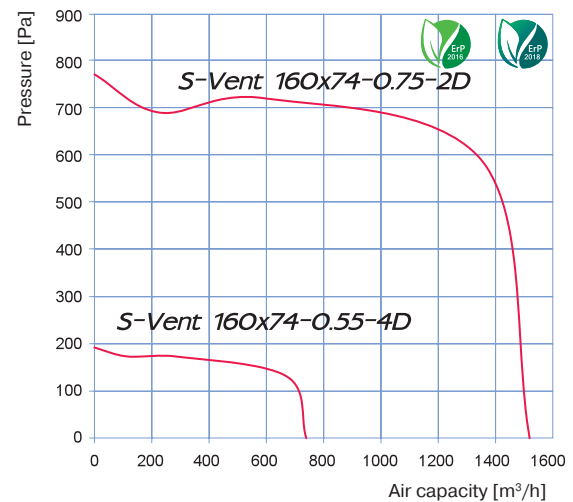
ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Specifications

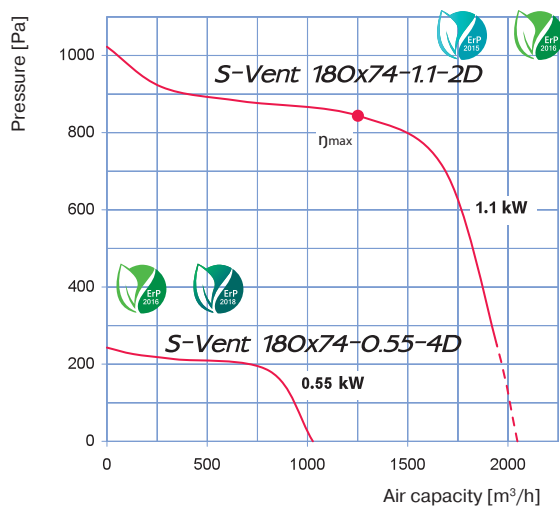
Parameters	S-Vent 140x74-0.25-4D	S-Vent 140x74-0.37-2D	S-Vent 160x74-0.55-4D	S-Vent 160x74-0.75-2D	S-Vent 180x74-0.55-4D	S-Vent 180x74-1.1-2D	S-Vent 200x93-0.55-4D	S-Vent 200x93-1.1-2D
Voltage [V / 50 Hz]	400	400	400	400	400	400	400	400
Power [kW]	0.25	0.37	0.55	0.75	0.55	1.1	0.55	1.1
Current [A]	0.8	0.9	1.6	1.8	1.6	2.6	1.6	2.6
Maximum air capacity [m ³ /h]	450	710	750	1540	1030	1950	1615	1900
RPM [min ⁻¹]	1350	2730	1360	2820	1360	2800	1360	2800
Sound pressure level at 3 m distance [dBA]	60	65	62	68	64	70	67	73
Max. operating temperature [°C]	60	60	60	60	60	60	60	60
SEC class	D			-	D	-	-	-
Ingress protection rating	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54



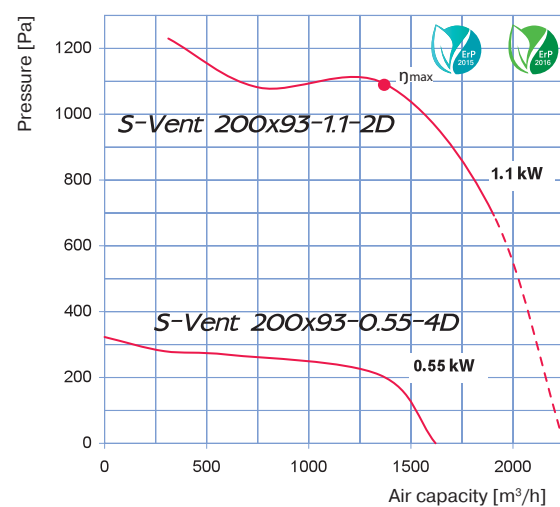
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 140x74-0.37-2D									
L _{WA} to environment, [dBA]	68	47	59	69	72	74	75	72	71
S-Vent 140x74-0.25-4D									
L _{WA} to environment, [dBA]	61	43	58	64	61	68	68	65	63



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 160x74-0.75-2D									
L _{WA} to environment, [dBA]	67	48	60	69	74	74	78	73	72
S-Vent 160x74-0.55-4D									
L _{WA} to environment, [dBA]	63	46	59	64	65	69	71	68	65



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 180x74-1.1-2D									
L _{WA} to environment, [dBA]	70	53	62	72	78	77	81	78	77
S-Vent 180x74-0.55-4D									
L _{WA} to environment, [dBA]	62	50	63	68	67	73	75	69	67



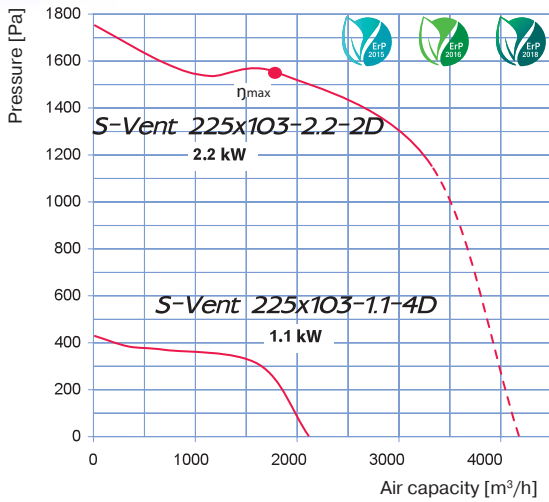
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 200x93-1.1-2D									
L _{WA} to environment, [dBA]	75	54	65	78	81	81	85	78	78
S-Vent 200x93-0.55-4D									
L _{WA} to environment, [dBA]	65	51	64	71	72	75	77	72	70

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
39.3	A	Static	46.3	No	0.769	1.67	1264	843	2940	1

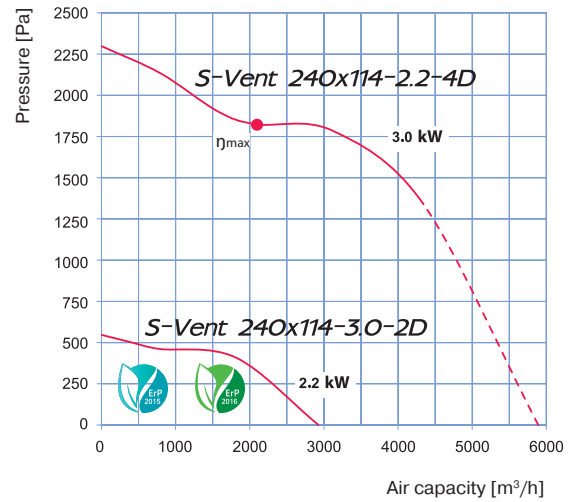
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
41.1	A	Static	47.2	No	1.075	1.99	1373	1135	2895	1

Specifications

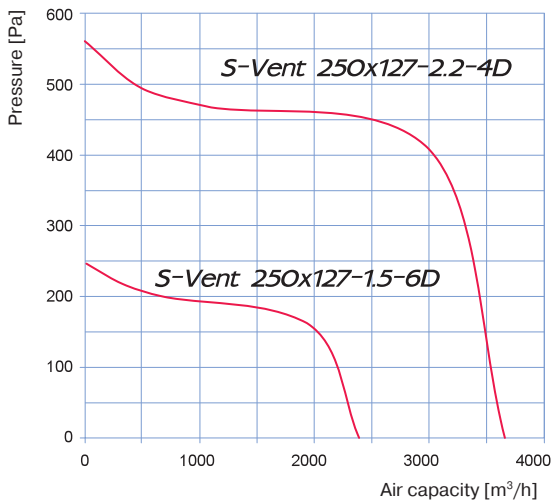
Parameters	S-Vent 225x103- 1.1-4D	S-Vent 225x103- 2.2-2D	S-Vent 240x114- 2.2-4D	S-Vent 240x114- 3.0-2D	S-Vent 250x127- 1.5-6D	S-Vent 250x127- 2.2-4D	S-Vent 250x127- 5.5-2D	S-Vent 280x127- 1.5-6D
Voltage [V / 50 Hz]	400	400	400	400	400	400	400	400
Power [kW]	1.1	2.2	2.2	3.0	1.5	2.2	5.5	1.5
Current [A]	2.8	4.7	5.1	6.1	4.2	5.1	10.7	4.2
Maximum air capacity [m ³ /h]	2125	3350	2930	4350	2415	3720	4820	3450
RPM [min ⁻¹]	1420	2865	1420	2870	940	1420	2850	940
Sound pressure level at 3 m distance [dBA]	72	75	74	78	68	78	81	69
Max. operating temperature [°C]	60	60	60	60	60	60	60	60
Ingress protection rating	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54



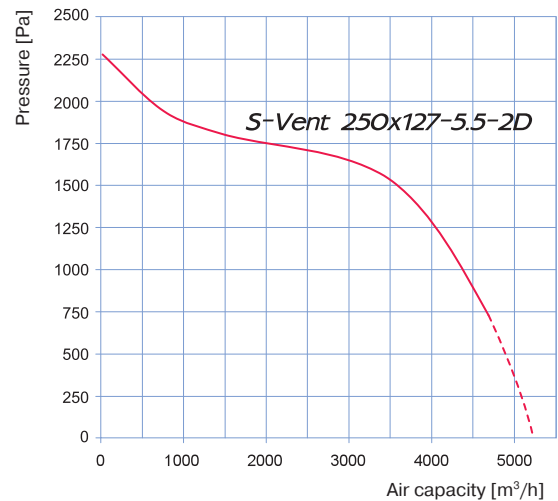
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 225x103-2.2-2D										
L _{WA} to environment, [dBA]	75	58	67	78	83	83	88	81	79	
S-Vent 225x103-1.1-4D										
L _{WA} to environment, [dBA]	72	55	65	75	76	81	81	77	75	
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
47.5	A	Static	52.4	No	1.680	3.17	1818	1547	2925	1



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 240x114-2.2-4D										
L _{WA} to environment, [dBA]	71	57	69	75	75	81	82	79	76	
S-Vent 240x114-3.0-2D										
L _{WA} to environment, [dBA]	77	58	69	74	78	73	79	78	78	
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
45.5	A	Static	49.5	No	2.369	4.39	2083	1826	2915	1



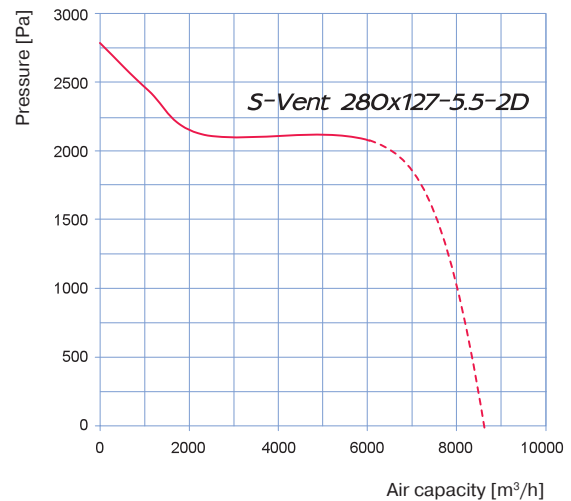
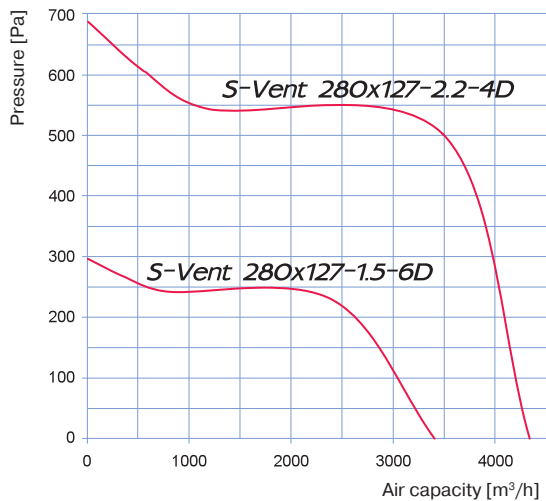
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 250x127-2.2-4D									
L _{WA} to environment, [dBA]	70	56	71	77	74	81	82	80	73
S-Vent 250x127-1.5-6D									
L _{WA} to environment, [dBA]	65	50	62	68	68	73	71	72	65



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 250x127-5.5-2D									
L _{WA} to environment, [dBA]	78	57	71	79	84	85	89	83	81

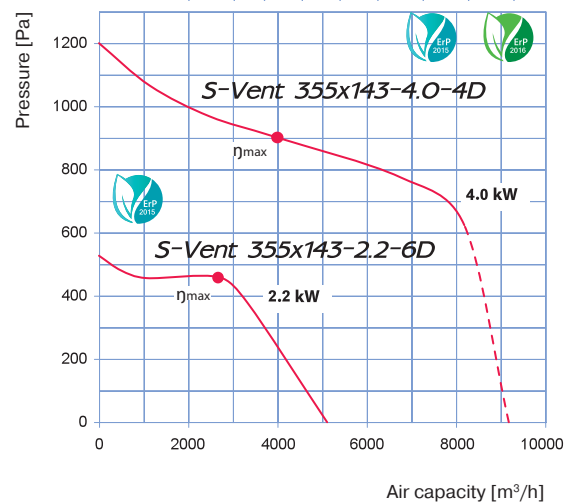
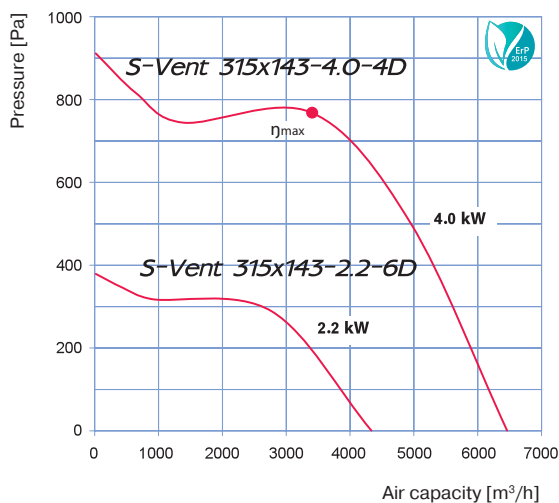
Specifications

Parameters	S-Vent	S-Vent	S-Vent	S-Vent	S-Vent	S-Vent	S-Vent	S-Vent
	280x127-2.2-4D	280x127-5.5-2D	315x143-2.2-6D	315x143-4.0-4D	355x143-2.2-6D	355x143-4.0-4D	400x183-1.5-8D	400x183-2.2-6D
Voltage [V / 50 Hz]	400	400	400	400	400	400	400	400
Power [kW]	2.2	5.5	2.2	4.0	2.2	4.0	1.5	2.2
Current [A]	5.1	10.7	5.6	8.7	5.6	8.7	4.2	5.8
Maximum air capacity [m ³ /h]	4395	6330	4375	6530	5090	8150	6545	8100
RPM [min ⁻¹]	1420	2865	940	1410	940	1410	700	940
Sound pressure level at 3 m distance [dBA]	75	81	70	79	71	79	62	73
Max. operating temperature [°C]	60	60	60	60	60	60	60	60
Ingress protection rating	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 280x127-2.2-4D									
L _{WA} to environment, [dBA]	73	61	74	76	81	82	83	81	77
S-Vent 280x127-1.5-6D									
L _{WA} to environment, [dBA]	67	50	63	69	67	73	71	69	66

Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 280x127-5.5-2D									
L _{WA} to environment, [dBA]	80	63	72	81	88	86	91	87	86

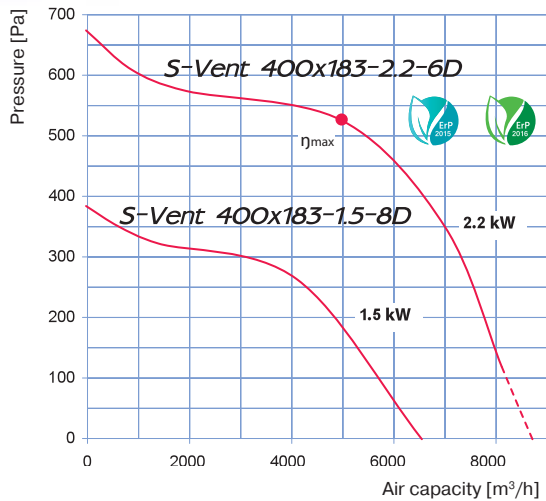


Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 315x143-4.0-4D										
L _{WA} to environment, [dBA]	78	62	73	81	84	88	86	86	83	
S-Vent 315x143-2.2-6D										
L _{WA} to environment, [dBA]	71	56	67	70	80	78	79	72	68	
η _v , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
36.3	A	Static	40.7	No	2.051	6.32	3429	767	1480	1

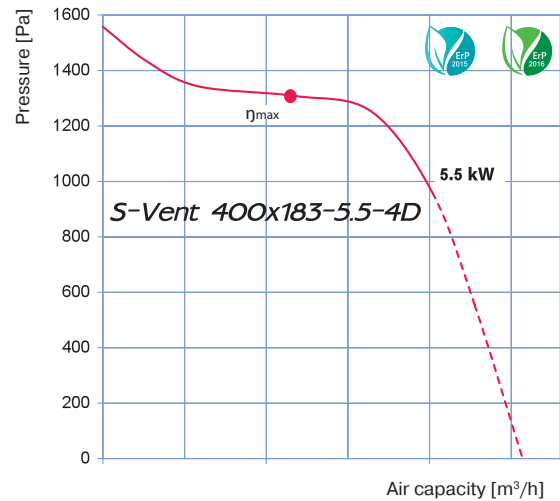
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 355x143-4.0-4D										
L _{WA} to environment, [dBA]	77	62	75	80	84	87	90	82	82	
S-Vent 355x143-2.2-6D										
L _{WA} to environment, [dBA]	71	54	68	73	82	82	82	75	72	
S-Vent 355x143-4.0-4D										
η _v , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
41.3	A	Static	45.2	No	2.449	6.6	3948	904	1475	1
S-Vent 355x143-2.2-6D										
η _v , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
34.1	A	Static	40.3	No	1.026	4.19	2680	460	990	1

Specifications

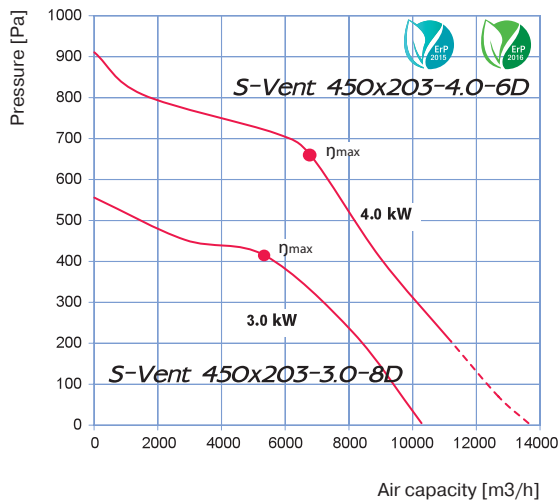
Parameters	S-Vent 400x183-5.5-4D	S-Vent 450x203-3.0-8D	S-Vent 450x203-4.0-6D	S-Vent 450x203-11.0-4D	S-Vent 500x229-5.5-8D	S-Vent 500x229-7.5-6D	S-Vent 500x229-11.0-4D
Voltage [V / 50 Hz]	400	400	400	400	400	400	400
Power [kW]	5.5	3.0	4.0	11.0	5.5	7.5	11.0
Current [A]	11.0	7.8	9.1	24.0	14.8	17.0	24.0
Maximum air capacity [m³/h]	10175	10230	11150	19000	11550	14960	17250
RPM [min ⁻¹]	1430	700	950	1450	700	955	1450
Sound pressure level at 3 m distance [dBA]	80	70	76	84	72	78	85
Max. operating temperature [°C]	60	60	60	60	60	60	60
Ingress protection rating	IP54	IP54	IP54	IP54	IP54	IP54	IP54



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 400x183-2.2-6D										
L _{wA} to environment, [dBA]	75	57	72	75	81	80	81	78	76	
S-Vent 400x183-1.5-8D										
L _{wA} to environment, [dBA]	68	53	65	69	74	76	77	73	67	
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
40.6	A	Static	45.3	No	1.831	4.71	4992	526	965	1



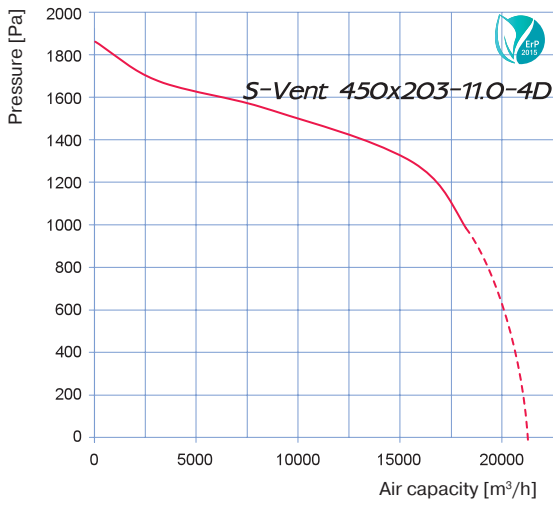
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 400x183-5.5-4D										
L _{wA} to environment, [dBA]	75	57	72	75	81	80	81	78	76	
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
47.7	A	Static	49.5	No	4.620	9.3	5931	1302	1465	1



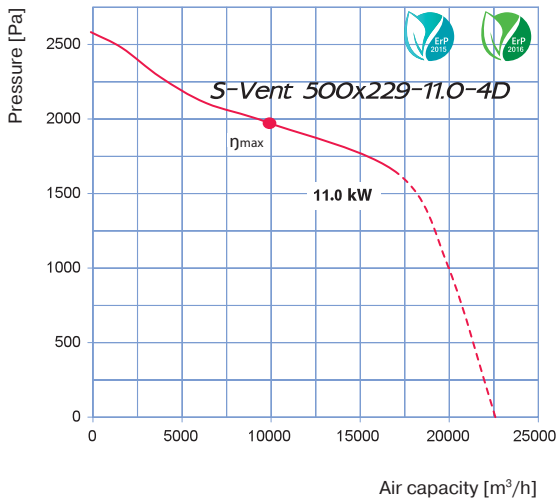
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 450x203-4.0-6D									
L _{wA} to environment, [dBA]	76	59	74	75	83	83	85	81	77
S-Vent 450x203-3.0-8D									
L _{wA} to environment, [dBA]	67	56	63	65	75	75	71	71	69

S-Vent 450x203-4.0-6D										
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
42.5	A	Static	45.9	No	2.950	6.9	6755	655	980	1
S-Vent 450x203-3.0-8D										
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
41.7	A	Static	47	No	1.486	6.18	5348	409	740	1

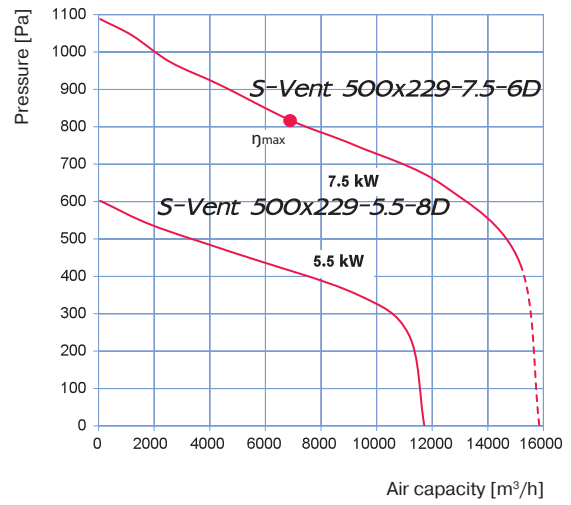
Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
S-Vent 400x203-11.0-4D									
L _{wA} to environment, [dBA]	83	70	84	89	88	94	94	94	91



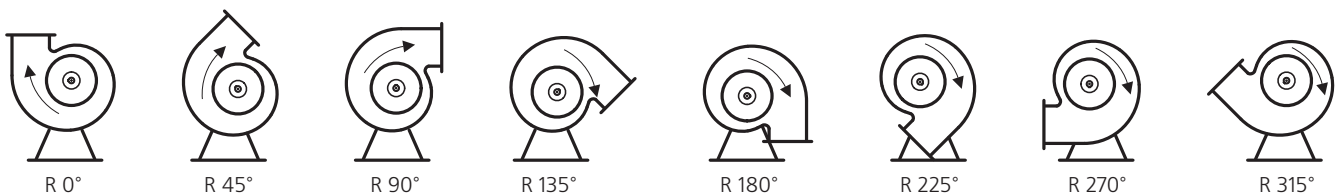
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 500x229-11.0-4D										
L _{wA} to environment, [dBA]	85	73	83	90	91	94	97	94	90	
η _v , (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
50.9	A	Static	50.6	No	10.5	23	10014	1972	1460	1



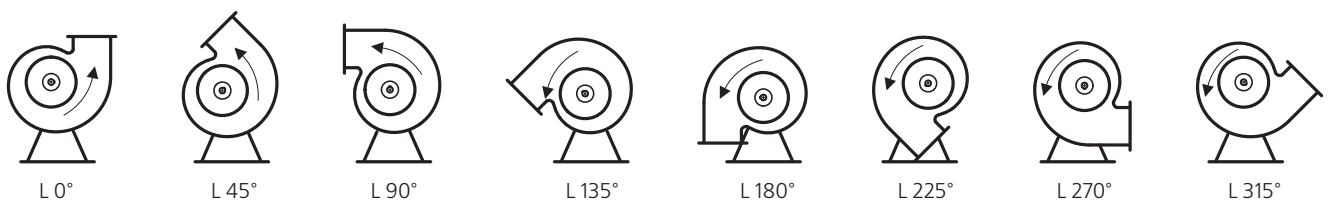
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
S-Vent 500x229-7.5-6D										
L _{wA} to environment, [dBA]	83	68	79	85	85	93	92	86	85	
S-Vent 500x229-5.5-8D										
L _{wA} to environment, [dBA]	77	61	74	78	81	86	85	81	80	
η _v , (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
38.3	A	Static	40.7	No	4.1	11.3	6791	815	990	1

Scroll orientation (view on the intake side)

Right scroll orientation



Left scroll orientation

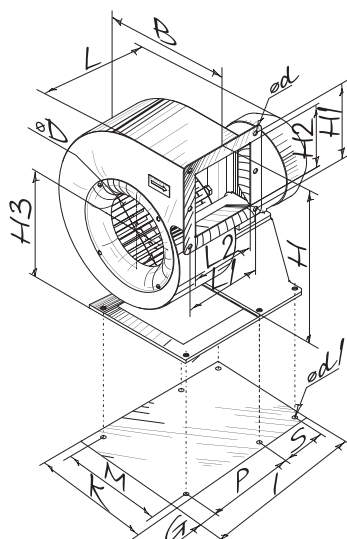


■ Selection table for accessories:

Type	Rubber anti-vibration mounts	Spring-loaded anti-vibration mounts	Flange	Grille
S-Vent 140x74-0.25-4D	SI-G 8	SI-F 8	FRZ-SV 140	SG-SV 140
S-Vent 140x74-0.37-2D			FRZ-SV 160	SG-SV 160
S-Vent 160x74-0.55-4D				
S-Vent 160x74-0.75-2D				
S-Vent 180x74-0.55-4D				
S-Vent 180x74-1.1-2D				
S-Vent 200x93-0.55-4D				
S-Vent 200x93-1.1-2D				
S-Vent 225x103-1.1-4D				
S-Vent 225x103-2.2-2D				
S-Vent 240x114-2.2-4D	SI-G 16	SI-F 16		
S-Vent 240x114-3.0-2D			FRZ-SV 250	SG-SV 250
S-Vent 250x127-1.5-6D				
S-Vent 250x127-2.2-4D				
S-Vent 250x127-5.5-2D				
S-Vent 280x127-1.5-6D				
S-Vent 280x127-2.2-4D				
S-Vent 280x127-5.5-2D				
S-Vent 315x143-2.2-6D	SI-G 26	SI-F 26		
S-Vent 315x143-4.0-4D			FRZ-SV 355	SG-SV 355
S-Vent 355x143-2.2-6D				
S-Vent 355x143-4.0-4D				
S-Vent 400x183-1.5-8D	SI-G 35	SI-F 35		
S-Vent 400x183-2.2-6D				
S-Vent 400x183-5.5-4D				
S-Vent 450x203-3.0-8D	SI-G 50	SI-F 50	FRZ-SV 450	SG-SV 450
S-Vent 450x203-4.0-6D				
S-Vent 450x203-11.0-4D				
S-Vent 500x229-5.5-8D	SI-G 75	SI-F 75	FRZ-SV 500	SG-SV 500
S-Vent 500x229-7.5-6D				
S-Vent 500x229-11.0-4D				

Overall dimensions

Type	Dimensions [mm]																	Weight [kg]
	∅D	∅d	∅d1	B	H	H1	H2	H3	L	L1	L2	P	M	I	G	K	S	
S-Vent 140x74-0.25-4D	140	8	10	242	323	125	92	144	309	125	95	124	220	234	18	253	80	9.3
S-Vent 140x74-0.37-2D	140	8	10	242	323	125	92	144	309	125	95	124	220	234	18	253	80	9.3
S-Vent 160x74-0.55-4D	160	8	10	277	373	134	106	173	356	134	104	141	220	260	17	252	90	12.7
S-Vent 160x74-0.75-2D	160	8	10	277	373	134	106	173	356	134	104	141	220	260	17	252	90	13.0
S-Vent 180x74-0.55-4D	180	10	10	311	414	143	120	193	365	143	114	146	270	270	22	314	90	13.5
S-Vent 180x74-1.1-2D	180	10	10	311	414	143	120	193	365	143	114	146	270	270	22	314	90	14.5
S-Vent 200x93-0.55-4D	200	10	10	345	436	160	134	193	380	160	129	158	270	284	24	315	90	15.2
S-Vent 200x93-1.1-2D	200	10	10	345	436	160	134	193	380	160	129	158	270	284	24	315	90	16.2
S-Vent 225x103-1.1-4D	225	10	12	388	507	178	151	232	432	172	141	174	275	316	27	330	100	21.2
S-Vent 225x103-2.2-2D	225	10	12	388	507	178	151	232	432	172	141	174	275	316	27	330	100	24.2
S-Vent 240x114-2.2-4D	240	10	12	414	568	186	161	282	461	186	156	195	275	362	27	330	125	30.5
S-Vent 240x114-3.0-2D	240	10	12	414	568	186	161	282	461	186	156	195	275	362	27	330	125	31.4
S-Vent 250x127-1.5-6D	250	10	12	431	594	202	168	292	473	202	166	206	300	373	27	355	125	33.0
S-Vent 250x127-2.2-4D	250	10	12	431	594	202	168	292	473	202	166	206	300	373	27	355	125	32.2
S-Vent 250x127-5.5-2D	250	10	12	431	614	202	168	312	517	202	166	213	300	397	27	355	140	40.0
S-Vent 280x127-1.5-6D	280	10	12	483	626	225	189	292	503	231	196	243	300	410	27	355	125	35.1
S-Vent 280x127-2.2-4D	280	10	12	483	626	225	189	292	503	231	196	243	300	410	27	355	125	34.2
S-Vent 280x127-5.5-2D	280	10	12	483	646	225	189	312	545	231	196	243	300	427	27	355	140	42.4
S-Vent 315x143-2.2-6D	315	10	15	543	731	250	213	353	568	255	216	268	350	452	27	405	140	46.8
S-Vent 315x143-4.0-4D	315	10	15	543	731	250	213	353	568	255	216	268	350	452	27	405	140	49.8
S-Vent 355x143-2.2-6D	355	10	15	611	817	275	241	403	566	255	214	253	350	442	32	405	140	49.0
S-Vent 355x143-4.0-4D	355	10	15	611	817	275	241	403	566	255	214	253	350	442	32	405	140	51.0
S-Vent 400x183-1.5-8D	400	10	15	689	870	310	272	403	619	310	268	313	400	497	27	455	140	57.1
S-Vent 400x183-2.2-6D	400	10	15	689	870	310	272	403	619	310	268	313	400	497	27	455	140	54.1
S-Vent 400x183-5.5-4D	400	10	15	689	882	310	272	414	662	330	289	341	400	525	27	455	140	69.5
S-Vent 450x203-3.0-8D	450	10	15	774	985	345	306	464	690	352	315	351	450	550	42	530	140	77.8
S-Vent 450x203-4.0-6D	450	10	15	774	985	345	306	464	690	352	315	351	450	550	42	530	140	76.5
S-Vent 450x203-11.0-4D	450	10	15	774	1005	345	306	484	722	352	315	371	450	608	42	530	178	105.0
S-Vent 500x229-5.5-8D	500	11	15	860	1115	390	341	534	761	401	353	408	500	645	42	580	178	85.0
S-Vent 500x229-7.5-6D	500	11	15	860	1115	390	341	534	761	401	353	408	500	645	42	580	178	86.0
S-Vent 500x229-11.0-4D	500	11	15	860	1115	390	341	534	761	401	353	408	500	645	42	580	178	107.0





Axial inline fans

Tube-M / Tube-MZ

Air capacity – up to 1700 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- Mounting in ventilation systems with low static pressure requiring high air capacity.
- Compatible with Ø 100 up to 315 mm round air ducts.

Design

- Compact steel casing covered with special polymer coating (**Tube-M** series) or galvanized steel casing (**Tube-MZ** series).
- Aluminium impeller.
- The fan is equipped with a power cord and external terminal block for connection to power mains.

Motor

- Single-phase asynchronous external rotor motor with axial impeller.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.

Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

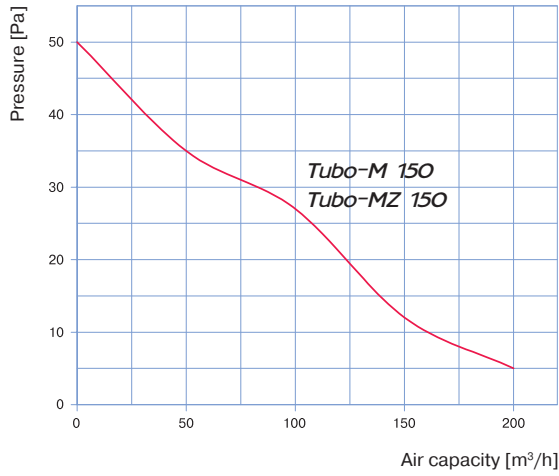
Mounting

- Mounting in air duct or directly to the wall in any position with respect to air flow direction in the system.
- Power is supplied to the fan through an external terminal box with sealed electric lead-in.
- Wall or ceiling mounting with fixing brackets supplied as a standard.
- Polymer coated or galvanized steel reducers are provided for connection of the **Tube-M** fans with Ø 150 up to 250 mm air ducts. The reducers are not included into delivery list and are available upon separate order.
- Tube-M 315** and **Tube-MZ 315** with Ø 315 mm air ducts have direct connection.

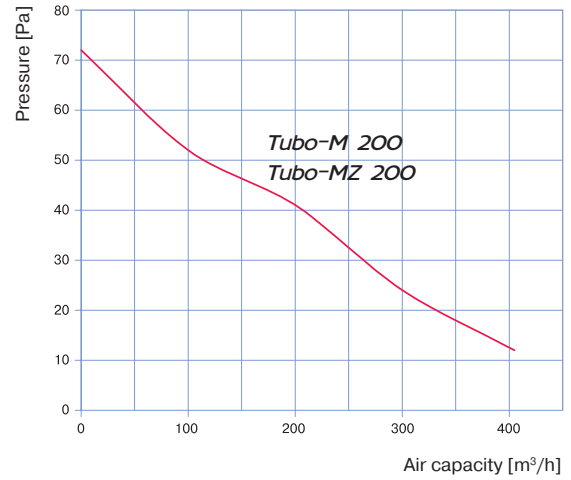
Specifications

Parameters	Tube-M 150 Tube-MZ 150	Tube-M 200 Tube-MZ 200	Tube-M 250 Tube-MZ 250	Tube-M 315 Tube-MZ 315
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	36	43	68	110
Current [A]	0.26	0.28	0.48	0.75
Maximum air capacity [m ³ /h]	200	405	1070	1700
RPM [min ⁻¹]	1300	1300	1300	1300
Sound pressure level at 3 m distance [dBA]	33	32	48	54
Max. operating temperature [°C]	40	40	40	40
Ingress protection rating	IPX4	IPX4	IPX4	IPX4

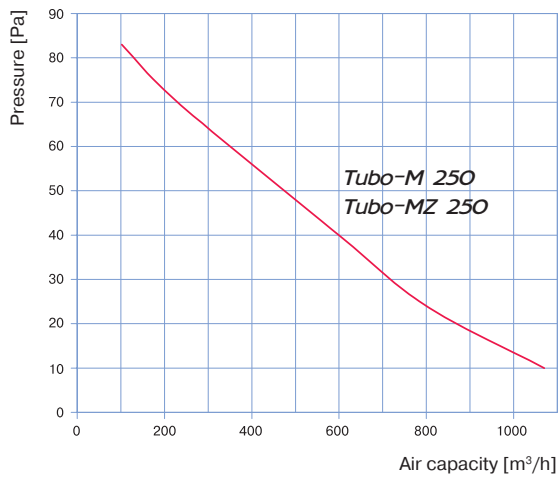
Specifications



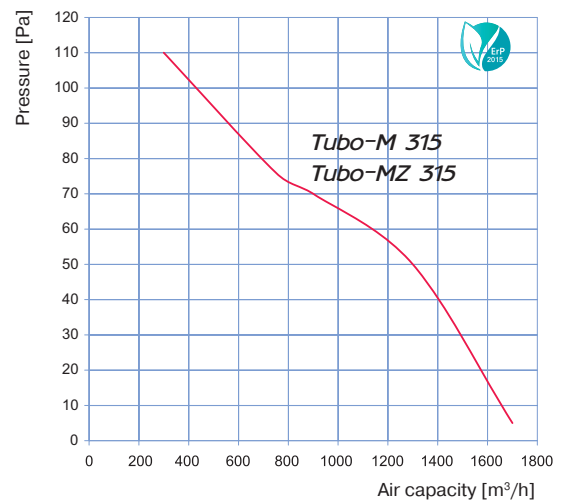
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	46	47	56	45	35	30	31	31	20



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	53	55	63	56	44	42	36	30	15



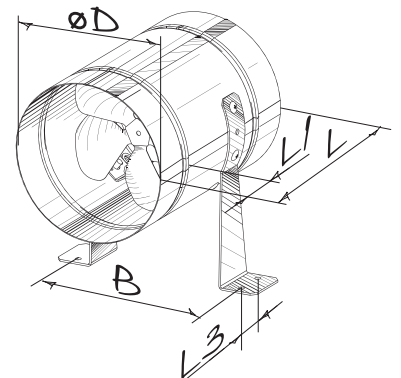
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	59	61	70	60	43	46	41	34	19



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	62	65	67	58	45	51	48	41	30

Overall dimensions

Type	Dimensions [mm]					Weight [kg]
	$\varnothing D$	B	L	L1	L3	
Tubo-M / Turbo-MZ 150	162	183	220	40	30	2.08
Tubo-M / Turbo-MZ 200	208	228	220	40	30	2.54
Tubo-M / Turbo-MZ 250	262	283	270	55	30	3.97
Tubo-M / Turbo-MZ 315	315	337	278	55	40	4.84





Axial inline fans

Axis-F

Air capacity – up to 11900 m³/h



Use

- Supply and exhaust ventilation systems installed in various premises.
- Ideal solution for boosting large air volumes at low aerodynamic resistance in the ventilation system.

Design

- Compact steel casing and impeller with a special polymer coating.
- Casing is equipped with connecting flanges for easy mounting into air duct.
- The fan is equipped with a terminal block for connection to power mains.

Motor

- Two- or four-pole asynchronous motor with external rotor and axial impeller.
- Single-phase (**E**) or three-phase (**D**) motor modifications.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.

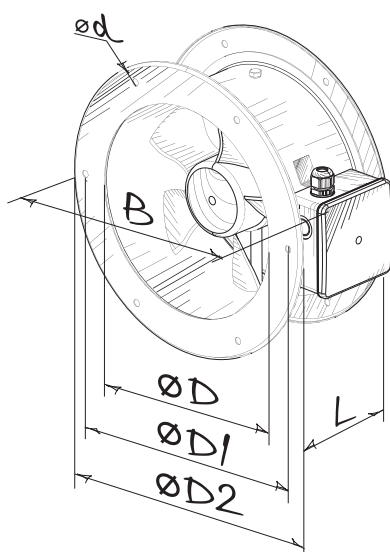
Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- The fan is installed in air ducts by connecting flanges on the fan casing.
- Mounting in any position with respect to air flow direction in the system.
- Power is supplied through an external terminal box.




Overall dimensions



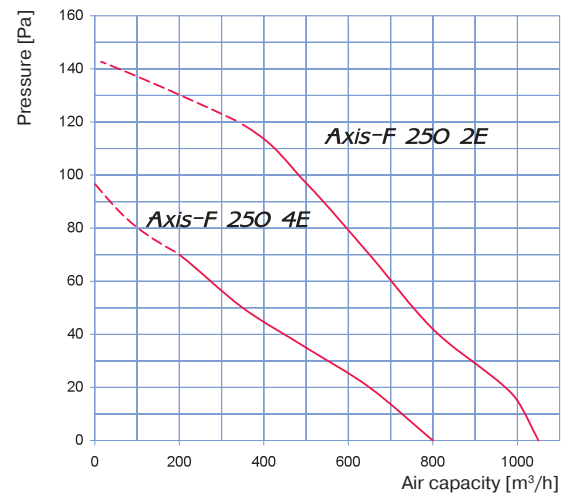
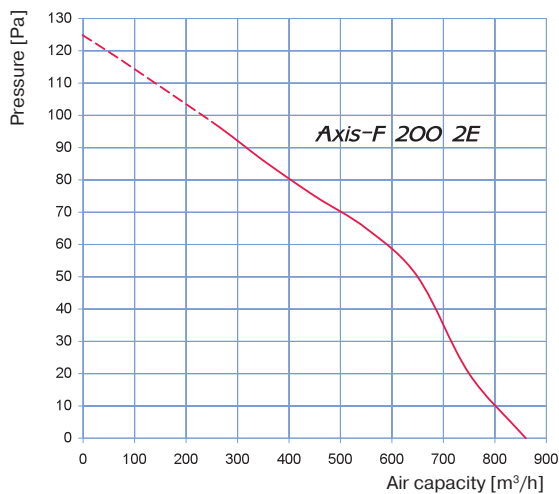
Type	Dimensions [mm]						Weight [kg]
	ØD	ØD1	ØD2	ød	B	L	
Axis-F 200 2E	205	235	255	7	290	120	1.95
Axis-F 250 2E	260	286	306	7	340	150	3.84
Axis-F 250 4E	260	286	306	7	340	150	3.96
Axis-F 300 2E	310	356	382	7	410	160	5.31
Axis-F 300 4E	310	356	382	7	420	160	5.59
Axis-F 350 4E	362	395	421	9.5	480	160	6.37
Axis-F 400 4E	412	438	465	9.5	550	170	8.39
Axis-F 450 4E	462	487	515	9.5	630	200	10.65
Axis-F 500 4E	515	541	570	9.5	635	220	12.65
Axis-F 550 4E	565	605	636	11.5	685	230	17.3
Axis-F 630 4E	645	674	715	11.5	780	250	20.13
Axis-F 250 2D	260	286	306	7	340	150	3.84
Axis-F 250 4D	260	286	306	7	340	150	3.84
Axis-F 300 2D	310	356	382	7	420	160	5.31
Axis-F 300 4D	310	356	382	7	420	160	5.31
Axis-F 350 4D	362	395	421	9.5	480	160	6.37
Axis-F 400 4D	412	438	465	9.5	550	170	8.39
Axis-F 450 4D	462	487	515	9.5	630	200	10.65

ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

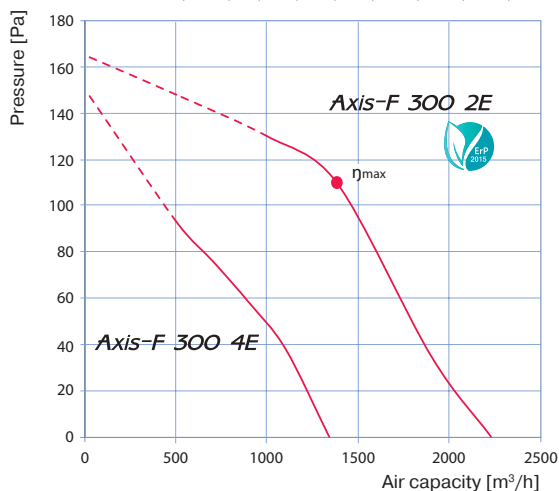
Specifications

Parameters	Axis-F 200 2E*	Axis-F 250 2E*	Axis-F 250 4E*	Axis-F 300 2E 	Axis-F 300 4E*	Axis-F 350 4E 	Axis-F 400 4E 
Voltage [V / 50 Hz]	230	230	230	230	230	230	230
Power [W]	55	80	50	145	75	140	180
Current [A]	0.26	0.4	0.22	0.66	0.35	0.65	0.82
Maximum air capacity [m³/h]	860	1050	800	2230	1340	2500	3580
RPM [min ⁻¹]	2300	2400	1380	2300	1350	1380	1380
Sound pressure level at 3 m distance [dBA]	50	60	55	60	58	62	63
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
SEC class	C	B	-	-	B	-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



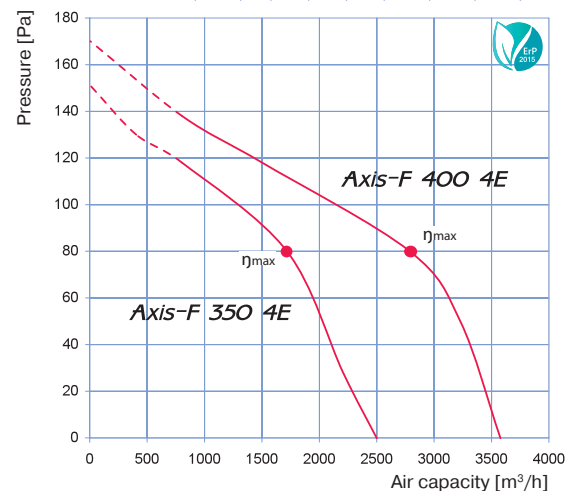
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to environment, [dBA]	65	56	58	58	57	59	55	51	45



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-F 300 2E	78	72	72	70	72	70	69	63	63
Axis-F 300 4E	67	58	57	59	57	58	53	52	49

Axis-F 300 2E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
30.5	A	Static	42.2	No	0.141	0.64	1380	110	2350	1

Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-F 250 2E	76	68	66	68	70	68	68	63	58
Axis-F 250 4E	60	52	50	52	53	52	52	44	43







Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-F 350 4E	70	61	62	64	63	63	58	56	52
Axis-F 400 4E	75	66	68	66	69	67	65	61	56

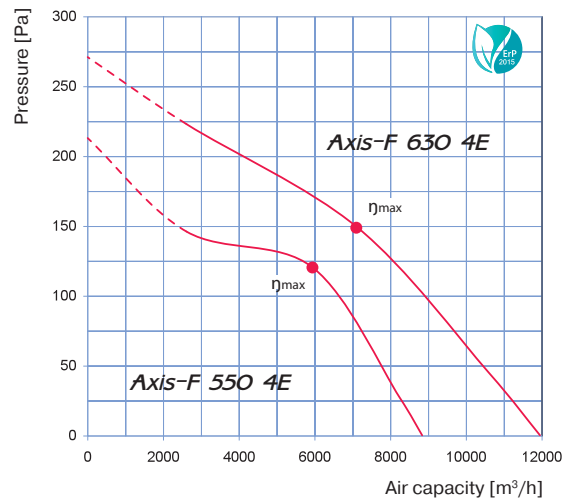
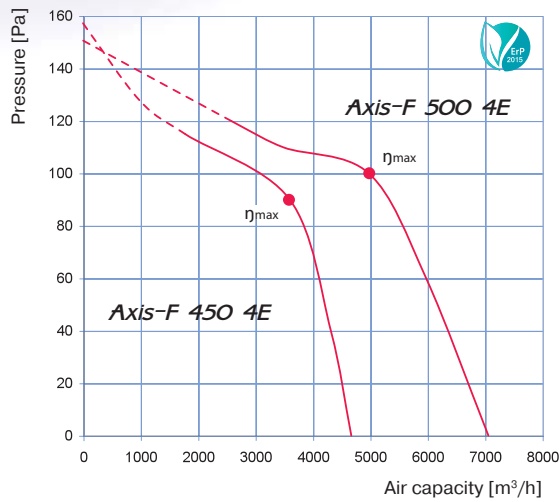
Axis-F 350 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
29.9	A	Static	41.8	No	0.130	0.6	1717	80	1375	1

Axis-F 400 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
33.8	A	Static	44.8	No	0.187	0.86	2787	80	1355	1

Specifications

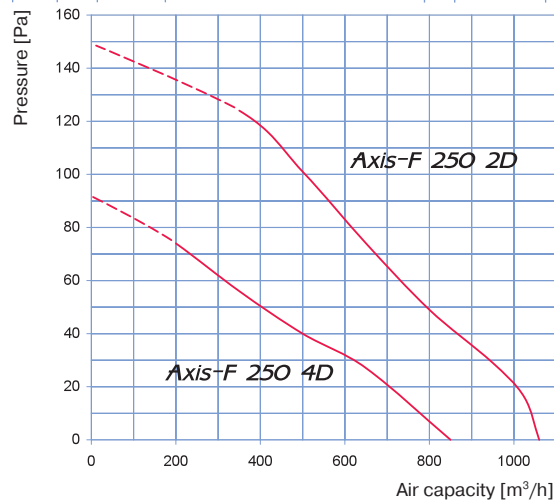
Parameters	Axis-F 450 4E 	Axis-F 500 4E 	Axis-F 550 4E 	Axis-F 630 4E 	Axis-F 250 2D*	Axis-F 250 4D*
Voltage [V / 50 Hz]	230	230	230	230	400	400
Power [W]	250	420	550	750	80	60
Current [A]	1.2	1.95	2.55	3.5	0.22	0.17
Maximum air capacity [m ³ /h]	4680	7060	8800	11900	1060	850
RPM [min ⁻¹]	1350	1300	1300	1360	2600	1400
Sound pressure level at 3 m distance [dBA]	64	69	70	75	60	55
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
SEC class	-	-	-	-	B	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.







Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-F 450 4E										
L _{WA} to environment, [dBA]	77	69	70	73	73	71	67	67	61	
Axis-F 500 4E										
L _{WA} to environment, [dBA]	80	71	73	72	74	73	70	67	63	
Axis-F 450 4E										
η, (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
32.0	A	Static	41.8	No	0.288	1.31	3610	90	1270	1
Axis-F 500 4E										
η, (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
32.1	A	Static	40.7	No	0.440	2.01	4987	100	1285	1

Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-F 550 4E										
L _{WA} to environment, [dBA]	83	73	75	73	75	74	72	66	63	
Axis-F 630 4E										
L _{WA} to environment, [dBA]	77	71	73	72	73	71	70	63	59	
Axis-F 550 4E										
η, (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
34.7	A	Static	42.6	No	0.581	2.64	5919	120	1240	1
Axis-F 630 4E										
η, (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
37.5	A	Static	44.4	No	0.800	3.76	7095	149	1290	1

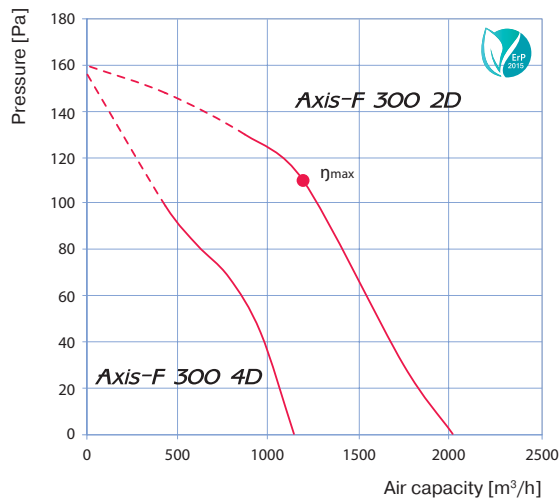


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-F 250 2D									
L _{WA} to environment, [dBA]	77	67	68	70	69	68	66	60	57
Axis-F 250 4D									
L _{WA} to environment, [dBA]	60	49	50	53	54	53	52	45	42

Specifications

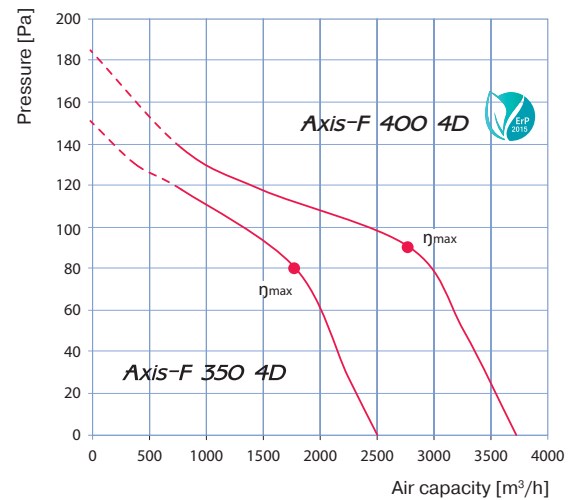
Parameters	Axis-F 300 2D 	Axis-F 300 4D*	Axis-F 350 4D 	Axis-F 400 4D 	Axis-F 450 4D 
Voltage [V / 50 Hz]	400	400	400	400	400
Power [W]	145	75	140	180	250
Current [A]	0.25	0.22	0.38	0.47	0.6
Maximum air capacity [m ³ /h]	2310	1310	2520	3740	5280
RPM [min ⁻¹]	2350	1380	1380	1380	1360
Sound pressure level at 3 m distance [dBA]	60	58	62	64	65
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
SEC class	-	B	-	-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-F 300 2D									
L _{wA} to environment, [dBA]	80	72	71	71	74	70	69	65	63
Axis-F 300 4D									
L _{wA} to environment, [dBA]	63	58	55	58	56	58	57	52	48

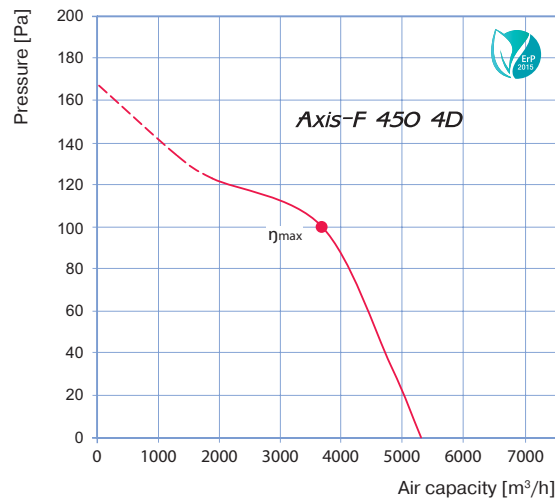
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
30.3	A	Static	42	No	0.141	0.25	1367	110	2350	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-F 350 4D									
L _{wA} to environment, [dBA]	72	62	61	64	64	61	61	56	54
Axis-F 400 4D									
L _{wA} to environment, [dBA]	75	65	66	69	66	67	64	60	55

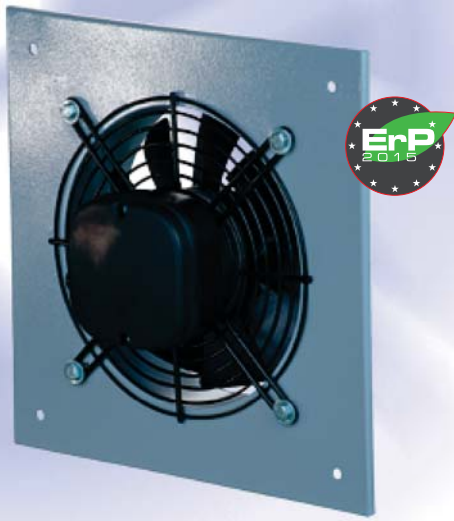
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
31.7	A	Static	43.7	No	0.129	0.37	1802	80	1400	1

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
34.3	A	Static	44.9	No	0.209	0.47	2807	90	1365	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to environment, [dBA]	76	65	68	69	69	70	64	60	57

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35.1	A	Static	44.8	No	0.296	0.59	3659	100	1310	1



Axial wall fan

Axis-Q

Air capacity – up to 12200 m³/h



■ Use

- Supply and exhaust ventilation systems installed in various premises.
- Ideal solution for boosting large air volumes at low aerodynamic resistance in the ventilation system.
- Refrigerating technologies for cooling of compressor condensing units.
- Direct air exhaust.
- For positive pressure ventilation in fire-fighting systems.

■ Design

- Steel casing and impeller with a special polymer atmospheric resistant coating.
- Casing is equipped with a square mounting plate and a round flange to facilitate wall mounting.
- The fan is equipped with a terminal box for connection to power mains.

■ Motor

- Two- or four-pole asynchronous motor with external rotor and axial impeller.
- Single-phase (**E**) or three-phase (**D**) motor modifications.
- Equipped with ball bearings for longer service life.
- Integrated overheating protection with automatic restart.

■ Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

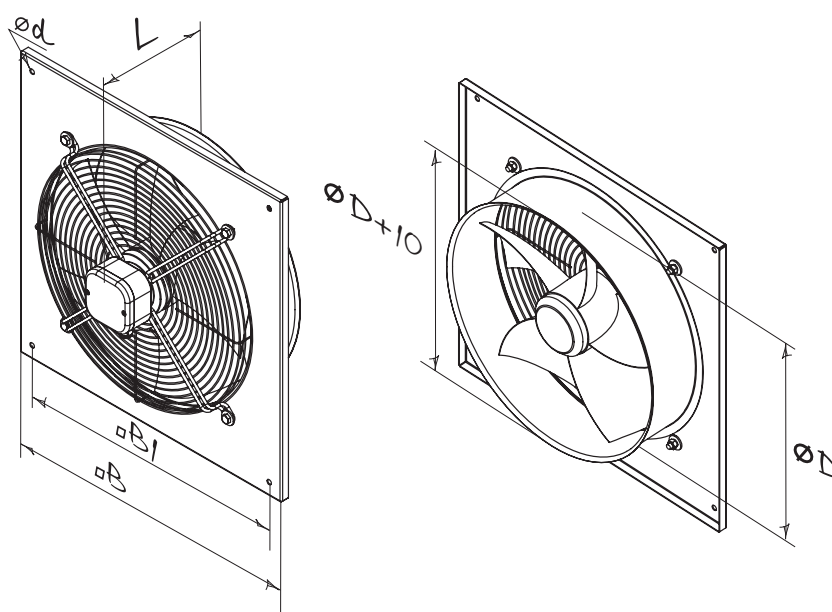
■ Mounting

- Wall surface mounting with a square connecting frame.
- Any mounting position with respect to air flow direction in the system.
- Power is supplied through an external terminal box.


ErP data	
Overall efficiency	η , (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Overall dimensions

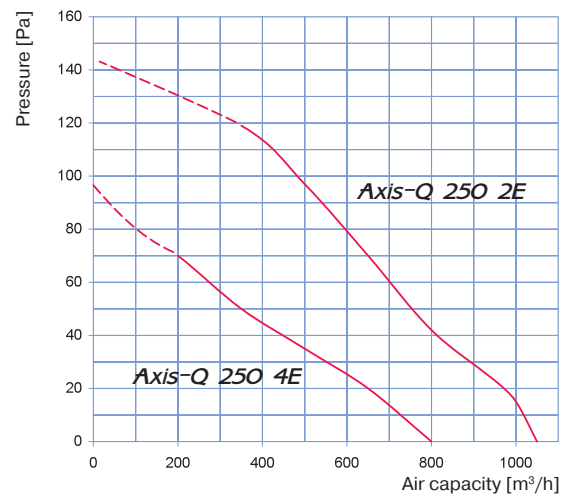
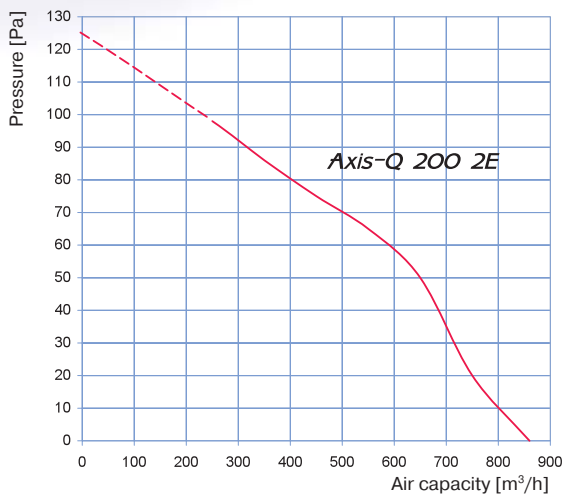
Type	Dimensions [mm]					Weight [kg]
	$\varnothing D$	$\varnothing d$	B	B1	L	
Axis-Q 200 2E	210	7	312	260	145	3.95
Axis-Q 250 2E	260	7	370	320	155	4.17
Axis-Q 250 4E	260	7	370	320	155	4.06
Axis-Q 300 2E	326	9	430	380	195	5.27
Axis-Q 300 4E	326	9	430	380	195	5.11
Axis-Q 350 4E	388	9	485	435	200	7.05
Axis-Q 400 4E	417	9	540	490	240	8.80
Axis-Q 450 4E	465	11	576	535	250	10.50
Axis-Q 500 4E	520	11	655	615	260	14.15
Axis-Q 550 4E	570	11	725	675	280	16.50
Axis-Q 630 4E	650	11	800	710	295	22.55
Axis-Q 250 2D	260	7	370	320	155	4.17
Axis-Q 250 4D	260	7	370	320	155	4.06
Axis-Q 300 2D	326	9	430	380	155	5.27
Axis-Q 300 4D	326	9	430	380	155	5.11
Axis-Q 350 4D	388	9	485	435	200	7.05
Axis-Q 400 4D	417	9	540	490	240	8.80
Axis-Q 450 4D	465	11	576	535	250	10.50
Axis-Q 500 4D	520	11	655	615	260	14.2
Axis-Q 550 4D	580	11	725	675	260	16.6
Axis-Q 630 4D	650	11	800	710	295	22.6
Axis-Q 630 6E	650	11	800	710	295	22.6



Specifications

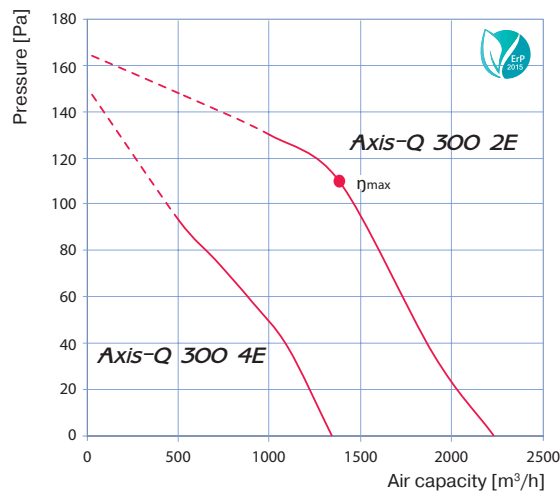
Parameters	Axis-Q 200 2E*	Axis-Q 250 2E*	Axis-Q 250 4E*	Axis-Q 300 2E 	Axis-Q 300 4E*
Voltage [V / 50 Hz]	230	230	230	230	230
Power [W]	55	80	50	145	75
Current [A]	0.26	0.4	0.22	0.66	0.35
Maximum air capacity [m ³ /h]	860	1050	800	2230	1340
RPM [min ⁻¹]	2300	2400	1380	2300	1350
Sound pressure level at 3 m distance [dBA]	50	60	55	60	58
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.









Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to environment, [dBA]	65	56	58	58	57	59	55	51	45

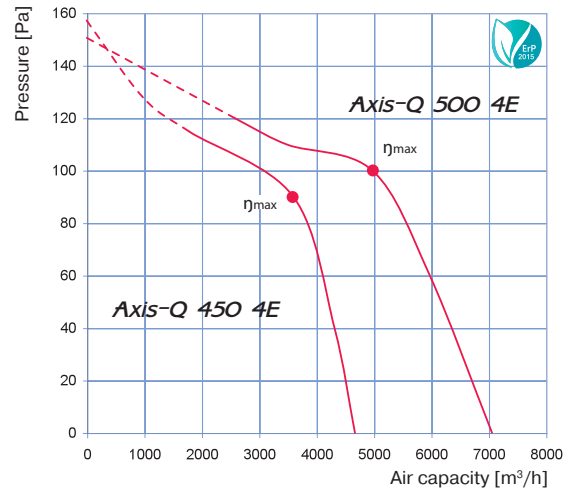
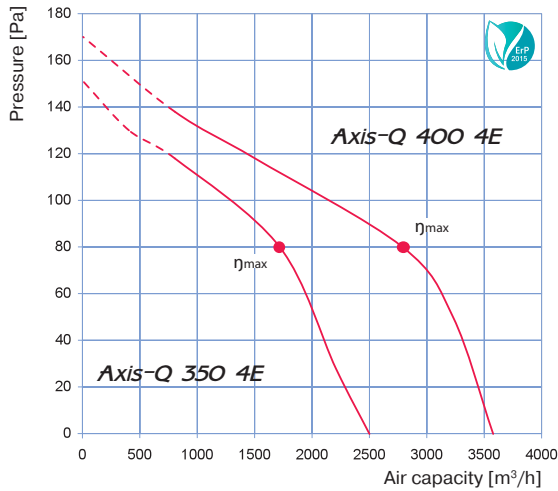
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-Q 250 2E									
L _{WA} to environment, [dBA]	76	68	66	68	70	68	68	63	58
Axis-Q 250 4E									
L _{WA} to environment, [dBA]	60	52	50	52	53	52	52	44	43



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-Q 300 2E										
L _{WA} to environment, [dBA]	78	72	72	70	72	70	69	63	63	
Axis-Q 300 4E										
L _{WA} to environment, [dBA]	67	58	57	59	57	58	53	52	49	
Axis-Q 300 2E										
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
30.5	A	Static	42.2	No	0.141	0.64	1380	110	2350	1

Specifications

Parameters	Axis-Q 350 4E 	Axis-Q 400 4E 	Axis-Q 450 4E 	Axis-Q 500 4E 	Axis-Q 550 4E 	Axis-Q 630 4E 
Voltage [V / 50 Hz]	230	230	230	230	230	230
Power [W]	140	180	250	420	550	750
Current [A]	0.65	0.82	1.2	1.95	2.55	3.5
Maximum air capacity [m ³ /h]	2500	3580	4680	7060	8800	11900
RPM [min ⁻¹]	1380	1380	1350	1300	1300	1360
Sound pressure level at 3 m distance [dBA]	62	63	64	69	70	75
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24	IP24



Sound-power level	Octave-frequency band [Hz]							
	Gen	63	125	250	500	1000	2000	4000

Axis-Q 350 4E									
L _{WA} to environment, [dBA]	70	61	62	64	63	63	58	56	52

Axis-Q 400 4E									
L _{WA} to environment, [dBA]	75	66	68	66	69	67	65	61	56

Axis-Q 350 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
29.9	A	Static	41.8	No	0.130	0.6	1717	80	1375	1

Axis-Q 400 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
33.8	A	Static	44.8	No	0.187	0.86	2787	80	1355	1

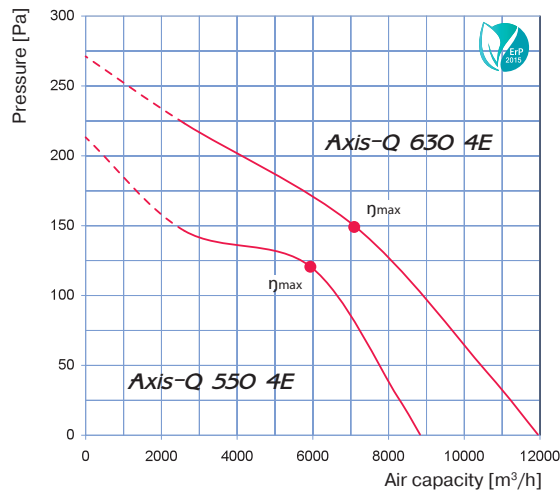
Sound-power level	Octave-frequency band [Hz]							
	Gen	63	125	250	500	1000	2000	4000

Axis-Q 450 4E									
L _{WA} to environment, [dBA]	77	69	70	73	73	71	67	67	61

Axis-Q 500 4E									
L _{WA} to environment, [dBA]	80	71	73	72	74	73	70	67	63

Axis-Q 450 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
32.0	A	Static	41.8	No	0.288	1.31	3610	90	1270	1

Axis-Q 500 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
32.1	A	Static	40.7	No	0.440	2.01	4987	100	1285	1



Sound-power level	Octave-frequency band [Hz]							
	Gen	63	125	250	500	1000	2000	4000




Axis-Q 550 4E									
L _{WA} to environment, [dBA]	83	73	75	73	75	74	72	66	63

Axis-Q 630 4E									
L _{WA} to environment, [dBA]	77	71	73	72	73	71	70	63	59

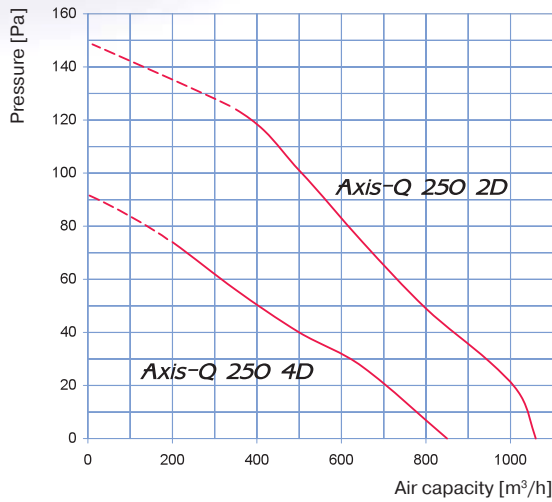
Axis-Q 550 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
34.7	A	Static	42.6	No	0.581	2.64	5919	120	1240	1

Axis-Q 630 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
37.5	A	Static	44.4	No	0.800	3.76	7095	149	1290	1

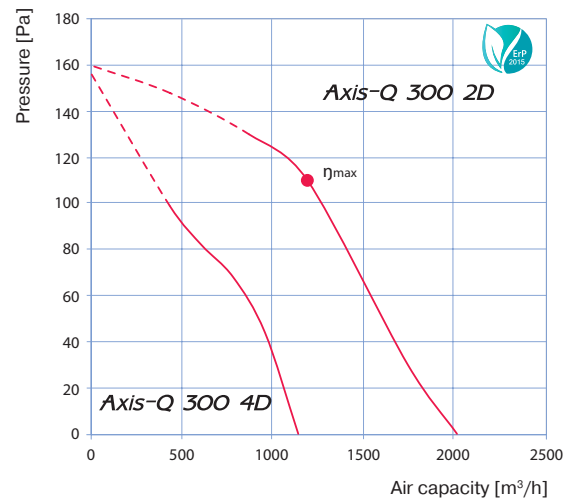
Specifications

Parameters	Axis-Q 250 2D*	Axis-Q 250 4D*	Axis-Q 300 2D 	Axis-Q 300 4D*	Axis-Q 350 4D 	Axis-Q 400 4D 
Voltage [V / 50 Hz]	400	400	400	400	400	400
Power [W]	80	60	145	75	140	180
Current [A]	0.22	0.17	0.25	0.22	0.38	0.47
Maximum air capacity [m ³ /h]	1060	850	2310	1310	2520	3740
RPM [min ⁻¹]	2600	1400	2350	1380	1380	1380
Sound pressure level at 3 m distance [dBA]	60	55	60	58	62	64
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24	IP24

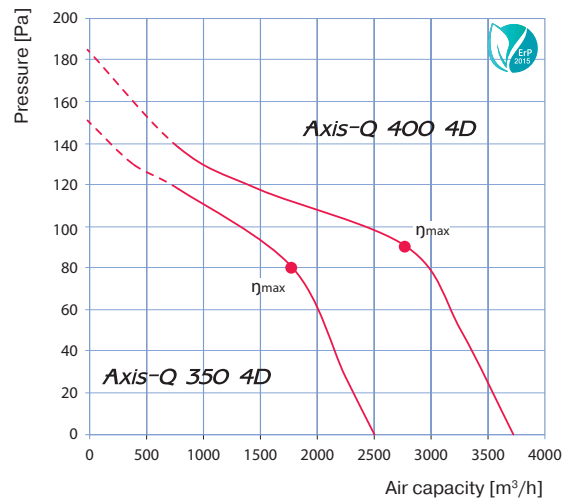
* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-Q 250 2D									
L _{WA} to environment, [dBA]	77	67	68	70	69	68	66	60	57
Axis-Q 250 4D									
L _{WA} to environment, [dBA]	60	49	50	53	54	53	52	45	42








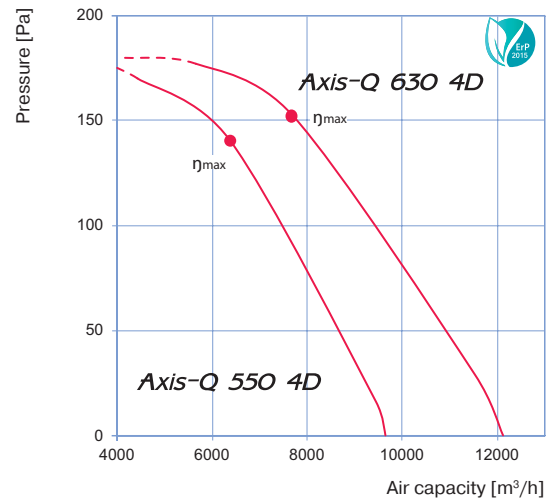
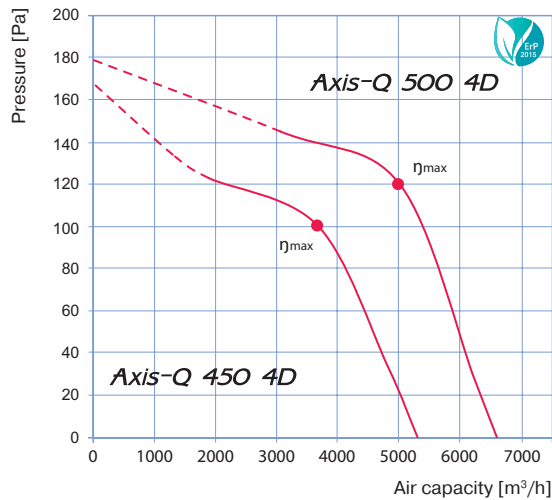
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-Q 300 2D										
L _{WA} to environment, [dBA]	80	72	71	71	74	70	69	65	63	
Axis-Q 300 4D										
L _{WA} to environment, [dBA]	63	58	55	58	56	58	57	52	48	
Axis-Q 300 2D										
η _a (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
30.3	A	Static	42	No	0.141	0.25	1367	110	2350	1



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-Q 350 4D										
L _{WA} to environment, [dBA]	72	62	61	64	64	61	61	56	54	
Axis-Q 400 4D										
L _{WA} to environment, [dBA]	75	65	66	69	66	67	64	60	55	
Axis-Q 350 4D										
η _a (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
31.7	A	Static	43.7	No	0.129	0.37	1802	80	1400	1
Axis-Q 400 4D										
η _a (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
34.3	A	Static	44.9	No	0.209	0.47	2807	90	1365	1

Specifications

Parameters	Axis-Q 450 4D 	Axis-Q 500 4D 	Axis-Q 550 4D 	Axis-Q 630 4D 	Axis-Q 630 6E 
Voltage [V / 50 Hz]	400	3 ~ 400	3 ~ 400	3 ~ 400	1 ~ 230
Power [W]	250	450	750	800	540
Current [A]	0.6	0.9	1.5	1.6	2.4
Maximum air capacity [m ³ /h]	5280	6570	9700	12200	10900
RPM [min ⁻¹]	1360	1300	1350	1320	850
Sound pressure level at 3 m distance [dBA]	65	72	73	78	72
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-Q 450 4D									
L _{WA} to environment, [dBA]	76	65	68	69	69	70	64	60	57
Axis-Q 500 4D									
L _{WA} to environment, [dBA]	82	73	71	75	78	76	71	65	61

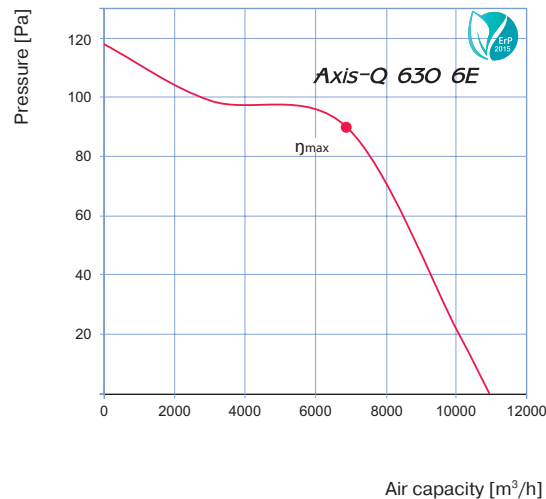
Axis-Q 450 4D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35.1	A	Static	44.8	No	0.296	0.59	3659	100	1310	1

Axis-Q 500 4D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35.5	A	Static	43.9	No	0.478	0.9	4988	120	1305	1

Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-Q 550 4D									
L _{WA} to environment, [dBA]	84	75	79	72	76	71	77	69	68
Axis-Q 630 4D									
L _{WA} to environment, [dBA]	78	75	69	70	74	74	69	65	64

Axis-Q 550 4D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
38.8	A	Static	46.3	No	0.656	1.27	6400	140	1175	1

Axis-Q 630 4D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
41.2	A	Static	48.1	No	0.810	1.61	7743	152	1290	1



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-Q 630 6E										
L _{WA} to environment, [dBA]	75	51	56	61	65	67	66	60	54	
Axis-Q 630 6E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35	A	Static	43.3	No	0.500	2.55	6857	90	915	1



Axial wall fans

Axis-QR

Air capacity – up to 12200 m³/h



■ Use

- Supply and exhaust ventilation systems installed in various premises.
- Ideal solution for boosting large air volumes at low aerodynamic resistance in the ventilation system.
- Refrigerating technologies for cooling of compressor condensing units.
- Direct air exhaust.
- For positive pressure ventilation in fire-fighting systems.

■ Design

- Steel casing and impeller with a special polymer atmospheric resistant coating.
- Casing is equipped with a round mounting plate and a round flange to facilitate wall mounting.
- The fan is equipped with a terminal box for connection to power mains.

■ Motor

- Two- or four-pole asynchronous motor with external rotor and axial impeller.
- Single-phase (**E**) or three-phase (**D**) motor modifications.
- Equipped with ball bearings for longer service life.
- Integrated overheating protection with automatic restart.

■ Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

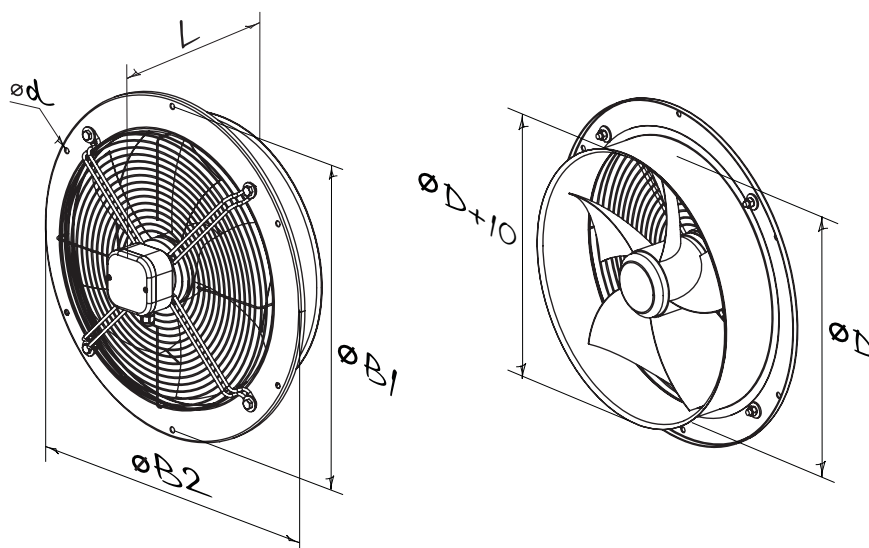
■ Mounting

- Wall surface mounting with a round connecting frame.
- Any mounting position with respect to air flow direction in the system.
- Power is supplied through an external terminal box.


ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Overall dimensions

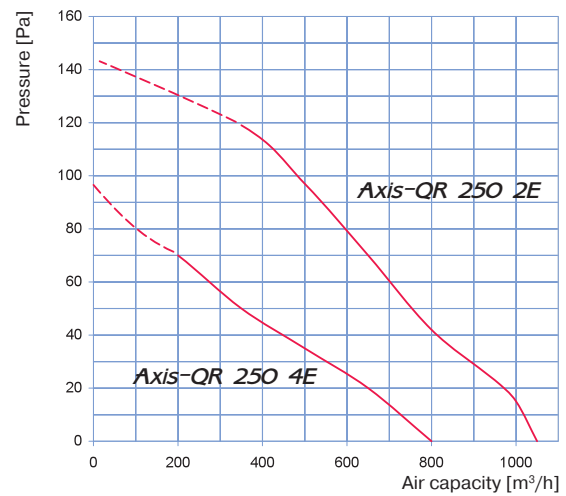
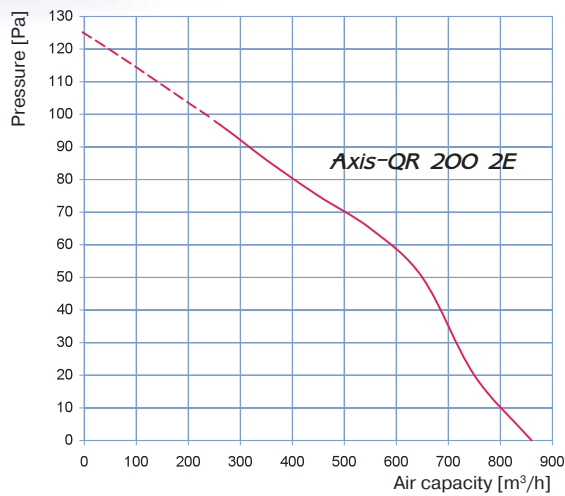
Type	Dimensions [mm]					Weight [kg]
	$\varnothing D$	$\varnothing d$	$\varnothing B1$	$\varnothing B2$	L	
Axis-QR 200 2E	210	7	250	280	145	3.95
Axis-QR 250 2E	260	7	295	320	155	4.17
Axis-QR 250 4E	260	7	295	320	155	4.06
Axis-QR 300 2E	326	9	380	397	195	5.27
Axis-QR 300 4E	326	9	380	397	195	5.11
Axis-QR 350 4E	388	9	442	460	200	7.05
Axis-QR 400 4E	417	9	504	528	240	8.80
Axis-QR 450 4E	465	11	578	607	250	10.50
Axis-QR 500 4E	520	11	590	655	260	14.15
Axis-QR 550 4E	570	11	645	710	280	16.50
Axis-QR 630 4E	650	11	760	800	295	22.55
Axis-QR 250 2D	260	7	295	320	155	4.17
Axis-QR 250 4D	260	7	295	320	155	4.06
Axis-QR 300 2D	326	9	380	397	155	5.27
Axis-QR 300 4D	326	9	380	397	155	5.11
Axis-QR 350 4D	388	9	442	460	200	7.05
Axis-QR 400 4D	417	9	504	528	240	8.80
Axis-QR 450 4D	465	11	578	607	250	10.50
Axis-QR 500 4D	520	11	655	615	260	14.2
Axis-QR 550 4D	580	11	725	675	260	16.6
Axis-QR 630 4D	650	11	800	710	295	22.6
Axis-QR 630 6E	650	11	800	710	295	22.6



Specifications

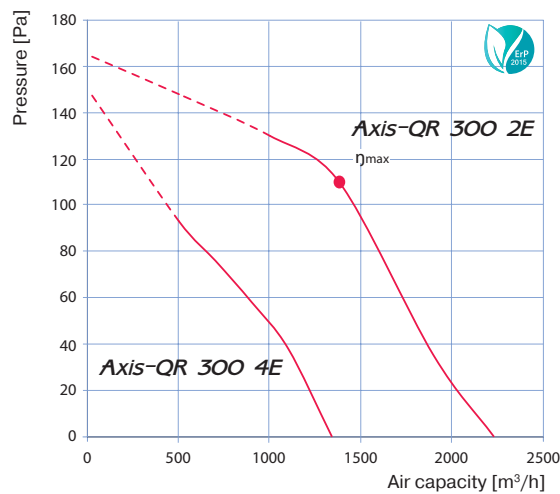
Parameters	Axis-QR 200 2E*	Axis-QR 250 2E*	Axis-QR 250 4E*	Axis-QR 300 2E 	Axis-QR 300 4E*
Voltage [V / 50 Hz]	230	230	230	230	230
Power [W]	55	80	50	145	75
Current [A]	0.26	0.4	0.22	0.66	0.35
Maximum air capacity [m ³ /h]	860	1050	800	2230	1340
RPM [min ⁻¹]	2300	2400	1380	2300	1350
Sound pressure level at 3 m distance [dBA]	50	60	55	60	58
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24

* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to environment, [dBA]	65	56	58	58	57	59	55	51	45

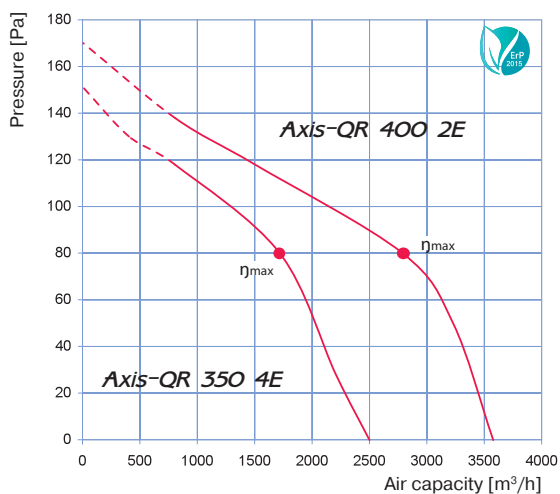
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-QR 250 2E									
L _{WA} to environment, [dBA]	76	68	66	68	70	68	68	63	58
Axis-QR 250 4E									
L _{WA} to environment, [dBA]	60	52	50	52	53	52	52	44	43



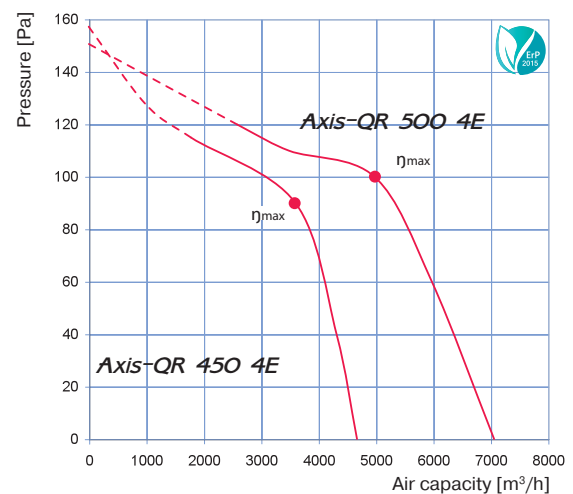
Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-QR 300 2E										
L _{WA} to environment, [dBA]	78	72	72	70	72	70	69	63	63	
Axis-QR 300 4E										
L _{WA} to environment, [dBA]	67	58	57	59	57	58	53	52	49	
Axis-QR 300 2E										
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
30.5	A	Static	42.2	No	0.141	0.64	1380	110	2350	1

Specifications

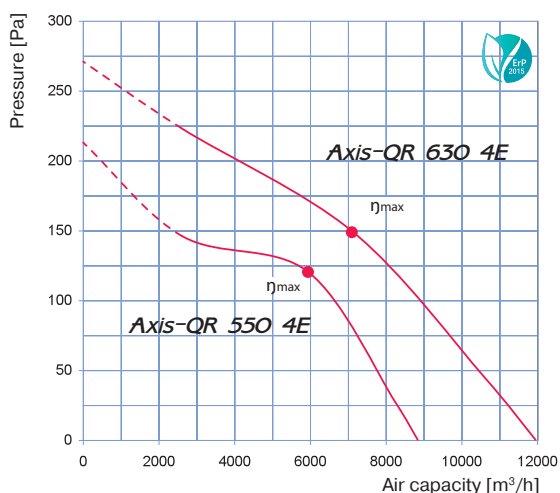
Parameters	Axis-QR 350 4E	Axis-QR 400 4E	Axis-QR 450 4E	Axis-QR 500 4E	Axis-QR 550 4E	Axis-QR 630 4E
Voltage [V / 50 Hz]	230	230	230	230	230	230
Power [W]	140	180	250	420	550	750
Current [A]	0.65	0.82	1.2	1.95	2.55	3.5
Maximum air capacity [m ³ /h]	2500	3580	4680	7060	8800	11900
RPM [min ⁻¹]	1380	1380	1350	1300	1300	1360
Sound pressure level at 3 m distance [dBA]	62	63	64	69	70	75
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24	IP24



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-QR 350 4E										
L _{WA} to environment, [dBA]	70	61	62	64	63	63	58	56	52	
Axis-QR 400 4E										
L _{WA} to environment, [dBA]	75	66	68	66	69	67	65	61	56	
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
29.9	A	Static	41.8	No	0.130	0.6	1717	80	1375	1
Axis-QR 400 4E										
33.8	A	Static	44.8	No	0.187	0.86	2787	80	1355	1






Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-QR 450 4E										
L _{WA} to environment, [dBA]	77	69	70	73	73	71	67	67	61	
Axis-QR 500 4E										
L _{WA} to environment, [dBA]	80	71	73	72	74	73	70	67	63	
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
32.0	A	Static	41.8	No	0.288	1.31	3610	90	1270	1
Axis-QR 500 4E										
32.1	A	Static	40.7	No	0.440	2.01	4987	100	1285	1



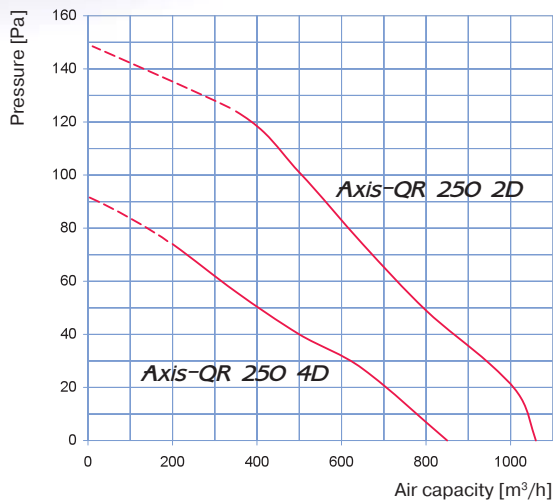
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-QR 550 4E									
L _{WA} to environment, [dBA]	83	73	75	73	75	74	72	66	63
Axis-QR 630 4E									
L _{WA} to environment, [dBA]	77	71	73	72	73	71	70	63	59

Axis-Q 630 4E										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
37.5	A	Static	44.4	No	0.800	3.76	7095	149	1290	1
Axis-Q 550 4E										
34.7	A	Static	42.6	No	0.581	2.64	5919	120	1240	1

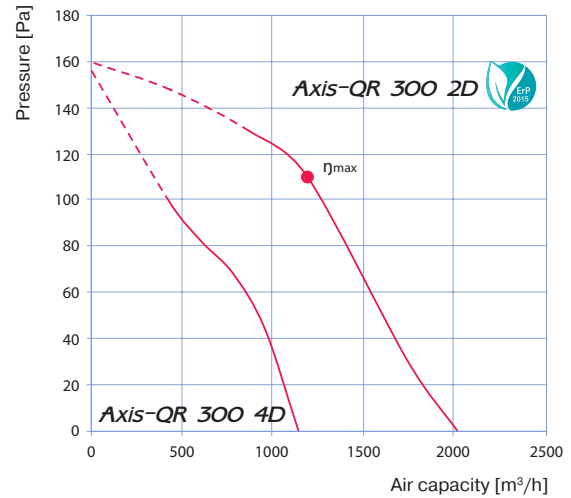
Specifications

Parameters	Axis-QR 250 2D*	Axis-QR 250 4D*	Axis-QR 300 2D 	Axis-QR 300 4D*	Axis-QR 350 4D 	Axis-QR 400 4D 
Voltage [V / 50 Hz]	400	400	400	400	400	400
Power [W]	80	60	145	75	140	180
Current [A]	0.22	0.17	0.25	0.22	0.38	0.47
Maximum air capacity [m³/h]	1060	850	2310	1310	2520	3740
RPM [min ⁻¹]	2600	1400	2350	1380	1380	1380
Sound pressure level at 3 m distance [dBA]	60	55	60	58	62	64
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24	IP24

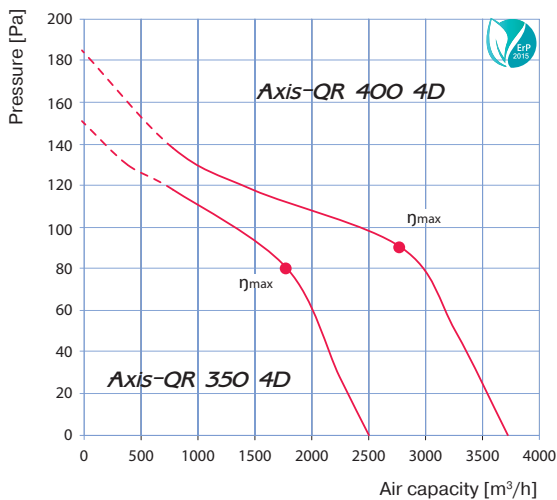
* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-QR 250 2D									
L _{WA} to environment, [dBA]	77	67	68	70	69	68	66	60	57
Axis-QR 250 4D									
L _{WA} to environment, [dBA]	60	49	50	53	54	53	52	45	42



Sound-power level	Octave-frequency band [Hz]									
	Gen	63	125	250	500	1000	2000	4000	8000	
Axis-QR 300 2D										
L _{WA} to environment, [dBA]	80	72	71	71	74	70	69	65	63	
Axis-QR 300 4D										
L _{WA} to environment, [dBA]	63	58	55	58	56	58	57	52	48	
Axis-QR 300 2D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
30.3	A	Static	42	No	0.141	0.25	1367	110	2350	1








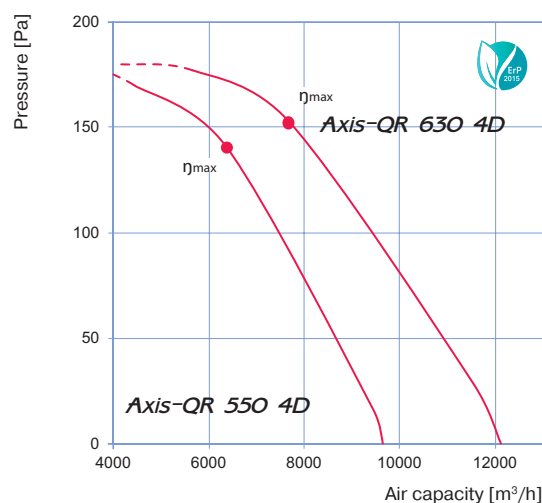
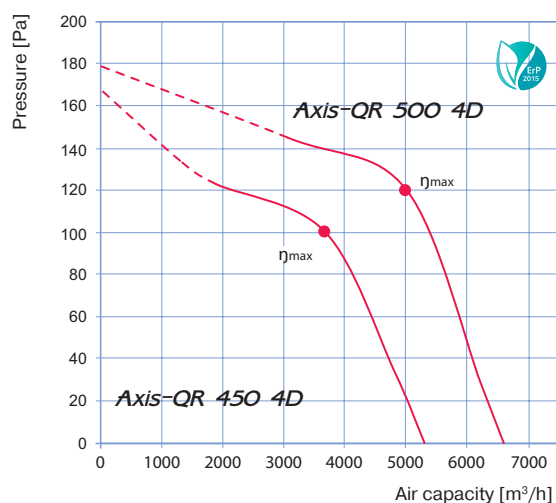
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Axis-QR 350 4D									
L _{WA} to environment, [dBA]	72	62	61	64	64	61	61	56	54
Axis-QR 400 4D									
L _{WA} to environment, [dBA]	75	65	66	69	66	67	64	60	55

Axis-QR 350 4D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
31.7	A	Static	43.7	No	0.129	0.37	1802	80	1400	1

Axis-QR 400 4D										
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
34.3	A	Static	44.9	No	0.209	0.47	2807	90	1365	1

Specifications

Parameters	Axis-QR 450 4D 	Axis-QR 500 4D 	Axis-QR 550 4D 	Axis-QR 630 4D 	Axis-QR 630 6E 
Voltage [V / 50 Hz]	400	3 ~ 400	3 ~ 400	3 ~ 400	1 ~ 230
Power [W]	250	450	750	800	540
Current [A]	0.6	0.9	1.5	1.6	2.4
Maximum air capacity [m ³ /h]	5280	6570	9700	12200	10900
RPM [min ⁻¹]	1360	1300	1350	1320	850
Sound pressure level at 3 m distance [dBA]	65	72	73	78	72
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Ingress protection rating	IP24	IP24	IP24	IP24	IP24



Sound-power level	Octave-frequency band [Hz]							
	Gen	63	125	250	500	1000	2000	4000

Axis-QR 450 4D

L _{WA} to environment, [dBA]	76	65	68	69	69	70	64	60	57
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Axis-QR 500 4D

L _{WA} to environment, [dBA]	82	73	71	75	78	76	71	65	61
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Axis-QR 450 4D

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35.1	A	Static	44.8	No	0.296	0.59	3659	100	1310	1

Axis-QR 500 4D

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35.5	A	Static	43.9	No	0.478	0.9	4988	120	1305	1

Sound-power level	Octave-frequency band [Hz]							
	Gen	63	125	250	500	1000	2000	4000

Axis-QR 550 4D

L _{WA} to environment, [dBA]	84	75	79	72	76	71	77	69	68
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Axis-QR 630 4D

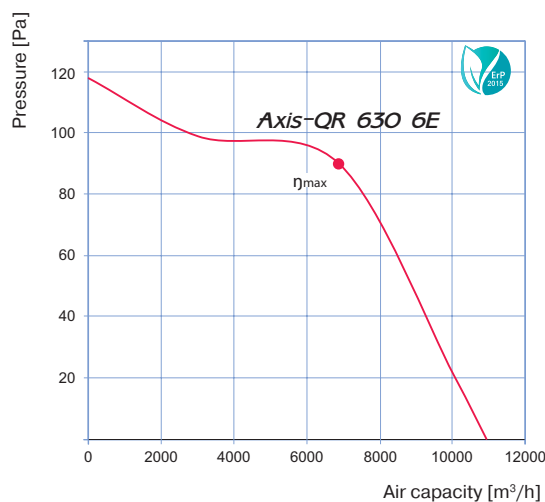
L _{WA} to environment, [dBA]	78	75	69	70	74	74	69	65	64
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Axis-QR 550 4D

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
38.8	A	Static	46.3	No	0.656	1.27	6400	140	1175	1

Axis-QR 630 4D

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
41.2	A	Static	48.1	No	0.810	1.61	7743	152	1290	1



Sound-power level	Octave-frequency band [Hz]							
	Gen	63	125	250	500	1000	2000	4000

L _{WA} to environment, [dBA]	75	51	56	61	65	67	66	60	54
---------------------------------------	----	----	----	----	----	----	----	----	----

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
35	A	Static	43.3	No	0.500	2.55	6857	90	915	1



Axial wall fans

Axis-QA

Air capacity – up to 1700 m³/h

■ Use

- Supply and exhaust ventilation systems installed in various premises.
- Mounting in ventilation systems with low static pressure requiring high air capacity.
- Direct air exhaust.

■ Design

- Compact steel casing covered with special polymer coating.
- Aluminium impeller.
- The casing is equipped with a square mounting plate and flange for easy surface wall mounting.
- The fan is equipped with a power cord and external terminal box for connection to power mains.

■ Motor

- Single-phase asynchronous motor with an internal rotor and an axial impeller.
- Motor with slide bearings.
- Integrated overheating protection with automatic restart.

■ Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

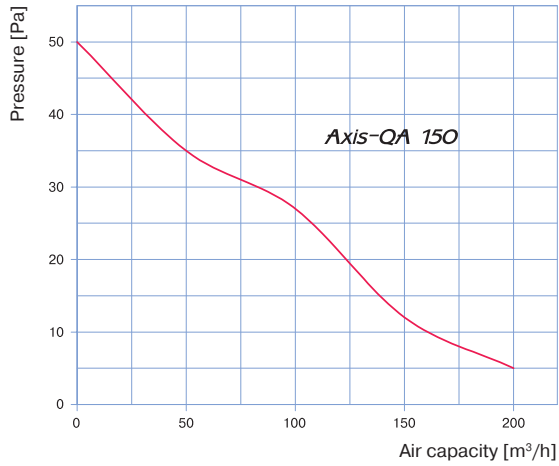
■ Mounting

- Wall surface mounting with a square connecting frame.
- Horizontal installation with respect to air flow direction in the system.
- Power supply through an external terminal box with electric lead-in.

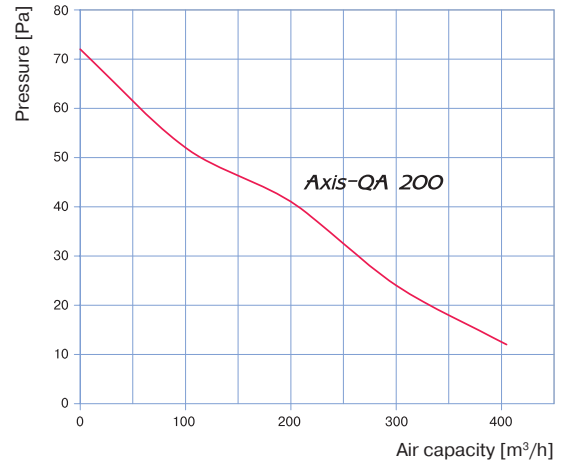
■ Specifications

Parameters	Axis-QA 150	Axis-QA 200	Axis-QA 250	Axis-QA 315
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	36	43	68	110
Current [A]	0.26	0.28	0.48	0.75
Maximum air capacity [m ³ /h]	200	405	1070	1700
RPM [min ⁻¹]	1300	1300	1300	1300
Sound pressure level at 3 m distance [dBA]	33	32	48	54
Max. operating temperature [°C]	40	40	40	40
Ingress protection rating	IP24	IP24	IP24	IP24

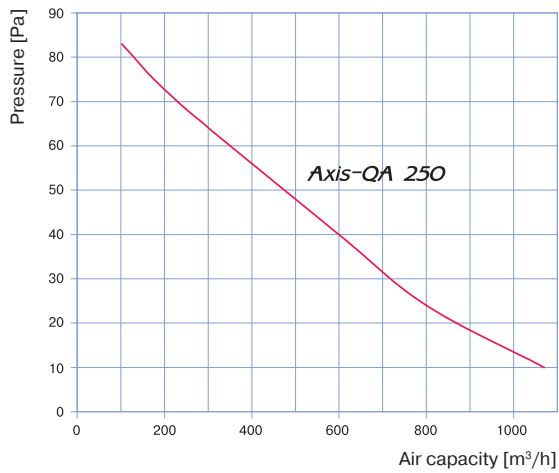
Specifications



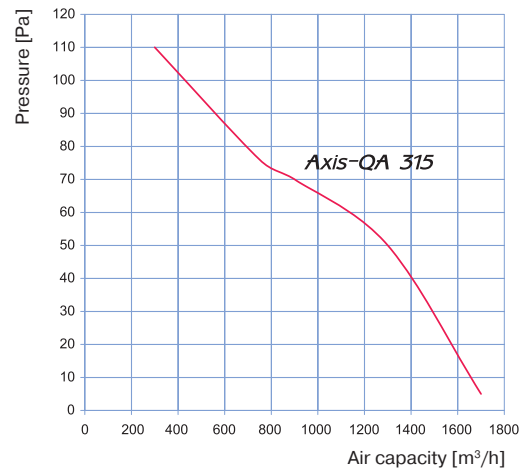
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	46	47	56	45	35	30	31	31	20



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	53	55	63	56	44	42	36	30	15

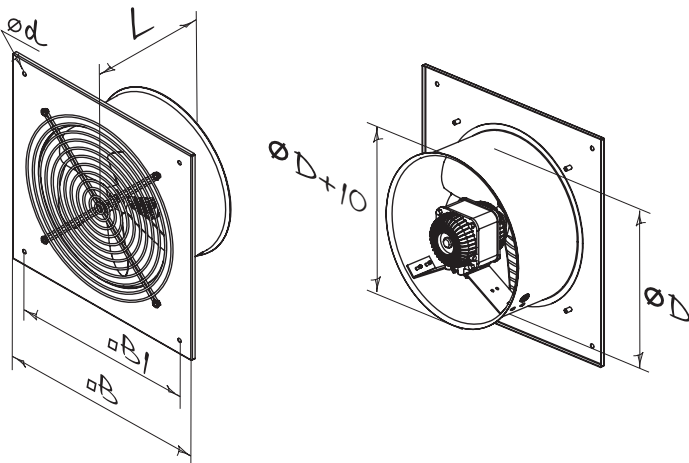


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	59	61	70	60	43	46	41	34	19



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	62	65	67	58	45	51	48	41	30

Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	øD	ød	B	B1	L	
Axis-QA 150	162	7	250	210	120	2.10
Axis-QA 200	208	7	312	260	120	2.82
Axis-QA 250	262	7	370	320	140	4.88
Axis-QA 315	312	9	430	380	170	5.46



Axial wall fans

Axis-QRA

Air capacity – up to 1700 m³/h

■ Use

- Supply and exhaust ventilation systems installed in various premises.
- Mounting in ventilation systems with low static pressure requiring high air capacity.
- Direct air exhaust.

■ Design

- Compact steel casing covered with special polymer coating.
- Aluminium impeller.
- The casing is equipped with a round mounting plate and flange for easy surface wall mounting.
- The fan is equipped with a power cord and external terminal box for connection to power mains.

■ Motor

- Single-phase asynchronous motor with an internal rotor and an axial impeller.
- Motor with slide bearings.
- Integrated overheating protection with automatic restart.

■ Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

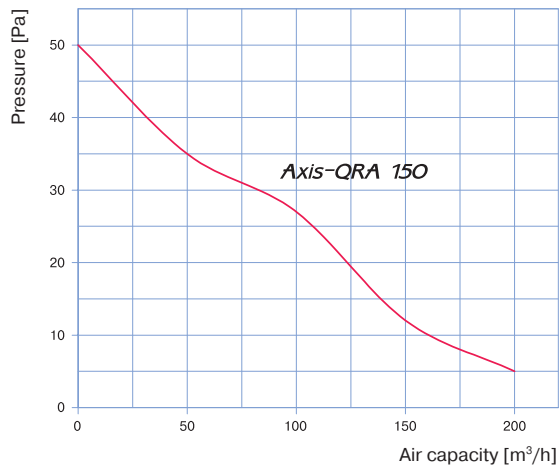
■ Mounting

- Wall surface mounting with a round connecting frame.
- Horizontal installation with respect to air flow direction in the system.
- Power supply through an external terminal box with electric lead-in.

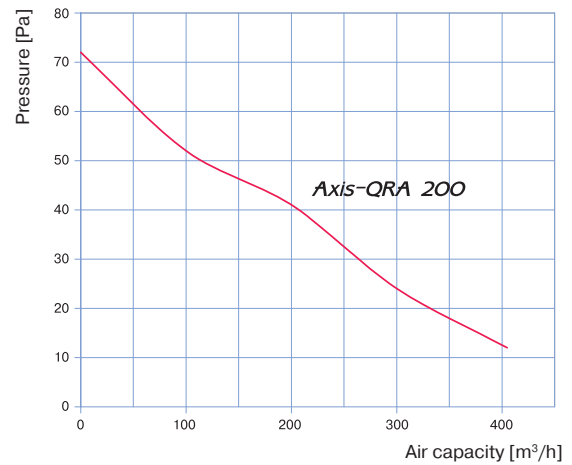
■ Specifications

Parameters	Axis-QRA 150	Axis-QRA 200	Axis-QRA 250	Axis-QRA 315
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	36	43	68	110
Current [A]	0.26	0.28	0.48	0.75
Maximum air capacity [m ³ /h]	200	405	1070	1700
RPM [min ⁻¹]	1300	1300	1300	1300
Sound pressure level at 3 m distance [dBA]	33	32	48	54
Max. operating temperature [°C]	40	40	40	40
Ingress protection rating	IP24	IP24	IP24	IP24

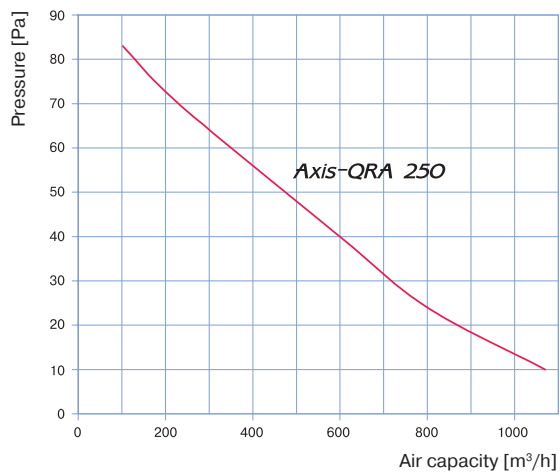
Specifications



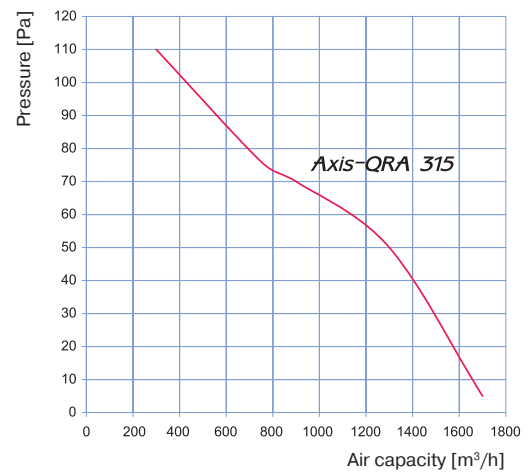
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	46	47	56	45	35	30	31	31	20



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	53	55	63	56	44	42	36	30	15

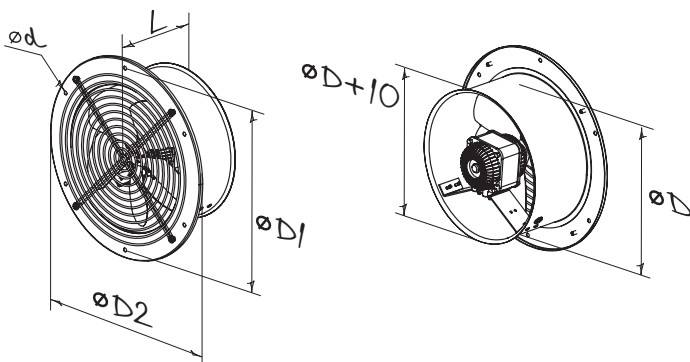


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	59	61	70	60	43	46	41	34	19



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to environment, [dBA]	62	65	67	58	45	51	48	41	30

Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	øD	øD1	øD2	ød	L	
Axis-QRA 150	162	190	220	7	120	1.91
Axis-QRA 200	208	270	300	7	120	2.50
Axis-QRA 250	262	330	360	7	140	4.10
Axis-QRA 315	312	390	420	9	170	5.24



Centrifugal roof fans

Tower-V

Air capacity – up to 4700 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- Roof mounting.
- For any types of roofs or vertical ventilation shafts.

Design

- Steel casing with a special polymer atmospheric resistant coating.
- Vertical air exhaust.
- The fan is equipped with a terminal block for connection to power mains.
- The fan is rated for continuous operation.
- The upper cover is equipped with two eye bolts for easy fan lifting on the roof with hoisting mechanism.
- A connecting plate with an intake opening is designed to facilitate mounting to the roof surface.

Motor

- Two-, four- or six-pole asynchronous motor with external rotor and centrifugal impeller with backward curved blades.
- Single-phase (E) or three-phase (D) motor modifications.
- Dynamically balanced turbine.
- Equipped with ball bearings for longer service life.
- Overheating protection with built-in thermal switches with automatic restart or with leaded outside terminals for connection to external protecting controls.

- The thermal switch terminal leads are designed for connection to respective circuit of the overload relay or respective terminals of the autotransformer or thyristor speed controller.

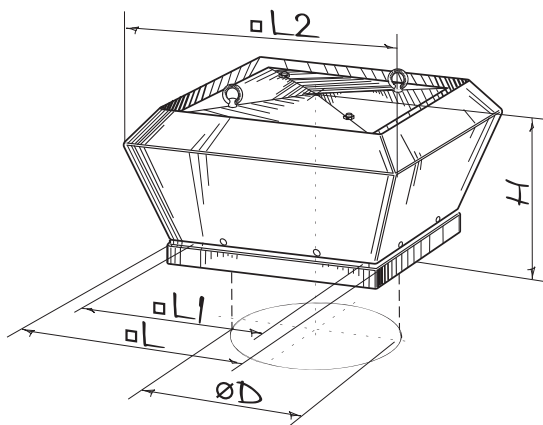
Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting



- Roof mounting directly above a ventilation shaft or air duct.
- The fan is connected to the air duct with the intake flange that is fixed to the fan base.
- The fan base has holes for fixing bolts that attach the fan to a stable level surface or a roof frame.
- Roof frame and intake flange available on separate order.
- Power is supplied through an external terminal box.

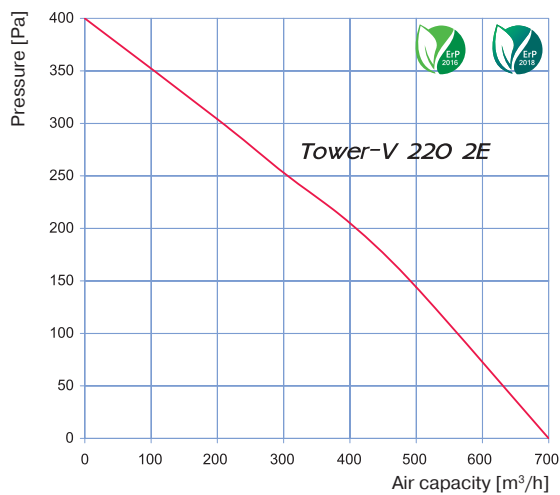
Overall dimensions



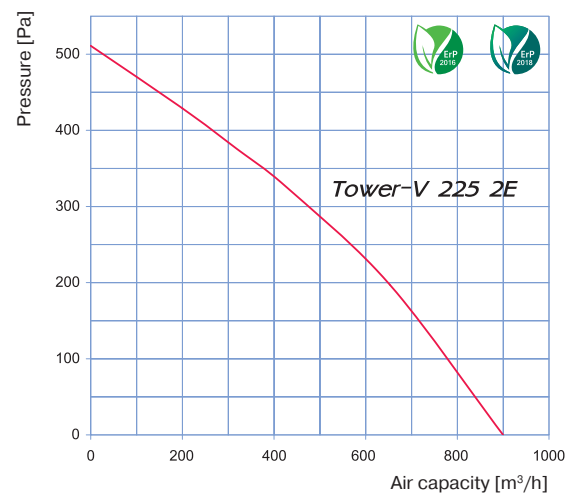
Type	Dimensions [mm]					Weight [kg]
	ØD	H	L2	L1	L	
Tower-V 220 2E	213	275	460	245	338	8.9
Tower-V 225 2E	213	275	460	245	338	9.6
Tower-V 250 2E	285	275	520	330	425	12.0
Tower-V 280 2E	285	275	520	330	425	12.7
Tower-V 310 4E	285	330	560	330	438	17.8
Tower-V 310 4D	285	330	560	330	438	17.8
Tower-V 355 4E	438	420	783	450	598	22.0
Tower-V 355 4D	438	420	783	450	598	22.0
Tower-V 400 4E	438	420	783	450	598	27.5
Tower-V 450 4E	438	454	872	535	668	30.0
Tower-V 400 4D	438	420	783	450	598	27.5
Tower-V 450 4D	438	454	872	535	668	30.0
Tower-V 500 6E	438	454	872	535	668	33.8

Specifications

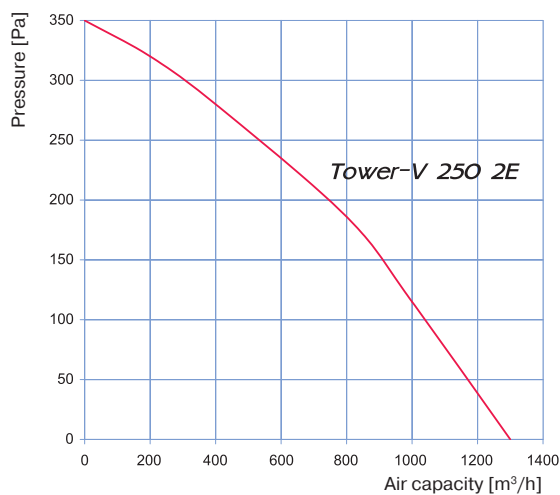
Parameters	Tower-V 220 2E 	Tower-V 225 2E 	Tower-V 250 2E	Tower-V 280 2E
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	85	135	155	225
Current [A]	0.38	0.6	0.7	1.0
Maximum air capacity [m ³ /h]	700	900	1300	1780
RPM [min ⁻¹]	2700	2650	2600	2700
Sound pressure level at 3 m distance [dBA]	49	49	65	66
Max. operating temperature [°C]	55	55	50	50
SEC class	B		-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



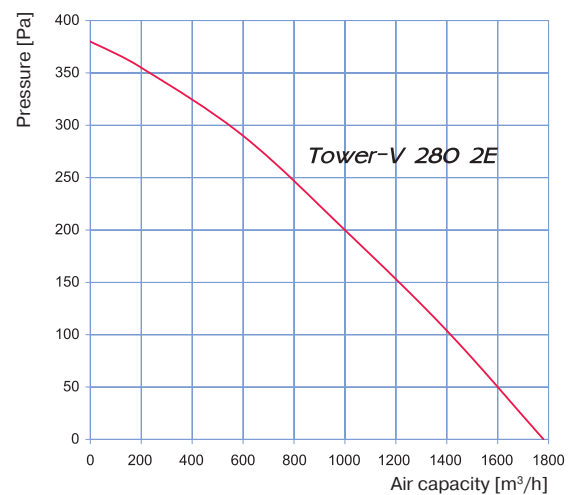
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	42	60	65	68	65	61	59	50
L _{WA} to environment, [dBA]	73	42	60	65	67	67	65	57	50



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	41	59	66	68	66	61	57	49
L _{WA} to environment, [dBA]	72	42	60	67	69	66	63	58	51






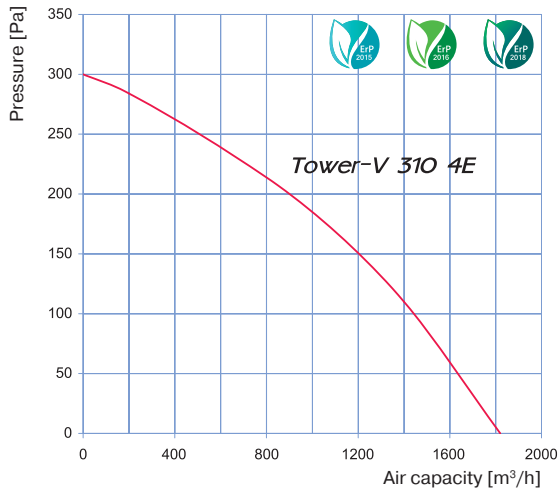
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	40	62	65	66	66	64	57	49
L _{WA} to environment, [dBA]	71	44	59	65	68	66	62	60	53



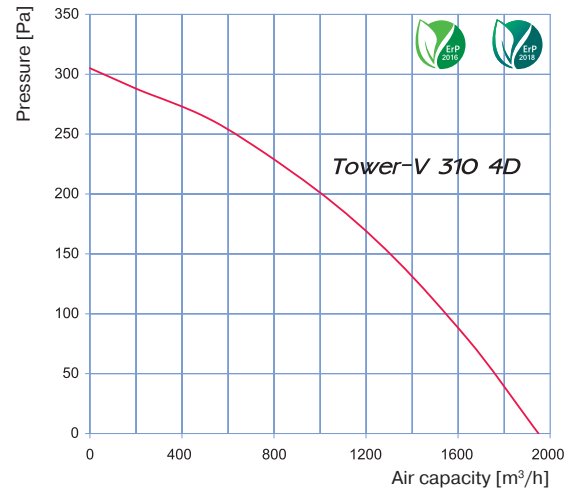
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	42	58	62	64	65	63	56	49
L _{WA} to environment, [dBA]	72	45	61	63	66	66	61	60	53

Specifications

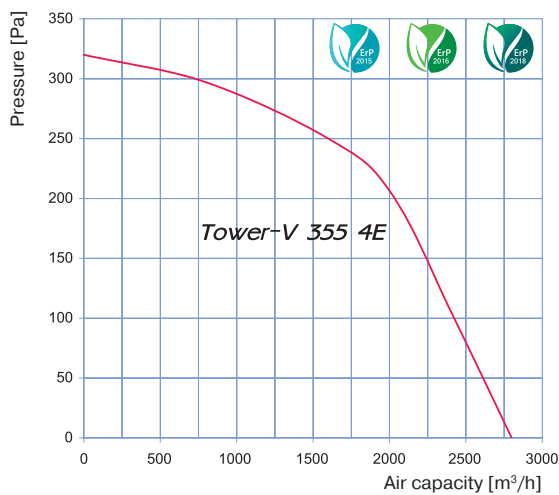
Parameters	Tower-V 310 4E 	Tower-V 310 4D 	Tower-V 355 4E 	Tower-V 355 4D 
Voltage [V / 50 Hz]	230	400	230	400
Power [W]	120	110	245	170
Current [A]	0.54	0.32	1.12	0.52
Maximum air capacity [m ³ /h]	1820	1950	2800	2350
RPM [min ⁻¹]	1370	1400	1420	1400
Sound pressure level at 3 m distance [dBA]	45	53	46	53
Max. operating temperature [°C]	85	65	50	70
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



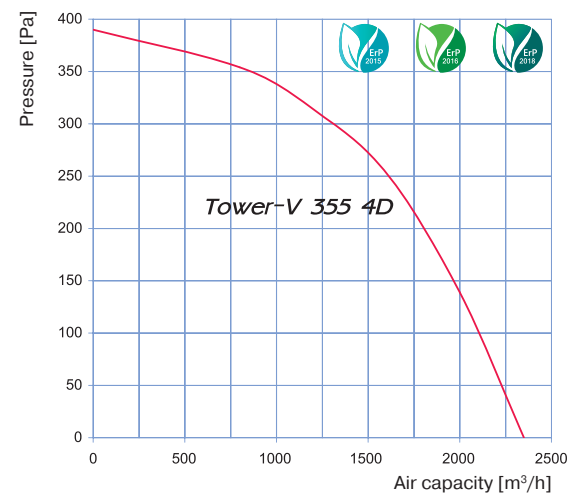
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	57	44	45	50	53	52	51	43	36
L _{WA} to environment, [dBA]	60	47	50	53	56	57	51	45	39



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	58	45	46	51	55	53	49	45	37
L _{WA} to environment, [dBA]	60	48	51	52	54	56	49	44	38








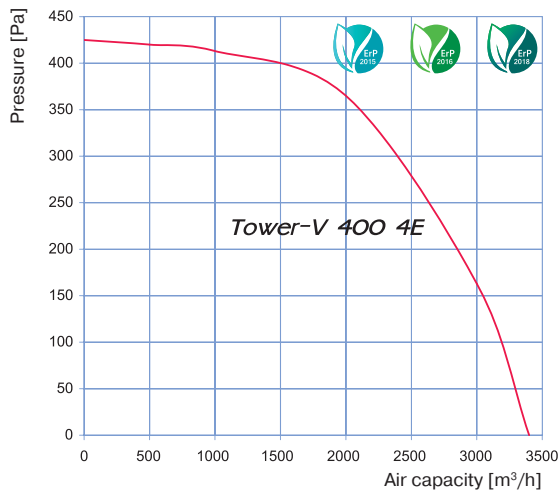
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	53	58	61	62	63	59	54	45
L _{WA} to environment, [dBA]	72	57	60	63	65	64	61	55	49



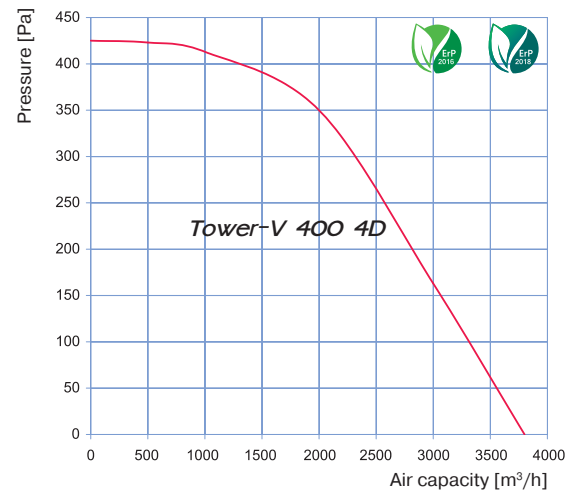
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	67	56	57	63	65	64	59	54	47
L _{WA} to environment, [dBA]	72	56	60	62	66	62	63	55	49

Specifications

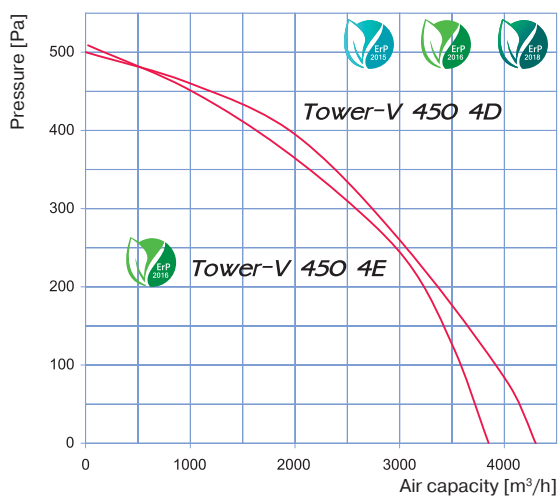
Parameters	Tower-V 400 4E 	Tower-V 400 4D 	Tower-V 450 4E 	Tower-V 450 4D 	Tower-V 500 6E 
Voltage [V / 50 Hz]	230	400 Y	230	400 Y	230
Power [W]	480	385	640	470	385
Current [A]	2.4	0.7	3.1	0.82	1.82
Maximum air capacity [m ³ /h]	3400	3800	3850	4300	4700
RPM [min ⁻¹]	1400	1430	1350	1430	880
Sound pressure level at 3 m distance [dBA]	52	52	53	53	47
Max. operating temperature [°C]	80	60	50	50	50
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4



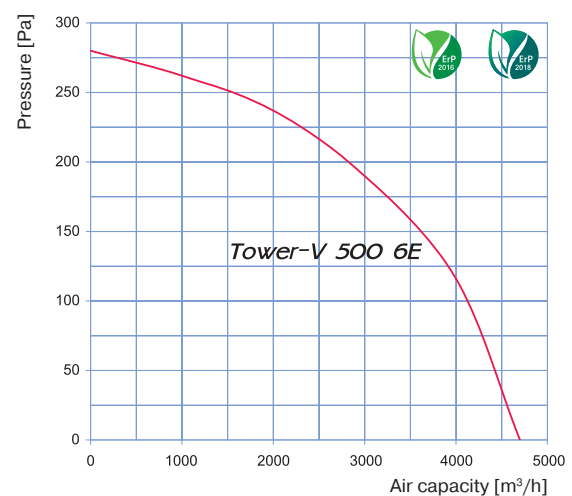
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	58	62	67	69	68	63	58	52
L _{WA} to environment, [dBA]	76	61	63	68	70	68	65	60	53



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	59	63	65	67	68	63	58	51
L _{WA} to environment, [dBA]	74	59	62	65	69	69	66	59	53



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Tower-V 450 4E									
L _{WA} to inlet, [dBA]	63	51	54	58	59	61	56	50	41
L _{WA} to environment, [dBA]	68	51	53	60	61	61	58	52	43
Tower-V 450 4D									
L _{WA} to inlet, [dBA]	64	49	55	59	60	60	56	48	42
L _{WA} to environment, [dBA]	66	51	56	58	61	61	56	52	46



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	67	54	55	59	61	64	59	55	46
L _{WA} to environment, [dBA]	70	56	56	62	64	63	60	56	45

Roof centrifugal fans with EC motor

Tower-V EC

Air capacity - up to 11400 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- Roof mounting.
- Any roof types or vertical ventilation shafts.
- For arranging energy-saving and controllable ventilation systems.

Design

- The casing is made of steel with a polymer atmospheric resistant coating.
- Vertical air exhaust.
- The fan is equipped with a terminal box for connection to power mains.
- The fan is rated for continuous operation always connected to power mains.
- The upper cover is equipped with two eye bolts for easy fan lifting on the roof with hoisting mechanism.
- A connecting plate is provided to facilitate mounting to the roof surface or to the mounting frame.

Motor

- High-efficient direct current EC motor with external rotor and backward curved blades.
- EC technologies meet the latest requirements to arrange high-efficient energy saving ventilation.
- EC motors have energy demand by 50 % less as compared to standard motors and have efficiency up to 90 %.
- EC motors are featured with high performance, low noise level and well controllable total speed range.
- Overheating protection by built-in thermal switches with automatic restart.
- Dynamically balanced turbine.

Operation and speed control

- The fan is controlled with a 0-10 V external control signal, e.g. **CDT E/0-10** speed controller for EC motors.
- The fan capacity is regulated by various parameters, including temperature level, pressure, smoke, etc.
- EC motor changes its rotation speed synchronously with the fluctuation of the control parameter to ensure the best suitable air flow.
- The fan is compatible both with 50 and 60 Hz power mains with no influence to the motor maximum speed.
- The parameters may be set and controlled due to data exchange between a PC and the fan.
- The fans can be integrated into a unified decentralized computerized network to adjust ventilation system with respect to specific user's demands.

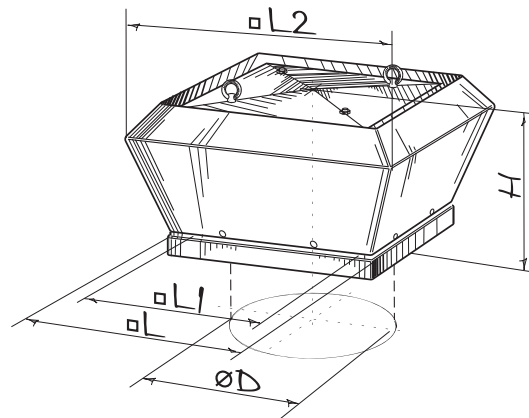
Mounting

- Roof mounting directly above a ventilation shaft or an air duct.
- The fan is attached to a square air duct or to the **MRDL/MRIDL** mounting frame (see accessories).
- The counterflange **FDL** mounted on the fan bottom (see accessories) is designed for the fan connection to a round air duct.
- The KDL backdraft dampers (see Accessories) are designed to prevent air back drafting when the fan is off.
- The VDL flexible connectors (see Accessories) are designed to absorb vibration from the fan to the air duct.
- External terminal box for connection to power mains.



ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

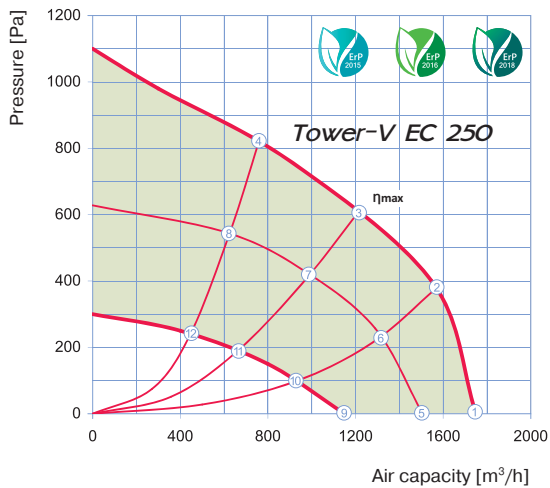
Overall dimensions

Type	Dimensions [mm]					Weight [kg]
	∅D	H	L	L1	L2	
Tower-V EC 250	285	320	435	330	528	16
Tower-V EC 280	285	327	435	330	557	18
Tower-V EC 310	285	327	435	330	557	21
Tower-V EC 355	438	387	595	450	708	38
Tower-V EC 400	438	387	595	450	708	82
Tower-V EC 450	438	464	665	535	898	84
Tower-V EC 500	438	464	665	535	898	88
Tower-V EC 560	605	560	940	750	1150	98



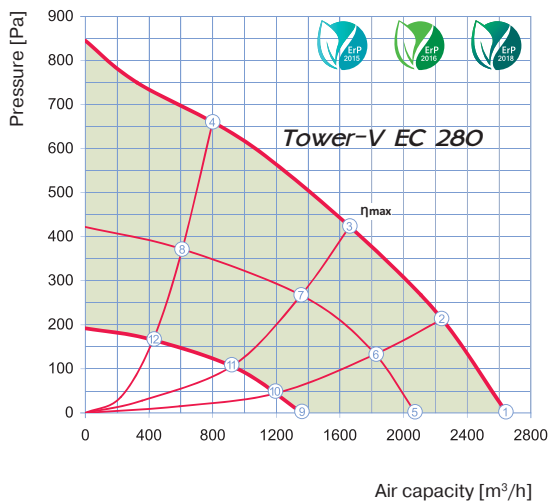
Specifications

Parameters	Tower-V EC 250 	Tower-V EC 280 
Voltage [V / 50 / 60 Hz]	1 ~ 200-277	1 ~ 200-277
Power [kW]	0.485	0.455
Current [A]	3.0	2.8
Maximum air capacity [m ³ /h]	1750	2650
RPM [min ⁻¹]	3580	2600
Sound pressure level at 3 m distance [dBA]	47	47
Max. operating temperature [°C]	-25 +60	-25 +40
Ingress protection rating	IPX4	IPX4



point	P, (W)	I, (A)	n, (min ⁻¹)
1	380	2.30	3580
2	465	3.00	3460
3	485	3.00	3460
4	440	2.40	3520
5	193	1.20	2830
6	245	1.50	2830
7	260	1.60	2830
8	225	1.40	2830
9	80	0.50	2000
10	100	0.60	2000
11	106	0.70	2000
12	94	0.60	2000



η _s , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
47.6	A	Static	61.4	Yes	0.485	3.0	1211	606	3460	1

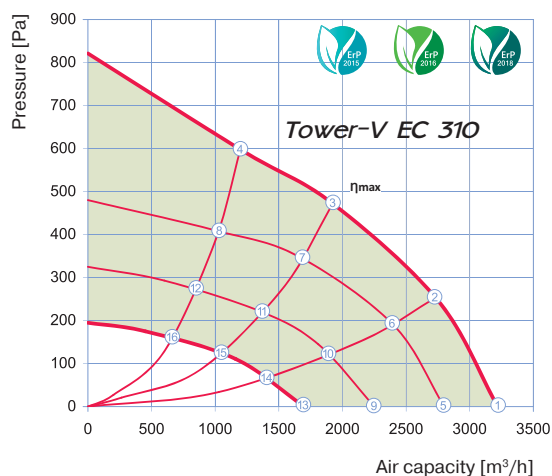


point	P, (W)	I, (A)	n, (min ⁻¹)
1	355	2.20	2760
2	400	2.50	2670
3	425	2.60	2660
4	386	2.30	2740
5	150	1.00	2050
6	206	1.10	2050
7	232	1.40	2050
8	196	1.20	2050
9	65	0.40	1460
10	80	0.50	1460
11	88	0.60	1460
12	70	0.50	1460

η _s , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
52.2	A	Static	66.5	Yes	0.425	2.6	1661	423	2660	1

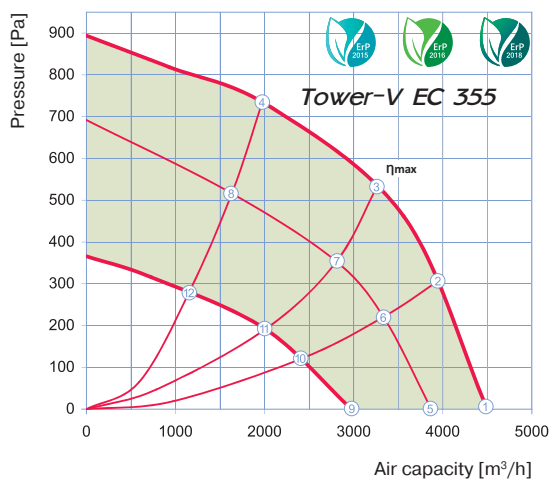
Specifications

Parameters	Tower-V EC 310 	Tower-V EC 355 
Voltage [V / 50 / 60 Hz]	1 ~ 200-277	3 ~ 380-480
Power [kW]	0.48	0.94
Current [A]	3.1	1.5
Maximum air capacity [m ³ /h]	3220	4500
RPM [min ⁻¹]	2300	2215
Sound pressure level at 3 m distance [dBA]	48	51
Max. operating temperature [°C]	-25 +60	-25 +60
Ingress protection rating	IPX4	IPX4



η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
59.2	A	Static	73	Yes	0.480	3.1	1920	470	2170	1



point	P, (W)	I, (A)	n, (min ⁻¹)
1	370	2.35	2300
2	445	2.85	2215
3	480	3.10	2170
4	448	2.85	2220
5	210	1.30	1900
6	284	1.70	1900
7	312	1.80	1900
8	278	1.70	1900
9	124	0.80	1560
10	158	1.00	1560
11	175	1.10	1560
12	158	1.00	1560
13	57	0.40	1200
14	73	0.50	1200
15	80	0.50	1200
16	70	0.50	1200

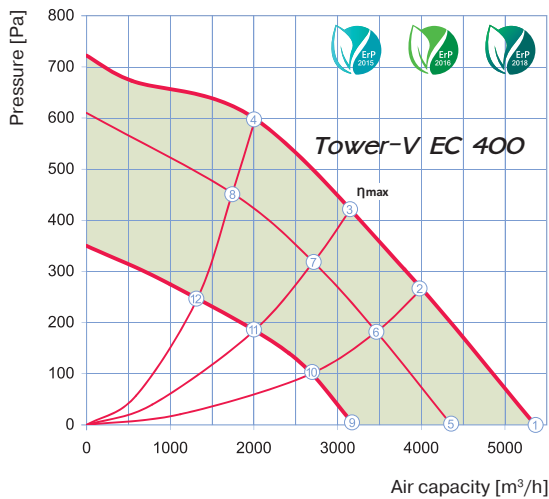


η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
57.3	A	Static	68.1	Yes	0.940	1.5	3266	534	2215	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	700	1.30	2205
2	880	1.40	2215
3	940	1.50	2215
4	850	1.40	2215
5	380	0.70	1825
6	470	0.90	1805
7	490	0.90	1790
8	460	0.90	1800
9	170	0.40	1335
10	200	0.40	1315
11	210	0.40	1315
12	190	0.40	1310

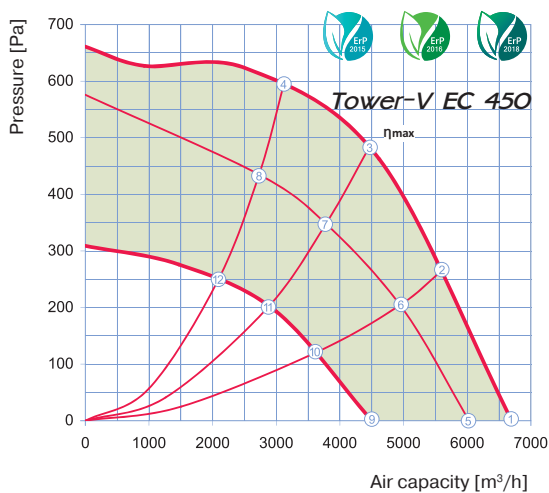
Specifications

Parameters	Tower-V EC 400 	Tower-V EC 450 
Voltage [V / 50 / 60 Hz]	3 ~ 380-480	3 ~ 380-480
Power [kW]	0.77	1.01
Current [A]	1.3	1.6
Maximum air capacity [m ³ /h]	5360	6700
RPM [min ⁻¹]	1755	1560
Sound pressure level at 3 m distance [dBA]	53	55
Max. operating temperature [°C]	-25 +60	-25 +60
Ingress protection rating	IPX4	IPX4



point	P, (W)	I, (A)	n, (min ⁻¹)
1	630	1.10	1755
2	750	1.30	1760
3	770	1.30	1760
4	720	1.20	1760
5	400	0.80	1510
6	420	0.80	1470
7	430	0.80	1465
8	410	0.80	1485
9	170	0.40	1100
10	180	0.40	1090
11	180	0.40	1085
12	180	0.40	1095



η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
53,3	A	Static	65	Yes	0,770	1,3	3148	420	1760	1

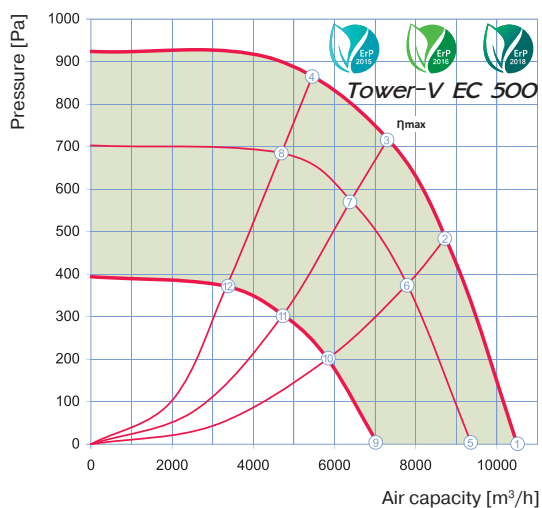


point	P, (W)	I, (A)	n, (min ⁻¹)
1	690	1.10	1560
2	910	1.50	1555
3	1010	1.60	1555
4	960	1.50	1560
5	430	0.80	1345
6	530	1.00	1315
7	580	1.00	1300
8	540	1.00	1315
9	190	0.40	985
10	220	0.50	970
11	250	0.50	965
12	230	0.50	970

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
65,8	A	Static	76,2	Yes	1,010	1,6	4460	483	1555	1

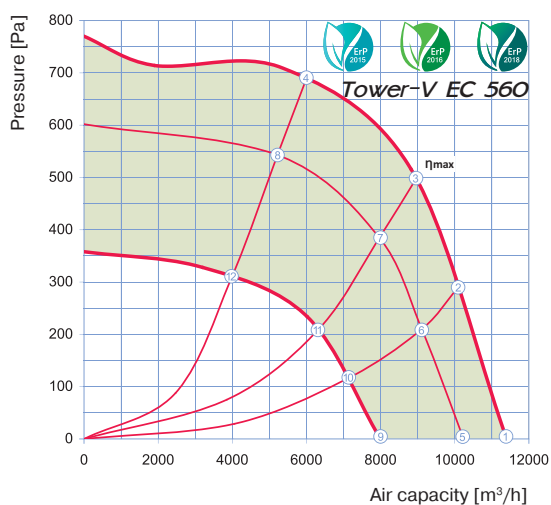
Specifications

Parameters	Tower-V EC 500 	Tower-V EC 560 
Voltage [V / 50 / 60 Hz]	3 ~ 380-480	3 ~ 380-480
Power [kW]	2.7	2.3
Current [A]	4.3	3.6
Maximum air capacity [m ³ /h]	10500	11400
RPM [min ⁻¹]	1700	1350
Sound pressure level at 3 m distance [dBA]	63	65
Max. operating temperature [°C]	-25 +60	-25 +60
Ingress protection rating	IPX4	IPX4



point	P, (W)	I, (A)	n, (min ⁻¹)
1	1850	2.90	1700
2	2500	3.90	1700
3	2650	4.10	1700
4	2400	3.60	1700
5	1300	2.10	1500
6	1700	2.60	1500
7	1750	2.70	1500
8	1650	2.60	1500
9	570	1.10	1100
10	700	1.30	1100
11	750	1.30	1100
12	700	1.30	1100

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
59,8	A	Static	65,8	Yes	2,650	4,1	7330	720	1700	1



point	P, (W)	I, (A)	n, (min ⁻¹)
1	1330	2.20	1350
2	1900	2.90	1350
3	2150	3.40	1350
4	2100	2.20	1350
5	900	1.60	1200
6	1300	2.10	1200
7	1550	2.50	1200
8	1430	2.30	1200
9	450	0.90	910
10	600	1.10	910
11	700	1.20	910
12	650	1.20	910

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
62,9	A	Static	69,9	Yes	2,150	3,4	8980	499	1350	1



Centrifugal roof fans

Tower-H

Air capacity – up to 4700 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- Roof mounting.
- For any types of roofs or vertical ventilation shafts.

Design

- Steel casing with a special polymer atmospheric resistant coating.
- Horizontal air exhaust.
- The fan is equipped with a terminal block for connection to power mains.
- The fan is rated for continuous operation.
- Impeller with a protecting insect screen.
- The upper cover is equipped with two eye bolts for easy fan lifting on the roof with hoisting mechanism.
- A connecting plate with an intake opening is designed to facilitate mounting to the roof surface.

Motor

- Two-, four- or six-pole asynchronous motor with external rotor and centrifugal impeller with backward curved blades.
- Single-phase (E) or three-phase (D) motor modifications.
- Dynamically balanced turbine.
- Equipped with ball bearings for longer service life.

- Overheating protection by built-in thermal switches with leaded outside terminals for connection to external protecting controls.
- The thermal switch terminal leads are designed for connection to respective circuit of the overload relay or respective terminals of the autotransformer or thyristor speed controller.

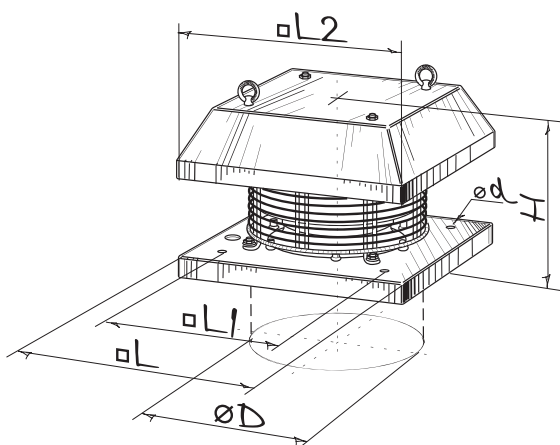
Speed control

- Smooth or step speed control with a thyristor or transformer speed controller (available upon order).

Mounting



- Roof mounting directly above a ventilation shaft or air duct.
- The fan is connected to the air duct with the intake flange that is fixed to the fan base.
- The fan base has holes for fixing bolts that attach the fan to the stable level surface or a roof frame.
- Roof frame and intake flange available on separate order.
- Power is supplied through an external terminal box.

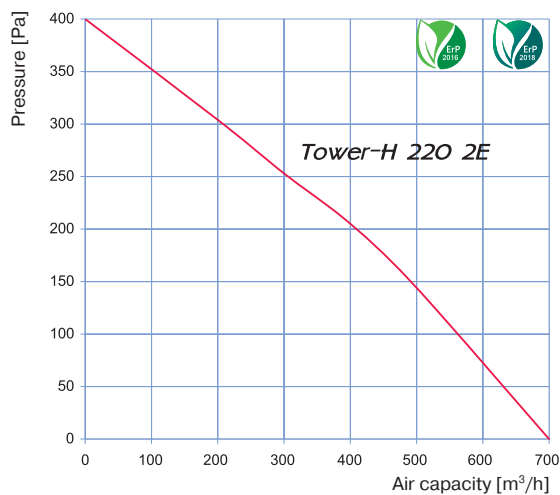
Overall dimensions



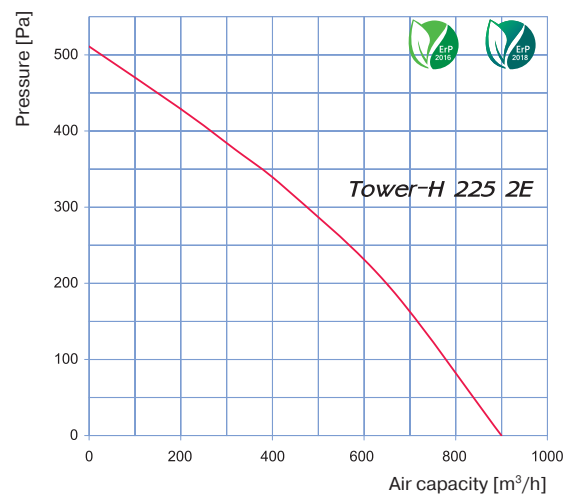
Type	Dimensions [mm]						Weight [kg]
	øD	ød	H	L	L1	L2	
Tower-H 220 2E	213	10	228	338	245	338	6.9
Tower-H 225 2E	213	10	228	338	245	338	7.1
Tower-H 250 2E	285	10	265	425	330	365	10.1
Tower-H 280 2E	285	10	265	425	330	365	10.2
Tower-H 310 4E	285	10	300	438	330	400	10.2
Tower-H 310 4D	285	10	300	438	330	400	10.2
Tower-H 355 4E	438	12	348	598	450	550	15.6
Tower-H 355 4D	438	12	325	598	450	550	15.6
Tower-H 400 4E	438	12	348	598	450	550	21.0
Tower-H 450 4E	438	12	400	668	535	640	22.7
Tower-H 400 4D	438	12	323	598	450	550	22.0
Tower-H 450 4D	438	12	400	668	535	640	22.7
Tower-H 500 6E	438	12	465	668	535	640	26.6

Specifications

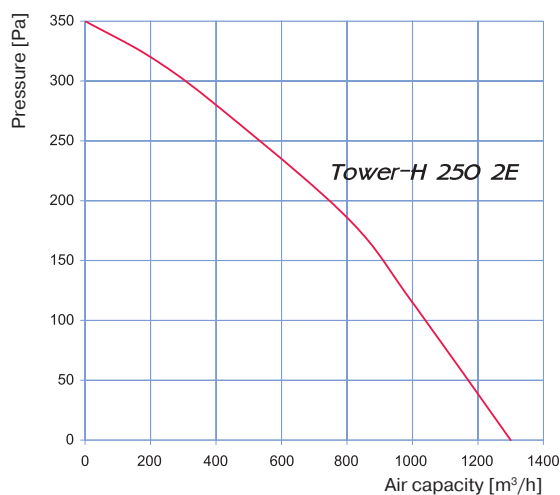
Parameters	Tower-H 220 2E 	Tower-H 225 2E 	Tower-H 250 2E	Tower-H 280 2E
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	85	135	155	225
Current [A]	0.38	0.6	0.7	1.0
Maximum air capacity [m ³ /h]	700	900	1300	1780
RPM [min ⁻¹]	2700	2650	2600	2700
Sound pressure level at 3 m distance [dBA]	49	49	65	66
Max. operating temperature [°C]	55	55	50	50
SEC class	B		-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



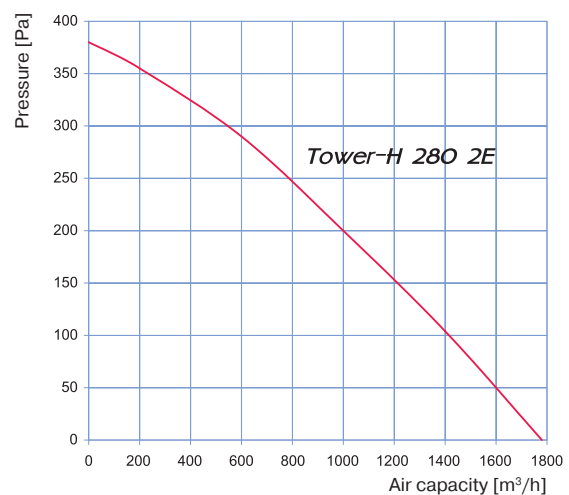
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	42	60	65	68	65	61	59	50
L _{WA} to environment, [dBA]	73	42	60	65	67	67	65	57	50



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	41	59	66	68	66	61	57	49
L _{WA} to environment, [dBA]	72	42	60	67	69	66	63	58	51






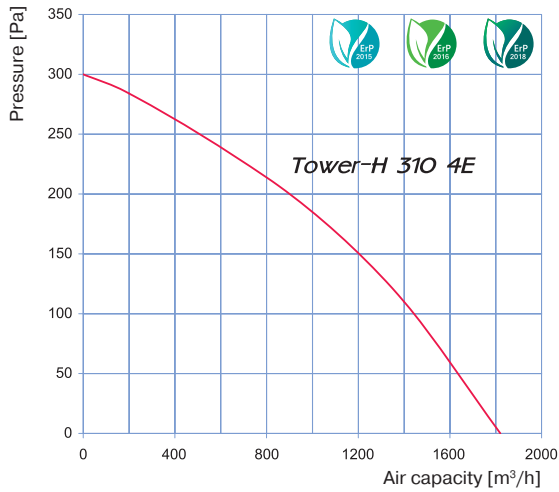
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	40	62	65	66	66	64	57	49
L _{WA} to environment, [dBA]	71	44	59	65	68	66	62	60	53



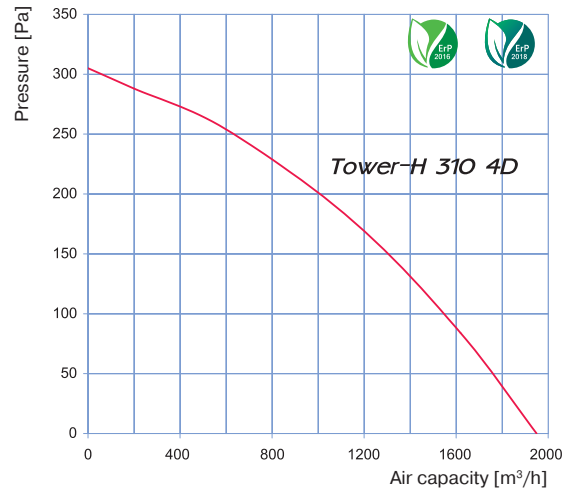
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	42	58	62	64	65	63	56	49
L _{WA} to environment, [dBA]	72	45	61	63	66	66	61	60	53

Specifications

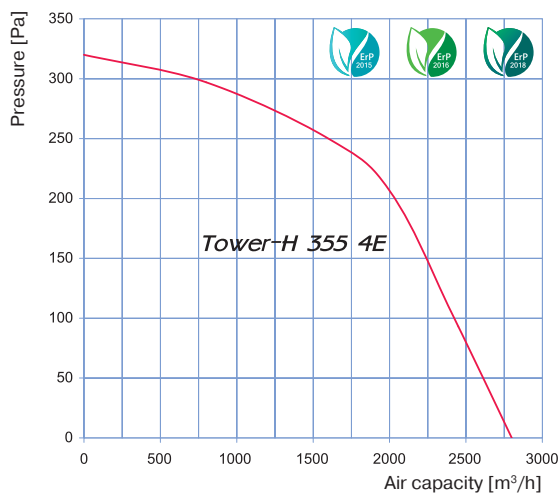
Parameters	Tower-H 310 4E 	Tower-H 310 4D 	Tower-H 355 4E 	Tower-H 355 4D 
Voltage [V / 50 Hz]	230	400	230	400
Power [W]	120	110	245	170
Current [A]	0.54	0.32	1.12	0.52
Maximum air capacity [m ³ /h]	1820	1950	2800	2350
RPM [min ⁻¹]	1370	1400	1420	1400
Sound pressure level at 3 m distance [dBA]	45	53	46	53
Max. operating temperature [°C]	85	65	50	70
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



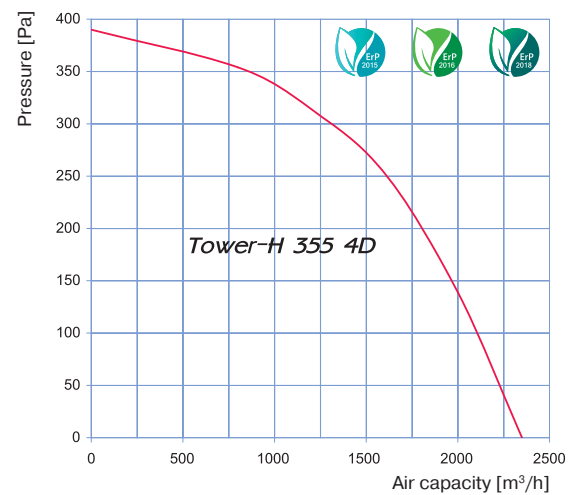
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	57	44	45	50	53	52	51	43	36
L _{WA} to environment, [dBA]	60	47	50	53	56	57	51	45	39



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	58	45	46	51	55	53	49	45	37
L _{WA} to environment, [dBA]	60	48	51	52	54	56	49	44	38








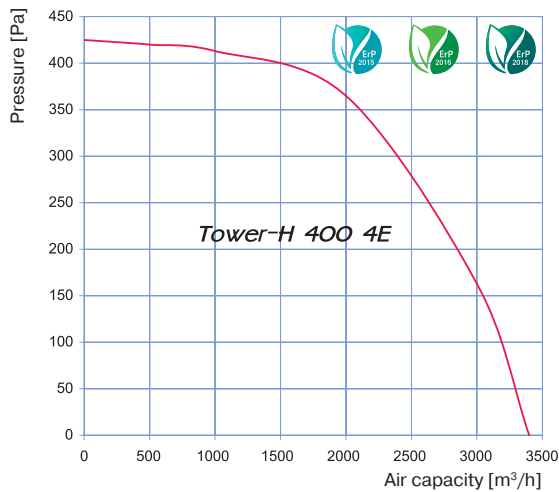
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	53	58	61	62	63	59	54	45
L _{WA} to environment, [dBA]	72	57	60	63	65	64	61	55	49



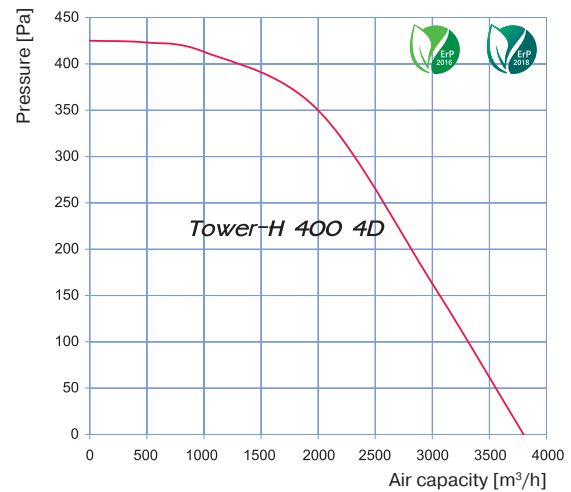
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	67	56	57	63	65	64	59	54	47
L _{WA} to environment, [dBA]	72	56	60	62	66	62	63	55	49

Specifications

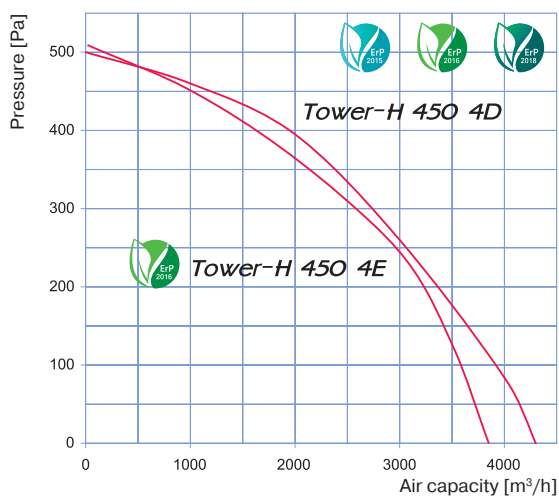
Parameters	Tower-H 400 4E 	Tower-H 400 4D 	Tower-H 450 4E 	Tower-H 450 4D 	Tower-H 500 6E 
Voltage [V / 50 Hz]	230	400 Y	230	400 Y	230
Power [W]	480	385	640	470	385
Current [A]	2.4	0.7	3.1	0.82	1.82
Maximum air capacity [m³/h]	3400	3800	3850	4300	4700
RPM [min ⁻¹]	1400	1430	1350	1430	880
Sound pressure level at 3 m distance [dBA]	52	52	53	53	47
Max. operating temperature [°C]	80	60	50	50	50
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4



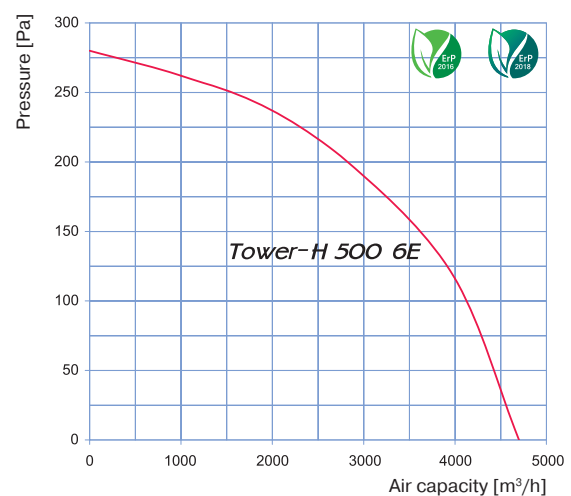
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	58	62	67	69	68	63	58	52
L _{WA} to environment, [dBA]	76	61	63	68	70	68	65	60	53



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	59	63	65	67	68	63	58	51
L _{WA} to environment, [dBA]	74	59	62	65	69	69	66	59	53



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Tower-V 450 4E									
L _{WA} to inlet, [dBA]	63	51	54	58	59	61	56	50	41
L _{WA} to environment, [dBA]	68	51	53	60	61	61	58	52	43
Tower-V 450 4D									
L _{WA} to inlet, [dBA]	64	49	55	59	60	60	56	48	42
L _{WA} to environment, [dBA]	66	51	56	58	61	61	56	52	46



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	67	54	55	59	61	64	59	55	46
L _{WA} to environment, [dBA]	70	56	56	62	64	63	60	56	45



Roof centrifugal fans with EC motor

Tower-H EC

Air capacity - up to 11400 m³/h



■ Use

- ❑ Exhaust ventilation systems installed in various premises.
- ❑ Roof mounting.
- ❑ Any roof types or vertical ventilation shafts.
- ❑ For arranging energy-saving and controllable ventilation systems.

■ Design

- ❑ The casing is made of steel with a polymer atmospheric resistant coating.
- ❑ Horizontal air exhaust.
- ❑ The fan is equipped with a terminal box for connection to power mains.
- ❑ The fan is rated for continuous operation always connected to power mains.
- ❑ The impeller has a protecting grille.
- ❑ The upper cover is equipped with two eye bolts for easy fan lifting on the roof with hoisting mechanism.
- ❑ A connecting plate is provided to facilitate mounting to the roof surface or to the mounting frame.

■ Motor

- ❑ High-efficient direct current EC motor with external rotor and backward curved blades.
- ❑ EC technologies meet the latest requirements to arrange high-efficient energy saving ventilation.
- ❑ EC motors have energy demand by 50 % less as compared to standard motors and have efficiency up to 90 %.
- ❑ EC motors are featured with high performance, low noise level and well controllable total speed range.
- ❑ Overheating protection by built-in thermal switches with automatic restart.
- ❑ Dynamically balanced turbine.

■ Operation and speed control

- ❑ The fan is controlled with a 0-10 V external control signal, e.g. **CDT E/0-10** speed controller for EC motors.
- ❑ The fan capacity is regulated by various parameters, including temperature level, pressure, smoke, etc.
- ❑ EC motor changes its rotation speed synchronously with the fluctuation of the control parameter to ensure the best suitable air flow.
- ❑ The fan is compatible with 50 and 60 Hz power mains with the same maximum speed.
- ❑ The parameters may be set and controlled due to data exchange between a PC and the fan.
- ❑ The fans can be integrated into a unified decentralized computerized network to adjust ventilation system with respect to specific user's demands.

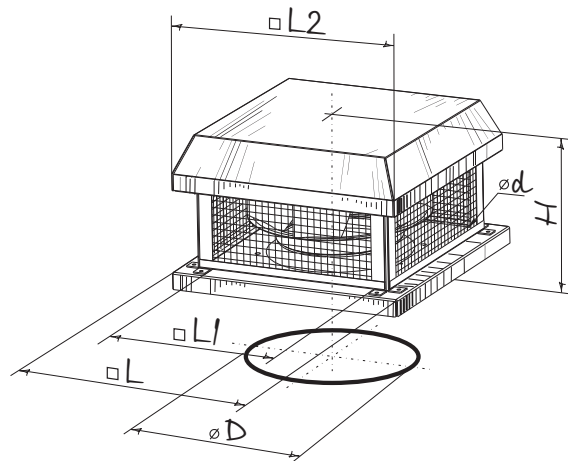
■ Mounting

- ❑ Roof mounting directly above a ventilation shaft or an air duct.
- ❑ The fan is attached to a square air duct or to the **MRDL/MRIDL** mounting frame (see accessories).
- ❑ The counterflange **FDL** mounted on the fan bottom (see accessories) is designed for the fan connection to a round air duct.
- ❑ The KDL backdraft dampers (see Accessories) are designed to prevent air back drafting when the fan is off.
- ❑ The VDL flexible connectors (see Accessories) are designed to absorb vibration from the fan to the air duct.
- ❑ External terminal box for connection to power mains.



ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

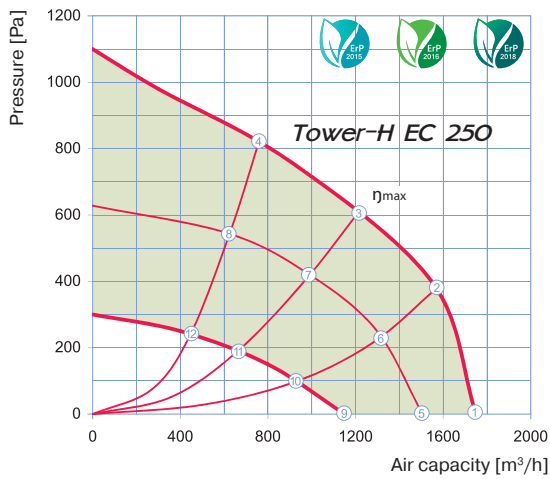
Overall dimensions

Type	Dimensions [mm]						Weight [kg]
	$\varnothing D$	$\varnothing d$	H	L	L1	L2	
Tower-H EC 250	285	11	289	435	330	411	16
Tower-H EC 280	285	11	264	435	330	431	16
Tower-H EC 310	285	11	272	435	330	431	19
Tower-H EC 355	438	11	326	595	450	558	38
Tower-H EC 400	438	11	357	595	450	558	81
Tower-H EC 450	438	11	407	665	535	637	82
Tower-H EC 500	438	11	437	665	535	637	81
Tower-H EC 560	605	14	487	940	750	912	98



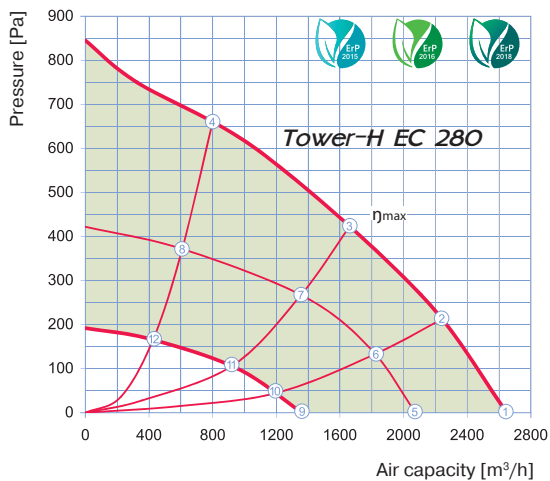
Specifications

Parameters	Tower-H EC 250 	Tower-H EC 280 
Voltage [V / 50 /60 Hz]	1 ~ 200-277	1 ~ 200-277
Power [kW]	0.485	0.455
Current [A]	3.0	2.8
Maximum air capacity [m³/h]	1750	2650
RPM [min ⁻¹]	3580	2600
Sound pressure level at 3 m distance [dBA]	47	47
Max. operating temperature [°C]	-25 +60	-25 +40
Ingress protection rating	IPX4	IPX4



η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
47.6	A	Static	61.4	Yes	0.485	3.0	1211	606	3460	1



point	P, (W)	I, (A)	n, (min ⁻¹)
1	380	2.30	3580
2	465	3.00	3460
3	485	3.00	3460
4	440	2.40	3520
5	193	1.20	2830
6	245	1.50	2830
7	260	1.60	2830
8	225	1.40	2830
9	80	0.50	2000
10	100	0.60	2000
11	106	0.70	2000
12	94	0.60	2000

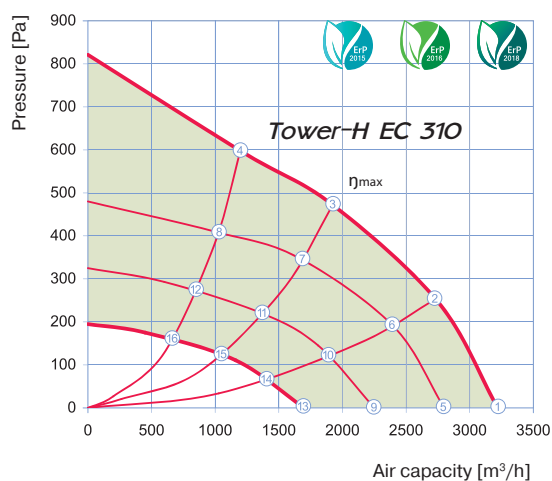


η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
52.2	A	Static	66.5	Yes	0.425	2.6	1661	423	2660	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	355	2.20	2760
2	400	2.50	2670
3	425	2.60	2660
4	386	2.30	2740
5	150	1.00	2050
6	206	1.10	2050
7	232	1.40	2050
8	196	1.20	2050
9	65	0.40	1460
10	80	0.50	1460
11	88	0.60	1460
12	70	0.50	1460

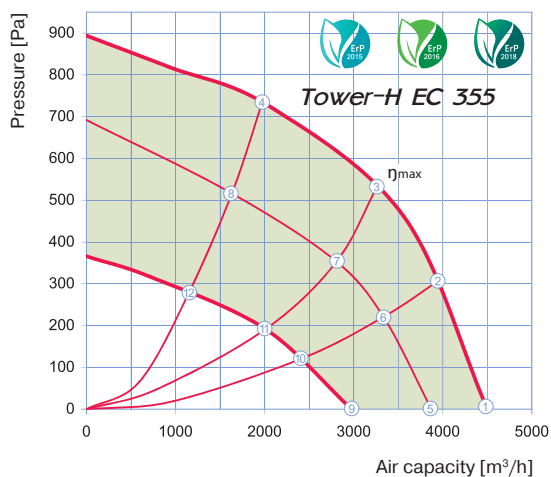
Specifications

Parameters	Tower-H EC 310 	Tower-H EC 355 
Voltage [V / 50 /60 Hz]	1 ~ 200-277	3 ~ 380-480
Power [kW]	0.48	0.94
Current [A]	3.1	1.5
Maximum air capacity [m ³ /h]	3220	4500
RPM [min ⁻¹]	2300	2215
Sound pressure level at 3 m distance [dBA]	48	51
Max. operating temperature [°C]	-25 +60	-25 +60
Ingress protection rating	IPX4	IPX4



η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
59.2	A	Static	73	Yes	0.480	3.1	1920	470	2170	1



point	P, (W)	I, (A)	n, (min ⁻¹)
1	370	2.35	2300
2	445	2.85	2215
3	480	3.10	2170
4	448	2.85	2220
5	210	1.30	1900
6	284	1.70	1900
7	312	1.80	1900
8	278	1.70	1900
9	124	0.80	1560
10	158	1.00	1560
11	175	1.10	1560
12	158	1.00	1560
13	57	0.40	1200
14	73	0.50	1200
15	80	0.50	1200
16	70	0.50	1200

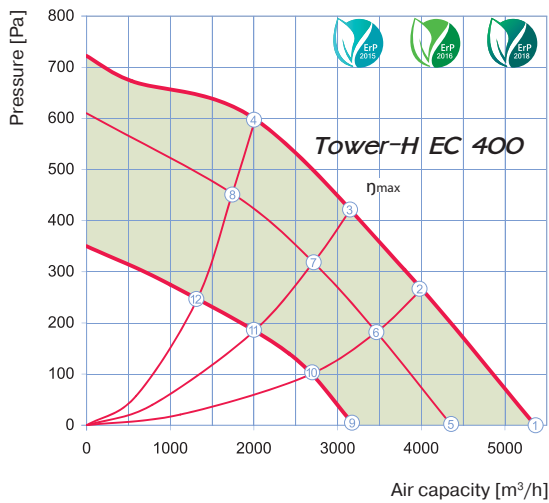


η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
57.3	A	Static	68.1	Yes	0.940	1.5	3266	534	2215	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	700	1.30	2205
2	880	1.40	2215
3	940	1.50	2215
4	850	1.40	2215
5	380	0.70	1825
6	470	0.90	1805
7	490	0.90	1790
8	460	0.90	1800
9	170	0.40	1335
10	200	0.40	1315
11	210	0.40	1315
12	190	0.40	1310

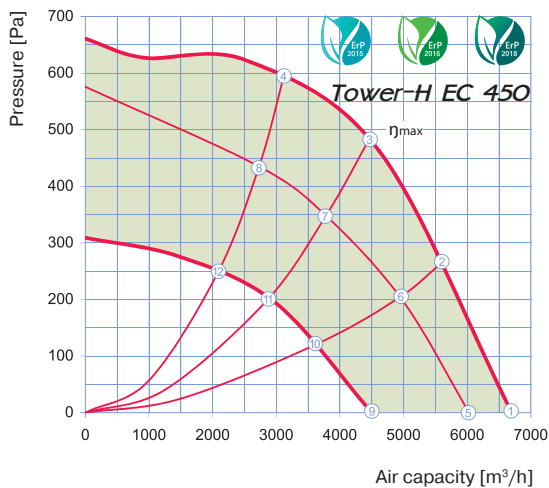
Specifications

Parameters	Tower-H EC 400 	Tower-H EC 450 
Voltage [V / 50 /60 Hz]	3 ~ 380-480	3 ~ 380-480
Power [kW]	0.77	1.01
Current [A]	1.3	1.6
Maximum air capacity [m³/h]	5360	6700
RPM [min ⁻¹]	1755	1560
Sound pressure level at 3 m distance [dBA]	53	55
Max. operating temperature [°C]	-25 +60	-25 +60
Ingress protection rating	IPX4	IPX4



η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
53.3	A	Static	65	Yes	0.770	1.3	3148	420	1760	1



point	P, (W)	I, (A)	n, (min ⁻¹)
1	630	1.10	1755
2	750	1.30	1760
3	770	1.30	1760
4	720	1.20	1760
5	400	0.80	1510
6	420	0.80	1470
7	430	0.80	1465
8	410	0.80	1485
9	170	0.40	1100
10	180	0.40	1090
11	180	0.40	1085
12	180	0.40	1095

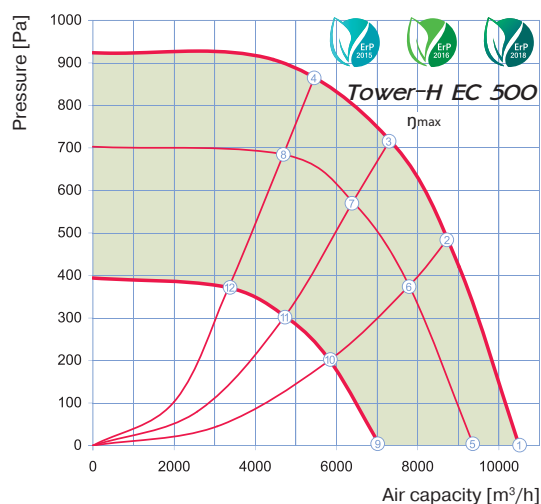


η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
65.8	A	Static	76.2	Yes	1.010	1.6	4460	483	1555	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	690	1.10	1560
2	910	1.50	1555
3	1010	1.60	1555
4	960	1.50	1560
5	430	0.80	1345
6	530	1.00	1315
7	580	1.00	1300
8	540	1.00	1315
9	190	0.40	985
10	220	0.50	970
11	250	0.50	965
12	230	0.50	970

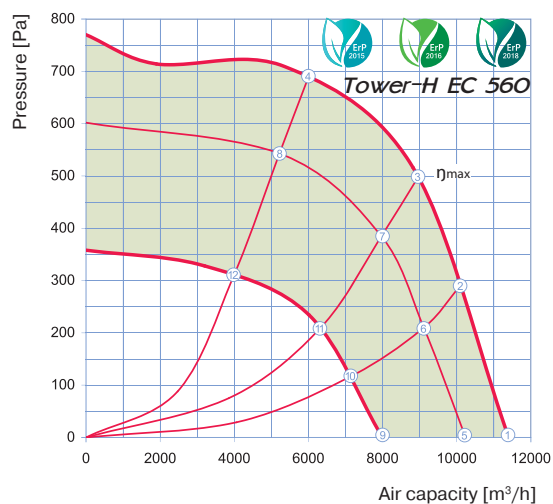
Specifications

Parameters	Tower-H EC 500 	Tower-H EC 560 
Voltage [V / 50 /60 Hz]	3 ~ 380-480	3 ~ 380-480
Power [kW]	2.7	2.3
Current [A]	4.3	3.6
Maximum air capacity [m³/h]	10500	11400
RPM [min ⁻¹]	1700	1350
Sound pressure level at 3 m distance [dBA]	63	65
Max. operating temperature [°C]	-25 +60	-25 +60
Ingress protection rating	IPX4	IPX4



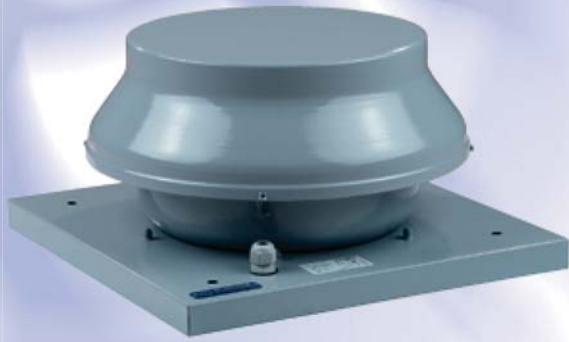
η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
59.8	A	Static	65.8	Yes	2.650	4.1	7330	720	1700	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1850	2.90	1700
2	2500	3.90	1700
3	2650	4.10	1700
4	2400	3.60	1700
5	1300	2.10	1500
6	1700	2.60	1500
7	1750	2.70	1500
8	1650	2.60	1500
9	570	1.10	1100
10	700	1.30	1100
11	750	1.30	1100
12	700	1.30	1100



η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
62.9	A	Static	69.9	Yes	2.150	3.4	8980	499	1350	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1330	2.20	1350
2	1900	2.90	1350
3	2150	3.40	1350
4	2100	2.20	1350
5	900	1.60	1200
6	1300	2.10	1200
7	1550	2.50	1200
8	1430	2.30	1200
9	450	0.90	910
10	600	1.10	910
11	700	1.20	910
12	650	1.20	910



Centrifugal roof fans

Tower-AM

Air capacity – up to 1880 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- Roof mounting.
- For any types of roofs or vertical ventilation shafts.
- Compatible with Ø 150 up to 315 mm round air ducts.

Design

- KSteel casing with a special polymer atmospheric resistant coating.
- Horizontal air exhaust.
- The fan is rated for continuous operation.
- A connecting plate is designed to facilitate the fan mounting to the roof surface.

Motor

- Single-phase external rotor motor and centrifugal impeller with backward curved blades.
- Dynamically balanced turbine.
- Equipped with ball bearings for longer service life.
- Overheating protection with built-in thermal switches with automatic restart.

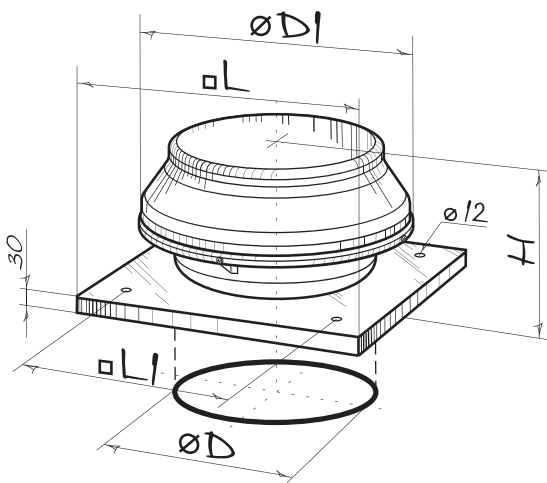
Speed control

- Smooth or step speed control with an external thyristor controller or an external auto transformer (both available upon separate order).

Mounting





- Roof mounting directly above a ventilation shaft or air duct.
- The fan is connected to the air duct with the intake flange that is fixed to the fan base.
- The fan base is perforated for fixing bolts that attach the fan to a stable level surface or a roof frame.
- Roof frame, intake flange and fixing bolts are available on separate order.
- Power is supplied through an external terminal box.

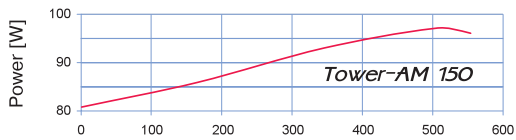
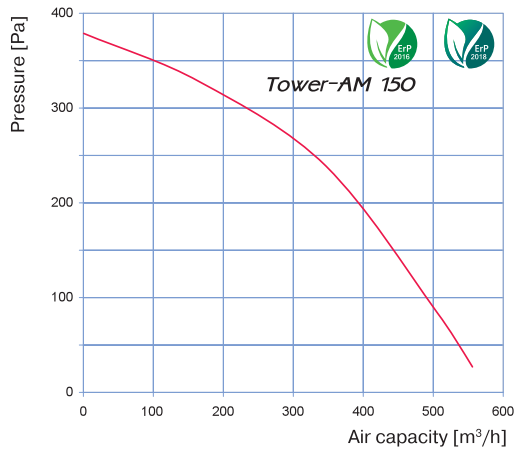
Overall dimensions



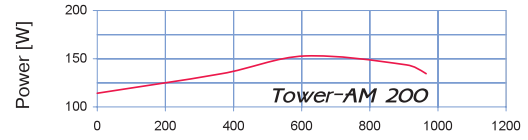
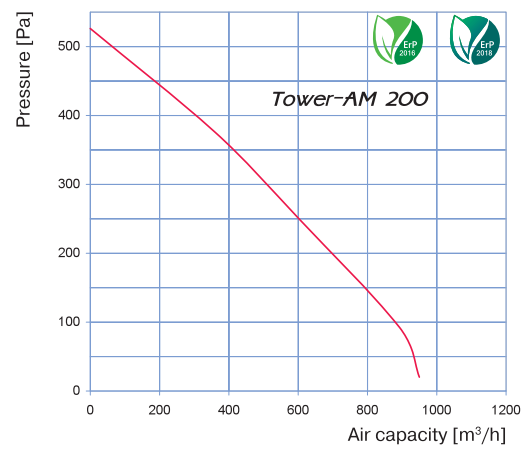
Type	Dimensions [mm]					Weight [kg]
	ØD	ØD1	H	L	L1	
Tower-AM 150	149	400	230	440	330	7.2
Tower-AM 200	198	400	250	440	330	8.1
Tower-AM 250	248	400	249	590	450	10.1
Tower-AM 315	315	550	339	590	450	12.3

Specifications

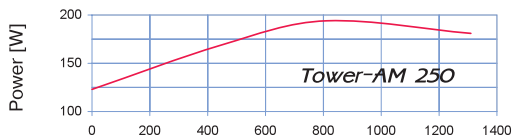
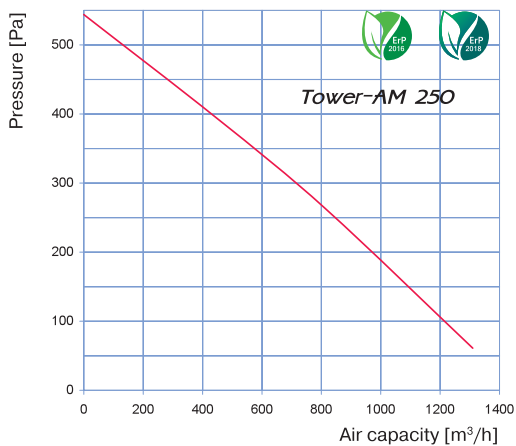
Parameters	Tower-AM 150 	Tower-AM 200 	Tower-AM 250 	Tower-AM 315 
Voltage [V / 50 Hz]	230	230	230	230
Power [W]	98	154	194	296
Current [A]	0.43	0.67	0.85	1.34
Maximum air capacity [m ³ /h]	555	950	1310	1880
RPM [min ⁻¹]	2705	2375	2790	2720
Sound pressure level at 3 m distance [dBA]	47	48	52	54
Max. operating temperature [°C]	-25 +55	-25 +50	-25 +50	-25 +45
SEC class	B		-	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4



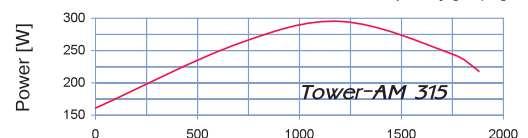
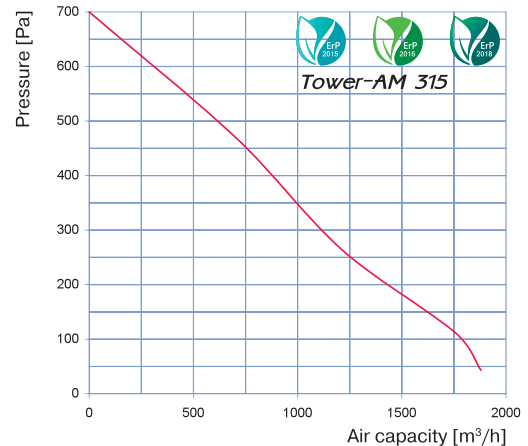
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	71	45	65	64	63	61	60	48	39
L _{WA} to environment, [dBA]	64	39	59	55	37	20	17	26	20



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	77	49	69	67	72	65	61	58	50
L _{WA} to environment, [dBA]	64	45	63	61	48	31	25	47	41



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	58	65	66	69	66	62	53	47
L _{WA} to environment, [dBA]	65	57	64	60	49	39	39	44	40



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	77	55	67	68	72	68	66	62	60
L _{WA} to environment, [dBA]	68	52	64	63	55	47	52	57	50



Axial roof fans

Tower-A

Air capacity – up to 2500 m³/h



Use

- Exhaust ventilation systems installed in various premises.
- Roof mounting.
- For any types of roofs or vertical ventilation shafts.

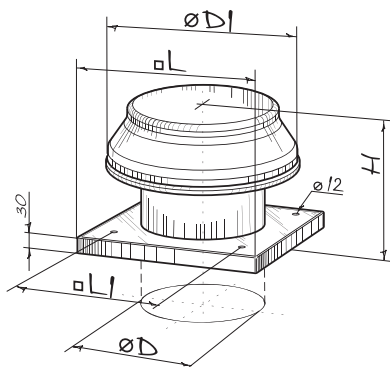
Design

- Steel casing and impeller with a special polymer atmospheric resistant coating.
- Horizontal air exhaust.
- The fan is equipped with a terminal block for connection to power mains.
- The fan is rated for continuous operation.
- A connecting plate with an intake opening is designed to facilitate mounting to the roof surface.

Motor

- Two- or four-pole asynchronous motor with external rotor and axial impeller.
- Single-phase (E) motor modification.
- Equipped with ball bearings for longer service life.
- Overheating protection by built-in thermal switches with automatic restart.

Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	ØD	ØD1	H	L	L1	
Tower-A 200 2E	208	345	250	425	330	4.5
Tower-A 250 2E	262	405	280	425	330	7.0
Tower-A 250 4E	262	405	280	425	330	7.0
Tower-A 300 2E	314	555	340	585	450	10.5
Tower-A 300 4E	314	555	340	585	450	10.5
Tower-A 350 4E	364	555	350	655	535	12.0

Speed control



- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

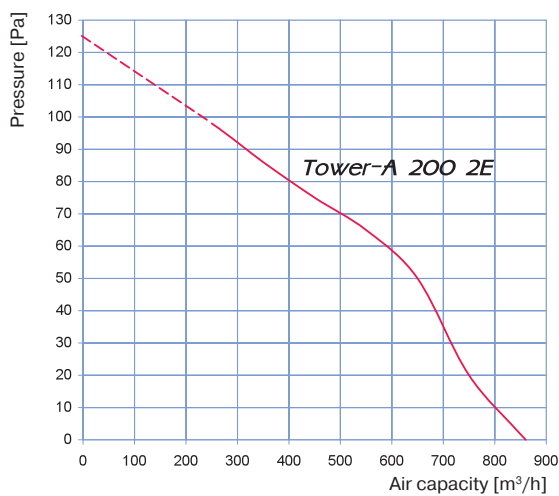
- Roof mounting directly above a ventilation shaft or air duct.
- The fan is connected to the air duct with the intake flange that is fixed to the fan base.
- The fan base has holes for fixing bolts that attach the fan to a stable level surface or a roof frame.
- Roof frame and intake flange available on separate order.
- Power is supplied through an external terminal box.

ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

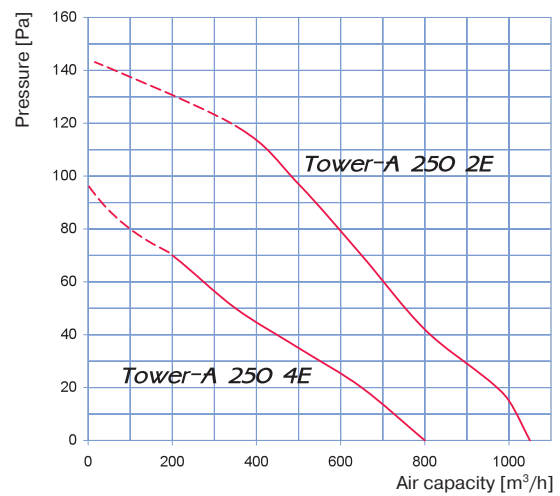
Specifications

Parameters	Tower-A 200 2E*	Tower-A 250 2E*	Tower-A 250 4E*	Tower-A 300 2E 	Tower-A 300 4E*	Tower-A 350 4E 
Voltage [V / 50 Hz]	230	230	230	230	230	230
Power [W]	55	80	50	145	75	140
Current [A]	0.26	0.4	0.22	0.66	0.35	0.65
Maximum air capacity [m ³ /h]	860	1050	800	2230	1340	2500
RPM [min ⁻¹]	2300	2400	1380	2300	1350	1380
Sound pressure level at 3 m distance [dBA]	50	60	55	60	58	62
Max. operating temperature [°C]	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
SEC class	-	-	-	-	B	-
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

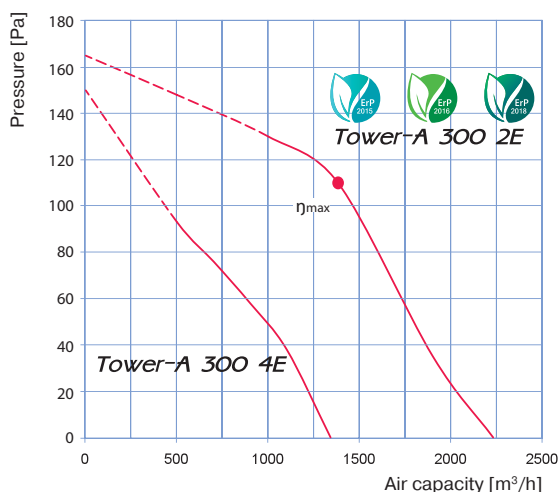
* Compliant to the ErP-regulation (EC) 327/2011, the power consumption at optimum efficiency is < 125W.



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	66	58	58	57	58	57	53	52	46
L _{WA} to environment, [dBA]	65	57	57	58	60	55	57	53	47

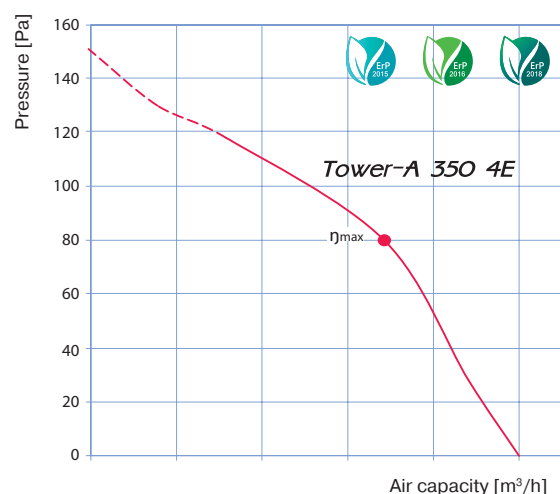


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Tower-A 250 2E									
L _{WA} to inlet, [dBA]	76	69	66	69	71	68	68	61	56
L _{WA} to environment, [dBA]	78	65	70	69	71	69	64	62	60
Tower-A 250 4E									
L _{WA} to inlet, [dBA]	59	50	51	53	55	53	51	45	43
L _{WA} to environment, [dBA]	60	51	52	54	55	54	51	45	42



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Tower-A 300 2E									
L _{WA} to inlet, [dBA]	79	68	71	73	72	71	69	64	59
L _{WA} to environment, [dBA]	78	68	72	72	74	72	70	64	61
Tower-A 300 4E									
L _{WA} to inlet, [dBA]	66	55	57	58	58	57	53	51	48
L _{WA} to environment, [dBA]	65	56	56	57	57	57	55	51	49

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
30.5	A	Static	30.5	No	0.141	0.64	1380	110	2350	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	70	61	62	61	65	61	58	56	53
L _{WA} to environment, [dBA]	68	61	63	63	62	60	60	56	52

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
29.9	A	Static	41.8	No	0.130	0.6	1717	80	1375	1



Axial roof fans

Tower-AL

Air capacity – up to 1700 m³/h

Use

- Exhaust ventilation systems installed in various premises.
- Roof mounting.
- For any types of roofs or vertical ventilation shafts.

Design

- Steel casing with a special polymer atmospheric resistant coating.
- Aluminium impeller.
- Horizontal air exhaust.
- The fan is equipped with a terminal block for connection to power mains.
- The fan is rated for continuous operation.
- A connecting plate with an intake opening is designed to facilitate mounting to the roof surface.

Motor

- Single-phase asynchronous external rotor motor with axial impeller.
- Equipped with ball bearings for longer service life.
- Overheating protection by built-in thermal switches with automatic restart.

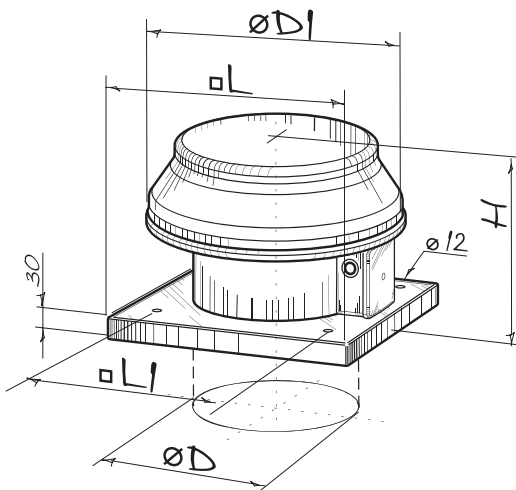
Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- Roof mounting directly above a ventilation shaft or air duct.
- The fan is connected to the air duct with the intake flange that is fixed to the fan base.
- The fan base has holes for fixing bolts that attach the fan to a stable level surface or a roof frame.
- Roof frame and intake flange available on separate order.
- Power is supplied through an external terminal box.

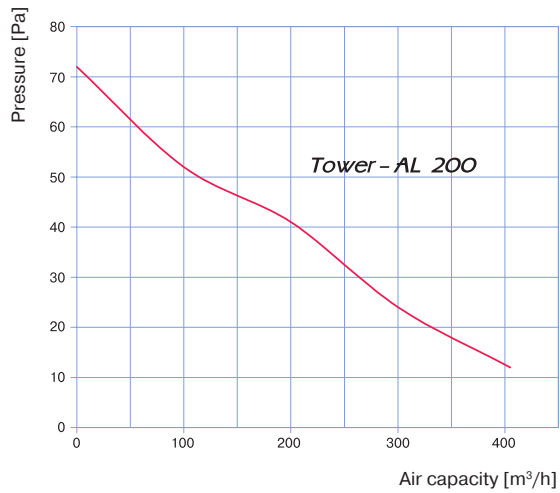
Overall dimensions



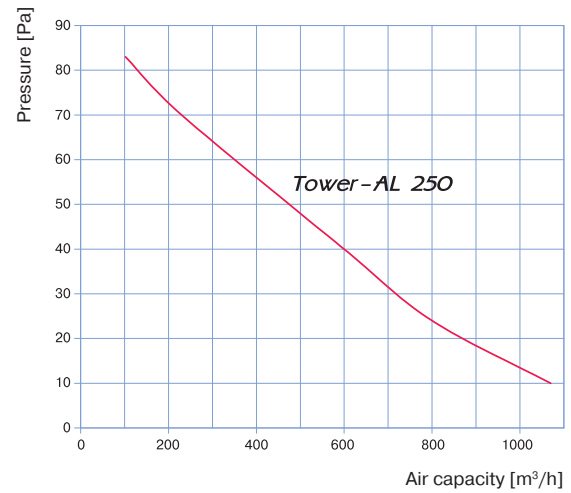
Type	Dimensions [mm]					Weight [kg]
	$\varnothing D$	$\varnothing D1$	H	L	L1	
Tower-AL 200	208	345	280	425	330	6.1
Tower-AL 250	262	405	300	425	330	7.2
Tower-AL 315	314	555	380	585	450	11.5

Specifications

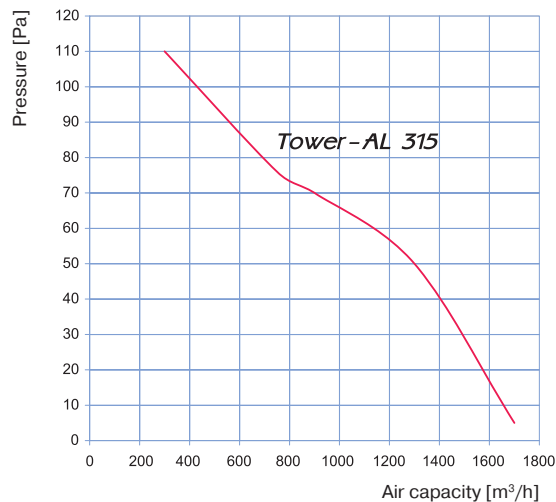
Parameters	Tower-AL 200	Tower-AL 250	Tower-AL 315
Voltage [V / 50 Hz]	230	230	230
Power [W]	43	68	110
Current [A]	0.28	0.48	0.75
Maximum air capacity [m ³ /h]	405	1070	1700
RPM [min ⁻¹]	1300	1300	1300
Sound pressure level at 3 m distance [dBA]	32	48	54
Max. operating temperature [°C]	50	50	50
SEC class	-	-	C
Ingress protection rating	IPX4	IPX4	IPX4



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	56	55	61	55	41	40	36	30	15
L _{WA} to environment, [dBA]	56	54	63	56	41	38	35	28	15



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	61	64	67	62	42	47	44	34	20
L _{WA} to environment, [dBA]	60	65	69	60	44	45	42	35	21



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	61	67	69	62	47	50	46	41	30
L _{WA} to environment, [dBA]	64	66	67	62	47	51	49	41	28



Centrifugal fans for rectangular ducts

Box

Air capacity – up to 2970 m³/h



■ Use

- Supply and exhaust ventilation systems installed in various premises.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.

■ Design

- Atmospheric resistant galvanized steel casing and impeller.
- The fan is rated for continuous operation.
- Fitted with standard 20 mm connecting flanges for connection to rectangular air ducts.
- Access cover on the casing for inspection and maintenance operations.
- The fan is equipped with a built-in terminal box with a leaded outside sealed electrical lead-in for connection to power mains.

■ Motor

- Two- or four-pole asynchronous motor with external rotor and centrifugal impeller with backward curved blades.
- Single-phase (**E**) or three-phase (**D**) motor modifications.
- Equipped with ball bearings for longer service life.
- Dynamically balanced turbine.
- Overheating protection by built-in thermal switches with automatic restart or with leaded outside terminals for connection to external protecting controls.
- The thermal switch terminal leads are designed for connection to respective circuit of the contactor, overload relay or respective terminals of the autotransformer or thyristor speed controller.




■ Speed control




- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).



■ Mounting

- The fan is designed for mounting inside rectangular air ducts and can be installed in any position.
- The fan flanges are connected to the air ducts through the bolts inserted into the flange holes.
- The fan is suitable for mounting into round duct at intake flange with a round reducer (available upon separate order).
- If vibration-absorbing flexible connectors are used to connect the fan to the air ducts provide their fixation to mounting structures with supports or brackets.
- While mounting provide enough space for accessing the cover for service operations.

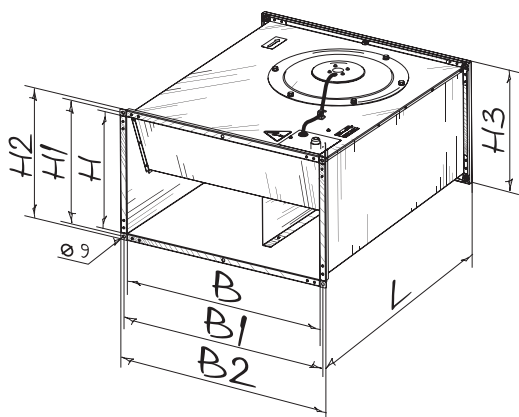
Specifications

Parameters	Box 40x20 2E 	Box 50x25 2E 	Box 50x30 4E 
Voltage [V / 50 Hz]	230	230	230
Power [W]	138	305	140
Current [A]	0.60	1.32	0.57
Maximum air capacity [m ³ /h]	930	1720	1700
RPM [min ⁻¹]	2600	2550	1390
Sound pressure level at 3 m distance [dBA]	59	61	53
Max. operating temperature [°C]	-25 +45	-25 +45	-25 +45
Ingress protection rating	IPX4	IPX4	IPX4

Parameters	Box 50x30 4D 	Box 60x30 4E 	Box 60x30 4D 
Voltage [V / 50 Hz]	400	230	400
Power [W]	136	220	230
Current [A]	0.34	0.90	0.52
Maximum air capacity [m ³ /h]	1380	2470	2530
RPM [min ⁻¹]	1360	1400	1360
Sound pressure level at 3 m distance [dBA]	53	55	53
Max. operating temperature [°C]	-25 +65	-25 +45	-25 +70
Ingress protection rating	IPX4	IPX4	IPX4

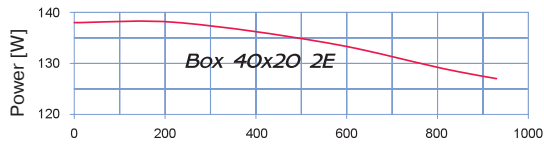
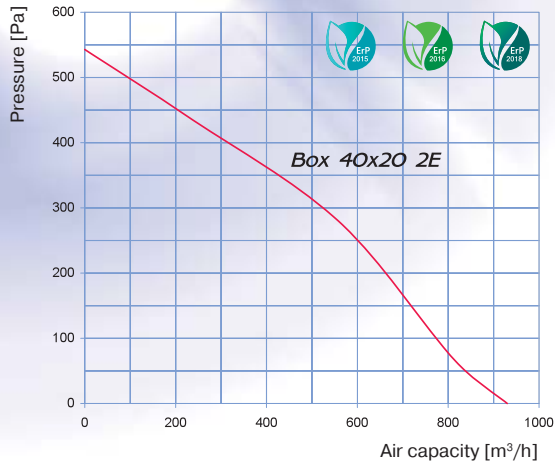
Parameters	Box 60x35 4E 	Box 60x35 4D 	
Voltage [V / 50 Hz]	230	400 Δ	400Y
Power [W]	470	510	380
Current [A]	2.37	1.41	0.70
Maximum air capacity [m ³ /h]	2950	2970	2660
RPM [min ⁻¹]	1370	1415	1235
Sound pressure level at 3 m distance [dBA]	67	64	63
Max. operating temperature [°C]	-40 +80	-40 +60	-40 +80
Ingress protection rating	IPX4	IPX4	

Overall dimensions

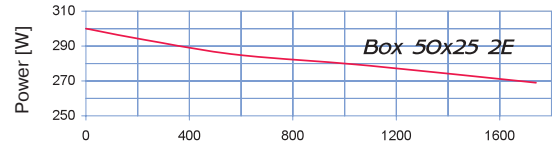
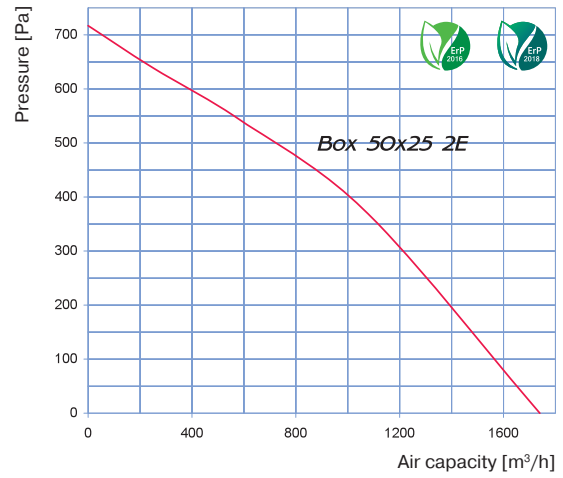


Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	H	H1	H2	H3	L	
Box 40x20 2E	400	420	440	200	220	240	240	500	13.6
Box 50x25 2E	500	520	540	250	270	290	290	640	17.7
Box 50x30 4E	500	520	540	300	320	340	340	680	25.5
Box 50x30 4D	500	520	540	300	320	340	340	680	25.5
Box 60x30 4E	600	620	640	300	320	340	342	680	31.5
Box 60x30 4D	600	620	640	300	320	340	342	680	32.5
Box 60x35 4E	600	620	640	350	370	390	390	735	41.5
Box 60x35 4D	600	620	640	350	370	390	390	735	41.5

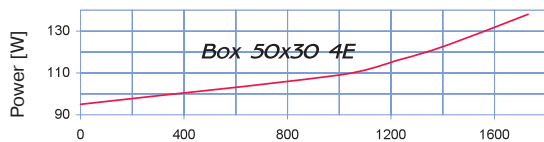
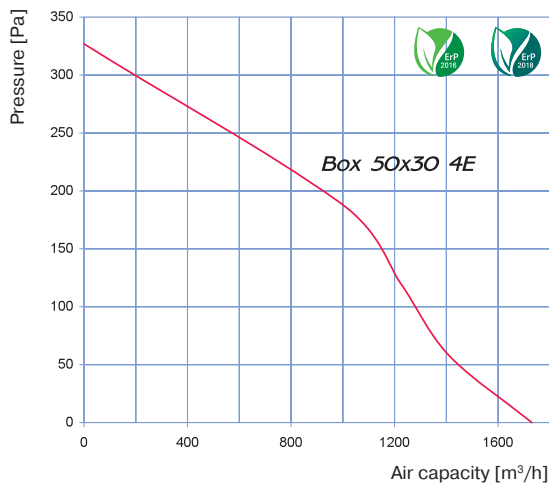
Specifications



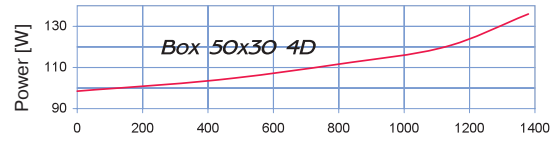
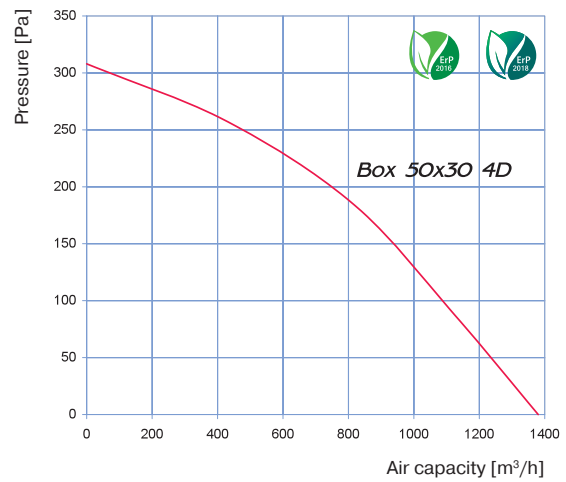
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	71	54	63	68	64	64	58	54	45
L _{WA} to outlet, [dBA]	75	53	62	66	68	69	66	60	48
L _{WA} to environment, [dBA]	58	36	48	56	54	50	46	41	32



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	60	68	60	56	56	49	46	46
L _{WA} to outlet, [dBA]	70	54	65	64	63	60	56	49	44
L _{WA} to environment, [dBA]	53	41	48	47	44	40	38	33	35

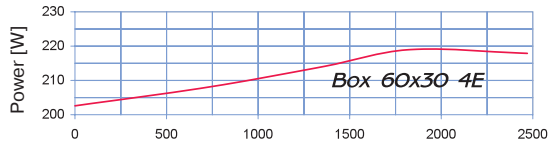
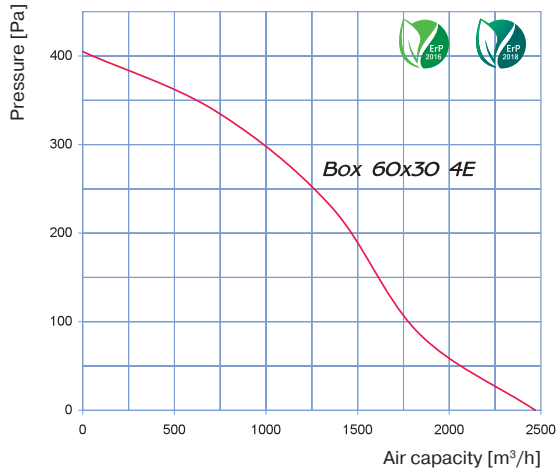


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	58	63	64	55	57	58	51	46
L _{WA} to outlet, [dBA]	73	57	60	72	65	65	64	57	48
L _{WA} to environment, [dBA]	56	44	52	51	51	49	48	43	33

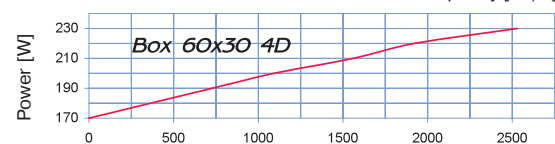
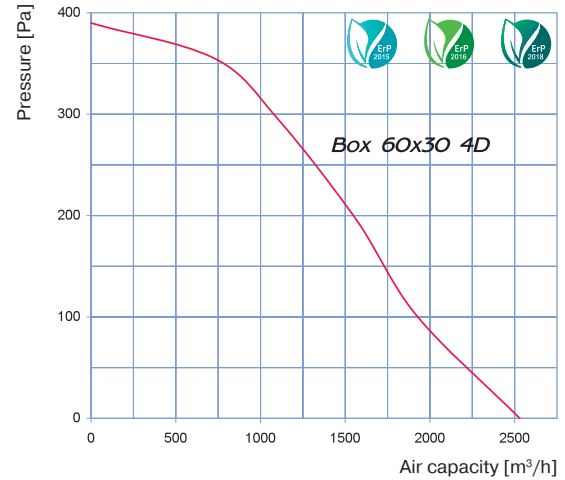


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	58	62	65	55	58	58	55	45
L _{WA} to outlet, [dBA]	71	56	62	69	64	66	63	59	50
L _{WA} to environment, [dBA]	55	42	51	51	52	52	48	43	32

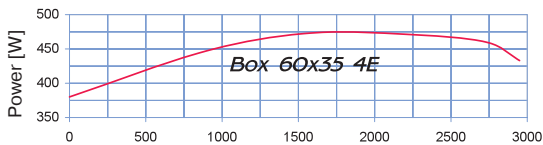
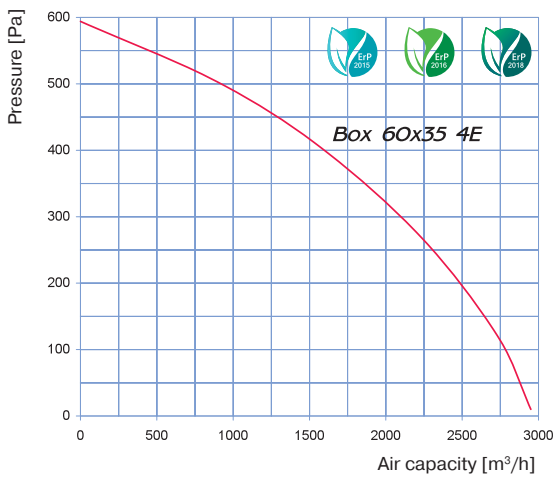
Specifications



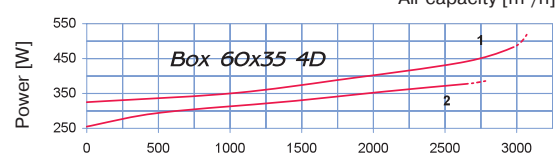
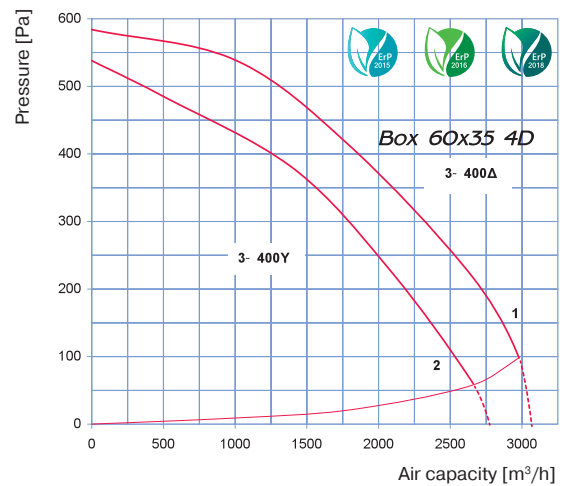
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	63	67	69	56	61	61	54	48
L _{WA} to outlet, [dBA]	78	57	65	73	68	69	69	61	54
L _{WA} to environment, [dBA]	61	43	55	54	55	53	49	48	35



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	61	69	67	60	62	58	56	50
L _{WA} to outlet, [dBA]	76	59	66	73	68	69	66	58	51
L _{WA} to environment, [dBA]	59	45	53	56	54	54	53	47	38



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	78	58	78	75	60	64	65	67	55
L _{WA} to outlet, [dBA]	79	58	69	75	67	70	69	69	56
L _{WA} to environment, [dBA]	64	37	61	55	51	54	49	43	35



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	57	59	72	66	64	65	58	47
L _{WA} to outlet, [dBA]	81	60	67	76	74	74	69	59	50
L _{WA} to environment, [dBA]	65	40	53	61	57	55	54	47	38



Centrifugal fans with EC motor for rectangular ducts

Box-EC

Air capacity – up to 10850 m³/h



■ Use

- ❑ Supply and exhaust ventilation systems installed in various premises.
- ❑ For arranging energy-saving and controllable ventilation systems.
- ❑ Compatible with 600x300 up to 1000x500 mm rectangular air ducts.

■ Design

- ❑ Atmospheric resistant galvanized steel casing and impeller.
- ❑ The fan is rated for continuous operation always connected to power mains.
- ❑ Fitted with standard 20 mm connecting flanges for connection to rectangular air ducts.
- ❑ Access cover on the casing for inspection and maintenance operations.

■ Motor

- ❑ High-efficient direct current EC motors with external rotor and impeller with backward curved blades.
- ❑ EC technologies meet the latest requirements to arrange high-efficient energy saving ventilation.
- ❑ EC motors have energy demand by 50 % less as compared to standards motors and have efficiency up to 90 %.
- ❑ EC motors are featured with high performance, low noise level and well controllable total speed range.
- ❑ Single-phase or three-phase motor modifications.
- ❑ Dynamically balanced turbine.

■ Speed control

- ❑ The fan is controlled with a 0-10 V external control signal, e.g. CDT E/0-10 speed controller for EC motors.

- ❑ The fan air capacity is regulated by various parameters, including temperature level, pressure, smoke, etc.
- ❑ When a control parameter changes the EC motor changes its rotation speed to provide the best suitable air flow.
- ❑ The fan is compatible with 50 Hz and 60 Hz power mains with the same maximum speed.
- ❑ Data exchange between PC and fan for setting and control of operating parameters.
- ❑ The fans with EC motors can be integrated into a unified decentralized computerized network to adjust ventilation system with respect to specific user's demands.

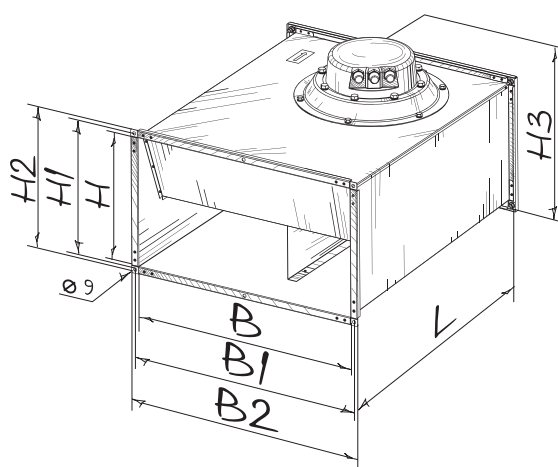
■ Mounting

- ❑ The fan is designed for mounting inside rectangular air ducts and can be installed in any position.
- ❑ The fan flanges are connected to the air ducts through the bolts inserted into the flange holes.
- ❑ Suitable for mounting into round duct on intake flange with a round flange reducer (available upon separate order).
- ❑ If flexible vibration-absorbing connectors are used to connect the fan to the air ducts provide their fixation to mounting structures with supports or brackets.
- ❑ While mounting provide enough space for accessing the cover for service operations.







ErP data	
Overall efficiency	η, (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Overall dimensions

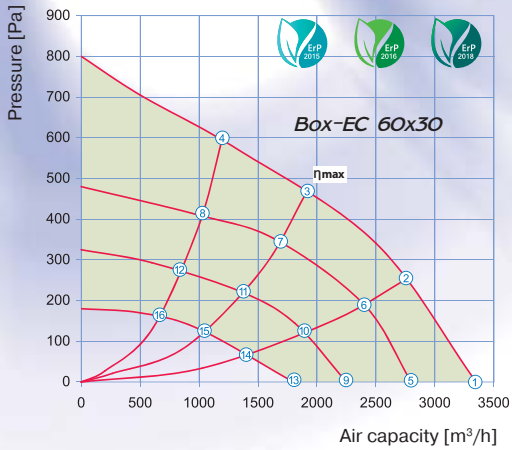
Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	H	H1	H2	H3	L	
Box-EC 60x30	600	620	640	300	320	340	430	680	35.0
Box-EC 60x35	600	620	640	350	370	390	480	735	49.5
Box-EC 70x40	700	720	740	400	420	440	540	780	60.0
Box-EC 80x50	800	820	840	500	520	540	640	880	70.0
Box-EC 90x50	900	920	940	500	520	540	640	954	90.0
Box-EC 100x50	1000	1020	1040	500	520	540	640	954	95.0



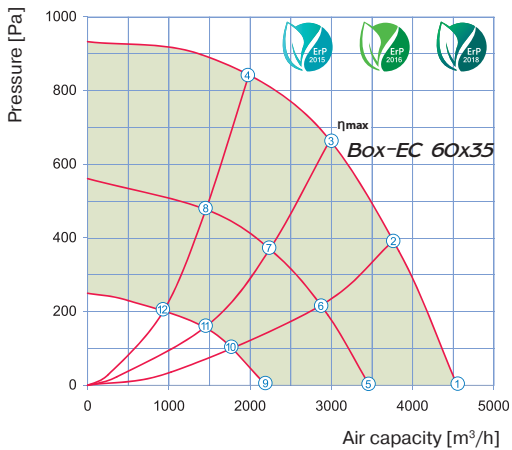
Specifications

Parameters	Box-EC 60x30 	Box-EC 60x35 	Box-EC 70x40 	Box-EC 80x50 	Box-EC 90x50 	Box-EC 100x50 
Voltage [V / 50 /60 Hz]	1 ~ 200-277	3 ~ 380-480	3 ~ 380-480	3 ~ 380-480	3 ~ 380-480	3 ~ 380-480
Power [kW]	0.48	0.99	1.70	2.95	2.98	2.98
Current [A]	3.10	1.70	2.60	4.60	4.60	4.60
Maximum air capacity [m³/h]	3350	4550	6300	8900	10850	10850
RPM [min ⁻¹]	2300	2580	2600	2500	2040	2040
Sound pressure level at 3 m distance [dBA]	58	60	63	65	69	69
Max. operating temperature [°C]	-25 +60	-25 +50	-25 +40	-25 +40	-25 +40	-25 +40
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

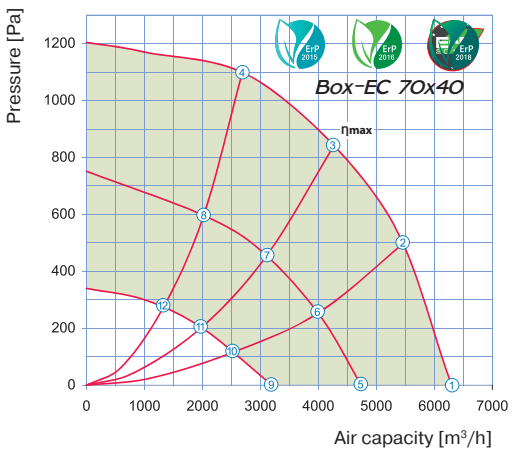
Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	79	68	78	68	65	71	74	70	69
L _{wA} to outlet, [dBA]	84	62	77	73	77	78	78	74	70
L _{wA} to environment, [dBA]	69	42	64	64	64	60	57	51	49



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	80	71	77	67	69	72	72	70	65
L _{wA} to outlet, [dBA]	84	67	75	71	74	77	77	77	70
L _{wA} to environment, [dBA]	68	52	63	65	61	60	56	50	46



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	84	79	76	72	68	76	75	69	68
L _{wA} to outlet, [dBA]	85	73	73	76	80	81	80	77	72
L _{wA} to environment, [dBA]	73	57	64	66	65	68	63	64	60

point	P, (W)	I, (A)	n, (min ⁻¹)
1	370	2.35	2300
2	445	2.85	2215
3	480	3.10	2170
4	448	2.85	2220
5	210	1.30	1900
6	284	1.70	1900
7	312	1.80	1900
8	278	1.70	1900
9	124	0.80	1560
10	158	1.00	1560
11	175	1.10	1560
12	158	1.00	1560
13	57	0.40	1200
14	73	0.50	1200
15	80	0.50	1200
16	70	0.50	1200

η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
53.3	A	Static	67.1	Yes	0.480	3.1	1920	470	2170	1

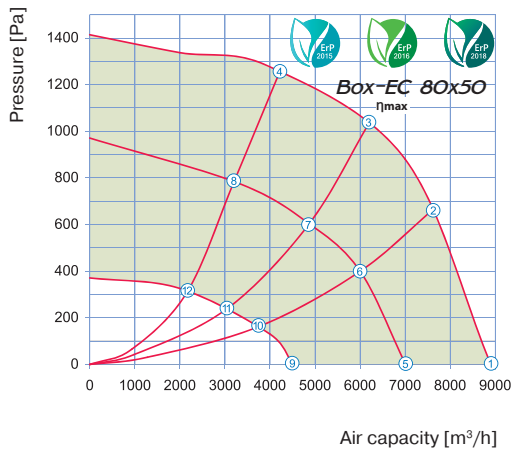
point	P, (W)	I, (A)	n, (min ⁻¹)
1	669	1.17	2580
2	862	1.46	2580
3	990	1.70	2580
4	907	1.53	2580
5	288	0.57	1930
6	348	0.69	1910
7	396	0.77	1900
8	360	0.72	1905
9	123	0.28	1305
10	144	0.33	1305
11	151	0.34	1305
12	151	0.34	1300

η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
56.6	A	Static	67.2	Yes	0.990	1.7	2979	664	2580	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1140	1.74	2600
2	1510	2.30	2600
3	1700	2.60	2600
4	1594	2.42	2600
5	436	0.73	1940
6	541	0.88	1910
7	533	0.95	1885
8	558	0.91	1905
9	194	0.40	1330
10	226	0.45	1315
11	239	0.47	1305
12	236	0.46	1305

η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
59.9	A	Static	68	Yes	1.700	2.6	4270	842	2600	1

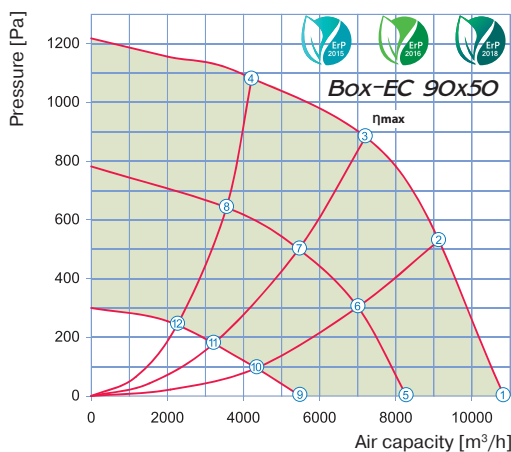
Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet, [dBA]	84	70	73	75	73	76	75	71	66
L_{wA} to outlet, [dBA]	91	73	77	76	81	87	86	79	76
L_{wA} to environment, [dBA]	72	62	68	66	68	69	65	58	57

point	P, (W)	I, (A)	n, (min ⁻¹)
1	2009	3.07	2500
2	2738	4.19	2500
3	2950	4.60	2500
4	2748	4.20	2500
5	945	1.48	1945
6	1170	1.80	1920
7	1247	1.91	1915
8	1193	1.84	1920
9	308	0.59	1255
10	416	0.76	1260
11	417	0.77	1255
12	410	0.75	1255

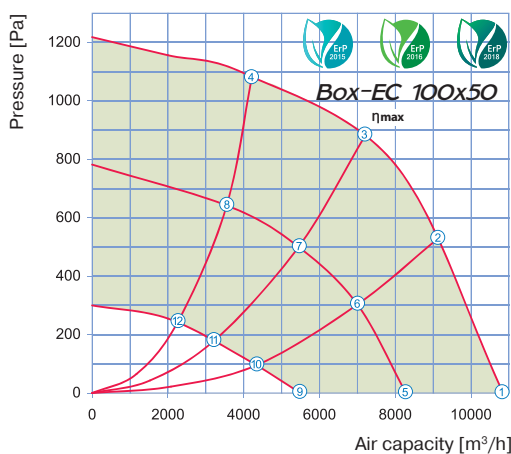
η , (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
62	A	Static	67.6	Yes	0.480	4.6	6210	1039	2500	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet, [dBA]	81	73	70	65	72	74	70	67	63
L_{wA} to outlet, [dBA]	86	70	70	72	78	79	78	73	70
L_{wA} to environment, [dBA]	69	57	63	63	65	62	56	53	54

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1988	3.00	2040
2	2596	3.94	2040
3	2980	4.60	2040
4	2638	3.99	2040
5	818	1.28	1550
6	1054	1.63	1545
7	1195	1.83	1550
8	1075	1.66	1570
9	313	0.60	1045
10	362	0.70	1025
11	387	0.72	1010
12	362	0.69	1005

η , (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
60.5	A	Static	66	Yes	2.980	4.6	7210	882	2040	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet, [dBA]	81	73	70	65	72	74	70	67	63
L_{wA} to outlet, [dBA]	86	70	70	72	78	79	78	73	70
L_{wA} to environment, [dBA]	69	57	63	63	65	62	56	53	54

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1988	3.00	2040
2	2596	3.94	2040
3	2980	4.60	2040
4	2638	3.99	2040
5	818	1.28	1550
6	1054	1.63	1545
7	1195	1.83	1550
8	1075	1.66	1570
9	313	0.60	1045
10	362	0.70	1025
11	387	0.72	1010
12	362	0.69	1005

η , (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
60.5	A	Static	66	Yes	2.980	4.6	7210	882	2040	1



Inline centrifugal fans with EC motor

Box-I EC

Air capacity - up to 10850 m³/h



Use

- ❑ Supply and exhaust ventilation systems installed in various premises.
- ❑ For arranging energy-saving and controllable ventilation systems.
- ❑ Compatible with 600x300 up to 1000x500 mm rectangular air ducts.

Design

- ❑ The casing and impeller are made of galvanized steel.
- ❑ The casing is heat- and sound-insulated with 50 mm mineral wool
- ❑ The fan is rated for continuous operation always connected to power mains.
- ❑ The fan casing has threaded openings for connection of rectangular air ducts.
- ❑ The access cover on the fan casing facilitates servicing and maintenance.



- ❑ Mounting angles with rubber anti vibration mounts for easy fan mounting.

Motor

- ❑ High-efficient direct current EC motor with external rotor and backward curved blades.



- ❑ EC technologies meet the latest requirements to arrange high-efficient energy saving ventilation.

- ❑ EC motors have energy demand by 50 % less as compared to standard motors and have efficiency up to 90 %.
- ❑ EC motors are featured with high performance, low noise level and well controllable total speed range.
- ❑ Dynamically balanced turbine.

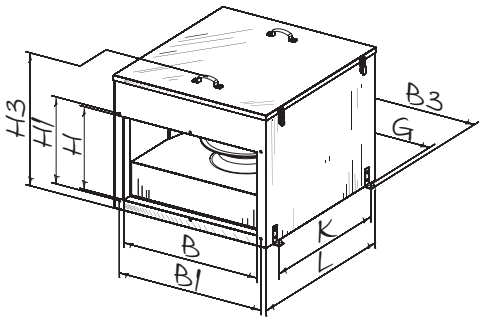
Operation and speed control

- ❑ The fan is controlled with a 0-10 V external control signal, e.g. CDT E/0-10 speed controller for EC motors.
- ❑ The fan capacity is regulated by various parameters, including temperature level, pressure, smoke, etc.
- ❑ EC motor changes its rotation speed synchronously with fluctuations of a control parameter to ensure the best suitable air flow.
- ❑ The fan is compatible both with 50 and 60 Hz power mains with no influence to the motor maximum speed.
- ❑ The parameters may be set and controlled due to data exchange between a PC and the fan.
- ❑ The fans can be integrated into a unified decentralized computerized network to adjust ventilation system with respect to specific user's demands.

Mounting

- ❑ For connection to rectangular air ducts.
- ❑ The fan flanges are connected to the air duct by the bolts inserted into the flange holes.
- ❑ In case of the fan connection to the air duct via flexible connectors the fan must be secured to a mounting frame with supports, hangers or brackets.
- ❑ While mounting provide enough space for accessing the cover for service operations.







Overall dimensions

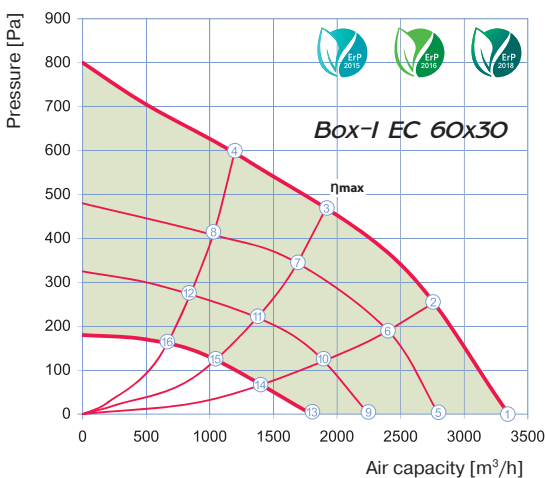


Type	Dimensions [mm]									Weight [kg]
	B	H	B1	H1	B3	H3	L	G	K	
Box-I EC 60x30	600	300	620	320	775	530	752	745	500	55
Box-I EC 60x35	600	350	620	370	775	630	802	745	500	66
Box-I EC 70x40	700	400	720	420	875	690	880	845	742	90
Box-I EC 80x50	800	500	820	520	975	810	935	945	800	113
Box-I EC 90x50	900	500	920	520	1075	810	1000	1045	800	128
Box-I EC 100x50	1000	500	1020	520	1175	810	1000	1145	800	135

ErP data	
Overall efficiency	η , (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR

Specifications

Parameters	Box-I EC 60x30 	Box-I EC 60x35 	Box-I EC 70x40 	Box-I EC 80x50 	Box-I EC 90x50 	Box-I EC 100x50 
Voltage [V / 50 / 60 Hz]	1 ~ 200-277	3 ~ 380-480	3 ~ 380-480	3 ~ 380-480	3 ~ 380-480	3 ~ 380-480
Power [kW]	0.48	0.99	1.70	2.95	2.98	2.98
Current [A]	3.10	1.70	2.60	4.60	4.60	4.60
Maximum air capacity [m ³ /h]	3350	4550	6300	8900	10850	10850
RPM [min ⁻¹]	2300	2580	2600	2500	2040	2040
Sound pressure level at 3 m distance [dBA]	49	51	54	57	60	60
Max. operating temperature [°C]	-25 +60	-25 +50	-25 +40	-25 +40	-25 +40	-25 +40
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

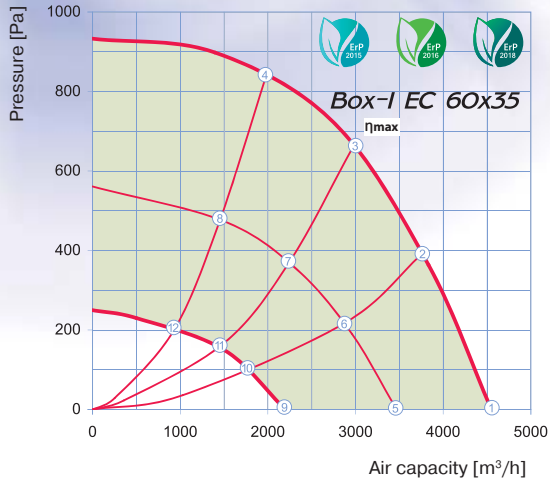


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	74	63	73	62	61	68	72	64	68
L _{WA} to outlet, [dBA]	79	55	74	67	75	73	72	69	69
L _{WA} to environment, [dBA]	58	30	52	52	52	47	44	37	39

η , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
53.3	A	Static	67.1	Yes	0.480	3.1	1920	470	2170	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	370	2.35	2300
2	445	2.85	2215
3	480	3.10	2170
4	448	2.85	2220
5	210	1.30	1900
6	284	1.70	1900
7	312	1.80	1900
8	278	1.70	1900
9	124	0.80	1560
10	158	1.00	1560
11	175	1.10	1560
12	158	1.00	1560
13	57	0.40	1200
14	73	0.50	1200
15	80	0.50	1200
16	70	0.50	1200

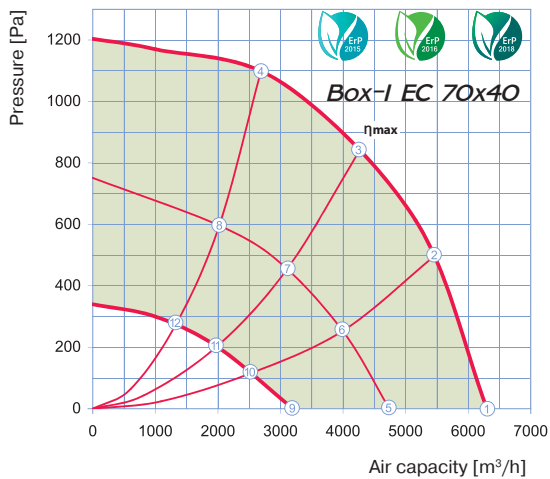
Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	77	69	72	64	66	67	65	64	63
L _{wA} to outlet, [dBA]	76	60	70	64	71	75	74	69	68
L _{wA} to environment, [dBA]	55	38	54	53	51	46	44	39	33

η , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
56.6	A	Static	67.2	Yes	0.990	1.7	2979	664	2580	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	669	1.17	2580
2	862	1.46	2580
3	990	1.70	2580
4	907	1.53	2580
5	288	0.57	1930
6	348	0.69	1910
7	396	0.77	1900
8	360	0.72	1905
9	123	0.28	1305
10	144	0.33	1305
11	151	0.34	1305
12	151	0.34	1300

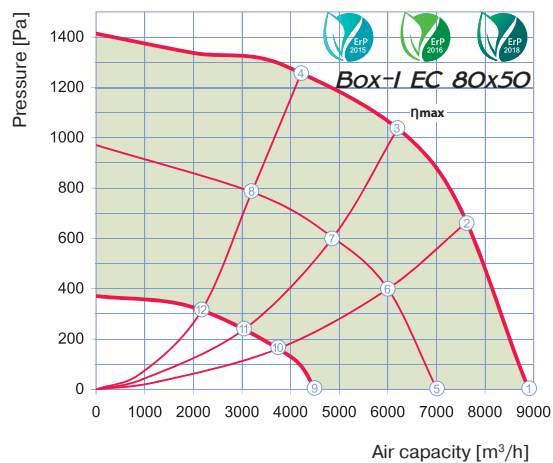


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	79	74	69	66	59	74	73	64	64
L _{wA} to outlet, [dBA]	78	67	66	71	74	74	71	74	68
L _{wA} to environment, [dBA]	63	43	54	54	51	54	52	55	48

η , (%)	MC	EC	N	VSD	[kW]	[A]	[m ³ /h]	[Pa]	[RPM]	SR
59.9	A	Static	68	Yes	1.700	2.6	4270	842	2600	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1140	1.74	2600
2	1510	2.30	2600
3	1700	2.60	2600
4	1594	2.42	2600
5	436	0.73	1940
6	541	0.88	1910
7	533	0.95	1885
8	558	0.91	1905
9	194	0.40	1330
10	226	0.45	1315
11	239	0.47	1305
12	236	0.46	1305

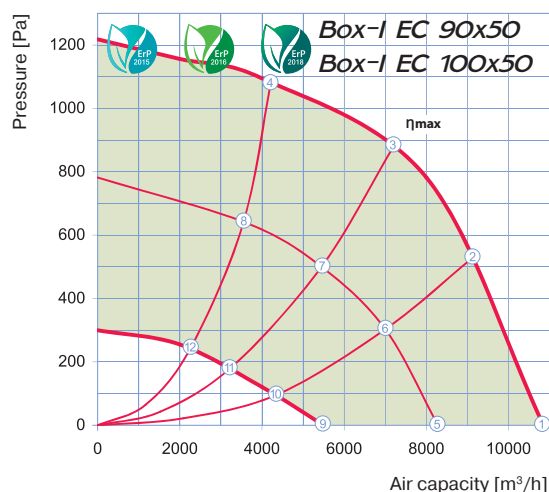
Specifications



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	81	67	67	70	68	72	71	67	61
L _{WA} to outlet, [dBA]	85	66	72	73	76	82	81	74	69
L _{WA} to environment, [dBA]	63	50	56	54	56	58	49	45	45

η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
62	A	Static	67.6	Yes	2.950	4.6	6210	1039	2500	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	2009	3.07	2500
2	2738	4.19	2500
3	2950	4.60	2500
4	2748	4.20	2500
5	945	1.48	1945
6	1170	1.80	1920
7	1247	1.91	1915
8	1193	1.84	1920
9	308	0.59	1255
10	416	0.76	1260
11	417	0.77	1255
12	410	0.75	1255



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
Box-I EC 90x50									
L _{WA} to inlet, [dBA]	76	65	63	58	61	69	63	58	56
L _{WA} to outlet, [dBA]	80	61	66	68	69	75	71	63	67
L _{WA} to environment, [dBA]	59	46	50	49	54	52	47	42	46

Box-I EC 100x50									
L _{WA} to inlet, [dBA]	77	68	64	59	64	69	65	62	57
L _{WA} to outlet, [dBA]	80	64	63	68	74	76	73	65	66
L _{WA} to environment, [dBA]	59	44	53	54	53	49	44	42	41

η, (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
60.5	A	Static	66	Yes	2.980	4.6	7210	882	2040	1

point	P, (W)	I, (A)	n, (min ⁻¹)
1	1988	3.00	2040
2	2596	3.94	2040
3	2980	4.60	2040
4	2638	3.99	2040
5	818	1.28	1550
6	1054	1.63	1545
7	1195	1.83	1550
8	1075	1.66	1570
9	313	0.60	1045
10	362	0.70	1025
11	387	0.72	1010
12	362	0.69	1005



Centrifugal fans for rectangular ducts

Box-F

Air capacity – up to 9540 m³/h



Use

- ❑ Supply and exhaust ventilation systems installed in various premises.
- ❑ Compatible with 400x200 up to 1000x500 mm rectangular air ducts.

Design

- ❑ Atmospheric resistant galvanized steel casing and impeller.
- ❑ The fan is rated for continuous operation.
- ❑ Fitted with standard 20 mm connecting flanges for connection to rectangular air ducts.
- ❑ Access cover on the casing for inspection and maintenance operations.
- ❑ The fans with standard size from 40x20 up to 60x35 are equipped with a terminal block integrated into the casing with leaded outside sealed electrical lead-in for connection to power mains.
- ❑ The fans with standard size from 70x40 up to 100x50 are equipped with an external terminal block for connection to power mains.

Motor

- ❑ Four- or six-pole asynchronous motor with external rotor and centrifugal impeller with forward curved blades.
- ❑ Due to its turbine design the fan has excellent air dynamic characteristics (high performance and pressure drop).
- ❑ Single-phase (**E**) or three-phase (**D**) motor modifications.
- ❑ Equipped with ball bearings for longer service life.
- ❑ Dynamically balanced turbine.
- ❑ Overheating protection by built-in thermal switches with leaded outside terminals for connection to external protecting controls.

- ❑ The thermal switch terminal leads are designed for connection to respective circuit of the overload relay or respective terminals of the autotransformer or thyristor speed controller.

Speed control

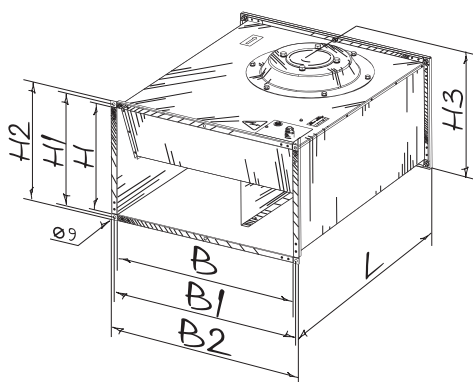
- ❑ Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- ❑ The fan is designed for mounting inside rectangular air ducts and can be installed in any position.
- ❑ The fan flanges are connected to the air ducts through the bolts inserted into the flange holes.
- ❑ Mounting to a round air duct on exhaust flange through a round pipe reducer. Available upon order.
- ❑ If flexible vibration-absorbing connectors are used to connect the fan to the air ducts provide their fixation to mounting structures with supports or brackets.
- ❑ While mounting provide enough space for accessing the cover for service operations.





ErP data	
Overall efficiency	η , (%)
Measurement category	MC
Efficiency category	EC
Efficiency grade	N
Variable speed drive	VSD
Power	[kW]
Current	[A]
Air flow	[m ³ /h]
Static pressure	[Pa]
Speed	[n/min ⁻¹]
Specific ratio	SR









Overall dimensions



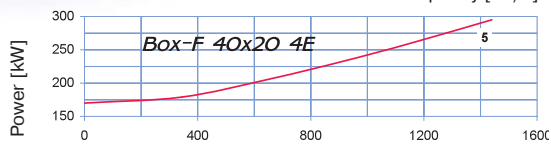
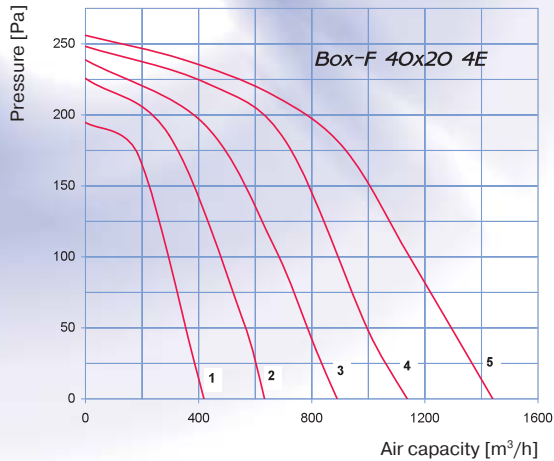
Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	H	H1	H2	H3	L	
Box-F 40x20 4E	400	420	440	200	220	240	255	500	17.5
Box-F 40x20 4D	400	420	440	200	220	240	255	500	17.5
Box-F 50x25 4E	500	520	540	250	270	290	335	640	24.0
Box-F 50x25 4D	500	520	540	250	270	290	335	640	24.0
Box-F 50x30 4E	500	520	540	300	320	340	365	680	33.0
Box-F 50x30 4D	500	520	540	300	320	340	365	680	33.0
Box-F 60x30 4E	600	620	640	300	320	340	375	680	35.0
Box-F 60x30 4D	600	620	640	300	320	340	375	680	35.0
Box-F 60x35 4E	600	620	640	350	370	390	425	735	49.5
Box-F 60x35 4D	600	620	640	350	370	390	425	735	49.5
Box-F 70x40 4D	700	720	740	400	420	440	480	780	60.0
Box-F 80x50 6D	800	820	840	500	520	540	580	820	70.0
Box-F 80x50 4D	800	820	840	500	520	540	580	820	74.0
Box-F 90x50 6D	900	920	940	500	520	540	580	954	90.0
Box-F 100x50 6D	1000	1020	1040	500	520	540	580	954	95.0

Specifications

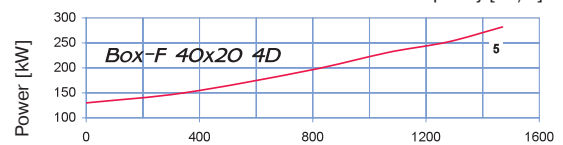
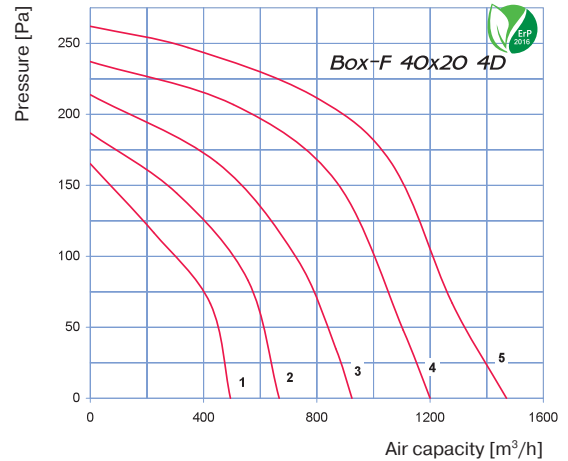
Parameters	Box-F 40x20 4E	Box-F 40x20 4D 	Box-F 50x25 4E 	Box-F 50x25 4D 	Box-F 50x30 4E	Box-F 50x30 4D	Box-F 60x30 4E 
Voltage [V / 50 Hz]	230	400	230	400	230	400	230
Power [W]	295	282	535	570	710	855	1240
Current [A]	1.32	0.60	2.49	0.94	3.10	1.70	6.45
Maximum air capacity [m³/h]	1440	1470	1750	1850	2350	2350	2950
RPM [min ⁻¹]	1350	1300	1250	1270	1230	1300	1210
Sound pressure level at 3 m distance [dBA]	50	52	53	54	57	56	59
Max. operating temperature [°C]	-25 +40	-25 +45	-20 +40	-20 +40	-25 +70	-20 +50	-25 +50
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

Parameters	Box-F 60x30 4D 	Box-F 60x35 4E 	Box-F 60x35 4D 	Box-F 70x40 4D 	Box-F 80x50 6D 	Box-F 80x50 4D 	Box-F 90x50 6D 	Box-F 100x50 6D 
Voltage [V / 50 Hz]	400	230	400	400	400	400	400	400
Power [W]	1560	2840	2460	3630	2790	5850	3870	3870
Current [A]	2.73	13.90	3.93	6.00	5.18	9.35	7.0	7.0
Maximum air capacity [m³/h]	3740	4260	5020	6450	7610	8120	9540	9540
RPM [min ⁻¹]	1310	1260	1300	1320	830	1140	930	930
Sound pressure level at 3 m distance [dBA]	57	59	60	65	59	67	61	61
Max. operating temperature [°C]	-25 +65	-20 +40	-20 +40	-25 +40	-20 +50	-25 +40	-20 +55	-20 +55
Ingress protection rating	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

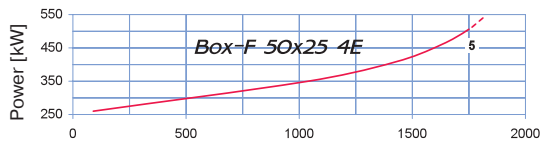
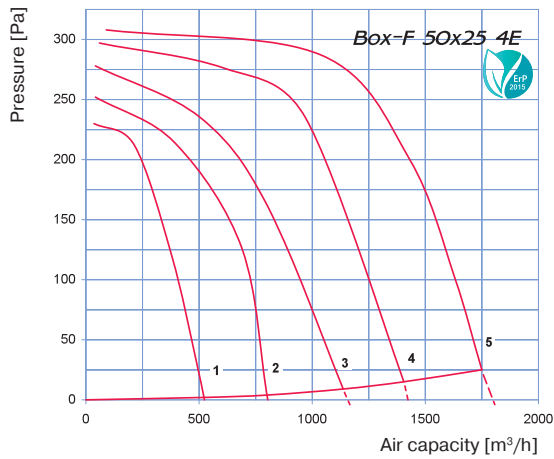
Specifications



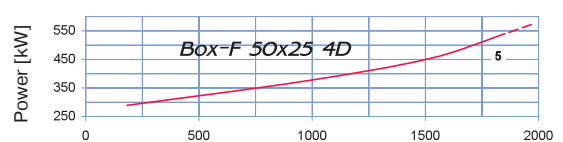
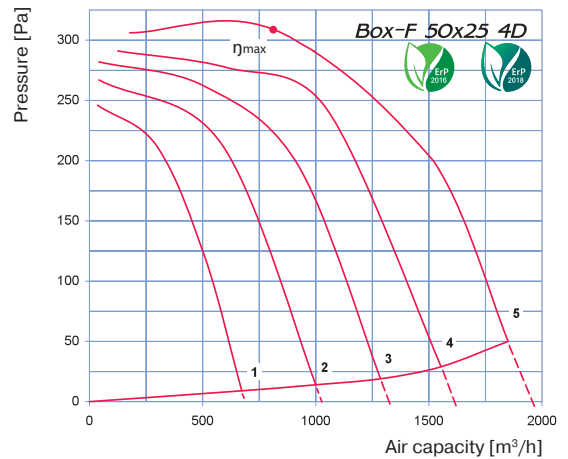
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	69	58	68	63	59	56	53	53	45
L _{WA} to outlet, [dBA]	70	53	63	67	62	65	63	58	55
L _{WA} to environment, [dBA]	59	34	46	57	52	49	43	40	36



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	56	69	65	57	58	57	53	48
L _{WA} to outlet, [dBA]	74	54	65	66	61	63	60	61	55
L _{WA} to environment, [dBA]	61	34	44	56	52	50	44	40	33



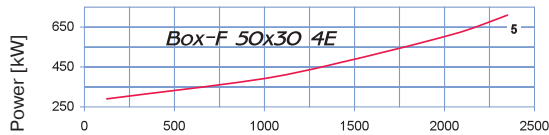
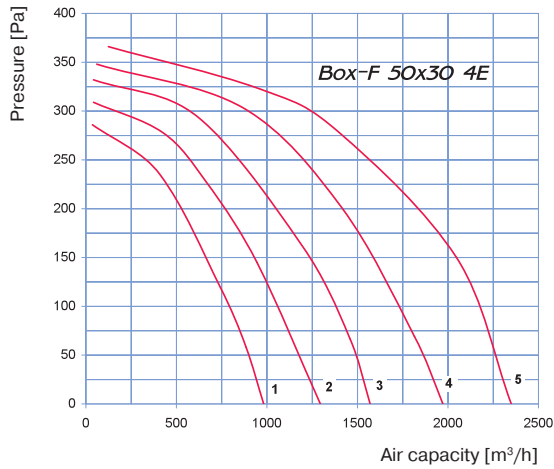
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	72	58	67	62	57	62	64	62	60
L _{WA} to outlet, [dBA]	77	57	63	62	66	72	69	68	63
L _{WA} to environment, [dBA]	62	41	49	54	53	56	52	51	53



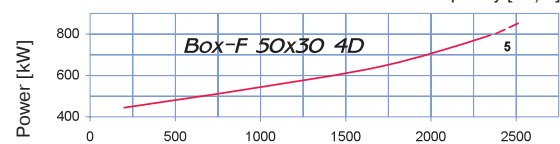
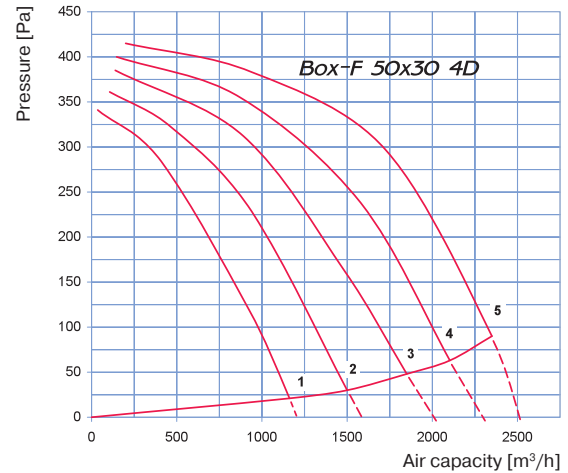
Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	74	60	67	64	61	64	62	60	58
L _{WA} to outlet, [dBA]	76	57	65	65	67	69	69	68	63
L _{WA} to environment, [dBA]	61	41	48	53	53	56	52	50	53

η _s (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
34.3	A	Static	44.9	Yes	0.210	0.6	820	310	1420	1

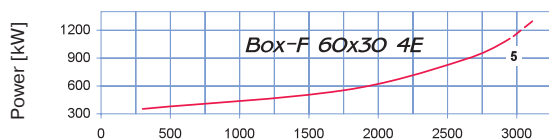
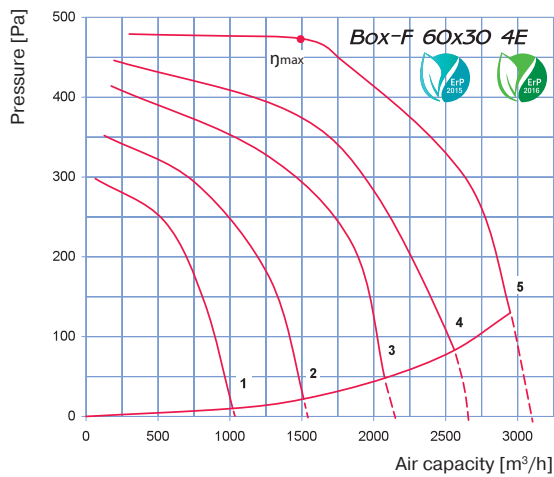
Specifications



Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	74	64	69	65	63	66	67	65	60
L _{WA} to outlet, [dBA]	79	62	69	66	72	73	72	71	64
L _{WA} to environment, [dBA]	64	46	53	59	54	58	56	49	50

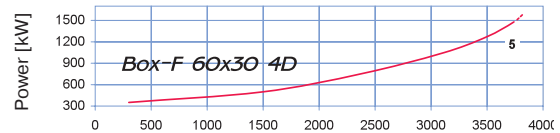
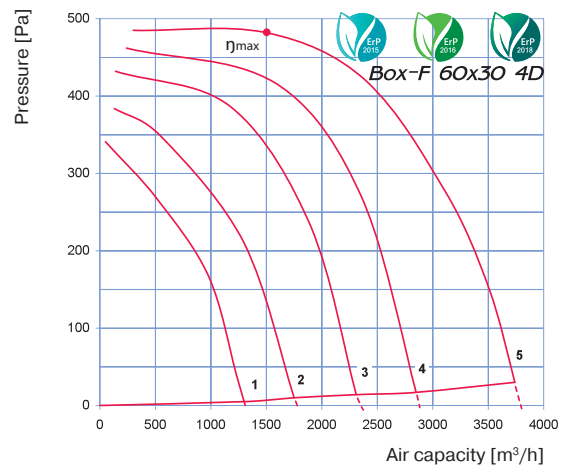


Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	77	67	69	62	63	68	68	68	63
L _{WA} to outlet, [dBA]	79	61	68	69	71	75	74	73	68
L _{WA} to environment, [dBA]	65	46	55	58	56	60	54	48	47



Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	83	66	77	69	66	71	70	71	67
L _{WA} to outlet, [dBA]	85	62	77	71	74	79	76	73	67
L _{WA} to environment, [dBA]	69	42	65	66	61	61	56	53	47

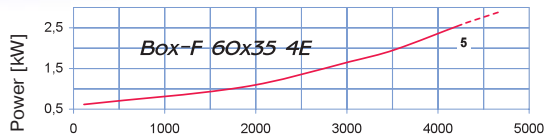
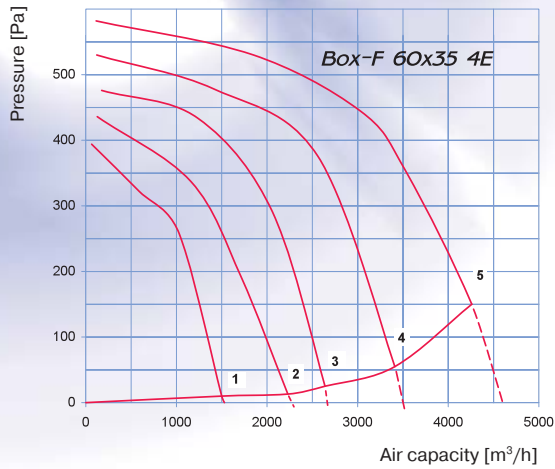
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
35.8	A	Static	43.7	No	0.555	2.33	1482	473	1425	1



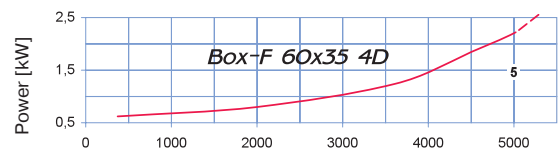
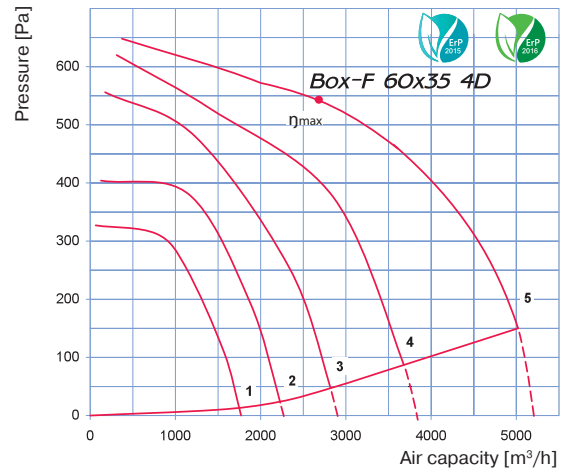
Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	82	66	77	67	67	70	72	68	69
L _{WA} to outlet, [dBA]	82	62	77	71	76	79	75	76	67
L _{WA} to environment, [dBA]	71	43	63	62	64	62	55	49	51

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
40.6	A	Static	48.8	No	0.510	1.9	1508	485	1440	1

Specifications

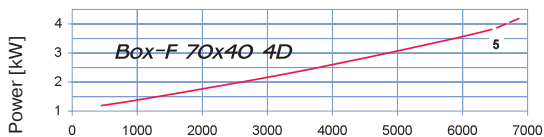
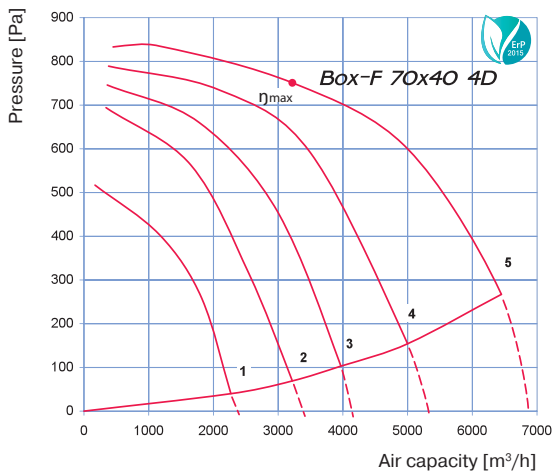


Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	78	71	74	65	66	75	72	70	64
L _{WA} to outlet, [dBA]	86	69	73	74	74	78	76	77	68
L _{WA} to environment, [dBA]	67	54	60	63	58	62	55	51	48



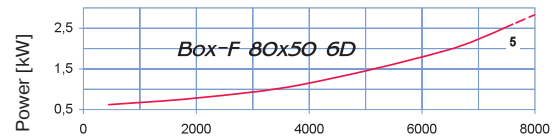
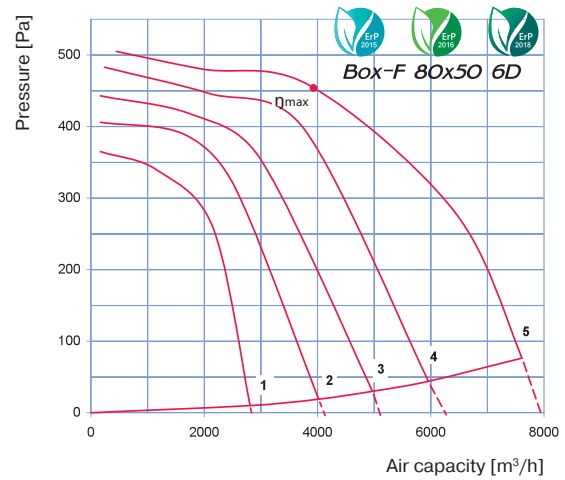
Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	80	72	75	69	67	73	71	69	67
L _{WA} to outlet, [dBA]	84	66	74	70	76	79	76	74	68
L _{WA} to environment, [dBA]	68	52	62	65	61	58	56	52	48

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
36.9	A	Static	43	No	1.120	2.56	2693	542	1410	1



Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	82	80	77	70	71	75	73	71	68
L _{WA} to outlet, [dBA]	86	74	77	75	78	83	81	77	71
L _{WA} to environment, [dBA]	71	55	64	69	67	70	63	62	59

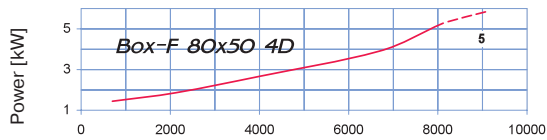
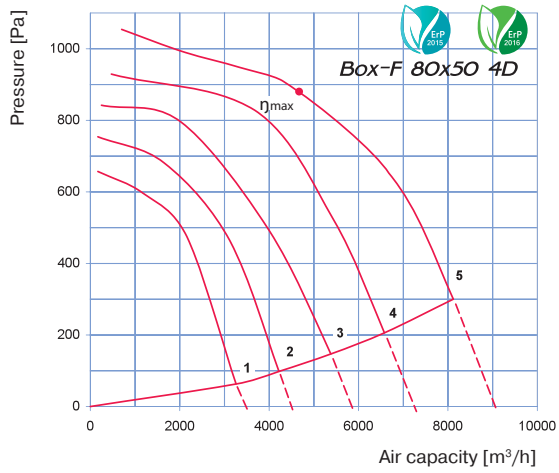
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
32.4	A	Static	41	No	1.890	4.34	3240	751	1430	1



Sound-power level	Gen	Octave-frequency band [Hz]							
		63	125	250	500	1000	2000	4000	8000
L _{WA} to inlet, [dBA]	77	64	66	66	70	71	70	66	62
L _{WA} to outlet, [dBA]	82	64	66	69	76	74	73	73	64
L _{WA} to environment, [dBA]	64	51	59	58	61	60	55	50	49

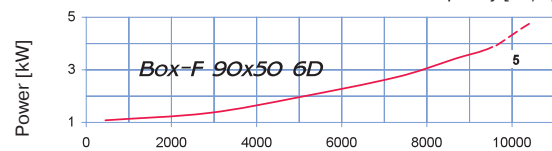
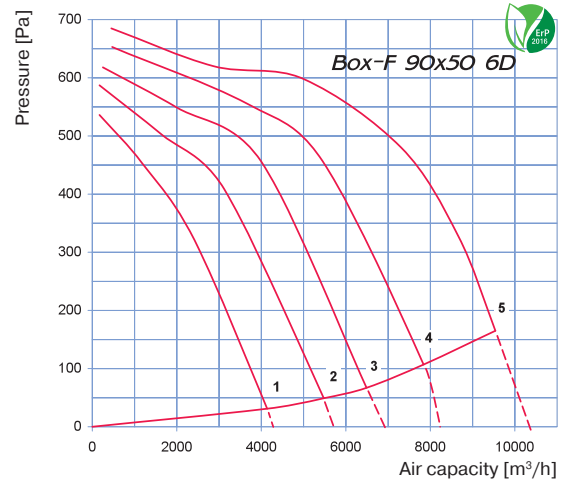
η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
43.6	A	Static	49.5	No	1.150	2.9	3870	457	940	1

Specifications

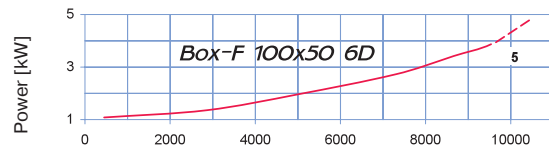
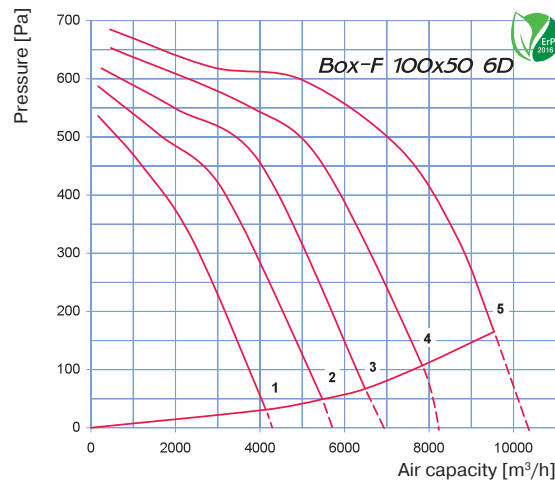


Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	82	71	74	75	70	75	75	70	67
L _{wA} to outlet, [dBA]	90	72	77	76	82	86	85	80	78
L _{wA} to environment, [dBA]	73	61	68	67	65	70	66	61	60

η _v (%)	MC	EC	N	VSD	[kW]	[A]	[m³/h]	[Pa]	[RPM]	SR
42.3	A	Static	45.9	No	2.743	4.9	4648	881	1330	1



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	78	70	68	63	72	69	71	68	64
L _{wA} to outlet, [dBA]	83	71	70	70	80	78	79	74	68
L _{wA} to environment, [dBA]	65	56	64	60	63	58	56	52	51



Sound-power level	Octave-frequency band [Hz]								
	Gen	63	125	250	500	1000	2000	4000	8000
L _{wA} to inlet, [dBA]	80	73	68	64	74	71	72	69	66
L _{wA} to outlet, [dBA]	86	70	71	71	78	78	78	75	71
L _{wA} to environment, [dBA]	69	59	61	59	65	61	58	53	53



Chimney centrifugal fans Kamin / Kamin-ER

Air capacity – up to 540 m³/h

Use

- For arranging warm air distribution system from chimney room to other rooms.
- For heating of occasionally or seasonally occupied buildings.
- Operating temperature from 0 to 150 °C.
- Compatible with Ø 125 up to 160 mm round air ducts.

Design

- Atmospheric resistant galvanized steel casing and impeller.
- Thermal and heat-insulation with non-flammable mineral wool.
- The casing is perforated for internal air circulation for cooling the motor down.
- The casing has fixing for connection of extra options (filter, mixing chamber, bypass system).
- Power is supplied to the fan through an external terminal box with sealed electric lead-in.
- Switches on and off at set temperatures. Regulation by built-in temperature regulator.



Motor

- Single-phase asynchronous motor. Centrifugal impeller with forward curved blades.
- The Kamin-ER fan is equipped with an external rotor motor.
- The motor is placed off the air flow and is equipped with extra axial impeller for motor cooling and blowing off.
- Motor insulation class F.
- Equipped with ball bearings for longer service life.
- Dynamically balanced turbine.
- Overheating protection by built-in thermal switches with automatic restart.

Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).

Mounting

- Suitable for installation in any mounting position with respect to air flow direction in the system.
- Warm air distribution from the fan to other premises through the mounted air ducts.

Options

- AF** – metal filter-box for air purification. Filter class G3.

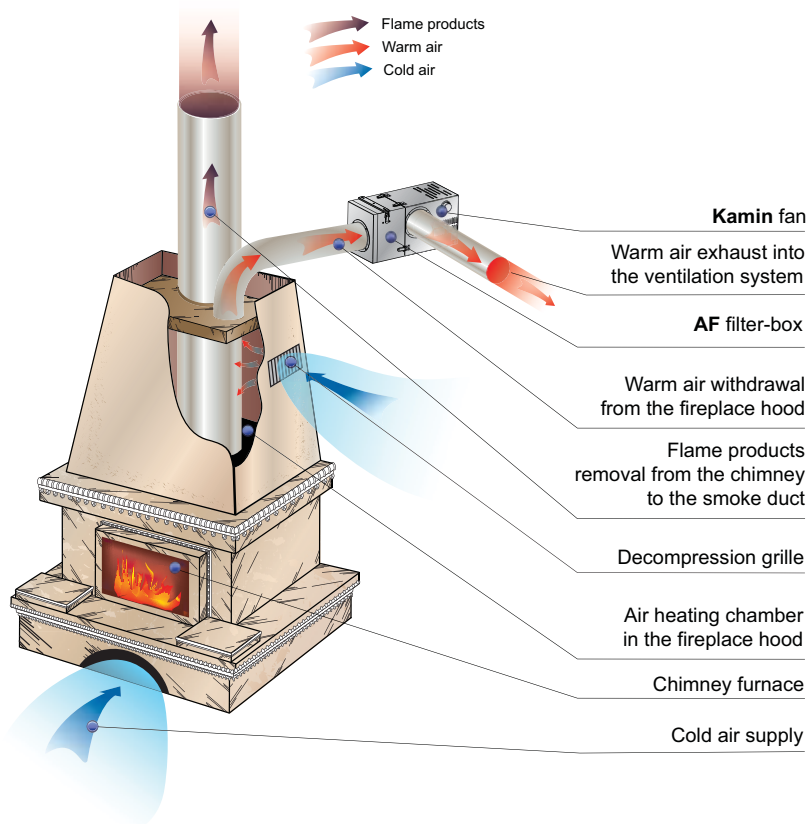


- KF** – metal mixing chamber for cold air supply. The chamber includes a temperature regulating damper and filter for air purification. The chamber provides cold air supply when the air temperature exceeds 90°C and hot air removal when the fan is off.

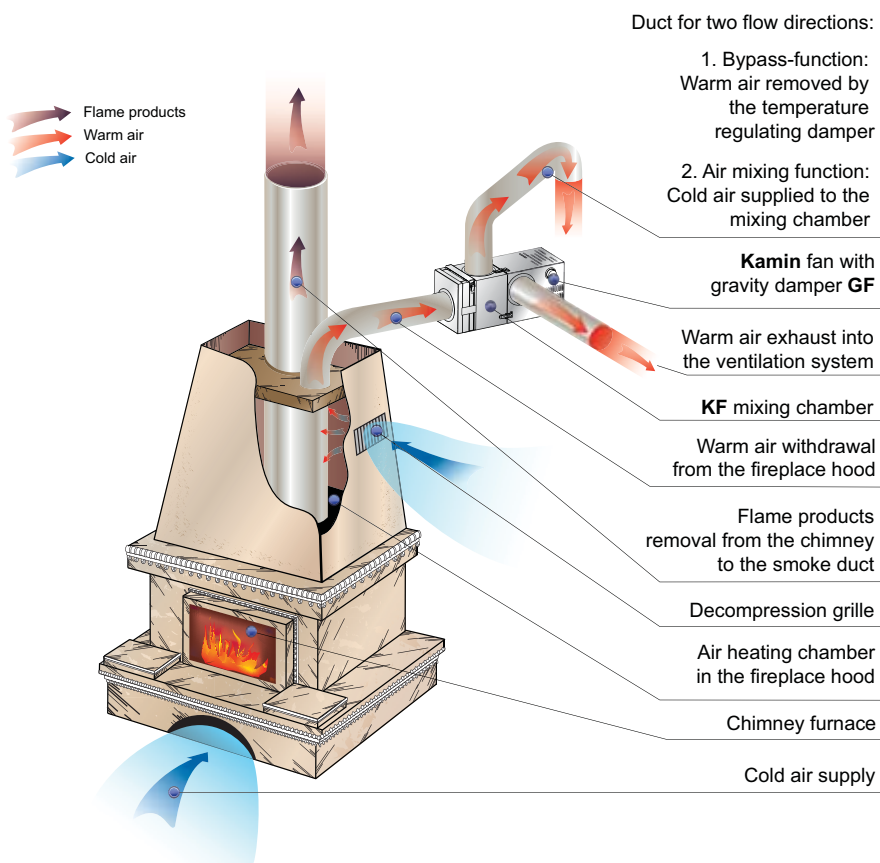


- GF** – gravity damper prevents air back draft into the system and together with mixing chamber KF provides by-pass motor overheating protection. When the fan is off, e.g. during power cut-off the gravity damper is closed and warm air is distributed through the mixing chamber and connected air ducts to other rooms.

■ Operating logic of the fan Kamin with AF filter-box



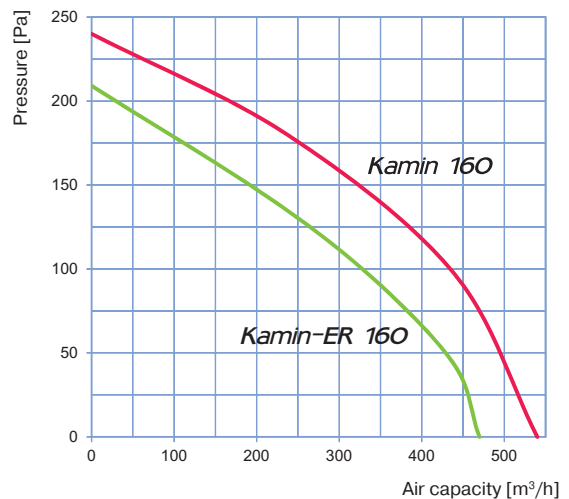
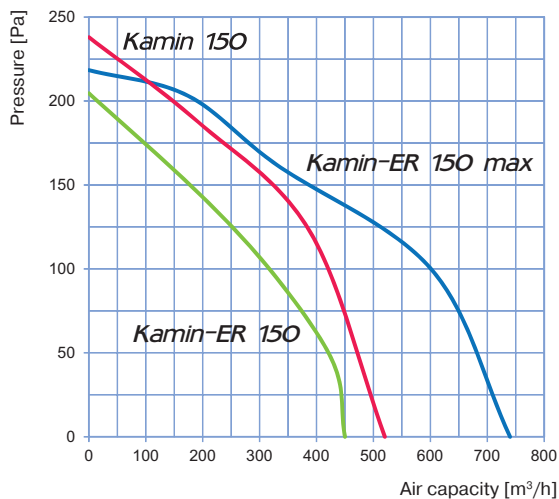
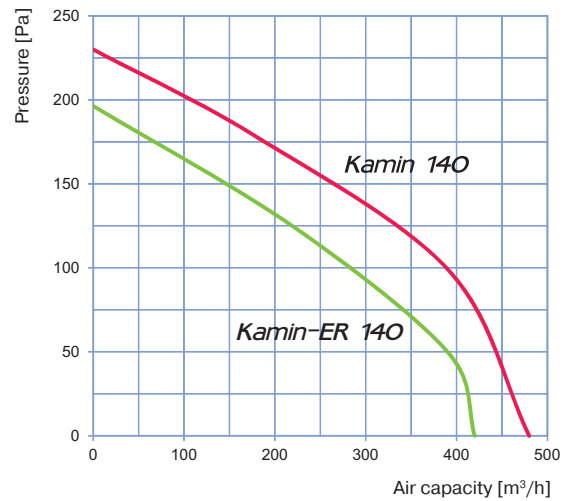
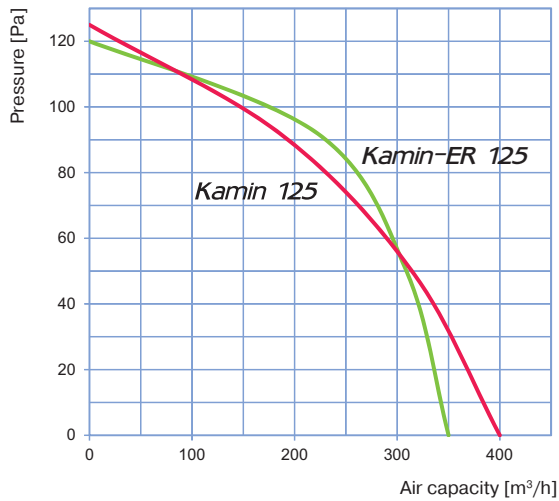
■ Operating logic of the fan Kamin with BY-PASS system



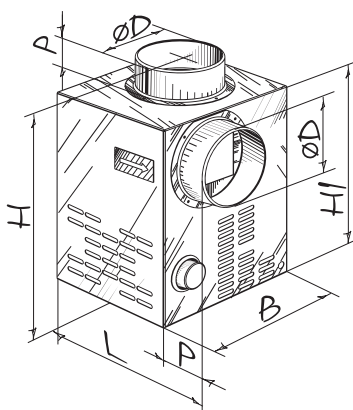
Specifications

Parameters	Kamin 125	Kamin 140	Kamin 150	Kamin 160
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	108	110	115	116
Current [A]	0.81	0.82	0.84	0.86
Maximum air capacity [m ³ /h]	400	480	520	540
RPM [min ⁻¹]	1300	1290	1280	1270
Sound pressure level at 3 m distance [dBA]	42	42	42	42
Max. operating temperature [°C]	150	150	150	150
Ingress protection rating	IPX2	IPX2	IPX2	IPX2

Parameters	Kamin-ER 125	Kamin-ER 140	Kamin-ER 150	Kamin-ER 150 max	Kamin-ER 160
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	32	41	43	127	44
Current [A]	0.14	0.18	0.19	0.55	0.19
Maximum air capacity [m ³ /h]	350	420	450	740	470
RPM [min ⁻¹]	1335	1250	1165	1310	1110
Sound pressure level at 3 m distance [dBA]	37	38	39	45	39
Max. operating temperature [°C]	150	150	150	150	150
Ingress protection rating	IPX2	IPX2	IPX2	IPX2	IPX2

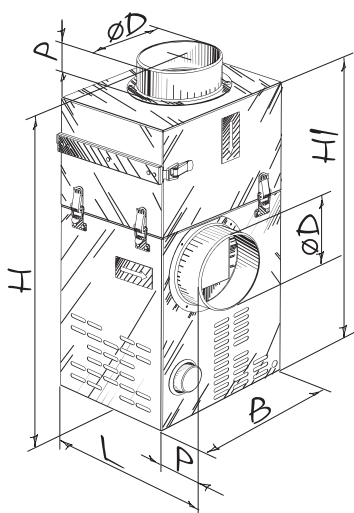


■ Overall dimensions of the Kamin / Kamin-ER series fans



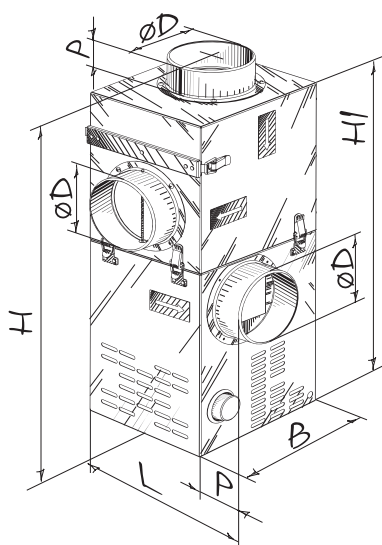
Type	Dimensions [mm]						Weight [kg]
	ØD	B	H	H1	L	P	
Kamin 125	124	245	350	300	260	50	4.5
Kamin 140	139	285	350	300	300	50	5.7
Kamin 150	149	285	350	300	300	50	5.7
Kamin 160	159	285	350	300	300	50	5.7
Kamin-ER 125	124	245	320	270	260	50	5.6
Kamin-ER 140	139	285	320	270	300	50	6.8
Kamin-ER 150	149	285	320	270	300	50	6.8
Kamin-ER 150 max	149	285	320	270	300	50	6.8
Kamin-ER 160	159	285	320	270	300	50	6.8

■ Overall dimensions of the Kamin / Kamin-ER series fans equipped with filter box AF



Type	Extra option	Dimensions [mm]						Weight [kg]
		ØD	B	H	H1	L	P	
Kamin 125	AF 125	124	245	530	480	260	50	6.7
Kamin 140	AF 140	139	285	540	490	300	50	8.7
Kamin 150	AF 150	149	285	540	490	300	50	8.7
Kamin 160	AF 160	159	285	540	490	300	50	8.7
Kamin-ER 125	AF 125	124	245	500	450	260	50	7.8
Kamin-ER 140	AF 140	139	285	510	460	300	50	9.8
Kamin-ER 150	AF 150	149	285	510	460	300	50	9.8
Kamin-ER 150 max	AF 150	149	285	510	460	300	50	9.8
Kamin-ER 160	AF 160	159	285	510	460	300	50	9.8

■ Overall dimensions of the Kamin / Kamin-ER series fans equipped with mixing chamber KF and damper GF



Type	Extra option	Dimensions [mm]						Weight [kg]
		ØD	B	H	H1	L	P	
Kamin 125	KF 125 / KF 125 + GF 125 (BY-PASS)	124	245	610	560	260	50	8.3
Kamin 140	KF / KF 140 + GF 140 (BY-PASS)	139	285	650	600	300	50	9.7
Kamin 150	KF 150 / KF 150 + GF 150 (BY-PASS)	149	285	650	600	300	50	9.7
Kamin 160	KF 160 / KF 160 + GF 160 (BY-PASS)	159	285	650	600	300	50	9.7
Kamin-ER 125	KF 125 / KF 125 + GF 125 (BY-PASS)	124	245	580	530	260	50	9.4
Kamin-ER 140	KF / KF 140 + GF 140 (BY-PASS)	139	285	620	570	300	50	10.8
Kamin-ER 150	KF 150 / KF 150 + GF 150 (BY-PASS)	149	285	620	570	300	50	10.8
Kamin-ER 150 max	KF 150 / KF 150 + GF 150 (BY-PASS)	149	285	620	570	300	50	10.8
Kamin-ER 160	KF 160 / KF 160 + GF 160 (BY-PASS)	159	285	620	570	300	50	10.8



Mono-pipe ventilation exhaust centrifugal units

Valeo

Air capacity – up to 150 m³/h

■ Use

- ❑ Exhaust ventilation systems installed in high-rise buildings and premises.
- ❑ For buildings with mono-pipe ventilation system.
- ❑ For mounting in kitchens and bathrooms.
- ❑ Installation in casing for flush or surface mounting.

■ Design

- ❑ The ventilation unit Valeo is designed for installation in a plastic or fireproof casing.
- ❑ The front panel is made of snow-white UV-resistant plastic.
- ❑ Filter with filter class G4 for motor, impeller and ductwork system protection against soiling.
- ❑ The filter is easily accessible for service operations.
- ❑ The ventilation unit with motor is fixed inside the casing with special latches.
- ❑ Due to modern design and various colour modifications the front panel matches well with any interior.

■ Motor

- ❑ Two- or three-speed motor with centrifugal impeller. Minimum energy demand.

■ Options for 2 speed units

❑ Timer (Valeo...T)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan is turned to higher speed with external switch 50 s after activation. After turning the switch off the fan continues operating within 6 min at higher speed and then reverts to default operation mode.

❑ Adjustable timer (Valeo...TR)

Depending on wiring connection the fan is off or runs permanently at low speed. If the fan is turned on with an external switch it switches to higher speed 0 to 150 s after switch activation. After turning the fan off it continues running at higher speed within 2 to 30 minutes and then reverts to previous mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

❑ Interval switch (Valeo...I)

Depending on wiring connection the fan is off or runs permanently at low speed. In interval mode regulated from 0,5 to 15 hours the fan switches periodically to higher speed for 10 minutes. The switch interval is adjusted with the internal regulator. If light in the room is turned on the fan switches to higher speed in 50 s. After light is off the fan reverts to interval mode operation.

- ❑ Galvanized steel impeller with forward curved blades.

- ❑ Automatic maintaining of constant air flow depending on variable air resistance of the duct.
- ❑ Balanced turbine ensures low-noise operation.
- ❑ Best aerodynamic characteristics due to special scroll casing design.
- ❑ Ball bearings provide long service life.

■ Control

- ❑ Step speed control with an external speed controller, e.g. **CDP-3/5** model which is available upon order.
- ❑ Wide range of system controls with programmable parameters (timer, adjustable timer, internal switch, photo sensor, humidity sensor).

❑ Photo sensor (Valeo...F)

Depending on wiring connection the fan is off or runs permanently at low speed. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan continues running at higher speed within 2 to 30 min and then reverts to default operating mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

❑ Humidity sensor (Valeo...H)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan switches to higher speed as relative humidity in the room increases from 60 % up to 90 % and switches off as humidity drops by 10 % below set level. If light in the room is turned on the fan switches to higher speed in 50 s. The run-out time is set by the internal regulator from 2 to 30 minutes.

■ Front panel modifications

- The standard snow white front panel can be replaced by the following models:



Platinum
grey metallic



Hi-Tech
natural brushed
aluminium



Hi-Tech Gold
natural gold-coloured
aluminium



Hi-Tech Chrome
natural mirror
aluminium

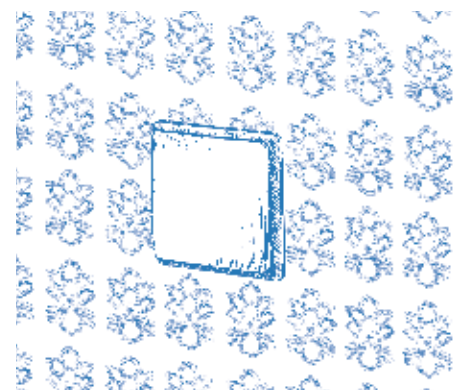
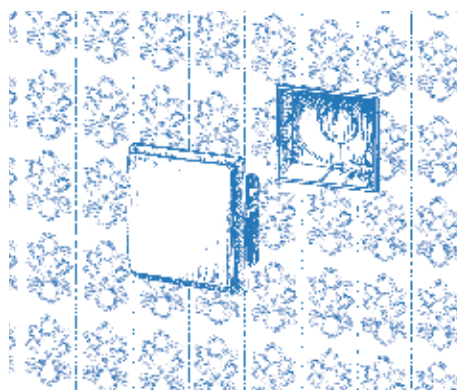
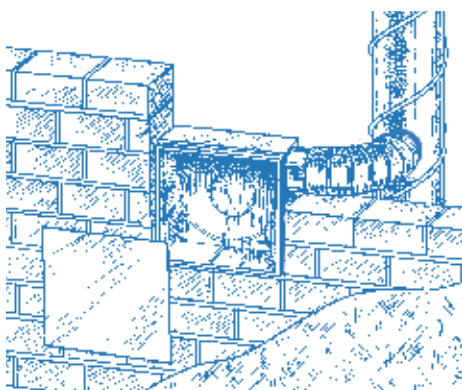
■ Mounting plastic casing for ventilation units Valeo



- **BP 80** – plastic casing for flush mounting.
- Made of quality ABS plastic and equipped with a gravity backdraft damper.
- Installed in wall or ceiling during general construction works by mounting brackets supplied as a standard.
- The casing is equipped with oblong slotted joints to facilitate mounting.
- Connection to main ventilation shaft with flexible air ducts.
- Exhaust spigot diameter 80 mm.
- After installation works cover the unit with a protecting cover to prevent dirt ingress.
- After finishing works install the unit Valeo inside the casing.
- For exhaust ventilation of neighbour rooms extra spigots may be connected to the casing.



gravity backdraft damper



■ Mounting fireproof casing for the ventilation units Valeo

- **BF 80** – fireproof casing for flush mounting.
- Made of silicate plates based on calcium silicate and has high thermal insulating properties.
 - Equipped with a fire-retarding damper to prevent fire and smoke expanding along air ducts. If temperature in the duct reaches 90°C the thermal fuse closes the damper.
 - When the fan is off the fire-retarding damper serves as a backdraft damper.
 - The fan casing is installed in wall or ceiling during general construction works by mounting brackets supplied as a standard.
 - Connection to main ventilation shaft with flexible air ducts. Exhaust spigot diameter 80 mm.
 - Power is supplied to the fan through a sealed electric lead-in on the casing.
 - After installation works cover the unit with a protecting cover to prevent dirt ingress.
 - After finishing works install the ventilation unit inside the casing and connect it to wiring system.
 - For exhaust ventilation of neighbour rooms extra spigots may be connected to the casing on the left (**BFL** modification), on the right (**BFR** modification), on the bottom (**BFD** modification).



fire-retarding damper



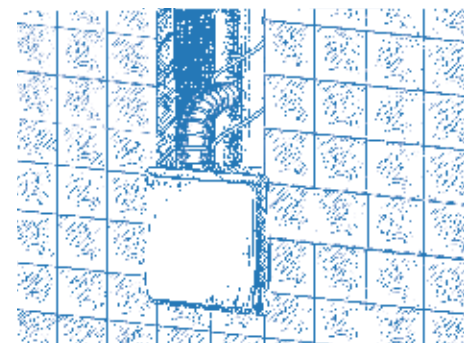
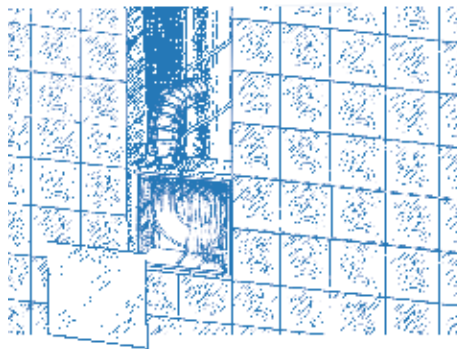
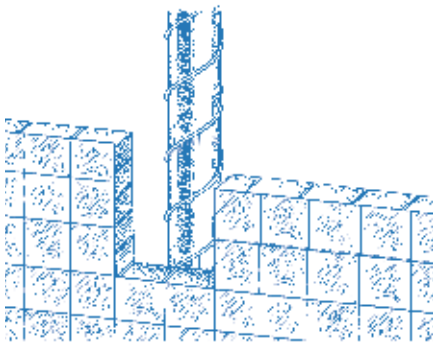
BFL 80



BFR 80



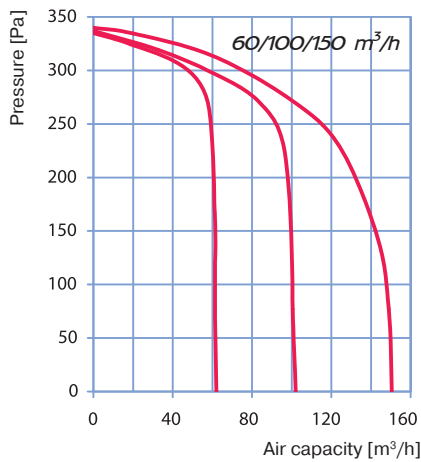
BFD 80



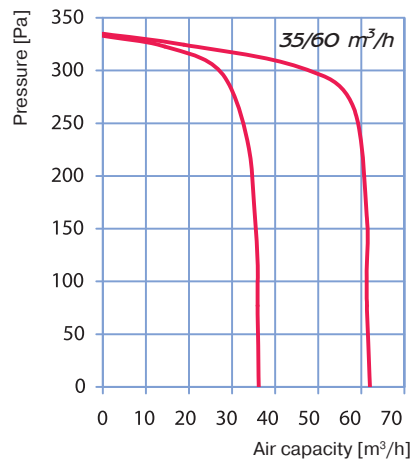
■ Specifications

Parameters	Valeo 60/100/150	Valeo 35/60	Valeo 35/100	Valeo 35/60/100	Valeo 60/100
Speeds	3	2	2	3	2
Voltage [V / 50 Hz]	220-240	220-240	220-240	220-240	220-240
Power [W]	17/27/48	12/17	12/27	12/17/27	17/27
Current [A]	0.14/0.18/0.21	0.12/0.14	0.12/0.18	0.12/0.14/0.18	0.14/0.18
Cable cross section [mm ²]	4x1.5	3x1.5	3x1.5	4x1.5	3x1.5
Maximum air capacity [m ³ /h]	63/102/150	35/63	35/102	35/63/102	63/102
RPM [min ⁻¹]	1350/1830/2640	890/1350	890/1830	890/1350/1830	1350/1830
Sound pressure level at 3 m distance [dBA]	30/35.2/43.7	26.6/30	26.6/35.2	26.6/30/35.2	30/35.2
Max. operating temperature [°C]	50	50	50	50	50

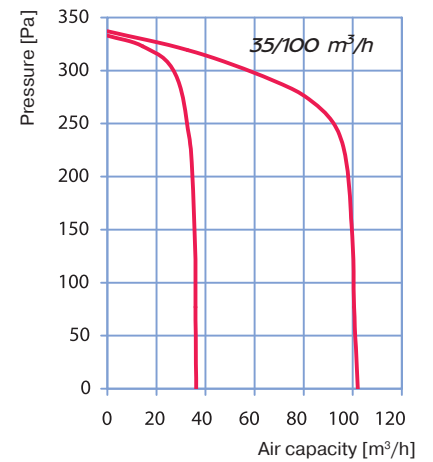
Aerodynamic characteristics



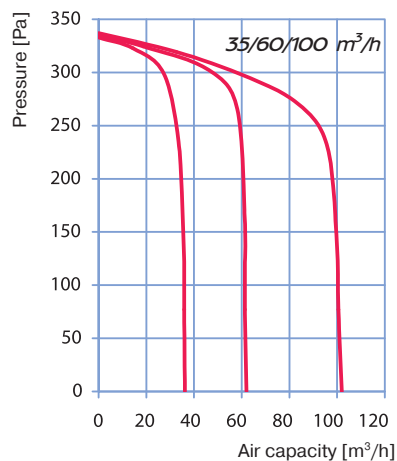
Valeo 60/100/150



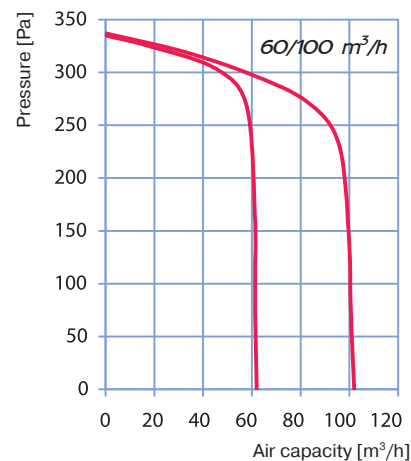
Valeo 35/60



Valeo 35/100



Valeo 35/60/100

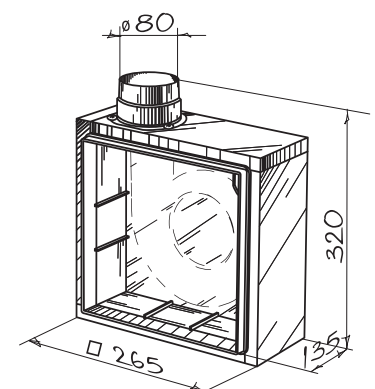
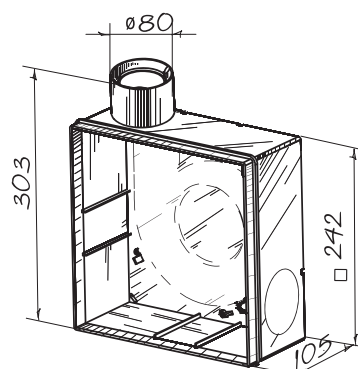
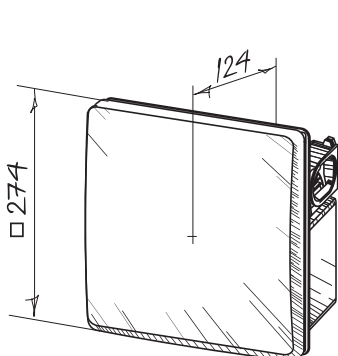


Valeo 60/100

■ The abrupt curves show high pressure performance and constant air flow of several VALEO fans integrated into a single ventilation shaft.

- available pressure up to 270 Pa at 35 m³/h;
- available pressure up to 260 Pa at 60 m³/h;
- available pressure up to 220 Pa at 100 m³/h.

Overall dimensions, mm

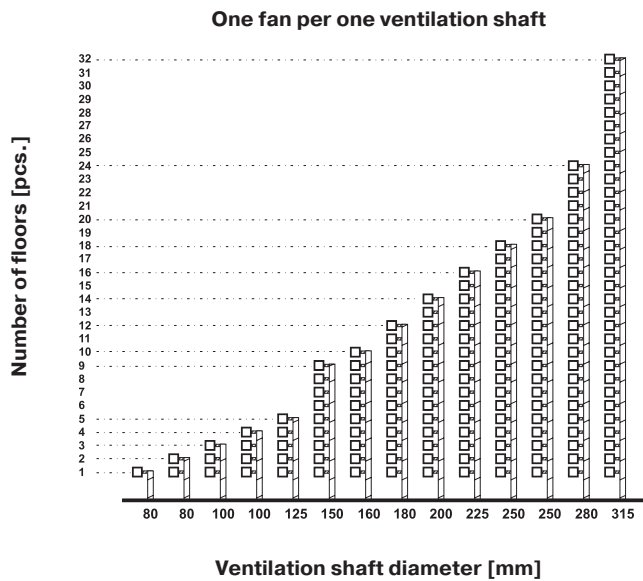
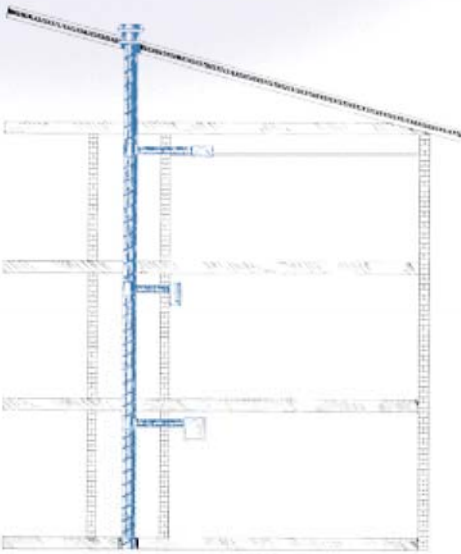


■ Calculation of basic ventilation shaft diameter for mono-pipe ventilation systems

□ The charts below display dependence of ventilation shaft dimensions as a function of number of storeys in high-rise buildings with mono-pipe ventilation system.

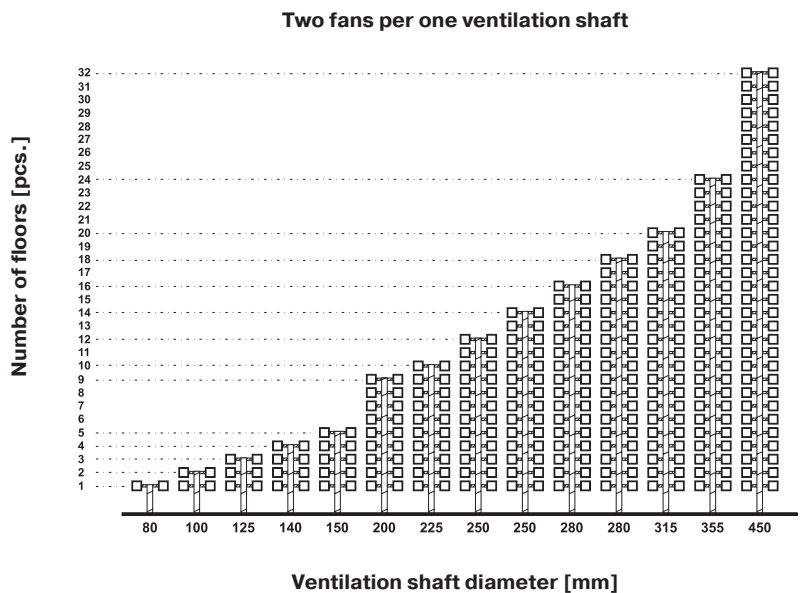
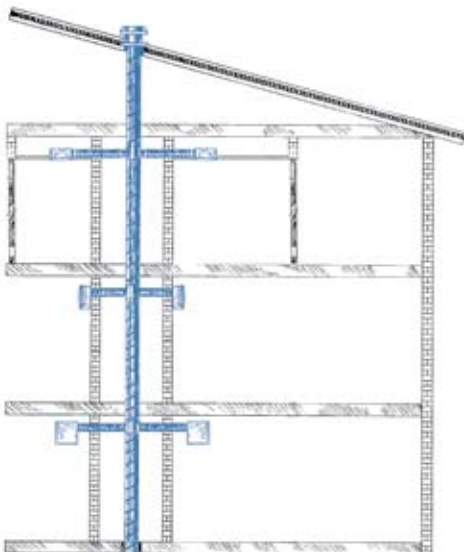
60 m³/h Exhaust ventilation of bathrooms and WC

□ One fan per each floor, rated air flow 60 m³/h for full operation mode of all fans.



60 m³/h

□ Two fans per each floor, rated air flow 60 m³/h for full operation mode of all the fans.

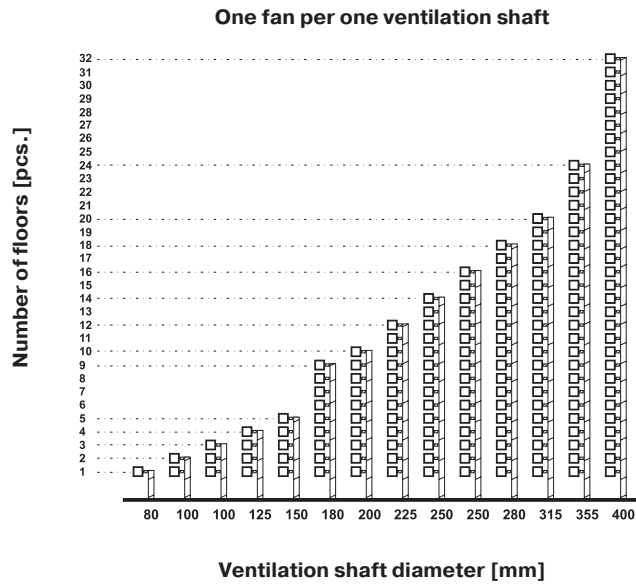


■ Calculation of basic ventilation shaft diameter for mono-pipe ventilation systems

□ The charts below display dependence of ventilation shaft dimensions as a function of number of storeys in high-rise buildings with mono-pipe ventilation system.

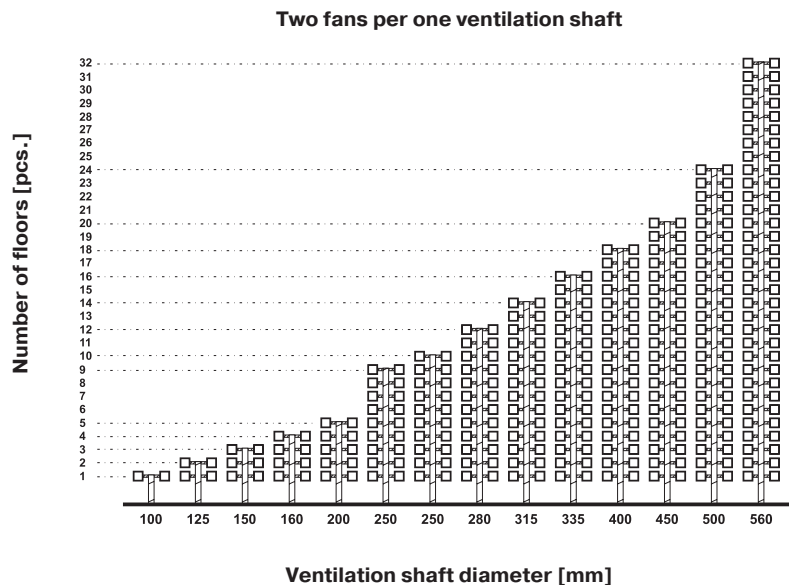
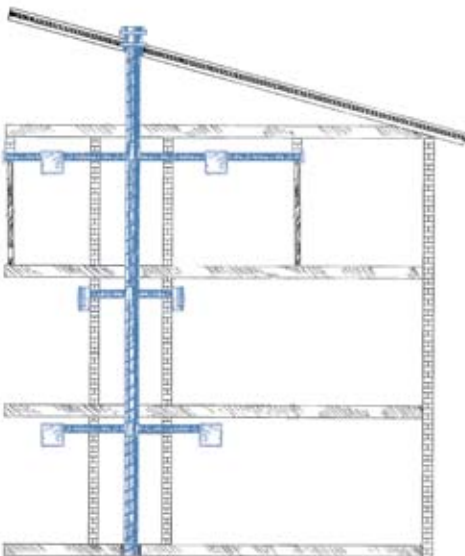
100 m³/h Exhaust ventilation of kitchens or room-to-room ventilation

- One fan per each floor, rated air flow for kitchen 100 m³/h for full operation mode of all fans.
- For synchronous room-to-room ventilation: 60 m³/h for bathroom and 40 m³/h for WC.



100 m³/h

- Two fans per each floor, rated air flow for kitchen 100 m³/h for full operation mode of all the fans.
- For synchronous room-to-room ventilation: 60 m³/h for bathroom and 40 m³/h for WC.





Mono-pipe ventilation exhaust centrifugal fans

Valeo-BP

Air capacity – up to 150 m³/h

■ Use

- ❑ Exhaust ventilation systems installed in high-rise buildings and premises.
- ❑ Mono-pipe ventilation systems.
- ❑ For mounting in kitchens and bathrooms.
- ❑ Flush wall or ceiling mounting.

■ Design

- ❑ The fan consists of the plastic casing **BP** for flush mounting and exhaust ventilation unit **Valeo** with a flat front panel.
- ❑ The casing is made of durable ABS plastic and fitted with a gravity backdraft damper to prevent backdraft.



- ❑ The front panel is made of snow white UV-resistant plastic.
- ❑ G4 purifying durable filter protects the motor, impeller and ductwork system against soiling.
- ❑ The filter is easily accessible for service operations.
- ❑ Due to modern design and various colour modifications the front panel matches well with any interior.
- ❑ The casing is equipped with oblong slotted joints to facilitate mounting of the casing in true vertical position.
- ❑ If the casing is installed with some vertical deviations the special turnable grille conceals possible mounting inaccuracies.
- ❑ Power is supplied to the fan through a sealed electric lead-in on the casing and the ventilation unit is equipped with an airtight terminal block for connection to the wiring system.
- ❑ For exhaust ventilation of a neighbour room extra spigots may be connected to the casing.
- ❑ Ingress protection rating IP55.

■ Motor

- ❑ Two- or three-speed motor with centrifugal impeller. Minimum energy demand.
- ❑ Galvanized steel impeller with forward curved blades.
- ❑ Automatic maintaining of constant air flow depending on variable air resistance of the duct.
- ❑ Balanced impeller ensures low-noise operation.
- ❑ Best aerodynamic characteristics due to special scroll casing design.
- ❑ Ball bearings provide long service life.
- ❑ The ventilation unit with motor is fixed inside the casing with special latches.

■ Control

- ❑ Step speed control with an external speed controller, e.g. **CDP-3/5** model which is available upon order.
- ❑ Wide range of intellectual controls programmable by set parameters (timer, adjustable timer, internal switch, photo sensor, humidity sensor).

■ Mounting

- ❑ Installed in wall or ceiling during general construction works by mounting brackets supplied as a standard.
- ❑ Connection to the main ventilation shaft with flexible air ducts.
- ❑ For exhaust ventilation of a neighbour room remove a plug and install an extra spigot. Available upon separate order.
- ❑ Exhaust spigot diameter 80 mm.
- ❑ Power is supplied to the fan through a sealed electric lead-in on the casing.
- ❑ After installation works cover the unit with a protecting cover to prevent dirt ingress.
- ❑ After finishing works install the ventilation unit inside the casing and connect it to wiring system.

Options for 2 speed fan models

Timer (Valeo-BP...T)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan is turned to higher speed with external switch 50 s after activation. After turning the switch off the fan continues operating within 6 min at higher speed and then reverts to default operation mode.

Adjustable timer (Valeo-BP...TR)

Depending on wiring connection the fan is off or runs permanently at low speed. If the fan is turned on with an external switch it switches to higher speed 0 to 150 s after switch activation. After turning the fan off it continues running at higher speed within 2 to 30 minutes and then reverts to previous mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

Interval switch (Valeo-BP...I)

Depending on wiring connection the fan is off or runs permanently at low speed. In interval mode regulated from 0,5 to 15 hours the fan switches periodically to higher speed for 10 minutes. The switch interval is adjusted with the internal regulator. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan reverts to interval mode operation.

Photo sensor (Valeo-BP...F)

Depending on wiring connection the fan is off or runs permanently at low speed. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan continues running at higher speed within 2 to 30 min and then reverts to default operating mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

Humidity sensor (Valeo-BP...H)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan switches to higher speed as relative humidity in the room increases from 60 % up to 90 % and switches off as humidity drops by 10 % below set level. If light in the room is turned on the fan switches to higher speed in 50 s. The run-out time is set by the internal regulator from 2 to 30 minutes.

Front panel modifications

The standard snow white front panel can be replaced by the following models:



Platinum
grey metallic



Hi-Tech
natural brushed
aluminium

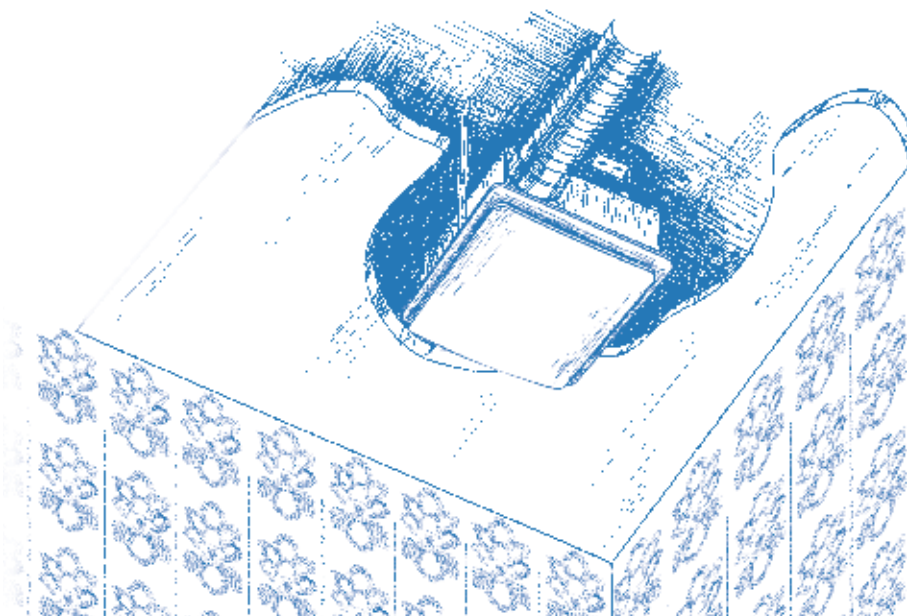


Hi-Tech Gold
natural gold-coloured
aluminium



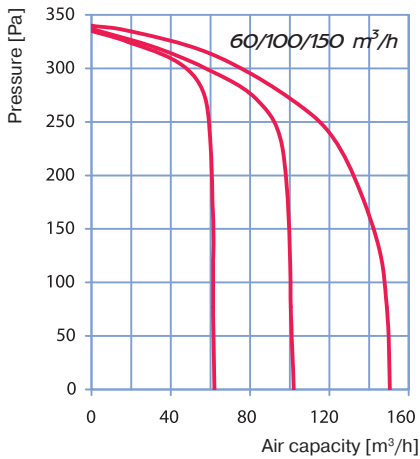
Hi-Tech Chrome
natural mirror
aluminium

Mounting example

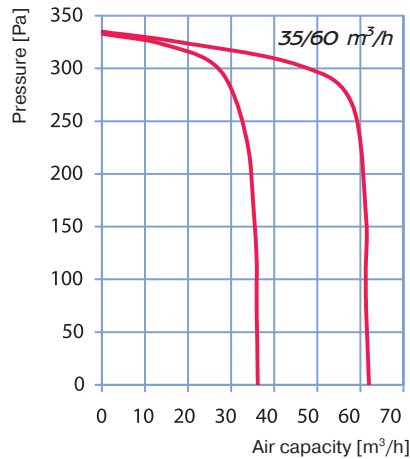


Specifications

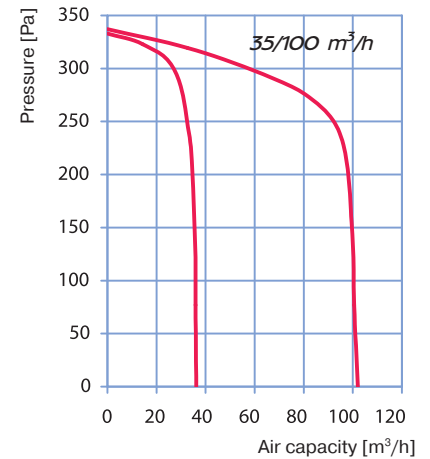
Parameters	Valeo-BP 60/100/150	Valeo-BP 35/60	Valeo-BP 35/100	Valeo-BP 35/60/100	Valeo-BP 60/100
Speeds	3	2	2	3	2
Voltage [V / 50 Hz]	220-240	220-240	220-240	220-240	220-240
Power [W]	17/27/48	12/17	12/27	12/17/27	17/27
Current [A]	0.14/0.18/0.21	0.12/0.14	0.12/0.18	0.12/0.14/0.18	0.14/0.18
Cable cross section [mm ²]	4 x 1.5	3 x 1.5	3 x 1.5	4 x 1.5	3 x 1.5
Maximum air capacity [m ³ /h]	63/102/150	35/63	35/102	35/63/102	63/102
RPM [min ⁻¹]	1350/1830/2640	890/1350	890/1830	890/1350/1830	1350/1830
Sound pressure level at 3 m distance [dBA]	30/35.2/43.7	26.6/30	26.6/35.2	26.6/30/35.2	30/35.2
Max. operating temperature [°C]	50	50	50	50	50



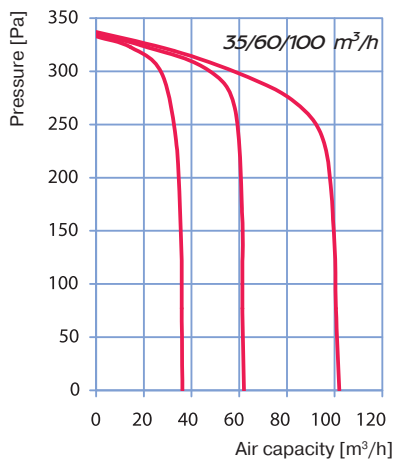
Valeo-BP 60/100/150



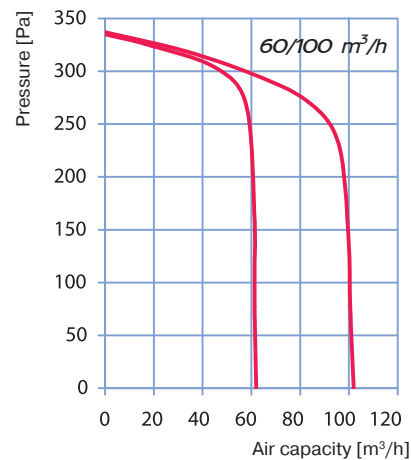
Valeo-BP 35/60



Valeo-BP 35/100



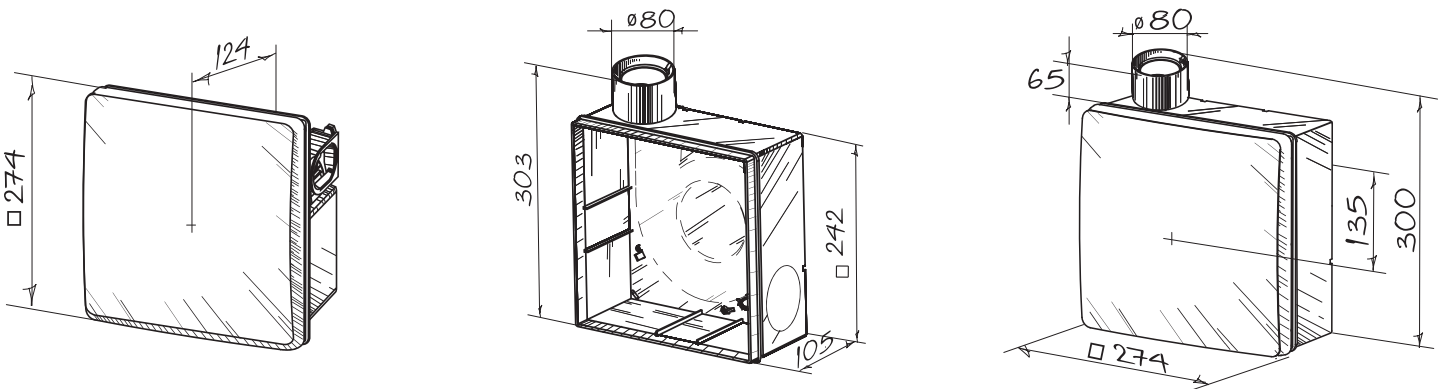
Valeo-BP 35/60/100



Valeo-BP 60/100

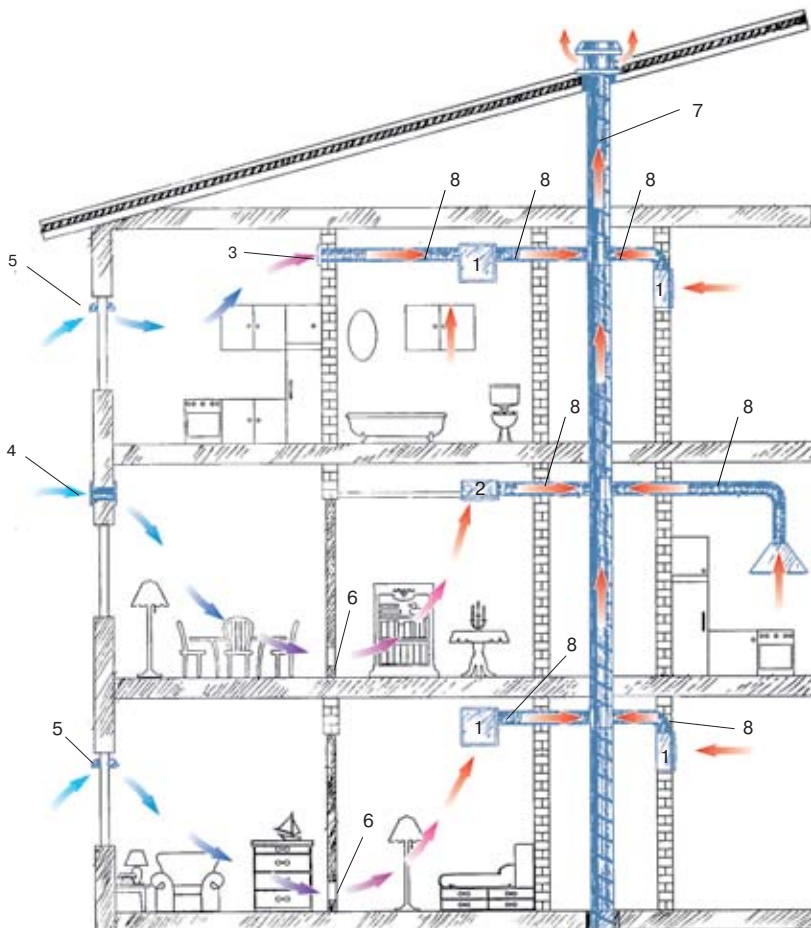
- The abrupt curves show high pressure performance and constant air flow of several Valeo-BP fans integrated into a single ventilation shaft.
- available pressure up to 270 Pa at 35 m³/h;
 - available pressure up to 260 Pa at 60 m³/h
 - available pressure up to 220 Pa at 100 m³/h.

Overall dimensions, mm



High-rise mono-pipe ventilation system arrangement example

- The mechanical centralized mono-pipe exhaust ventilation system for kitchens and bathrooms based on Valeo-BP fans is specially designed for high-rise residential premises.
- Fresh air is supplied to bedrooms, children's room or living rooms through window or wall vents. Vent modifications with air volume regulation are available.
- Stale air is extracted by exhaust fans from the room through inside doors or door grilles in the kitchen, bathroom or WC.
- This ventilation system arrangement ensures non-stop controllable air circulation in the room, comfortable microclimate and high fire safety.



1. Exhaust fan **Valeo-BP** with extra spigot for room-to-room ventilation.
2. Exhaust fan **Valeo-BP**.
3. BLAUBERG wall grille, **DECOR** series.
4. BLAUBERG wall vent, **WHM** series.
5. BLAUBERG window vent, **FHM** series.
6. BLAUBERG ventilation door grilles, **DECOR** series.
7. Central ventilation shaft.
8. Flexible air ducts for connection of exhaust fans to the central ventilation shaft, e.g. BLAUBERG air ducts, **BlauFlex** series.



Mono-pipe ventilation exhaust centrifugal fans

Valeo-BF

Air capacity – up to 150 m³/h

■ Use

- ❑ Exhaust ventilation systems installed in high-rise buildings and premises.
- ❑ For buildings with mono-pipe ventilation system.
- ❑ For mounting in kitchens and bathrooms.
- ❑ Flush wall or ceiling mounting.

■ Design

- ❑ The fan consists of the fireproof casing BF for flush mounting and exhaust ventilation unit Valeo with a flat front panel.
- ❑ The casing is made of silicate plates based on calcium silicate and has high thermal insulating properties.
- ❑ Equipped with a fire-retarding damper to prevent fire and smoke expanding along air ducts. If temperature in the duct reaches 90°C the thermal fuse melts and closes the damper.



- ❑ When the fan is off the fire-retarding damper serves as a backdraft damper.
- ❑ The front panel is made of snow white UV-resistant plastic.
- ❑ Filter with filter class G4 for motor, impeller and ductwork system protection against soiling.
- ❑ The filter is easily accessible for service operations.
- ❑ Due to modern design and various colour modifications the front panel matches well with any interior.
- ❑ The casing is equipped with oblong slotted joints to facilitate mounting of the casing in true vertical position
- ❑ If the casing is installed with some vertical deviations the special turnable grille conceals possible mounting inaccuracies.
- ❑ Power is supplied to the fan through a sealed electric lead-in on the casing and the ventilation unit is equipped with an airtight terminal block for connection to the wiring system.
- ❑ For room-to-room ventilation some ventilation unit modifications are equipped with extra spigots: **Valeo-BFL** – on the left; **Valeo-BFR** – on the right; **Valeo-BFD** – on the bottom.
- ❑ Ingress protection rating IP55.

■ Motor

- ❑ Two- or three-speed motor with centrifugal impeller. Minimum energy demand.
- ❑ Galvanized steel impeller with forward curved blades.
- ❑ Automatic maintaining of constant air flow depending on variable air resistance of the duct.
- ❑ Balanced impeller ensures low-noise operation.
- ❑ Best aerodynamic characteristics due to special scroll casing design.
- ❑ Ball bearings provide long service life.
- ❑ The ventilation unit with motor is fixed inside the casing with special latches.

■ Control

- ❑ Step speed control with an external speed controller, e.g. **CDP-3/5** model which is available upon order.
- ❑ Wide range of intellectual controls programmable by set parameters (timer, adjustable timer, internal switch, photo sensor, humidity sensor).

■ Mounting

- ❑ Installed in wall or ceiling during general construction works by mounting brackets supplied as a standard.
- ❑ Connection to main ventilation shaft with flexible air ducts.
- ❑ Exhaust spigot diameter 80 mm.
- ❑ Power is supplied to the fan through a sealed electric lead-in on the casing.
- ❑ After installation works cover the unit with a protecting cover to prevent dirt ingress.
- ❑ After finishing works install the ventilation unit inside the casing and connect it to wiring system.

Options for 2 speed fan models

Timer (Valeo-BF...T)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan is turned to higher speed with external switch 50 s after activation. After turning the switch off the fan continues operating within 6 min at higher speed and then reverts to default operation mode.

Adjustable timer (Valeo-BF...TR)

Depending on wiring connection the fan is off or runs permanently at low speed. If the fan is turned on with an external switch it switches to higher speed 0 to 150 s after switch activation. After turning the fan off it continues running at higher speed within 2 to 30 minutes and then reverts to previous mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

Interval switch (Valeo-BF...I)

Depending on wiring connection the fan is off or runs permanently at low speed. In interval mode regulated from 0,5 to 15 hours the fan switches periodically to higher speed for 10 minutes. The switch interval is adjusted with the internal regulator. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan reverts to interval mode operation.

Photo sensor (Valeo-BF...F)

Depending on wiring connection the fan is off or runs permanently at low speed. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan continues running at higher speed within 2 to 30 min and then reverts to default operating mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

Humidity sensor (Valeo-BF...H)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan switches to higher speed as relative humidity in the room increases from 60 % up to 90 % and switches off as humidity drops by 10 % below set level. If light in the room is turned on the fan switches to higher speed in 50 s. The run-out time is set by the internal regulator from 2 to 30 minutes.

Front panel modifications

The standard snow white front panel can be replaced by the following models:



Platinum
grey metallic



Hi-Tech
natural brushed
aluminium

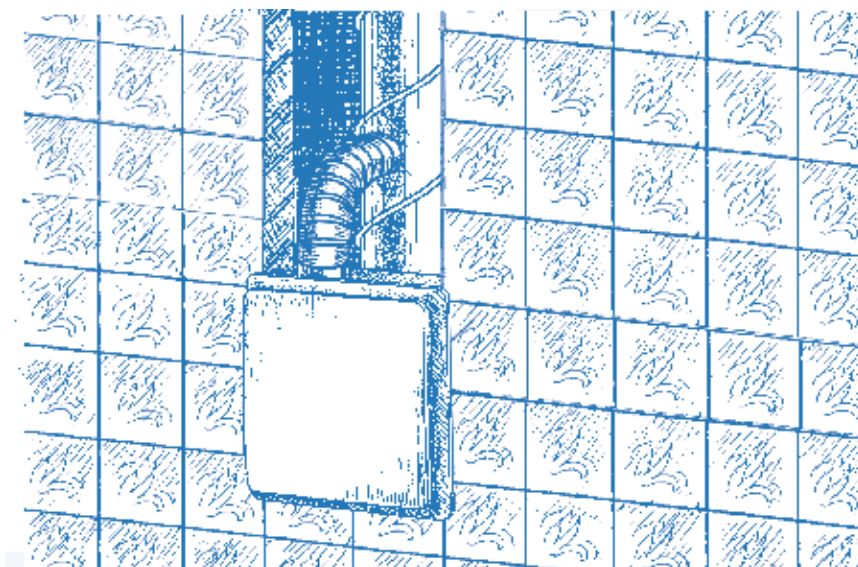


Hi-Tech Gold
natural gold-coloured
aluminium



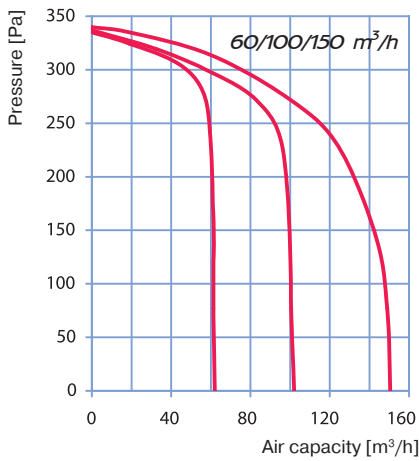
Hi-Tech Chrome
natural mirror
aluminium

Mounting example

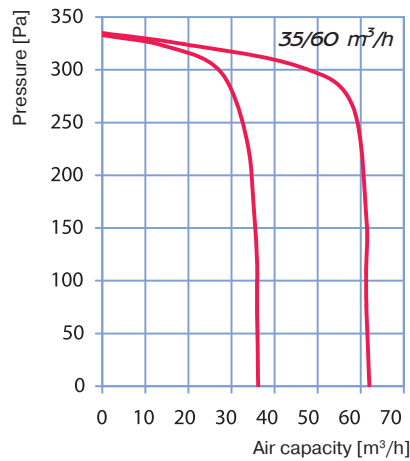


Specifications

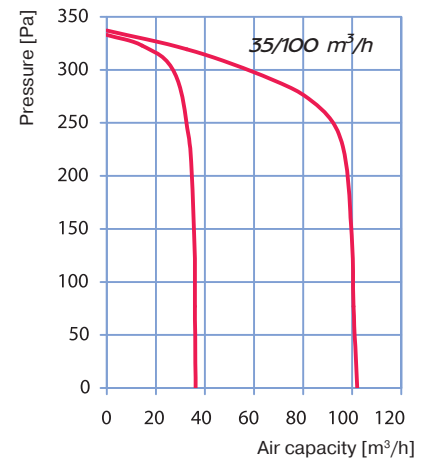
Parameters	Valeo-BF 60/100/150	Valeo-BF 35/60	Valeo-BF 35/100	Valeo-BF 35/60/100	Valeo-BF 60/100
Speeds	3	2	2	3	2
Voltage [V / 50 Hz]	220-240	220-240	220-240	220-240	220-240
Power [W]	17/27/48	12/17	12/27	12/17/27	17/27
Current [A]	0.14/0.18/0.21	0.12/0.14	0.12/0.18	0.12/0.14/0.18	0.14/0.18
Cable cross section [mm ²]	4 x 1.5	3 x 1.5	3 x 1.5	4 x 1.5	3 x 1.5
Maximum air capacity [m ³ /h]	63/102/150	35/63	35/102	35/63/102	63/102
RPM [min ⁻¹]	1350/1830/2640	890/1350	890/1830	890/1350/1830	1350/1830
Sound pressure level at 3 m distance [dBA]	30/35.2/43.7	26.6/30	26.6/35.2	26.6/30/35.2	30/35.2
Max. operating temperature [°C]	50	50	50	50	50



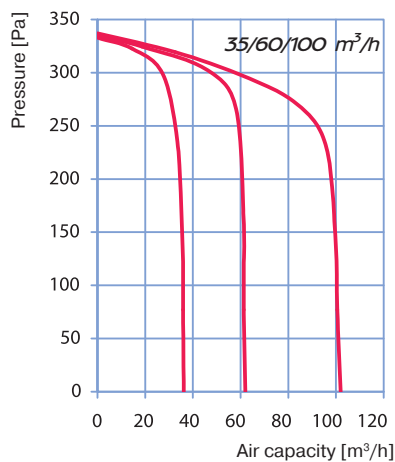
Valeo-BF 60/100/150



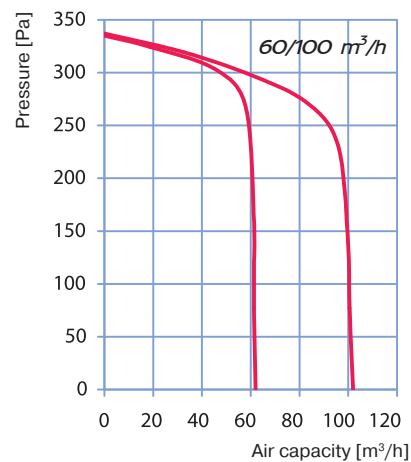
Valeo-BF 35/60



Valeo-BF 35/100



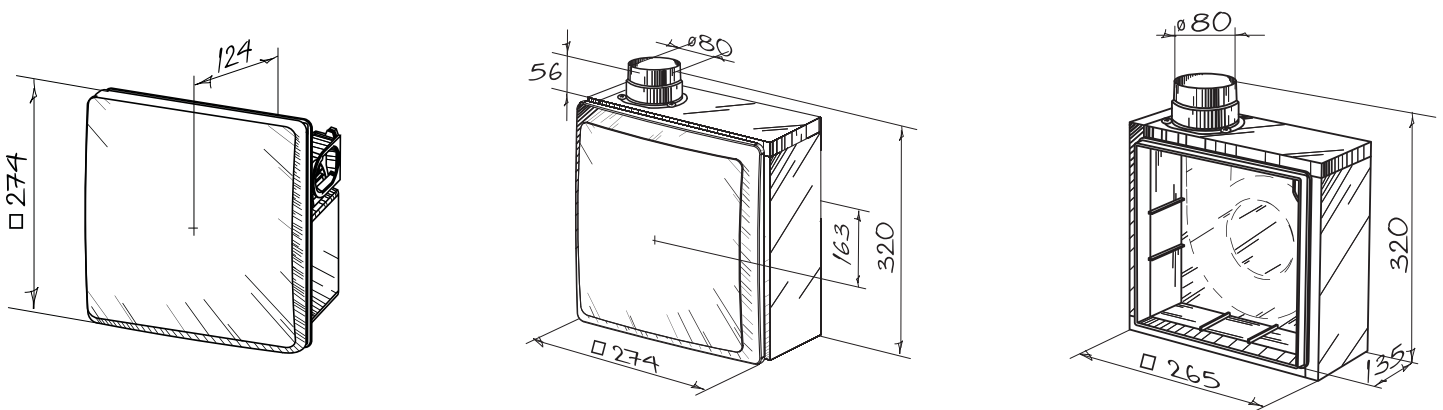
Valeo-BF 35/60/100



Valeo-BF 60/100

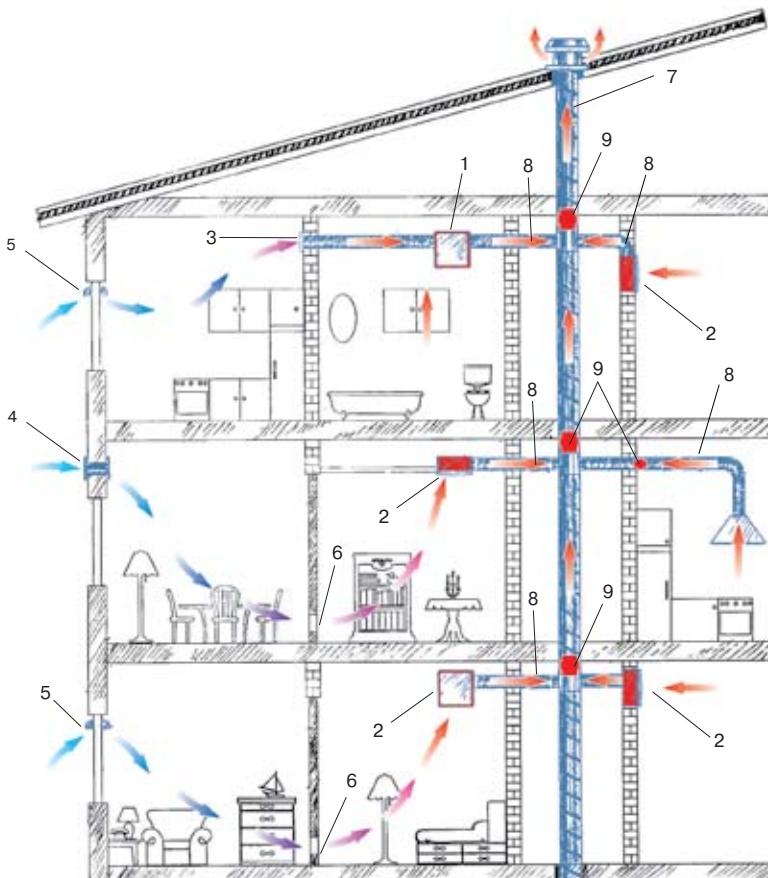
- The abrupt curves show high pressure performance and constant air flow of several Valeo-BF fans integrated into a single ventilation shaft.
- available pressure up to 270 Pa at 35 m³/h;
 - available pressure up to 260 Pa at 60 m³/h
 - available pressure up to 220 Pa at 100 m³/h.

Overall dimensions



High-rise mono-pipe ventilation system arrangement example

- The mechanical centralized mono-pipe exhaust ventilation system for kitchens and bathrooms based on **Valeo-BF** fans in fireproof casing with fire-retarding damper is specially designed for high-rise residential premises with high fire safety requirements. The inter-floor fire dampers are installed in the ventilation shaft to prevent fire and smoke extension in case of fire.
- Fresh air is supplied to bedrooms, children's room or living rooms through window or wall vents. Vent modifications with air volume regulation are available.
- Stale air is extracted by exhaust fans from the room through inside doors or door grilles in the kitchen, bathroom or WC.
- This ventilation system arrangement ensures non-stop controllable air circulation in the room, comfortable microclimate and high fire safety.



1. Exhaust fan **Valeo-BFD** with extra spigot for room-to-room ventilation.
2. Exhaust fan **Valeo-BF**.
3. BLAUBERG wall grille, **DECOR** series.
4. BLAUBERG wall vent, **WMH** series.
5. BLAUBERG window vent, **FHM** series.
6. BLAUBERG ventilation door grilles, **DECOR** series.
7. Central ventilation shaft.
8. Flexible thermal-resistant air ducts for connection of exhaust fans to the central ventilation shaft.
9. Inter-floor fire damper.

Mono-pipe ventilation exhaust centrifugal fans

Valeo-E

Air capacity – up to 150 m³/h



■ Use

- ❑ Exhaust ventilation systems installed in high-rise buildings and premises.
- ❑ For buildings with mono-pipe ventilation system.
- ❑ For mounting in kitchens and bathrooms.
- ❑ Surface wall or ceiling mounting.

■ Design

- ❑ The fan consists of the plastic casing for surface mounting and exhaust ventilation unit Valeo with a flat front panel.
- ❑ The casing is made of durable ABS plastic and fitted with a gravity backdraft damper to prevent backdrafting.



- ❑ The front panel is made of snow-white UV-resistant plastic.
- ❑ Filter with filter class G4 for motor, impeller and ductwork system protection against soiling.
- ❑ The filter is easily accessible for service operations.
- ❑ Due to modern design and various colour modifications the front panel matches well with any interior.
- ❑ The casing is equipped with oblong slotted joints to facilitate mounting of the casing in true vertical position.
- ❑ Power is supplied to the fan through a sealed electric lead-in on the casing and the ventilation unit is equipped with an airtight terminal block for connection to the wiring system
- ❑ Exhaust spigot diameter 80 mm.
- ❑ Ingress protection rating IP55.

■ Motor

- ❑ Two- or three-speed motor with centrifugal impeller. Minimum energy demand.
- ❑ Galvanized steel impeller with forward curved blades.
- ❑ Automatic maintaining of constant air flow depending on variable air resistance of the duct.
- ❑ Balanced impeller ensures low-noise operation.
- ❑ Best aerodynamic characteristics due to special scroll casing design.
- ❑ Ball bearings provide long service life.
- ❑ The ventilation unit with motor is fixed inside the casing with special latches.

■ Control

- ❑ Step speed control with an external speed controller, e.g. **CDP-3/5** model which is available upon order.
- ❑ Wide range of intellectual controls programmable by set parameters (timer, adjustable timer, internal switch, photo sensor, humidity sensor).

■ Mounting

- ❑ Flexible air duct connected to ductwork system and wiring are routed to the fan through wall or ceiling.
- ❑ After finishing works a flexible air duct is fixed on the fan spigot with clamps.
- ❑ Power is supplied to the fan through a sealed electric lead-in on the casing.
- ❑ The casing is installed at site with dowels and is adjusted vertically with oblong slotted joints.
- ❑ The ventilation unit connected to wiring system is installed in the mounted and fixed casing.

Options for 2 speed fan models

Timer (Valeo-E...T)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan is turned to higher speed with external switch 50 s after activation. After turning the switch off the fan continues operating within 6 min at higher speed and then reverts to default operation mode.

Adjustable timer (Valeo-BF...TR)

Depending on wiring connection the fan is off or runs permanently at low speed. If the fan is turned on with an external switch it switches to higher speed 0 to 150 s after switch activation. After turning the fan off it continues running at higher speed 2 to 30 minutes and then reverts to previous mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

Interval switch (Valeo-BF...I)

Depending on wiring connection the fan is off or runs permanently at low speed. In interval mode regulated from 0,5 to 15 hours the fan switches periodically to higher speed for 10 minutes. The switch interval is adjusted with the internal regulator. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan reverts to interval mode operation.

Photo sensor (Valeo-BF...F)

Depending on wiring connection the fan is off or runs permanently at low speed. If light in the room is turned with the external switch the fan switches to higher speed in 50 s. After light is off the fan continues running at higher speed within 2 to 30 min and then reverts to default operating mode. The fan run-out time and delay time for higher speed are regulated with the internal regulator.

Humidity sensor (Valeo-BF...H)

Depending on wiring connection the fan is off or runs permanently at low speed. The fan switches to higher speed as relative humidity in the room increases from 60 % up to 90 % and switches off as humidity drops by 10 % below set level. If light in the room is turned on the fan switches to higher speed in 50 s. The run-out time is set by the internal regulator from 2 to 30 minutes.

Front panel modifications

The standard snow white front panel can be replaced by the following models:



Platinum
grey metallic



Hi-Tech
natural brushed
aluminium

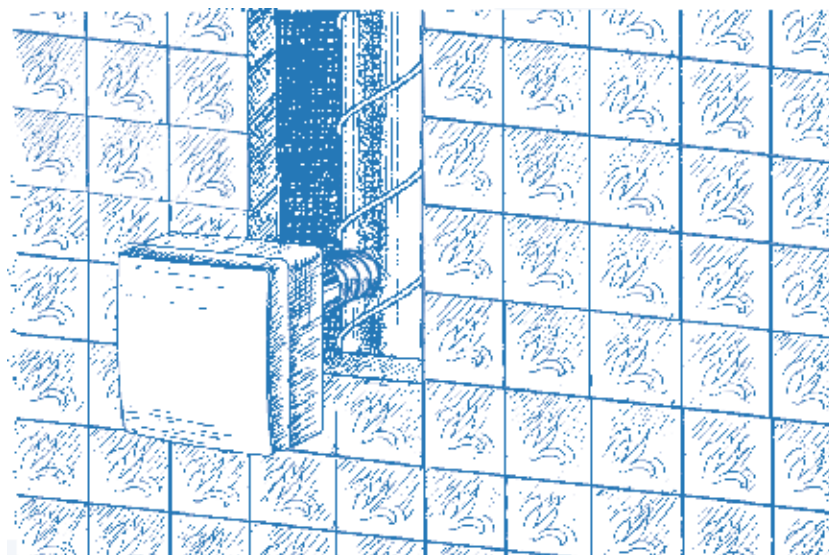


Hi-Tech Gold
natural gold-coloured
aluminium



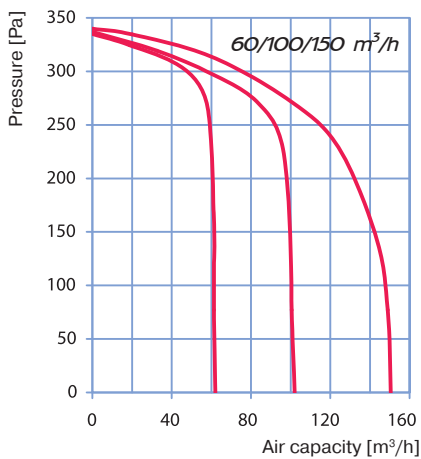
Hi-Tech Chrome
natural mirror
aluminium

Mounting example

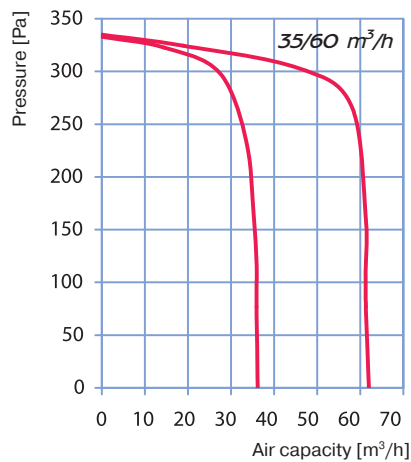


Specifications

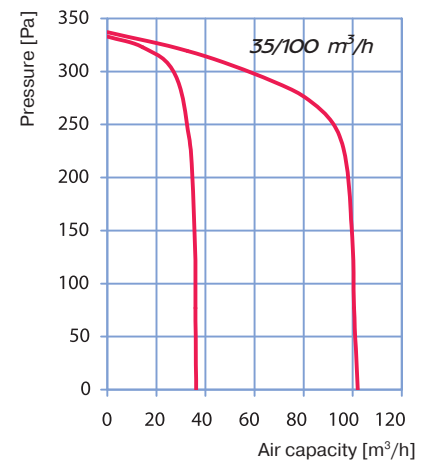
Parameters	Valeo-E 60/100/150	Valeo-E 35/60	Valeo-E 35/100	Valeo-E 35/60/100	Valeo-E 60/100
Speeds	3	2	2	3	2
Voltage [V / 50 Hz]	220-240	220-240	220-240	220-240	220-240
Power [W]	17/27/48	12/17	12/27	12/17/27	17/27
Current [A]	0.14/0.18/0.21	0.12/0.14	0.12/0.18	0.12/0.14/0.18	0.14/0.18
Cable cross section [mm ²]	4 x 1.5	3 x 1.5	3 x 1.5	4 x 1.5	3 x 1.5
Maximum air capacity [m ³ /h]	63/102/150	35/63	35/102	35/63/102	63/102
RPM [min ⁻¹]	1350/1830/2640	890/1350	890/1830	890/1350/1830	1350/1830
Sound pressure level at 3 m distance [dBA]	30/35.2/43.7	26.6/30	26.6/35.2	26.6/30/35.2	30/35.2
Max. operating temperature [°C]	50	50	50	50	50



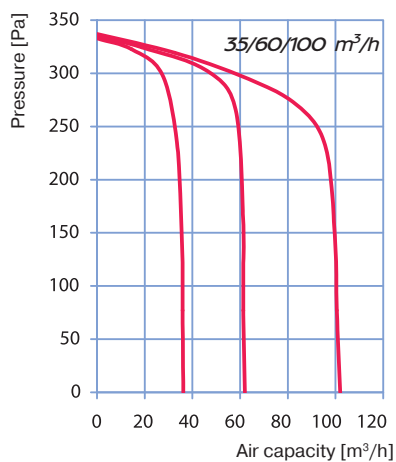
Valeo-E 60/100/150



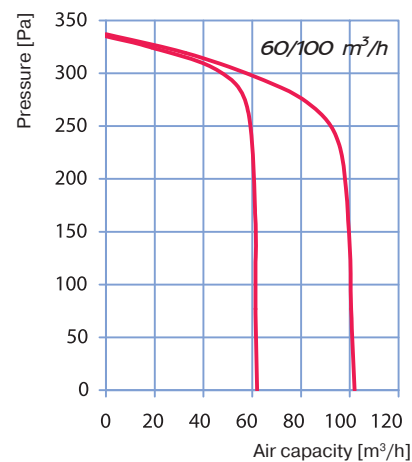
Valeo-E 35/60



Valeo-E 35/100



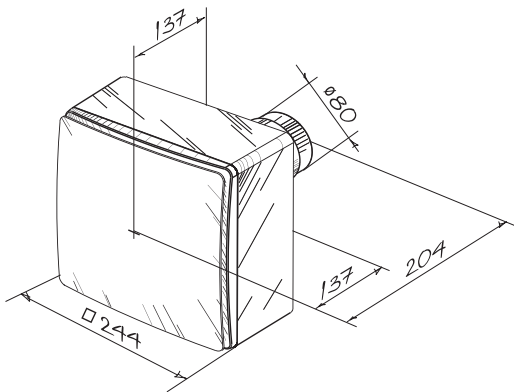
Valeo-E 35/60/100



Valeo-E 60/100

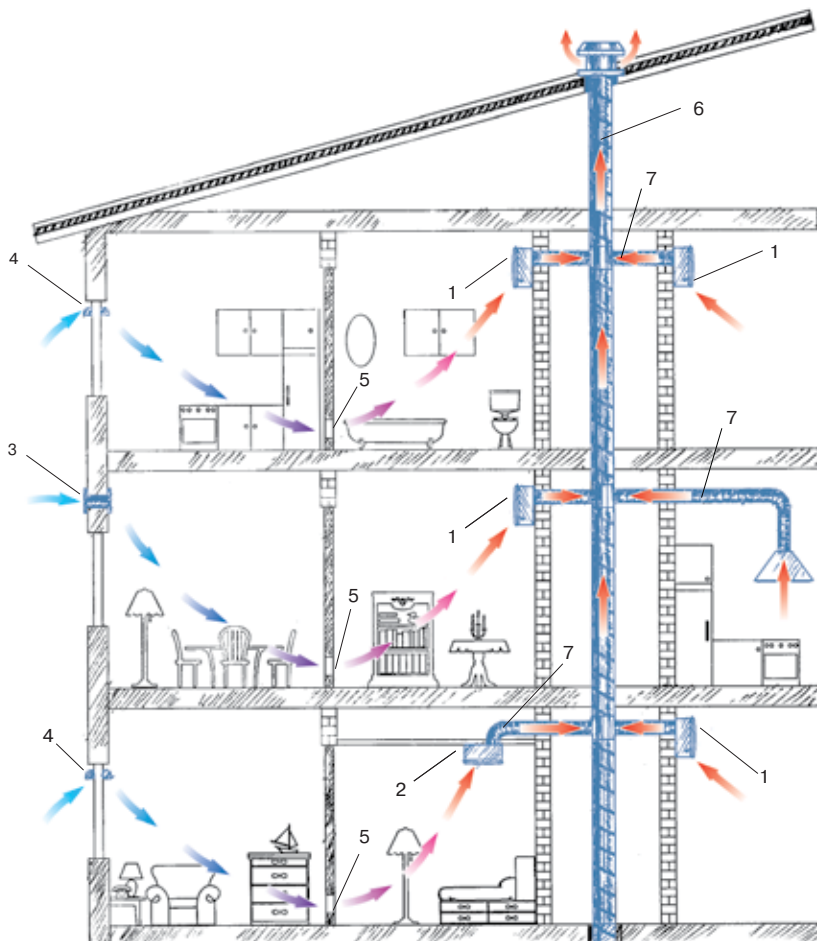
- The abrupt curves show high pressure performance and constant air flow of several Valeo-E fans integrated into a single ventilation shaft.
- available pressure up to 270 Pa at 35 m³/h;
 - available pressure up to 260 Pa at 60 m³/h;
 - available pressure up to 220 Pa at 100 m³/h.

Overall dimensions, mm



High-rise mono-pipe ventilation system arrangement example

- The mechanical centralized mono-pipe exhaust ventilation system for kitchens and bathrooms based on Valeo-E fans is specially designed for high-rise residential premises.
- Fresh air is supplied to bedrooms, children's room or living rooms through window or wall vents. Vent modifications with air volume regulation are available.
- Stale air is extracted by exhaust fans from the room through inside doors or door grilles in the kitchen, bathroom or WC.
- This ventilation system arrangement ensures non-stop controllable air circulation in the room, comfortable microclimate and high fire safety.



1. Exhaust fan **Valeo-E** (surface mounting).
2. Exhaust fan **Valeo-E** (ceiling mounting).
3. BLAUBERG wall vent, **WMH** series.
4. BLAUBERG window vent, **FHM** series.
5. BLAUBERG ventilation grilles, **DECOR** series.
6. Central ventilation shaft.
7. Flexible air ducts for connection of exhaust fans to the central ventilation shaft, e.g. BLAUBERG air ducts, **Blauflex** series.



Units for air cooling and heating

ALBE

Air capacity – up to 3850 m³/h

Heating capacity – up to 45 kW

■ Use

- Air heating or cooling with water heater and its smooth distribution in a room with a fan and louvre shutters.
- Arranging of energy efficient air heating or cooling in various premises including medium and large-scale buildings.
- Local heating or cooling of job sites or separate areas.

■ Design

- The unit consists of a high-performance axial fan and a high-efficient copper-aluminium water heater.
- Steel polymer-coated casing equipped with louvre shutters for uniform air distribution.
- The water coils are equipped with internally threaded pipes on the casing side for connection to the heat medium.
- Fixing brackets are designed for wall or ceiling mounting.

■ Motor

- Asynchronous external rotor motor and axial impeller.
- Single-phase motor.
- Equipped with ball bearings for longer service life.
- Integrated thermal protection with automatic restart.

■ Speed control

- Smooth speed control with an external thyristor controller or step speed control with an external auto transformer (both available upon separate order).
- Fan speed control provides regulation of the air flow and respectively the thermal transmission for heating or cooling.

■ Mounting

- The units may be installed vertically on walls or columns or horizontally on ceiling or beams.

■ Specifications

Parameters	ALBE-25	ALBE-30	ALBE-40
Unit supply voltage, V / 50 Hz	220-240	220-240	220-240
Fan power, W	136	191	255
Fan current, A	0.6	0.85	1.12
Fan rotation speed [min ⁻¹]	1350	1440	1360
Maximum air capacity [m ³ /h]	2200	3000	3850
Sound pressure level at 3 m distance [dBA]	53	55	58
Maximum heat medium temperature, °C	100	100	100
Ingress protection rating	IP44	IP44	IP44
Insulation class	F	B	F

■ Technical data for heating mode

Air capacity [m ³ /h]	Water inlet temperature [°C]	Supply air temperature [°C]	ALBE-25			
			Power [kW]	Outlet temperature [°C]	Water flow rate [l/s]	Water pressure loss [kPa]
2200	90/70	-15	34.5	26	0.42	7.5
		-10	32	29	0.39	6.6
		-5	30	32	0.36	5.8
		0	28	35	0.33	5.2
		5	26.2	38.5	0.33	4.5
		10	24.2	41.4	0.31	3.9
		15	22.1	44.2	0.28	3.3
	80/60	-15	30.4	21.2	0.36	6.0
		-10	28.3	24.3	0.34	5.3
		-5	26.2	27.4	0.33	4.6
		0	24.1	30.4	0.31	4.0
		5	22.1	33.3	0.28	3.3
		10	20.1	36.1	0.26	2.8
		15	18.1	38.8	0.25	2.3
	70/50	-15	26	16	0.33	4.6
		-10	24	19.2	0.31	4.0
		-5	22	22	0.28	3.4
		0	20	25	0.25	2.8
		5	18	28	0.22	2.3
		10	15.9	30.6	0.19	1.9
		15	13.8	33	0.17	1.4
	60/40	-15	22	11	0.28	3.4
		-10	20	14	0.25	2.8
		-5	18	17	0.22	2.3
		0	16	20	0.19	1.8
		5	14	22	0.17	1.4
		10	12	25	0.14	1.0
		15	9.0	27	0.11	0.7

■ Technical data for cooling mode

Air capacity [m ³ /h]	Water inlet temperature [°C]	Supply air tem- perature [°C]	ALBE-25			
			Power [kW]	Outlet temperature [°C]	Water flow rate [l/s]	Water pressure loss [kPa]
2200	7/12	35	9.1	26	0.44	7.5
		30	5.8	22.5	0.28	6.1
		25	3.2	21	0.17	2.1
		20	2.0	18	0.08	0.9

■ **Technical data for heating mode**

Air capacity [m ³ /h]	Water inlet temperature [°C]	Supply air temperature [°C]	ALBE-30			
			Power, kW	Outlet temperature [°C]	Water flow rate [l/s]	Water pressure loss [kPa]
3000	90/70	-15	48.4	27.2	0.58	7.4
		-10	45.4	30.3	0.56	6.6
		-5	42.4	33.4	0.53	5.9
		0	39.5	36.4	0.47	5.2
		5	36.7	39.4	0.44	4.5
		10	33.8	42.1	0.42	3.9
		15	31	44.9	0.39	3.3
	80/60	-15	42	22	0.53	6.0
		-10	39	25.2	0.47	5.3
		-5	36.7	28.2	0.44	4.6
		0	33.8	31.1	0.42	3.9
		5	30.9	34.0	0.39	3.4
		10	28.1	36.7	0.33	2.8
		15	25.3	40	0.31	2.3
	70/50	-15	36.6	17	0.44	4.7
		-10	33.7	20	0.42	4.0
		-5	30	22.9	0.39	3.4
		0	28	25.7	0.33	2.9
		5	25	28.5	0.31	2.4
		10	22	31.1	0.28	1.9
		15	19.4	33.7	0.25	1.5
	60/40	-15	31	11.7	0.36	3.5
		-10	27.6	14.6	0.33	2.9
		-5	24	17.4	0.31	2.4
		0	21	20	0.28	1.9
		5	19	22.7	0.22	1.5
		10	16	25.2	0.19	1.1
		15	13	27.5	0.17	0.7

■ **Technical data for cooling mode**

Air capacity [m ³ /h]	Water inlet temperature [°C]	Supply air temperature [°C]	ALBE-30			
			Power, kW	Outlet temperature [°C]	Water flow rate [l/s]	Water pressure loss [kPa]
3000	7/12	35	11.4	27	0.56	11.2
		30	7.3	22.9	0.36	5.0
		25	3.9	21.1	0.19	1.6
		20	2.4	17.7	0.11	0.7

■ **Technical data for cooling mode**

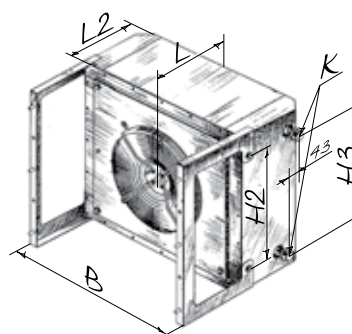
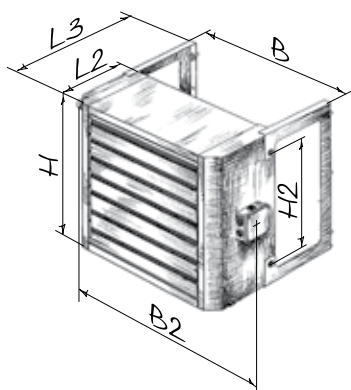
Air capacity [m ³ /h]	Water inlet temperature [°C]	Supply air temperature [°C]	ALBE-45			
			Power, kW	Outlet temperature [°C]	Water flow rate [l/s]	Water pressure loss [kPa]
3850	7/12	35	18.0	24.9	0.86	31.8
		30	10.8	21.7	0.53	12.9
		25	7.3	19	0.36	6.3
		20	3.2	17.4	0.14	1.4

Technical data for heating mode

Air capacity [m ³ /h]	Water inlet temperature [°C]	Supply air temperature [°C]	ALBE-45			
			Power. kW	Outlet temperature [°C]	Water flow rate [l/s]	Water pressure loss [kPa]
3850	90/70	-15	63.0	28.4	0.78	11.9
		-10	59.2	31.5	0.72	10.6
		-5	55.4	34.6	0.67	9.4
		0	51.6	37.5	0.64	8.3
		5	47.9	40.4	0.58	7.3
		10	44.3	43.2	0.56	6.3
		15	40.6	45.9	0.50	5.4
	80/60	-15	55.6	23.3	0.67	9.7
		-10	51.8	26.4	0.64	8.5
		-5	48.0	29.3	0.58	7.4
		0	44.3	32.2	0.56	6.4
		5	40.6	35.0	0.50	5.5
		10	37.0	37.8	0.44	4.6
		15	33.4	40.4	0.42	3.8
	70/50	-15	48.1	18.1	0.58	7.6
		-10	44.3	21.1	0.53	6.6
		-5	40.6	23.9	0.50	5.6
		0	36.9	26.8	0.44	4.7
		5	33.2	29.5	0.42	3.9
		10	29.6	32.2	0.36	3.2
		15	26.0	34.8	0.31	2.5
	60/40	-15	40.4	12.8	0.50	5.7
		-10	36.7	15.7	0.44	4.8
		-5	32.9	18.5	0.39	3.9
		0	29.2	21.3	0.36	3.2
		5	25.6	23.9	0.31	2.5
		10	21.9	26.4	0.28	1.9
		15	18.1	28.8	0.22	1.3

Overall dimensions

Type	Dimensions [mm]										Weight [kg]
	B	B2	H	H2	H3	L	L2	L3	K	Number of tube raw	
ALBE-25	680	785	605	450	468	360	286	600	G 3/4"	2	37.0
ALBE-30	680	785	655	500	518	360	286	650	G 3/4"	2	40.0
ALBE-45	780	885	710	550	570	380	300	700	G 3/4"	2	50.0





Mounting frames MRDL / MRIDL for roof fans

Use

- For facilitation of mounting and installation of **Tower-H, Tower-V, Tower-H EC, Tower-V EC, Tower-A, Tower-AL** roof fans on the flat roof.
- Prevents water ingress inside a ventilation shaft or air duct.

Design

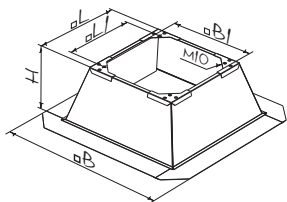
- Mounting frames in standard (**MRDL** model) or sound-insulated modifications (**MRIDL** model).
- The casing is made of galvanized steel.
- MRIDL models are equipped with 20 mm heat- and sound-insulated mineral wool layer.
- Specially designed flanges on the frame bottom enable easy and reliable mounting on the roof.

- The casing has threaded openings for fastening of the fan with bolts.
- Size 630 – 1100 is equipped with a detachable bolted panel for mounting facilitation.

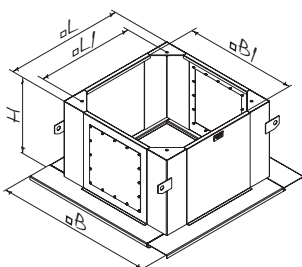
Mounting

- Fixing on the roof with flanges in the bottom with subsequent extra insulation.
- The fan is attached to the roof frame with bolts.

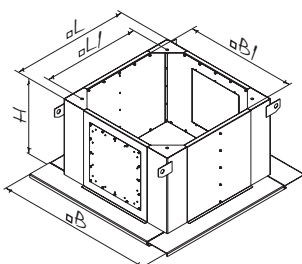
Overall dimensions



MRDL 220-225 - MRDL 560
MRIDL 220-225 - MRIDL 560



MRDL 630 - MRDL 1000-1100



MRIDL 630 - MRIDL 1000-1100

Type	Dimensions [mm]					Weight [kg]
	B	B1	H	L	L1	
MRDL 200-225	720	254	300,5	301	245	10,4
MRDL 250-315	810	352	300,5	401	330	12,0
MRDL 355-400	980	506	300,5	561	450	16,4
MRDL 450-500	997	576	300,5	631	535	16,9
MRDL 560	1180	770	300,5	817	750	26,7
MRDL 630	1212	852	600,0	912	750	65,9
MRDL 710, 800	1262	902	600,0	962	840	68,5
MRDL 900	1512	1152	650,0	1212	1050	85,7
MRDL 1000, 1100	1712	1352	730,0	1412	1240	103,7

Type	Dimensions [mm]					Weight [kg]
	B	B1	H	L	L1	
MRIDL 200-225	720	254	300,5	301	245	13,8
MRIDL 250-315	810	352	300,5	401	330	16,9
MRIDL 355-400	980	506	300,5	561	450	20,3
MRIDL 450-500	997	576	300,5	631	535	21,2
MRIDL 560	1180	770	300,5	817	750	35,7
MRIDL 630	1212	850	600,0	912	750	85,5
MRIDL 710, 800	1262	900	600,0	962	840	89,0
MRIDL 900	1512	1150	650,0	1212	1050	113,0
MRIDL 1000, 1100	1712	1350	730,0	1412	1240	140,6



Backdraft dampers

KDL

for roof fans

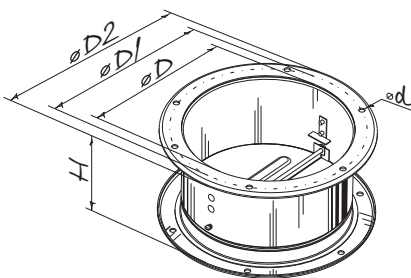
Use

- For automatic shutoff of air ducts when the fan is off.
- Backdraft prevention when mechanical ventilation is off.
- Compatible with **Tower-H, Tower-V, Tower-H EC, Tower-V EC** roof fans.

Design

- The casing and the rotary blade are made of galvanized steel.
- Gravity actuated damper (the damper rotary blade is opened by air pressure and reset automatically when the fan is off and no air pressure is produced).
- The damper is equipped with the flanges for connection to the roof fan, the **VDL** flexible connector or the **FDL** counterflange.

Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	øD	øD1	øD2	ød	H	
KDL 220-225	183	213	235	7	115	1.0
KDL 250-315	256	285	306	7	156	1.7
KDL 355-500	402	438	464	9	220	3x.5
KDL 560	569	605	642	11.5	300	7.3



Flexible connectors

VDL

for roof fans

Use

- Absorbing vibration from the fan to the air duct.
- Partial thermal distortion compensation in the air ductworks.
- For mounting with the **Tower-H**, **Tower-V**, **Tower-H EC**, **Tower-V EC** roof fans.

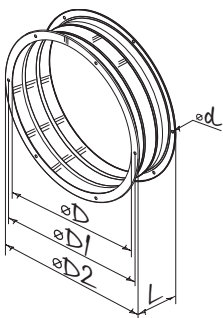
Design

- Consists of two flanges interconnected with a vibration-absorbing material.
- The flanges made of galvanized steel.
- The connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.

Mounting

- The end flanges of the flexible connector are fixed to the mating flanges of the air duct or fan (**FDL** counterflange) or to the backdraft damper through galvanized bolts and clamps.

Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	øD	øD1	øD2	ød	L	
VDL 220-225	183	213	235	7	200	0.8
VDL 250-315	256	285	308	7	200	1.2
VDL 355-500	402	438	484	9	200	1.75
VDL 560	569	605	639	9	200	2.62

Counterflanges

FDL

for roof fans



■ Use

- Connection of round air ducts with the **Tower-H, Tower-V, Tower-H EC, Tower-V EC** roof fans.

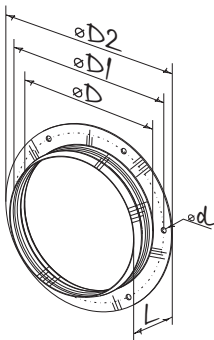
■ Design

- Counterflange made of galvanized steel.

■ Mounting

- The end face is connected to the fan or other parts with bolts and the mating part is connected to the air duct.

■ Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	øD	øD1	øD2	ød	L	
FDL 220-225	183	213	235	7	40	0.34
FDL 250-315	256	285	306	7	40	0.52
FDL 355-500	402	438	464	9	40	1.05
FDL 560	569	605	639	9	40	1.60



Duct electrical heaters

EKH

for round ducts

Use

- For warming up of supply air in heating, ventilation and air conditioning systems installed in various premises.
- Compatible with Ø 100 to 315 mm round air ducts.

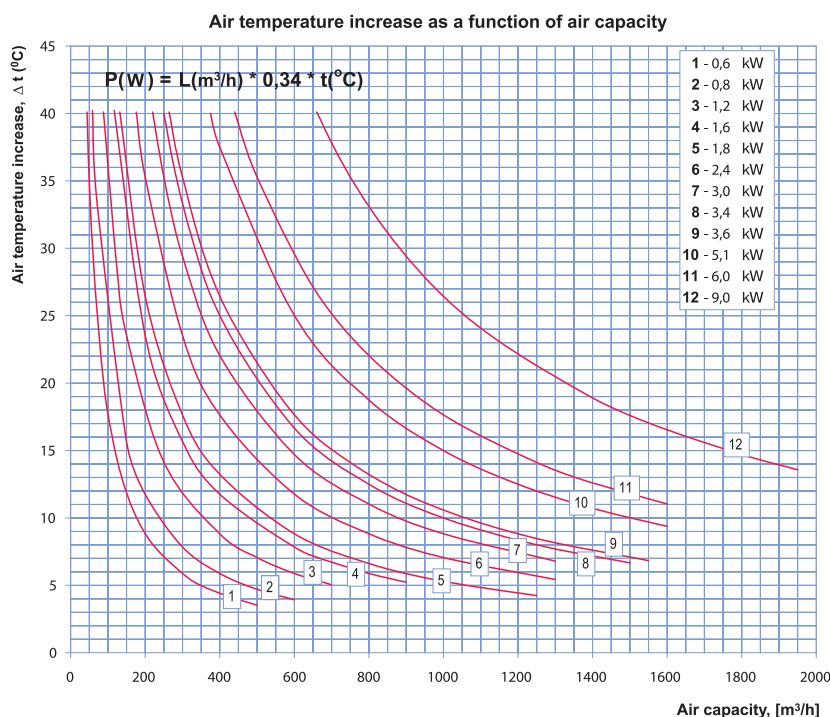
Design

- Galvanized steel case and junction box.
- Heating elements made of stainless steel.
- Airtight connection with air ducts due to rubber seals.
- Several power options for each standard size.
- For higher heating capacity several heaters may be installed in series.
- Equipped with overheat protection thermostats:
 - basic protection with automatic restart at +50 °C;
 - emergency protection with manual restart at +90 °C.

Mounting

- Fixing to round ducts with clamps.
- Any mounting position except for the junction box downwards to prevent condensate leakage and short circuit.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

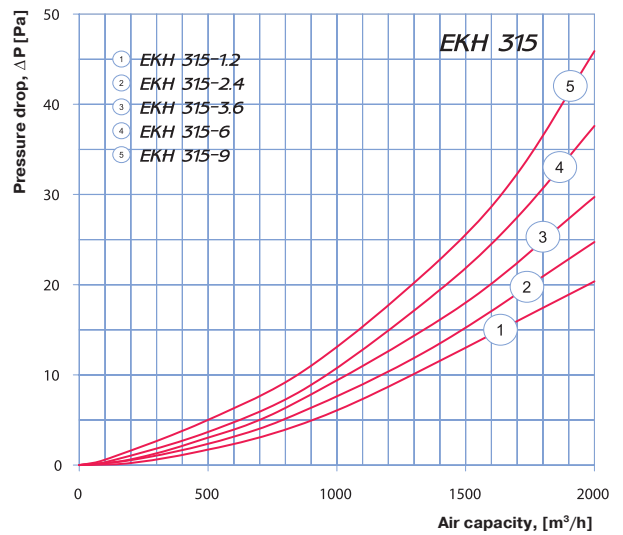
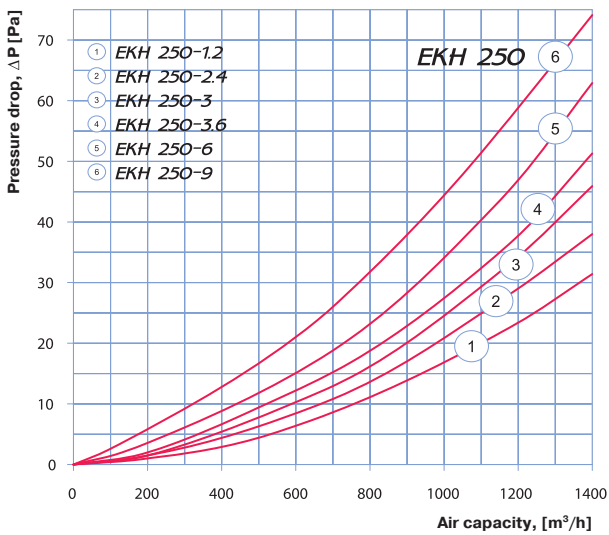
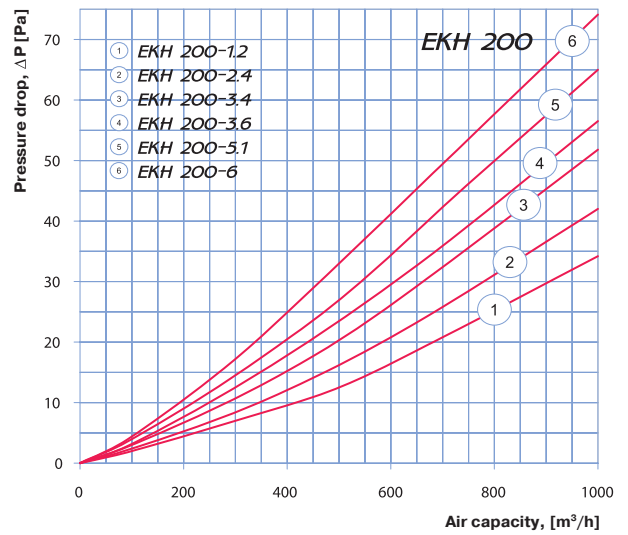
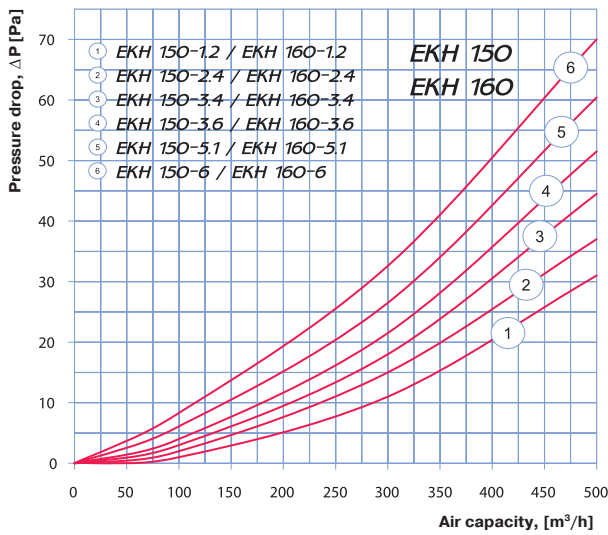
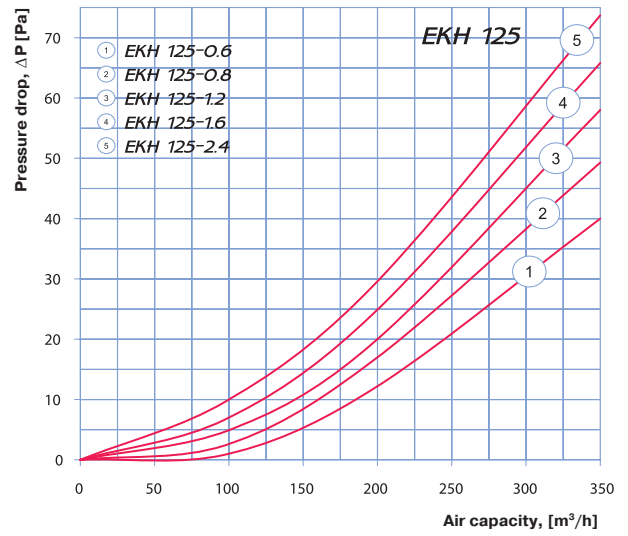
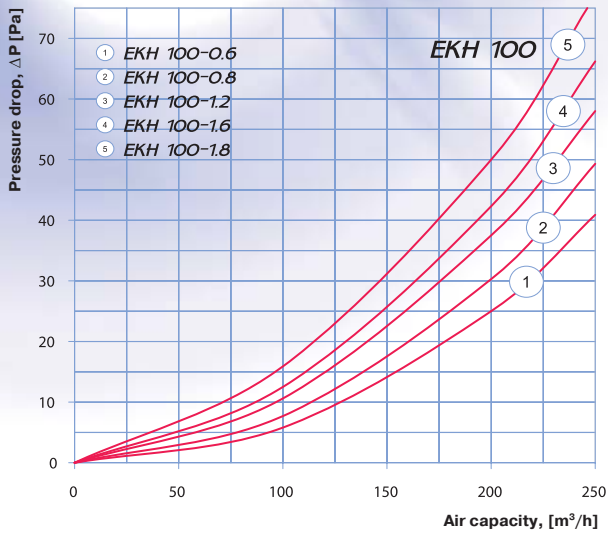
- Recommended distance between the heater and other system components must be not less than two connecting diameters for air flow stabilization.
- Duct heaters are rated for minimum air flow speed 1.5 m/s and maximum air temperature supplied to the units 40 °C. In case of speed regulation with a speed controller the minimum air speed through the heater must be provided.
- For correct and safe heater operation an automatic control and protection system is recommended including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - power cut-off in case of supply fan shutdown or low air flow speed as well as in case of actuating the overheat protection thermostats;
 - heat removal from the heating elements after ventilation system shutdown.

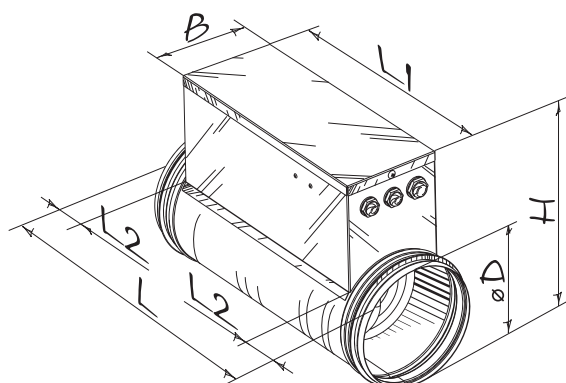


■ Specifications

Type	Minimum air capacity [m ³ /h]	Minimum current [A]	Voltage [V]	Power [kW]	Number of heating coils x capacity [kW]	Phase
EKH 100-0.6	60	2.6	230	0.6	1x0.6	1
EKH 100-0.8	80	3.5	230	0.8	1x0.8	1
EKH 100-1.2	90	5.2	230	1.2	2x0.6	1
EKH 100-1.6	120	7.0	230	1.6	2x0.8	1
EKH 100-1.8	130	7.8	230	1.8	3x0.6	1
EKH 125-0.6	60	2.6	230	0.6	1x0.6	1
EKH 125-0.8	80	3.5	230	0.8	1x0.8	1
EKH 125-1.2	90	5.2	230	1.2	2x0.6	1
EKH 125-1.6	120	7.0	230	1.6	2x0.8	1
EKH 125-2.4	150	7.8	230	2.4	3x0.8	1
EKH 150-1.2	120	5.2	230	1.2	1x1.2	1
EKH 150-2.4	150	10.4	230	2.4	2x1.2	1
EKH 150-3.4	220	14.7	230	3.4	2x1.7	1
EKH 150-3.6	265	5.2	400	3.6	3x1.2	3
EKH 150-5.1	320	7.4	400	5.1	3x1.7	3
EKH 150-6	360	8.7	400	6.0	3x2.0	3
EKH 160-1.2	150	5.2	230	1.2	1x1.2	1
EKH 160-2.4	180	10.4	230	2.4	2x1.2	1
EKH 160-3.4	250	14.8	230	3.4	2x1.7	1
EKH 160-3.6	265	5.2	400	3.6	3x1.2	3
EKH 160-5.1	375	7.4	400	5.1	3x1.7	3
EKH 160-6	440	8.7	400	6.0	3x2.0	3
EKH 200-1.2	150	5.2	230	1.2	1x1.2	1
EKH 200-2.4	180	10.4	230	2.4	2x1.2	1
EKH 200-3.4	250	14.8	230	3.4	2x1.7	1
EKH 200-3.6	265	5.2	400	3.6	3x1.2	3
EKH 200-5.1	375	7.4	400	5.1	3x1.7	3
EKH 200-6	440	8.7	400	6.0	3x2.0	3
EKH 250-1.2	180	5.2	230	1.2	1x1.2	1
EKH 250-2.4	265	10.4	230	2.4	2x1.2	1
EKH 250-3	375	13.0	230	3.0	1x3.0	1
EKH 250-3.6	375	5.2	400	3.6	3x1.2	3
EKH 250-6	440	8.7	400	6.0	3x2.0	3
EKH 250-9	660	13.0	400	9.0	3x3.0	3
EKH 315-1.2	180	5.2	230	1.2	1x1.2	1
EKH 315-2.4	265	10.4	230	2.4	2x1.2	1
EKH 315-3.6	375	5.2	400	3.6	3x1.2	3
EKH 315-6	440	8.7	400	6.0	3x2.0	3
EKH 315-9	660	13.0	400	9.0	3x3.0	3

Specifications



Overall dimensions


Type	Dimensions [mm]						Weight [kg]
	øD	B	H	L	L1	L2	
EKH 100-0.6	99	94	207	306	226	40	2.6
EKH 100-0.8	99	94	207	306	226	40	2.6
EKH 100-1.2	99	94	207	306	226	40	2.9
EKH 100-1.6	99	94	207	306	226	40	2.9
EKH 100-1.8	99	94	207	376	296	40	3.1
EKH 125-0.6	124	103	230	306	226	40	2.4
EKH 125-0.8	124	103	230	306	226	40	2.4
EKH 125-1.2	124	103	230	306	226	40	2.7
EKH 125-1.6	124	103	230	306	226	40	2.7
EKH 125-2.4	124	103	230	376	296	40	3.0
EKH 150-1.2	149	120	255	306	226	40	2.5
EKH 150-2.4	149	120	255	306	226	40	3.1
EKH 150-3.4	149	120	255	306	226	40	3.1
EKH 150-3.6	149	120	255	376	296	40	4.1
EKH 150-5.1	149	120	255	376	296	40	4.1
EKH 150-6	149	120	255	376	296	40	4.1
EKH 160-1.2	159	120	267	306	226	40	2.1
EKH 160-2.4	159	120	267	306	226	40	2.9
EKH 160-3.4	159	120	267	306	226	40	3.2
EKH 160-3.6	159	120	267	376	296	40	3.9
EKH 160-5.1	159	120	267	376	296	40	3.9
EKH 160-6	159	120	267	376	296	40	3.9
EKH 200-1.2	199	150	302	294	214	40	2.4
EKH 200-2.4	199	150	302	294	214	40	3.2
EKH 200-3.4	199	150	302	294	214	40	3.3
EKH 200-3.6	199	150	302	376	296	40	4.1
EKH 200-5.1	199	150	302	376	296	40	4.1
EKH 200-6	199	150	302	376	296	40	4.1
EKH 250-1.2	249	150	356	306	226	40	2.4
EKH 250-2.4	249	150	356	306	226	40	2.6
EKH 250-3	249	150	356	306	226	40	2.4
EKH 250-3.6	249	150	356	376	296	40	2.9
EKH 250-6	249	150	356	376	296	40	2.9
EKH 250-9	249	150	356	376	296	40	2.9
EKH 315-1.2	313	150	425	294	214	40	2.6
EKH 315-2.4	313	150	425	294	214	40	2.8
EKH 315-3.6	313	150	425	376	296	40	3.1
EKH 315-6	313	150	425	376	296	40	3.1
EKH 315-9	313	150	425	376	296	40	3.1



Duct water heaters

WKH

for round ducts

Use

- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor application use antifreezing mixture (ethylene glycol solution).
- Compatible with Ø 100 to 315 mm round air ducts.

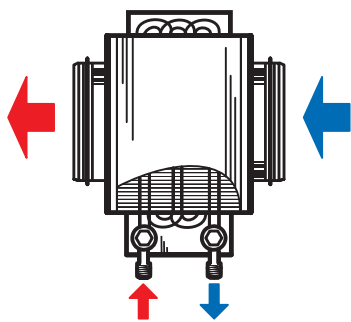
Design

- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Airtight connection with air ducts due to rubber seals.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor or freezing protection mechanism.
- Available in two- or four-row tube modifications.
- Suitable for operation at maximum operating pressure 1.6 MPa (16 bar) and maximum operating temperature +100 °C.

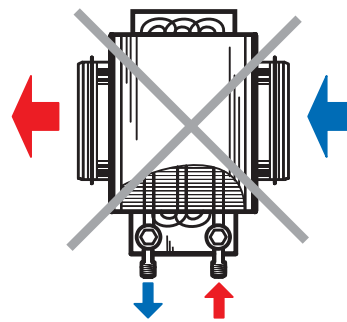
Mounting

- Fixing to round ducts with clamps.
- Any mounting position that ensures the heater deaeration.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

- Install the heater in front or behind the fan. In case of mounting behind the fan ensure a distance of not less than two connecting diameters for air flow stabilization and keep the maximum permissible air temperature inside the fan.
- Connect the heater on counter-flow basis, otherwise its capacity drops by 5-15 %. All the nomographic charts are rated for counter-flow connection.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - ventilation system start-up with pre-heated heater;
 - use of air dampers fitted with a spring return actuator;
 - fan turns off in case of freezing danger for the heater.



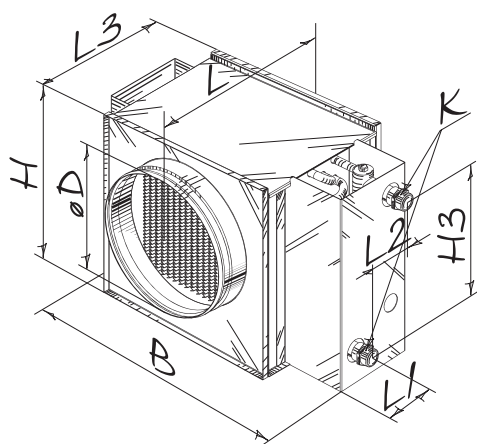
Connection against air flow



Connection along air flow

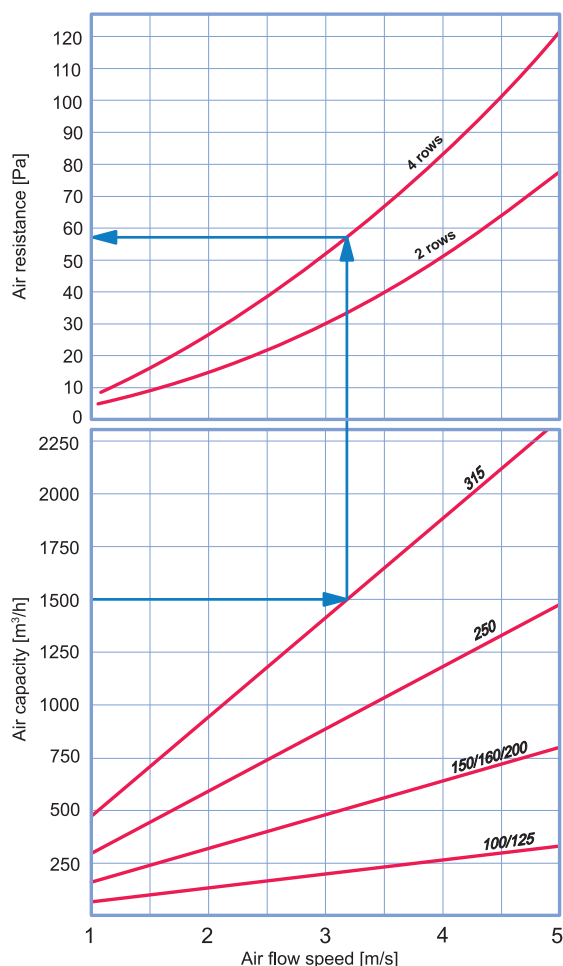
■ Overall dimensions

Type	Dimensions [mm]									Number of water coil rows	Weight [kg]
	∅D	B	H	H3	L	L1	L2	L3	K		
WKH 100-2	99	350	230	150	300	32	43	220	G 3/4"	2	3.9
WKH 100-4	99	350	230	150	300	28	65	220	G 3/4"	4	5.2
WKH 125-2	124	350	230	150	300	32	43	220	G 3/4"	2	4.0
WKH 125-4	124	350	230	150	300	28	65	220	G 3/4"	4	5.3
WKH 150-2	149	400	280	200	300	32	43	220	G 3/4"	2	7.5
WKH 150-4	149	400	280	200	300	28	65	220	G 3/4"	4	8.2
WKH 160-2	159	400	280	200	300	32	43	220	G 3/4"	2	7.5
WKH 160-4	159	400	280	200	300	28	65	220	G 3/4"	4	8.2
WKH 200-2	198	400	280	200	300	32	43	220	G 3/4"	2	7.5
WKH 200-4	198	400	280	200	300	28	65	220	G 3/4"	4	8.2
WKH 250-2	248	470	350	270	350	32	43	270	G 1"	2	10.3
WKH 250-4	248	470	350	270	350	28	65	270	G 1"	4	10.8
WKH 315-2	313	550	430	350	450	57	43	370	G 1"	2	12.6
WKH 315-4	313	550	430	350	450	53	65	370	G 1"	4	13.4

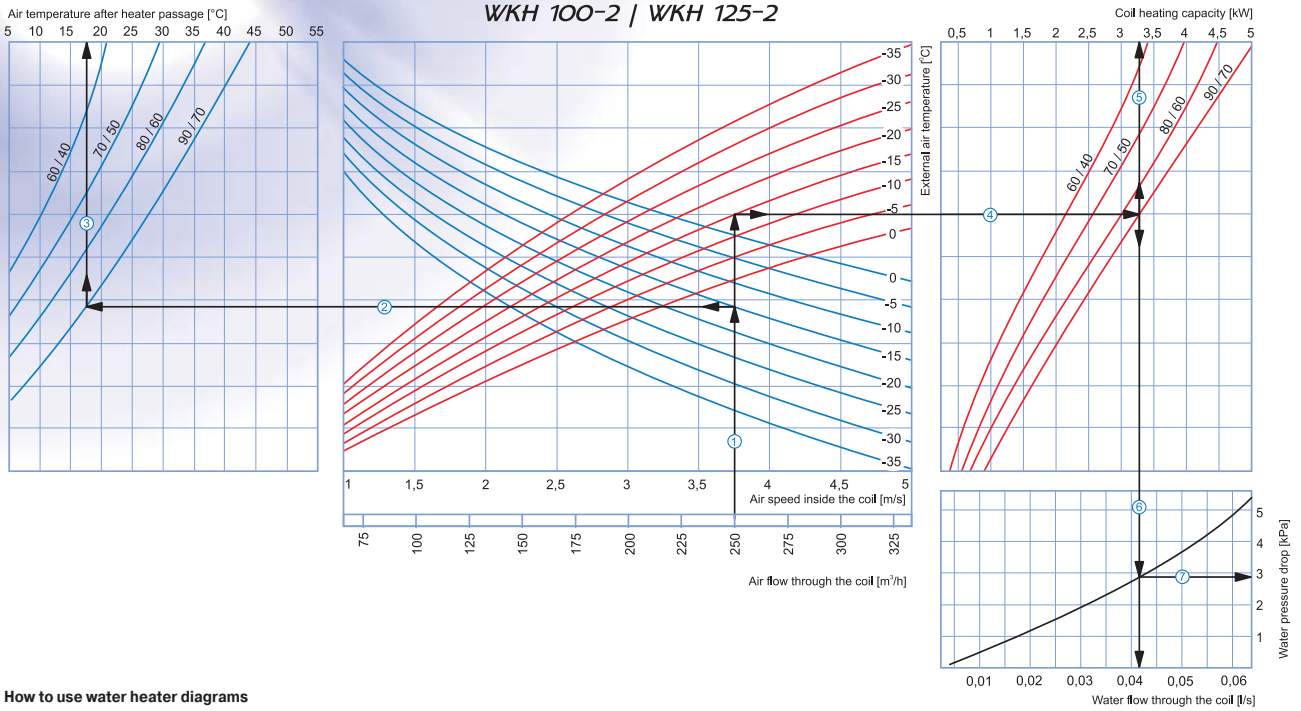


Air pressure loss for water heaters WKH

WKH round heaters



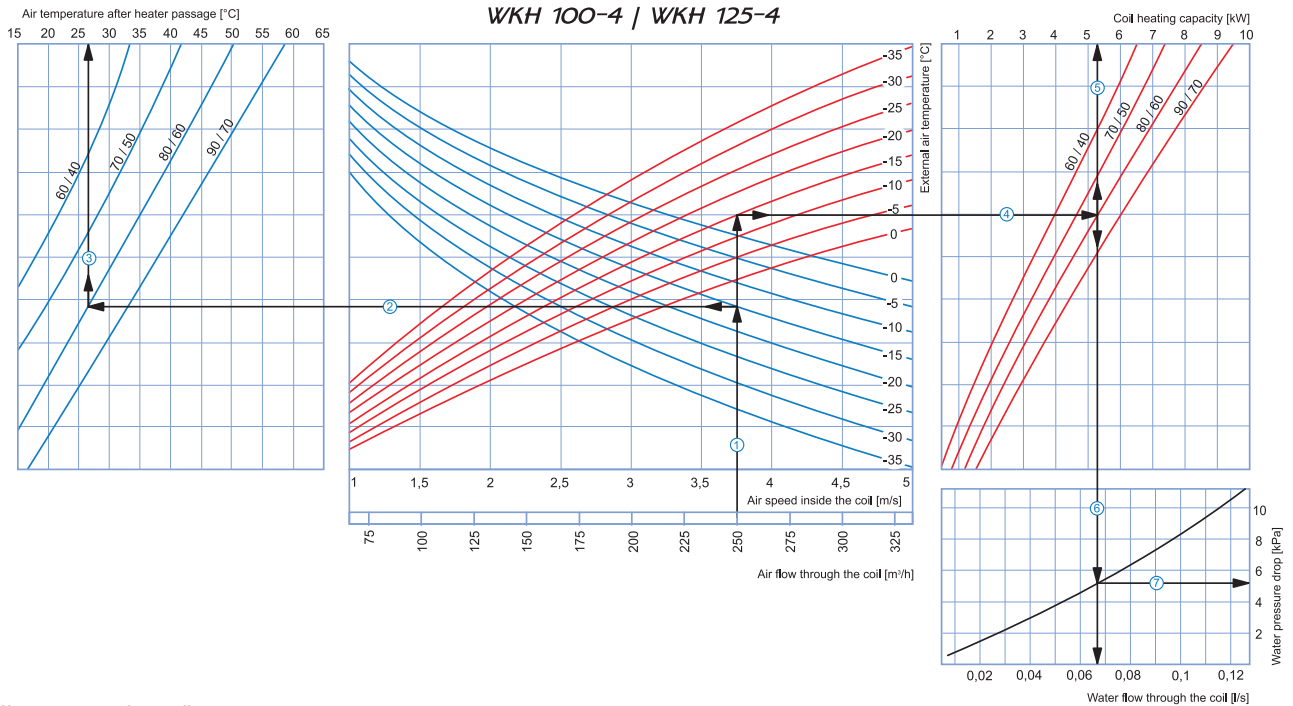
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 250 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 250 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+17,5 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (3.25 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.042 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (2.9 kPa).

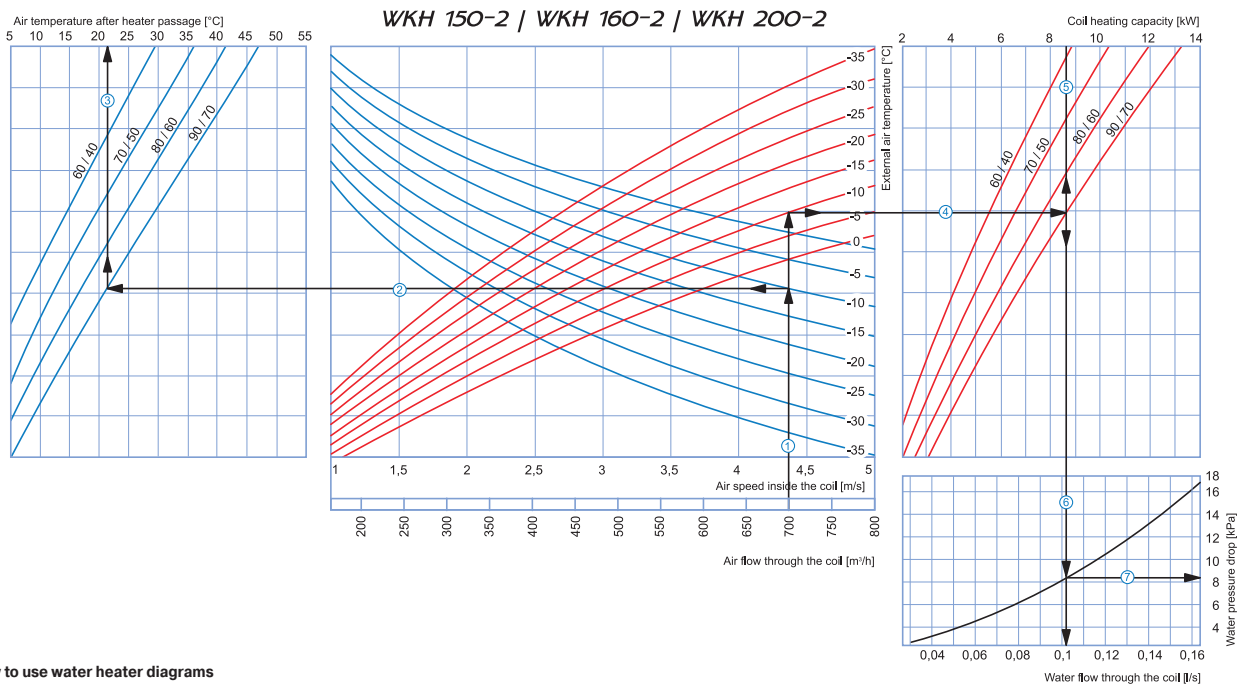


How to use water heater diagrams

System Parameters: Air flow = 250 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 80/60 °C.

- **Air Speed inside coil:** Starting from 250 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 80/60 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+27 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 80/60 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (5.2 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.067 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (5.2 kPa).

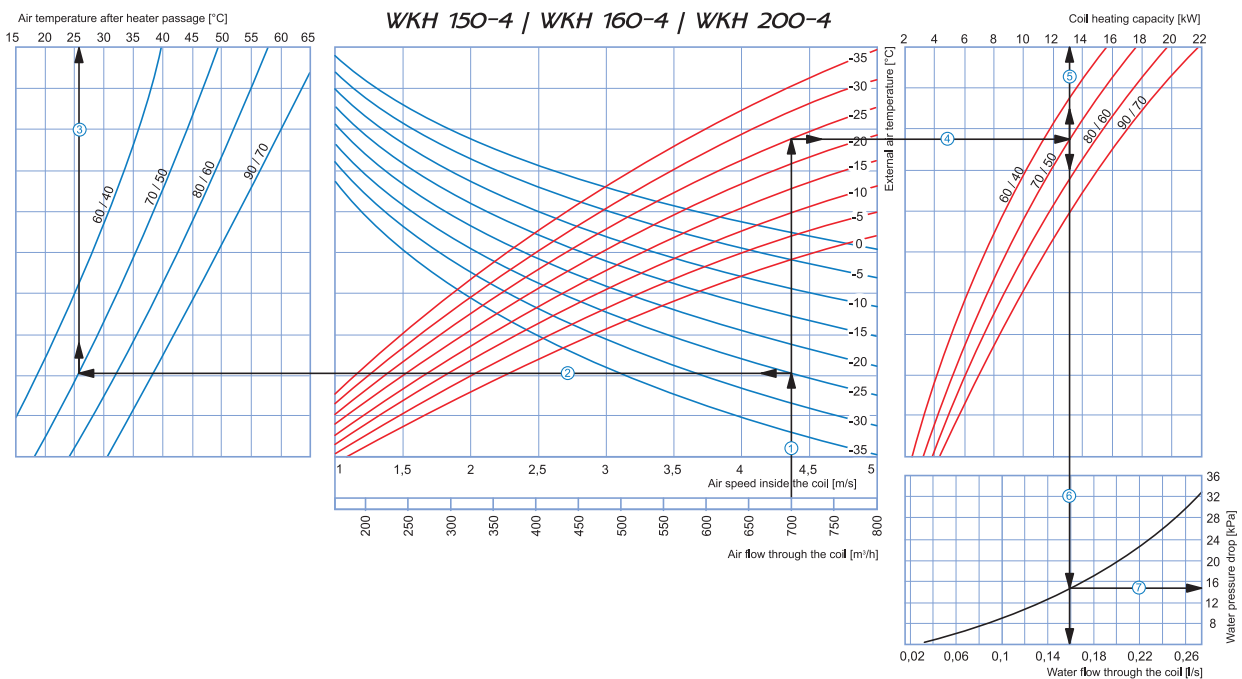
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 700 m³/h. Outside air temperature = -10 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 700 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -10 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+21 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -10 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (8.6 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.11 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (8.2 kPa).

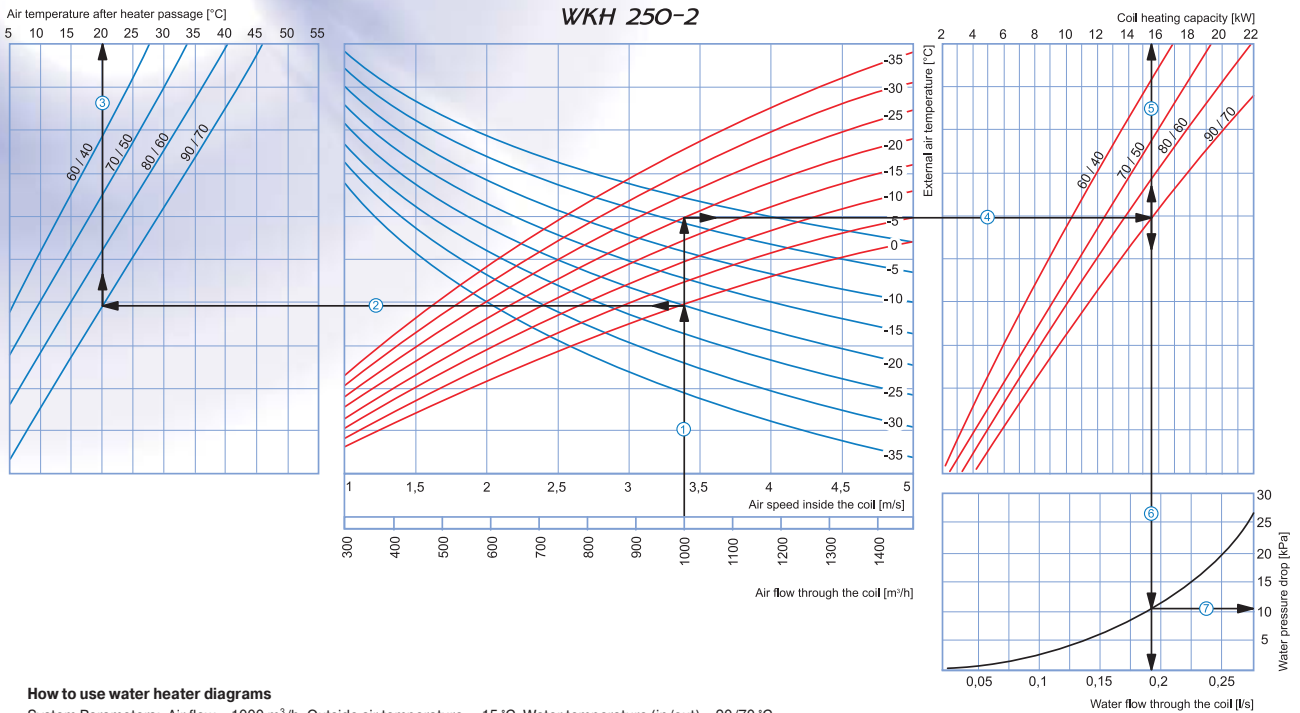


How to use water heater diagrams

System Parameters: Air flow = 700 m³/h. Outside air temperature = -25 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 700 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -25 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+26 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -25 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (13.0 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.16 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (15 kPa).

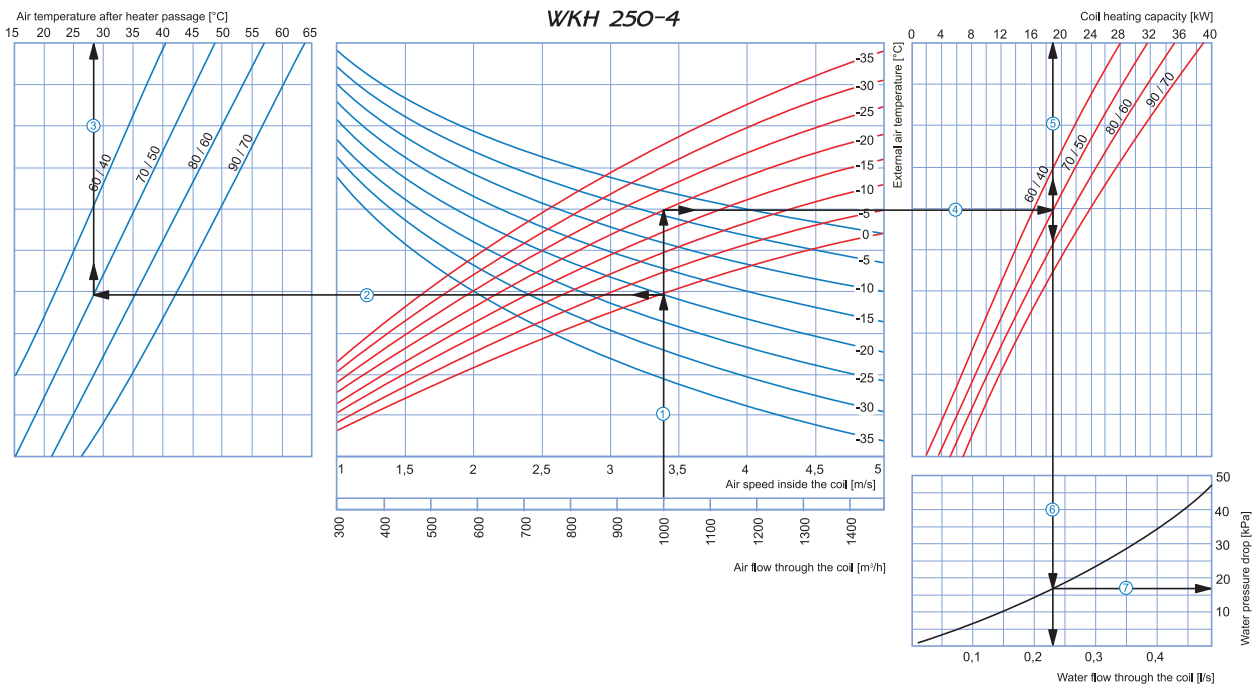
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 1000 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- Air Speed inside coil:** Starting from 1000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.4 m/s.
- Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+20 °C).
- Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (15.5 kW).
- Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.019 l/s).
- Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (11 kPa).

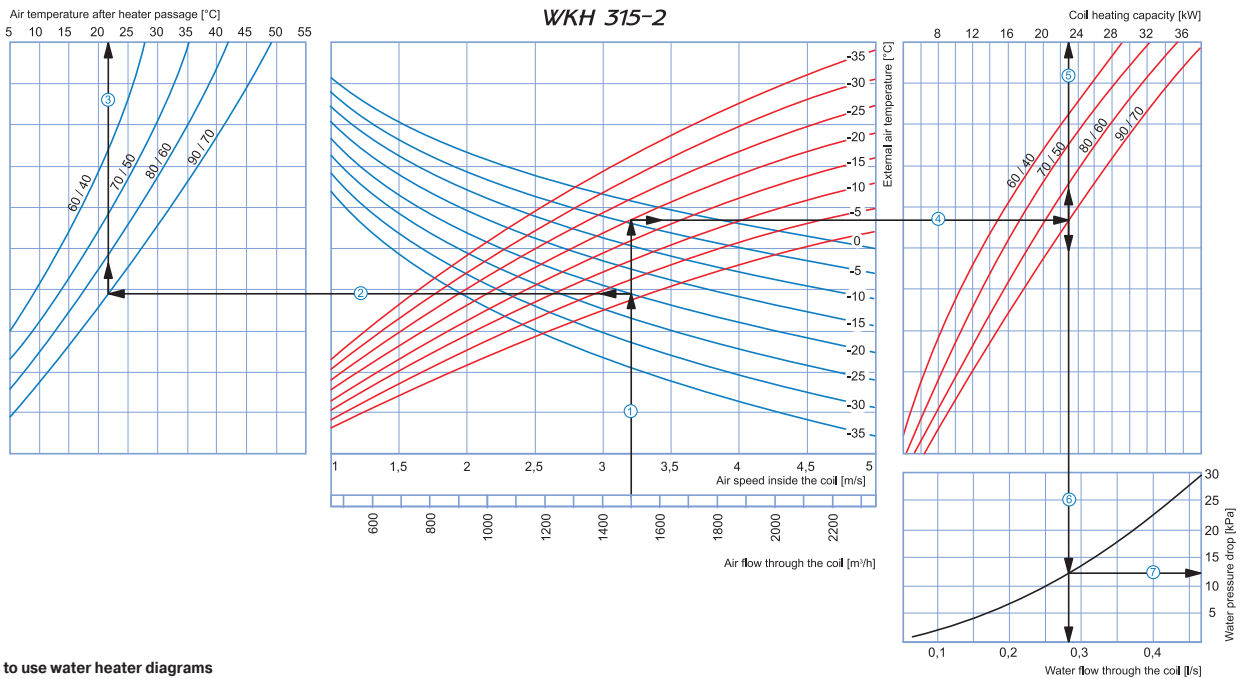


How to use water heater diagrams

System Parameters: Air flow = 1000 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 70/50 °C.

- Air Speed inside coil:** Starting from 1000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.4 m/s.
- Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+27 °C).
- Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (19 kW).
- Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.023 l/s).
- Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (17 kPa).

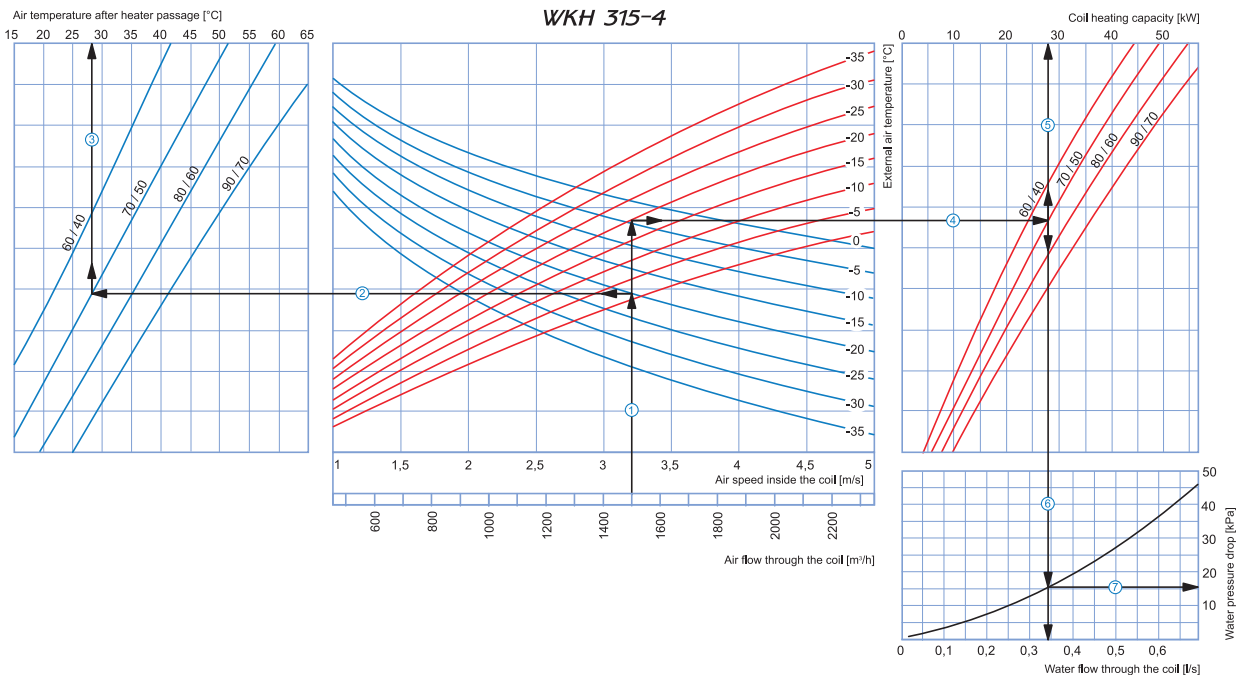
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 1500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 1500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.2 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+21 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (23 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.28 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (12.5 kPa).



How to use water heater diagrams

System Parameters: Air flow = 1500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 1500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.2 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+28 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (28.0 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.34 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (16 kPa).



Duct electrical heater

EKH

for rectangular ducts

Use

- For warming up of supply air in heating, ventilation and air conditioning systems installed in various premises.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.

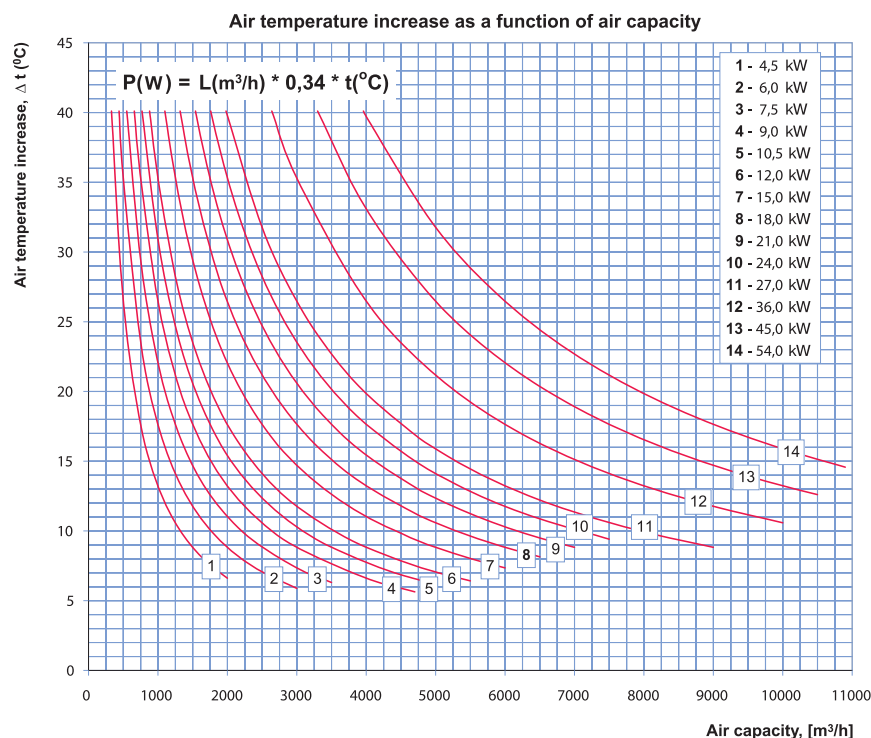
Design

- Galvanized steel case and junction box.
- Heating elements are made of stainless steel and have additional ribbing to increase heat exchange surface.
- Several power options for each standard size.
- For higher heating capacity several heaters may be installed in series.
- Equipped with overheat protection thermostats:
 - basic protection with automatic restart at +50 °C;
 - emergency protection with manual restart at +90 °C.

Mounting

- Fixing to rectangular ducts with flange connection.
- Any mounting position except for the junction box downwards to prevent condensate leakage and short circuit.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

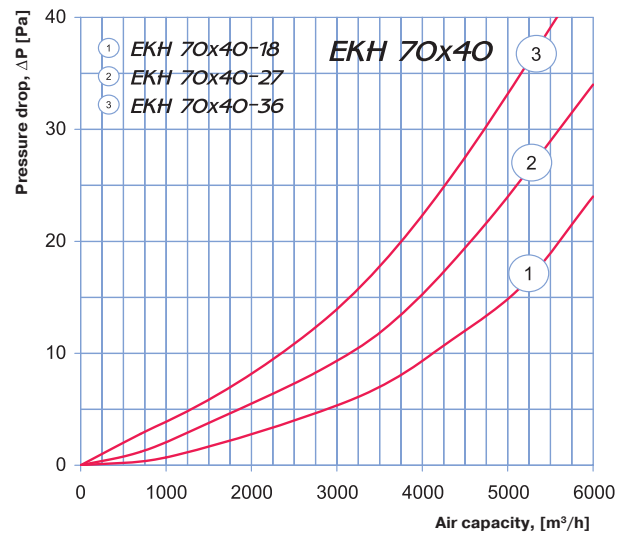
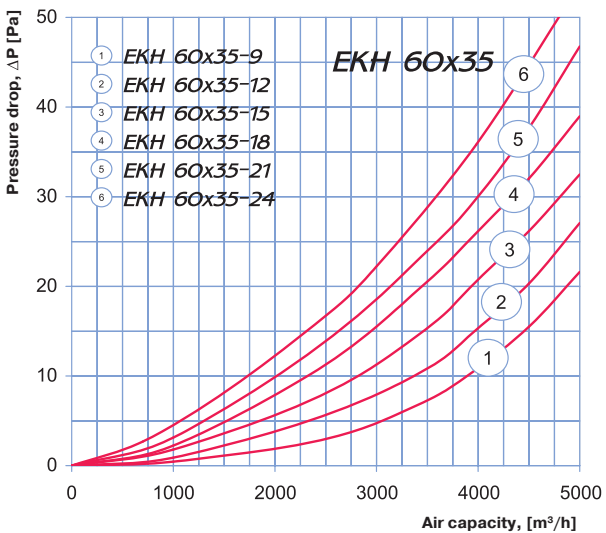
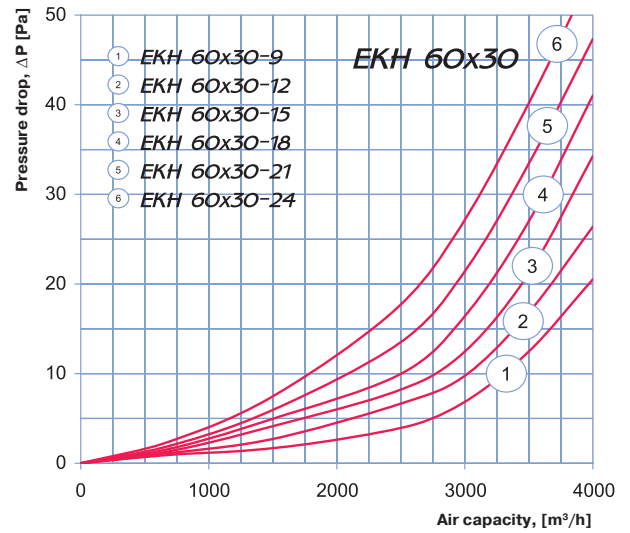
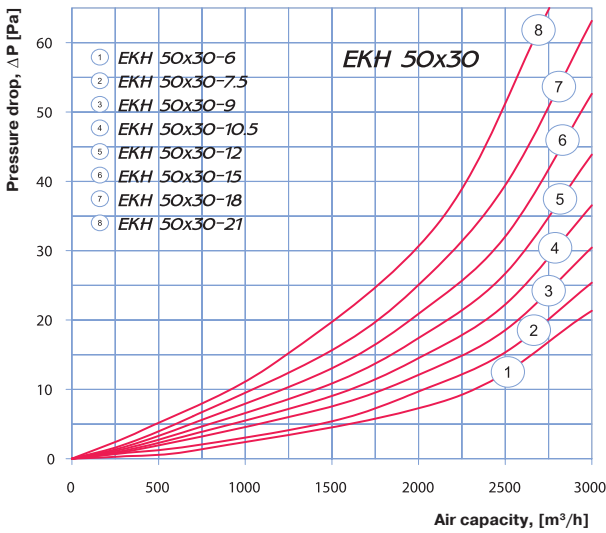
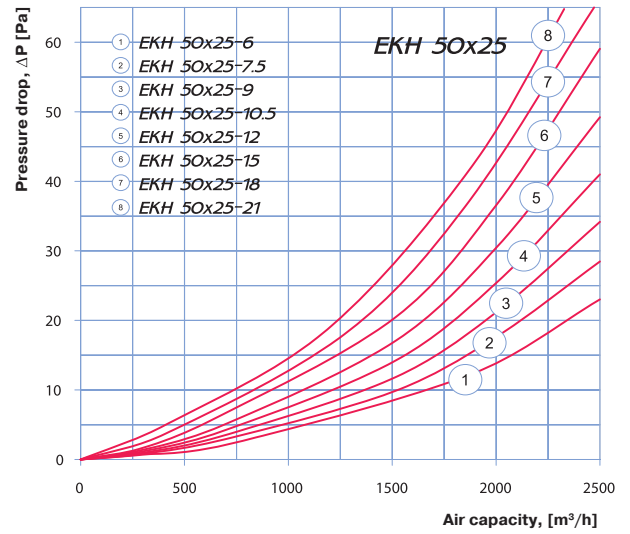
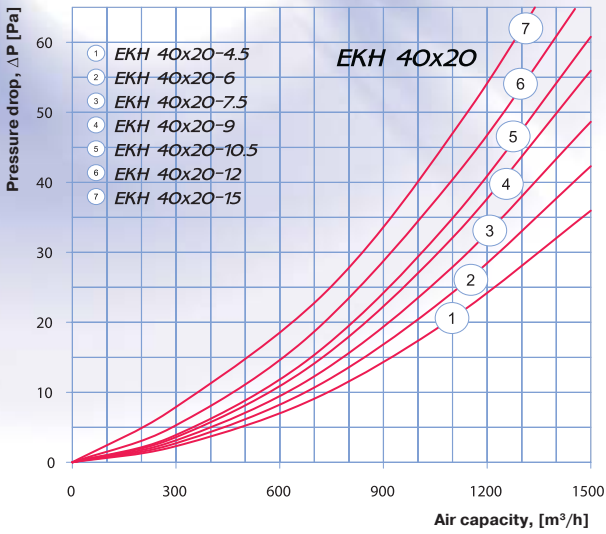
- Recommended distance between the heater and other system components must be not less than one air heater diagonal for air flow stabilization.
- Duct heaters are rated for minimum air flow speed 1.5 m/s and maximum operating air temperature supplied to the units 40 °C. In case of speed regulation with a speed controller the minimum air speed through the heater must be provided.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - power cut-off in case of the supply fan shutdown or low air flow speed as well as in case of actuating the overheat protection thermostats;
 - heat removal from the heating elements after ventilation system shutdown.



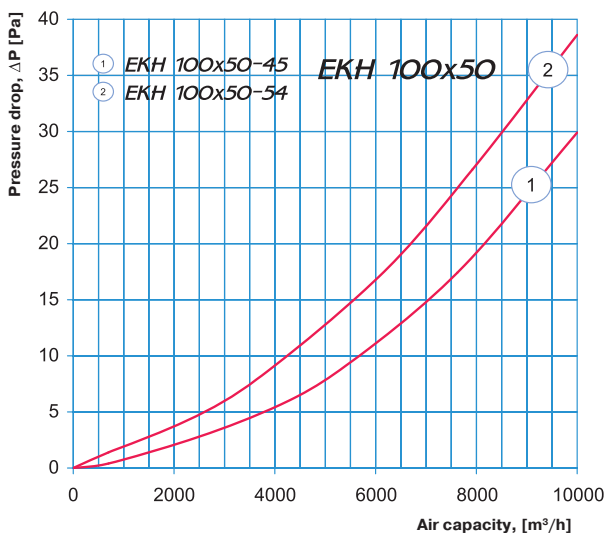
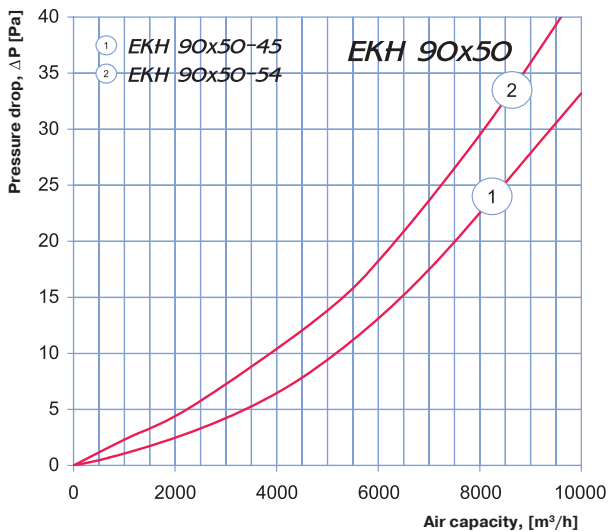
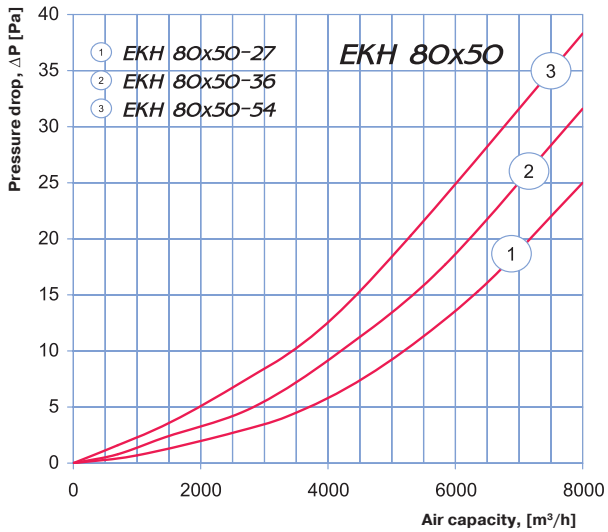
■ Specifications

Type	Minimum air capacity [m ³ /h]	Minimum current [A]	Voltage [V]	Power [kW]	Number of heating coils x capacity [kW]
EKH 40x20-4.5	330	6.5	400	4.5	3x1.5
EKH 40x20-6	440	8.7	400	6.0	3x2.0
EKH 40x20-7.5	550	10.9	400	7.5	3x2.5
EKH 40x20-9	660	13.0	400	9.0	3x3.0
EKH 40x20-10.5	770	15.2	400	10.5	3x3.5
EKH 40x20-12	880	17.4	400	12.0	3x4.0
EKH 40x20-15	1100	21.7	400	15.0	3x5.0
EKH 50x25-6	440	8.7	400	6.0	3x2.0
EKH 50x25-7.5	550	10.9	400	7.5	3x2.5
EKH 50x25-9	660	13.0	400	9.0	3x3.0
EKH 50x25-10.5	770	15.2	400	10.5	3x3.5
EKH 50x25-12	880	17.4	400	12.0	3x4.0
EKH 50x25-15	1100	21.7	400	15.0	3x5.0
EKH 50x25-18	1320	26.0	400	18.0	3x6.0
EKH 50x25-21	1540	30.0	400	21.0	3x7.0
EKH 50x30-6	440	8.7	400	6.0	3x2.0
EKH 50x30-7.5	550	10.9	400	7.5	3x2.5
EKH 50x30-9	660	13.0	400	9.0	3x3.0
EKH 50x30-10.5	770	15.2	400	10.5	3x3.5
EKH 50x30-12	880	17.4	400	12.0	3x4.0
EKH 50x30-15	1100	21.7	400	15.0	3x5.0
EKH 50x30-18	1320	26.0	400	18.0	3x6.0
EKH 50x30-21	1540	30.0	400	21.0	3x7.0
EKH 60x30-9	660	13.0	400	9.0	3x3.0
EKH 60x30-12	880	17.4	400	12.0	3x4.0
EKH 60x30-15	1100	21.7	400	15.0	3x5.0
EKH 60x30-18	1320	26.0	400	18.0	3x6.0
EKH 60x30-21	1540	30.0	400	21.0	3x7.0
EKH 60x30-24	1760	34.7	400	24.0	3x8.0
EKH 60x35-9	660	13.0	400	9.0	3x3.0
EKH 60x35-12	880	17.4	400	12.0	3x4.0
EKH 60x35-15	1100	21.7	400	15.0	3x5.0
EKH 60x35-18	1320	26.0	400	18.0	3x6.0
EKH 60x35-21	1540	30.0	400	21.0	3x7.0
EKH 60x35-24	1760	34.7	400	24.0	3x8.0
EKH 70x40-18	1320	26.0	400	18.0	6x3.0
EKH 70x40-27	1980	39.0	400	27.0	9x3.0
EKH 70x40-36	2640	52.0	400	36.0	12x3.0
EKH 80x50-27	1980	39.0	400	27.0	9x3.0
EKH 80x50-36	2640	52.0	400	36.0	12x3.0
EKH 80x50-54	3960	78.0	400	54.0	18x3.0
EKH 90x50-45	3300	65.0	400	45.0	15x3.0
EKH 90x50-54	3960	78.0	400	54.0	18x3.0
EKH 100x50-45	3300	65.0	400	45.0	15x3.0
EKH 100x50-54	3960	78.0	400	54.0	18x3.0

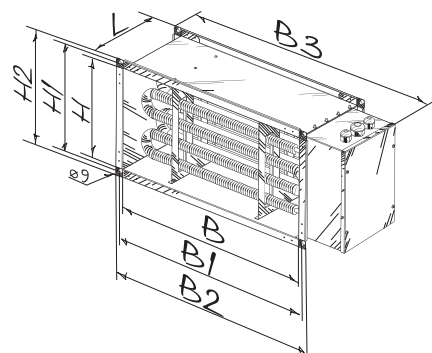
Specifications



Overall dimensions



Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	B3	H	H1	H2	L	
EKH 40x20-4.5	400	420	440	540	200	220	240	200	6.5
EKH 40x20-6	400	420	440	540	200	220	240	200	6.5
EKH 40x20-7.5	400	420	440	540	200	220	240	200	6.5
EKH 40x20-9	400	420	440	540	200	220	240	200	6.5
EKH 40x20-10.5	400	420	440	540	200	220	240	200	6.5
EKH 40x20-12	400	420	440	540	200	220	240	200	6.5
EKH 40x20-15	400	420	440	540	200	220	240	200	6.5
EKH 50x25-6	500	520	540	640	250	270	290	200	7.65
EKH 50x25-7.5	500	520	540	640	250	270	290	200	7.65
EKH 50x25-9	500	520	540	640	250	270	290	200	7.65
EKH 50x25-10.5	500	520	540	640	250	270	290	200	7.65
EKH 50x25-12	500	520	540	640	250	270	290	200	7.65
EKH 50x25-15	500	520	540	640	250	270	290	200	7.65
EKH 50x25-18	500	520	540	640	250	270	290	200	7.65
EKH 50x25-21	500	520	540	640	250	270	290	200	7.65
EKH 50x30-6	500	520	540	640	300	320	340	200	8.2
EKH 50x30-7.5	500	520	540	640	300	320	340	200	8.2
EKH 50x30-9	500	520	540	640	300	320	340	200	8.2
EKH 50x30-10.5	500	520	540	640	300	320	340	200	8.2
EKH 50x30-12	500	520	540	640	300	320	340	200	8.2
EKH 50x30-15	500	520	540	640	300	320	340	200	8.2
EKH 50x30-18	500	520	540	640	300	320	340	200	8.2
EKH 50x30-21	500	520	540	640	300	320	340	200	8.2
EKH 60x30-9	600	620	640	740	300	320	340	200	9.4
EKH 60x30-12	600	620	640	740	300	320	340	200	9.4
EKH 60x30-15	600	620	640	740	300	320	340	200	9.4
EKH 60x30-18	600	620	640	740	300	320	340	200	9.4
EKH 60x30-21	600	620	640	740	300	320	340	200	9.4
EKH 60x30-24	600	620	640	740	300	320	340	200	9.4
EKH 60x35-9	600	620	640	740	350	370	390	200	9.75
EKH 60x35-12	600	620	640	740	350	370	390	200	9.75
EKH 60x35-15	600	620	640	740	350	370	390	200	9.75
EKH 60x35-18	600	620	640	740	350	370	390	200	9.75
EKH 60x35-21	600	620	640	740	350	370	390	200	9.75
EKH 60x35-24	600	620	640	740	350	370	390	200	9.75
EKH 70x40-18	700	720	740	840	400	420	440	390	14
EKH 70x40-27	700	720	740	840	400	420	440	510	18.5
EKH 70x40-36	700	720	740	840	400	420	440	750	25
EKH 80x50-27	800	820	840	940	500	520	540	390	19
EKH 80x50-36	800	820	840	940	500	520	540	510	23.5
EKH 80x50-54	800	820	840	940	500	520	540	750	30
EKH 90x50-45	900	920	940	1040	500	520	540	750	31
EKH 90x50-54	900	920	940	1040	500	520	540	750	33.5
EKH 100x50-45	1000	1020	1040	1140	500	520	540	750	33
EKH 100x50-54	1000	1020	1040	1140	500	520	540	750	36





Duct water heaters

WKH

for rectangular ducts

Use

- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor application use antifreezing mixture (ethylene glycol solution).
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.

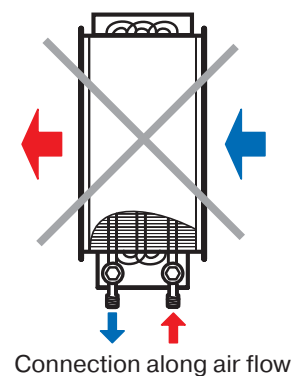
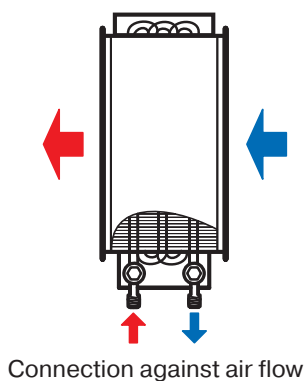
Design

- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor or freezing protection mechanism.
- Available in two, three- or four-row tube modifications.
- Suitable for operation at maximum operating pressure 1.6 MPa (16 bar) and maximum operating temperature +100 °C.

Mounting

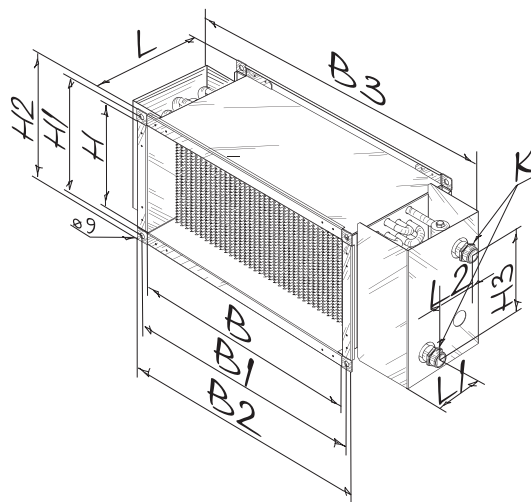
- Fixing to rectangular ducts with flange connection.
- Any mounting position that ensures the heater deaeration.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

- Install the heater in front or behind the fan. In case of mounting behind the fan ensure the distance no less than 1-1,5 m for air flow stabilization and keep the maximum permissible air temperature inside the fan.
- Connect the heater on counter-flow basis, otherwise its capacity drops by 5-15 %. All the nomographic charts are rated for counter-flow connection.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - ventilation system start-up with pre-heated heater;
 - use of air dampers with a servo actuator with a return spring;
 - fan turning off in case of the heater freezing danger.



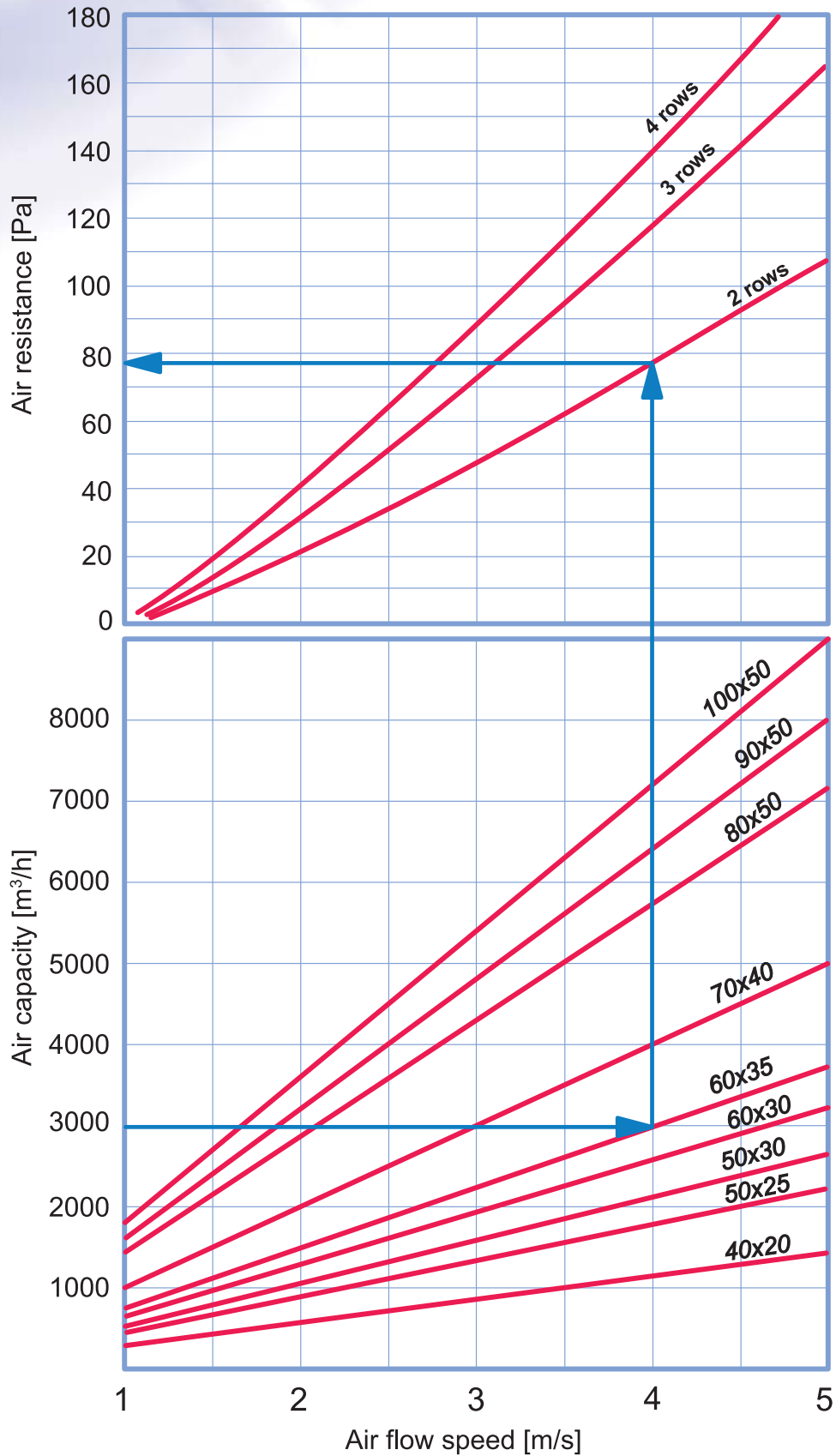
■ Overall dimensions

Type	Dimensions [mm]												Number of water coil rows	Weight [kg]
	B	B1	B2	B3	H	H1	H2	H3	L	L1	L2	K		
WKH 40x20-2	400	420	440	565	200	220	240	150	200	43	43	G 3/4"	2	7.6
WKH 40x20-4	400	420	440	565	200	220	240	150	200	38	65	G 3/4"	4	8.1
WKH 50x25-2	500	520	540	665	250	270	290	200	200	43	43	G 3/4"	2	15.8
WKH 50x25-4	500	520	540	665	250	270	290	200	200	38	65	G 3/4"	4	16.3
WKH 50x30-2	500	520	540	665	300	320	340	250	200	43	43	G 1"	2	11.5
WKH 50x30-4	500	520	540	665	300	320	340	250	200	38	65	G 1"	4	12.0
WKH 60x30-2	600	620	640	765	300	320	340	250	200	43	43	G 1"	2	21.8
WKH 60x30-4	600	620	640	765	300	320	340	250	200	38	65	G 1"	4	22.3
WKH 60x35-2	600	620	640	765	350	370	390	300	200	43	43	G 1"	2	22.4
WKH 60x35-4	600	620	640	765	350	370	390	300	200	38	65	G 1"	4	22.9
WKH 70x40-2	700	720	740	865	400	420	440	350	200	36	47	G 1"	2	27.8
WKH 70x40-3	700	720	740	865	400	420	440	350	200	42	58	G 1"	3	28.4
WKH 80x50-2	800	820	840	965	500	520	540	450	200	36	47	G 1"	2	36.5
WKH 80x50-3	800	820	840	965	500	520	540	450	200	42	58	G 1"	3	37.2
WKH 90x50-2	900	920	940	1065	500	520	540	450	200	36	47	G 1"	2	40.4
WKH 90x50-3	900	920	940	1065	500	520	540	450	200	42	58	G 1"	3	41.2
WKH 100x50-2	1000	1020	1040	1165	500	520	540	450	200	36	47	G 1"	2	44.3
WKH 100x50-3	1000	1020	1040	1165	500	520	540	450	200	42	58	G 1"	3	45.2

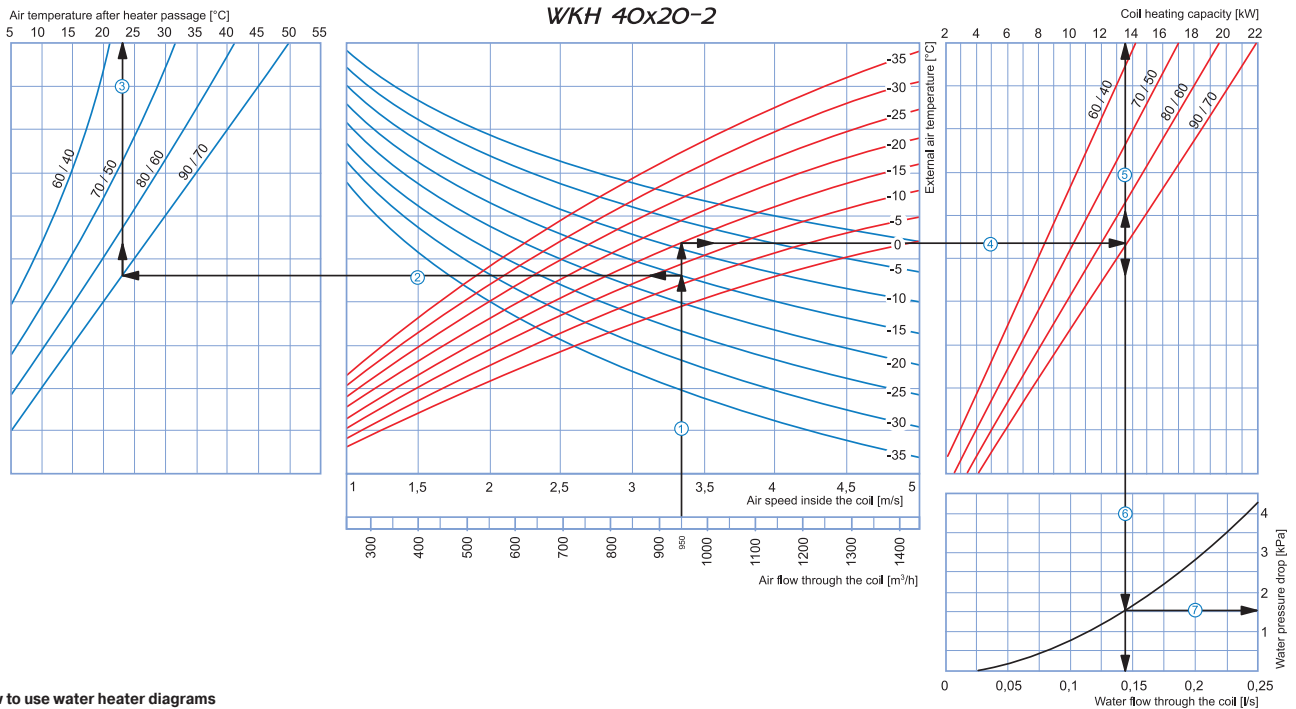


Air pressure loss for water heaters WKH

WKH rectangular heaters



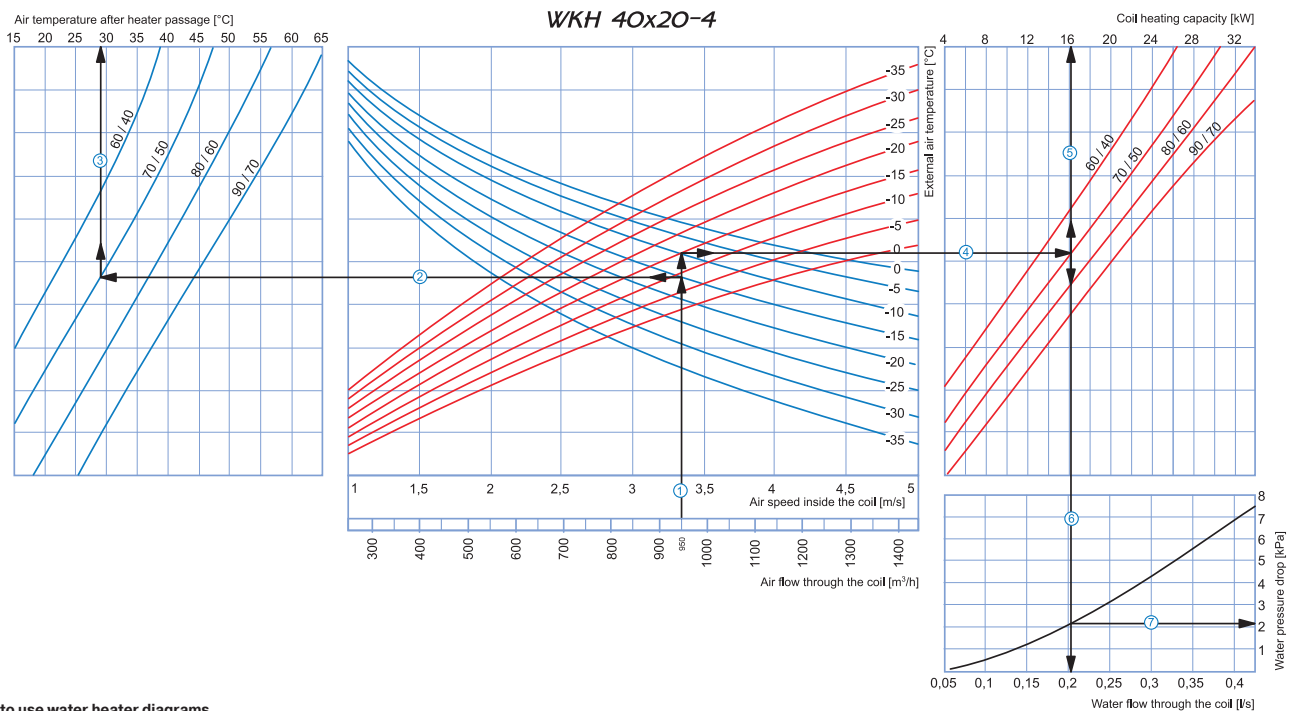
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 950 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 950 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.35 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+23 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (13.5 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.14 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (1.5 kPa).

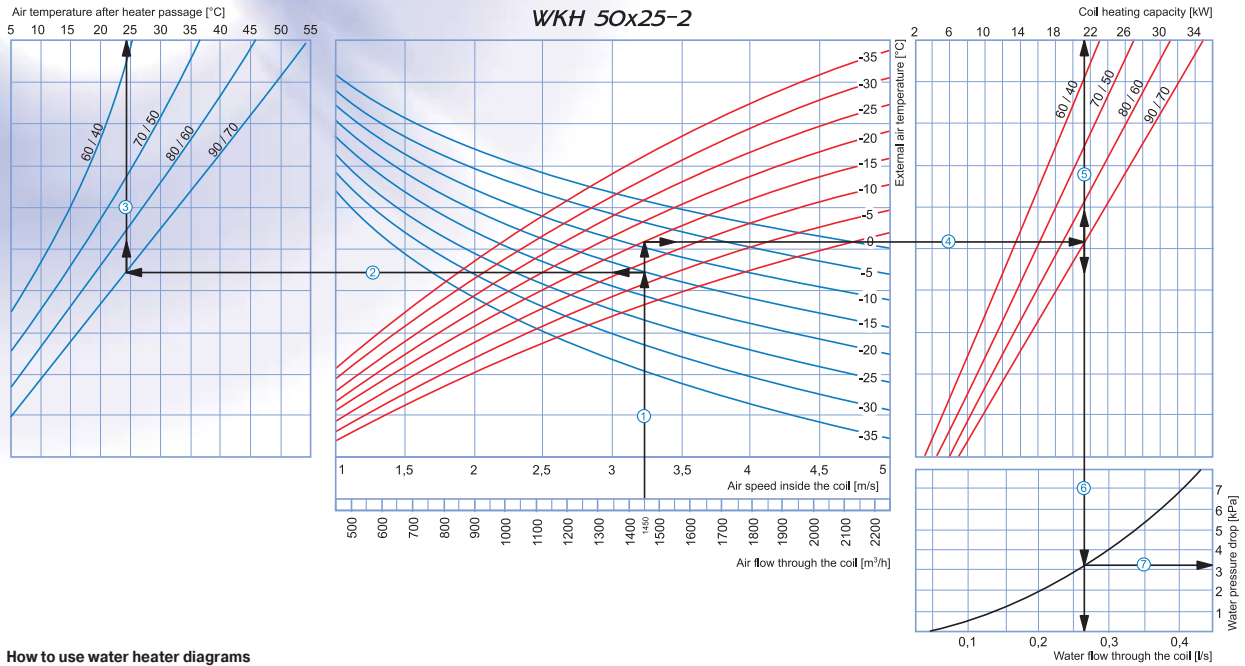


How to use water heater diagrams

System Parameters: Air flow = 950 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 950 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.35 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+29 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (16 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.2 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (2.1 kPa).

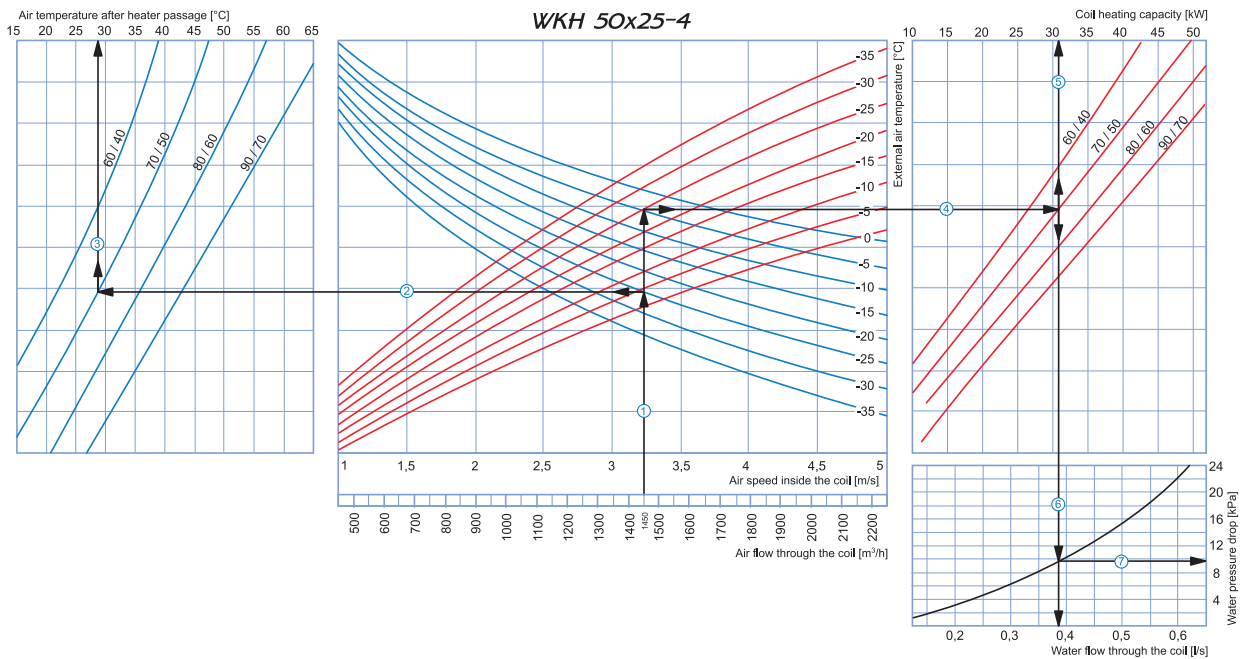
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 1450 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 1450 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.2 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+24 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (21.5 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.27 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (3.2 kPa).

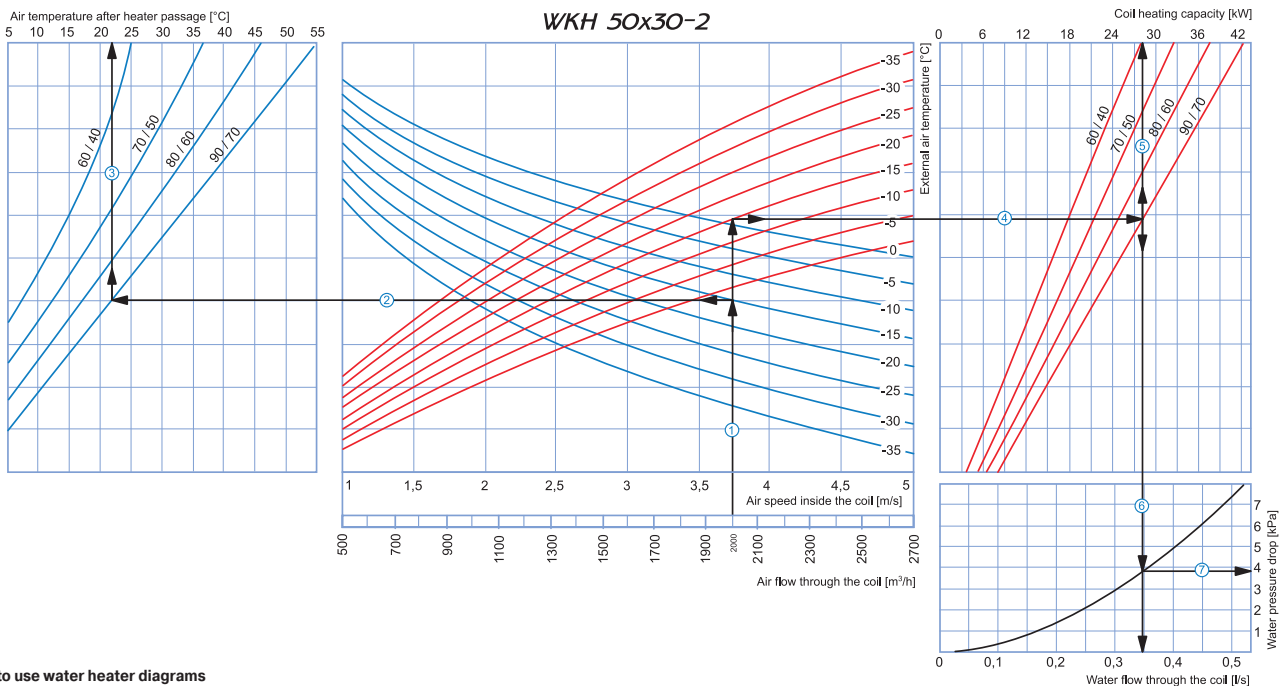


How to use water heater diagrams

System Parameters: Air flow = 1450 m³/h. Outside air temperature = -25 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 1450 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.2 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -25 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+27 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -25 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (31 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.38 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (9.8 kPa).

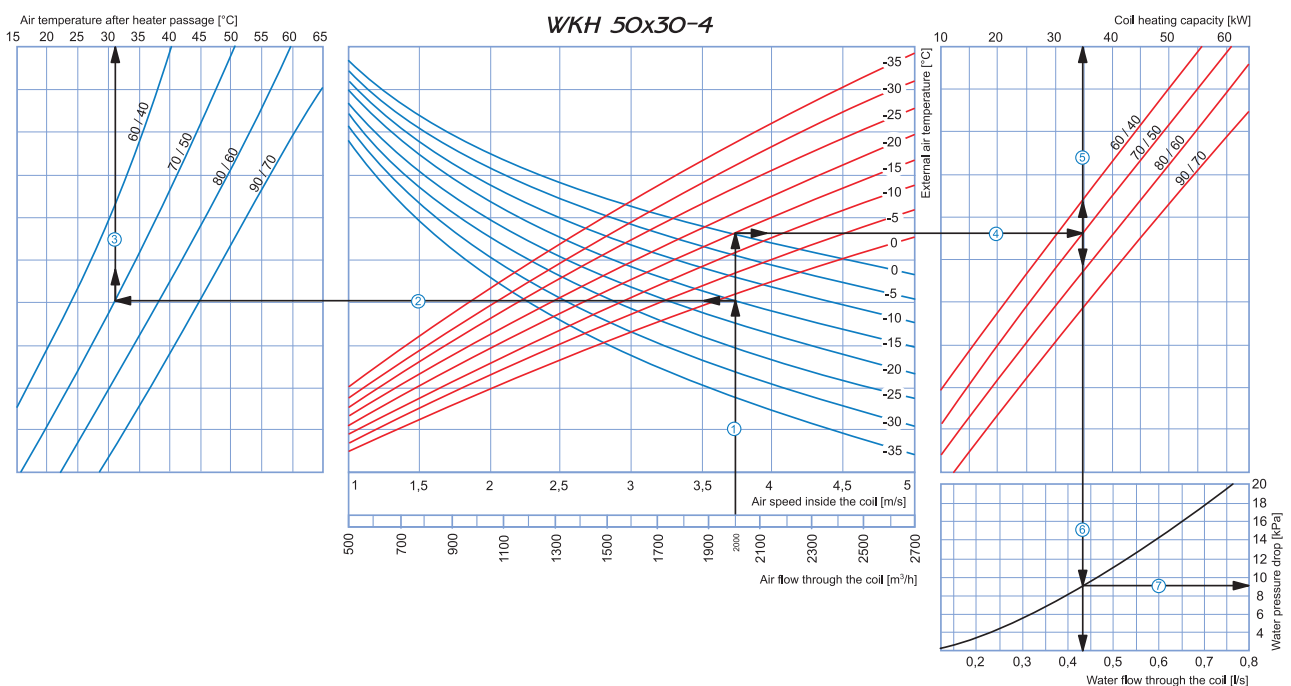
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 2000 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 2000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+22 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (28 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.35 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (3.8 kPa).

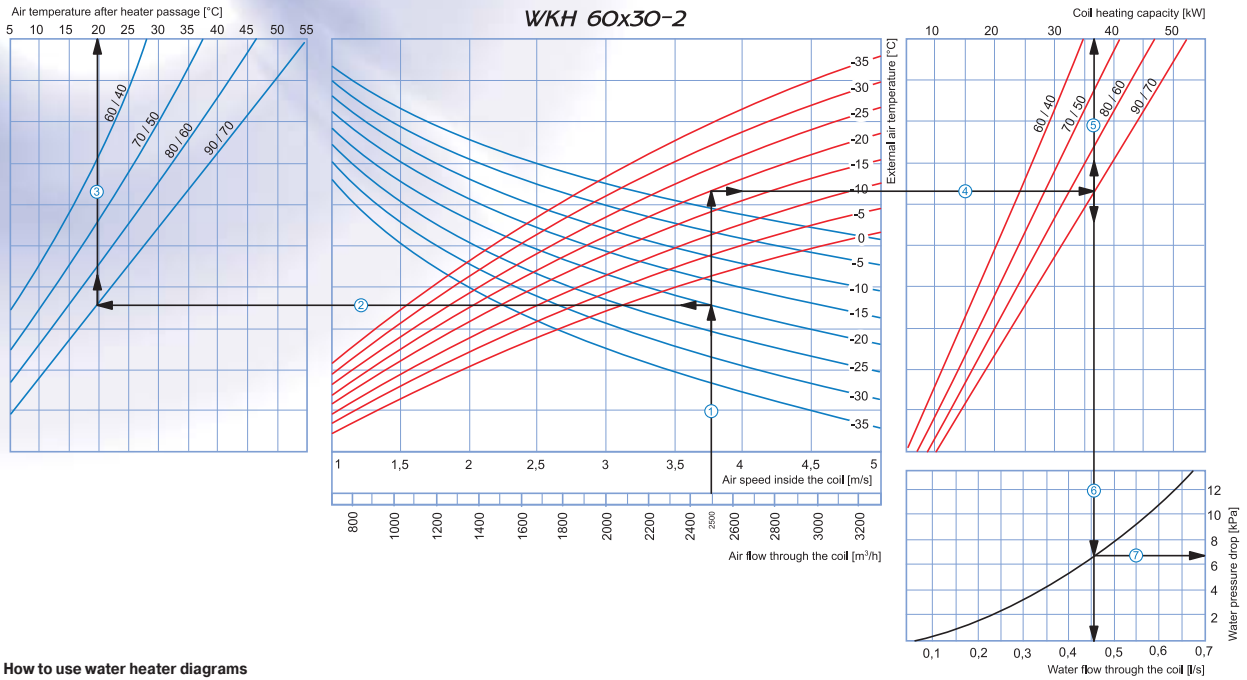


How to use water heater diagrams

System Parameters: Air flow = 2000 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 2000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+31 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (35 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.43 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (9 kPa).

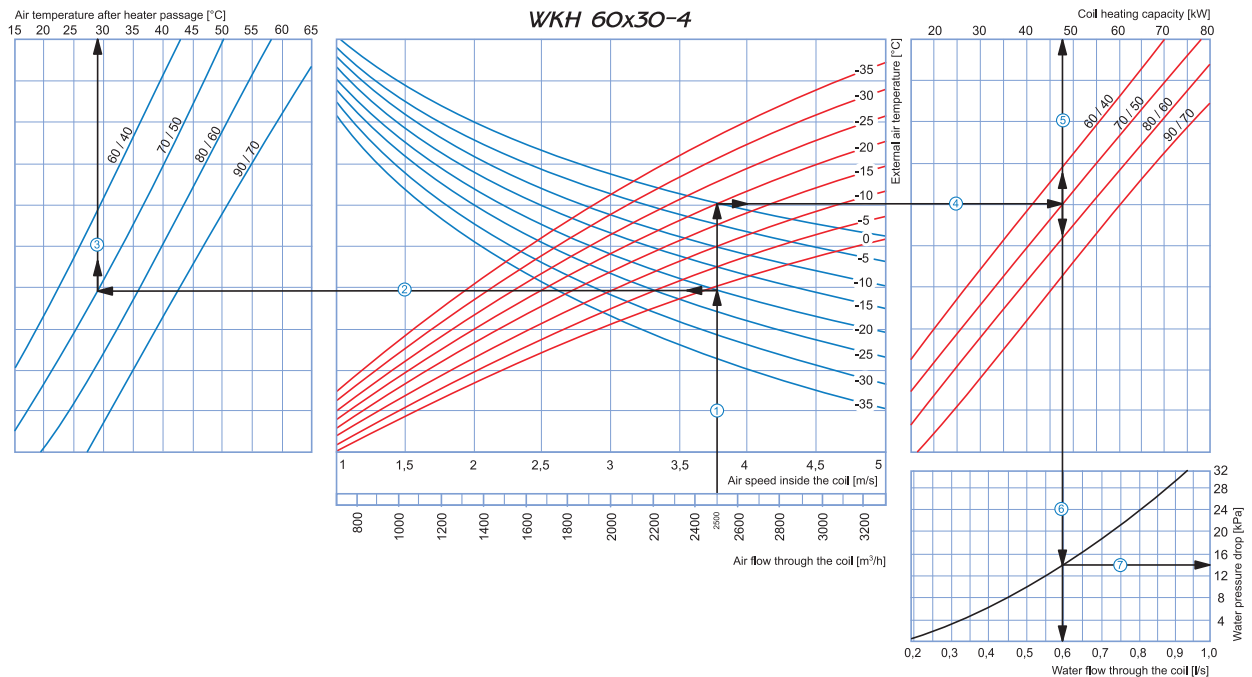
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 2500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 1450 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+20 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (37 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.46 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (6.7 kPa).

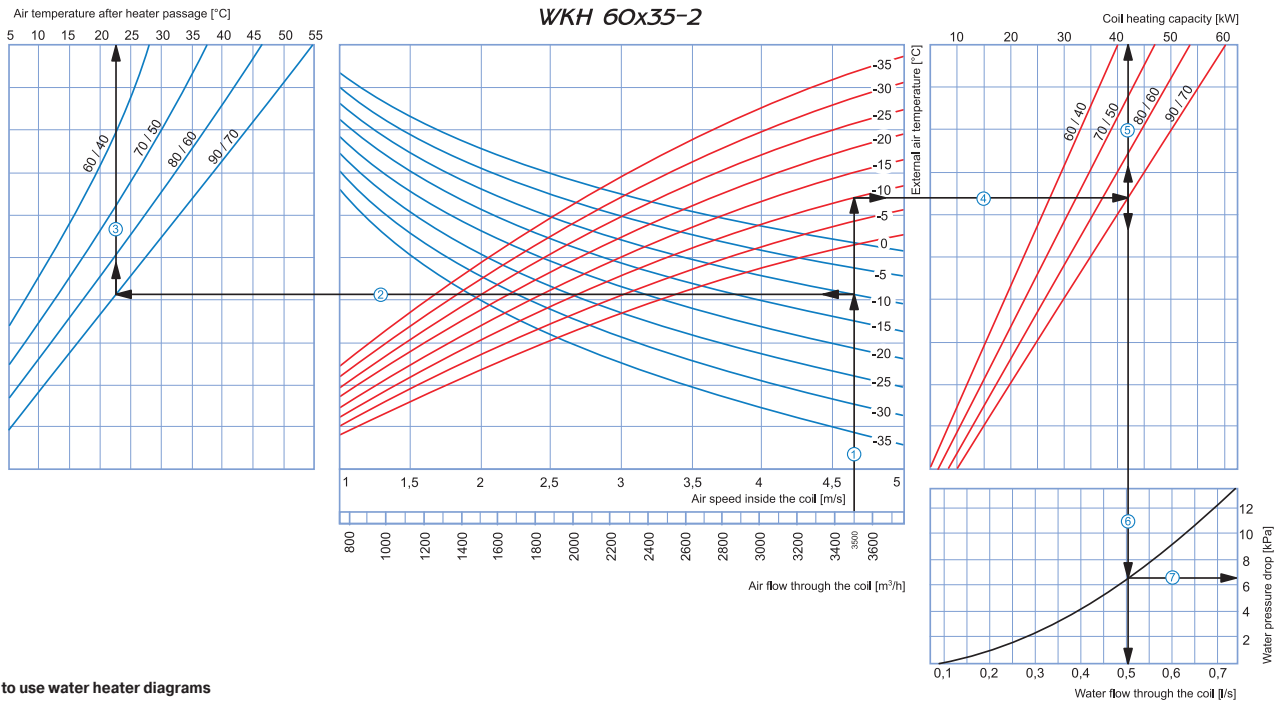


How to use water heater diagrams

System Parameters: Air flow = 2500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 2500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+29 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (48 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.6 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (14 kPa).

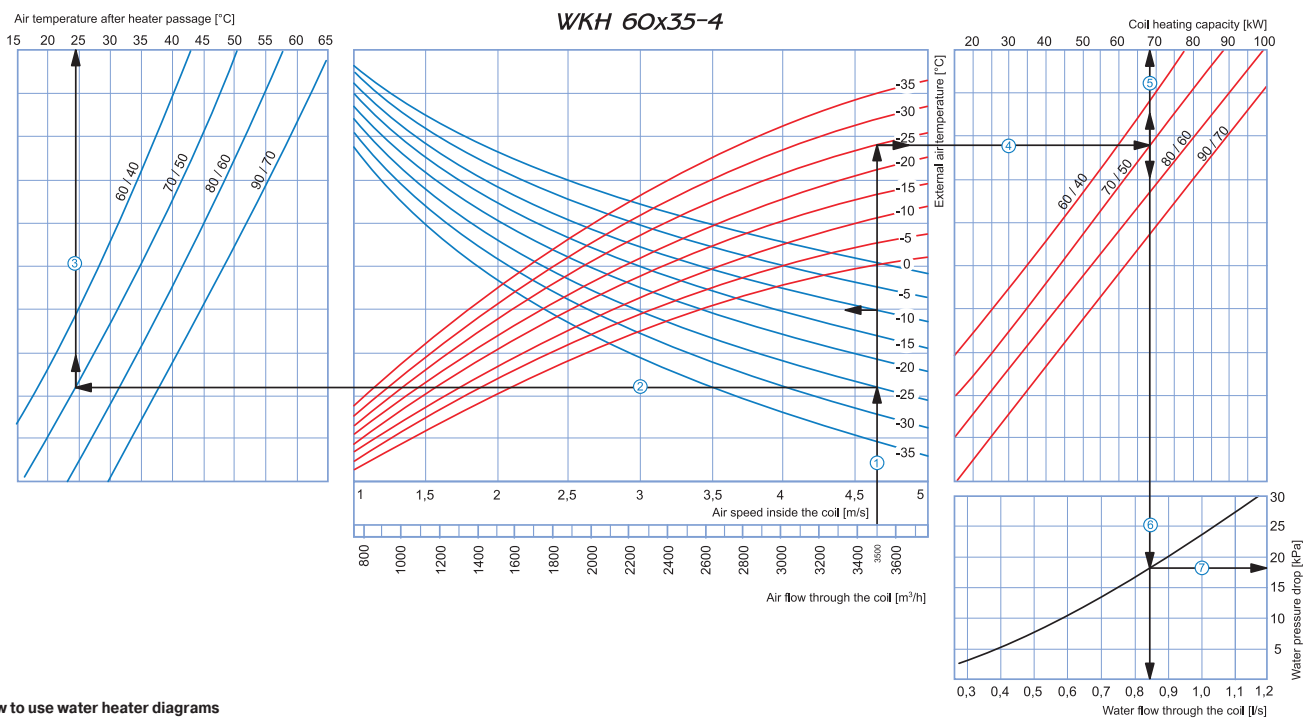
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 3500 m³/h. Outside air temperature = -10 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 3500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.65 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -10 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+22.5 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -10 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (42 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.5 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (6.5 kPa).

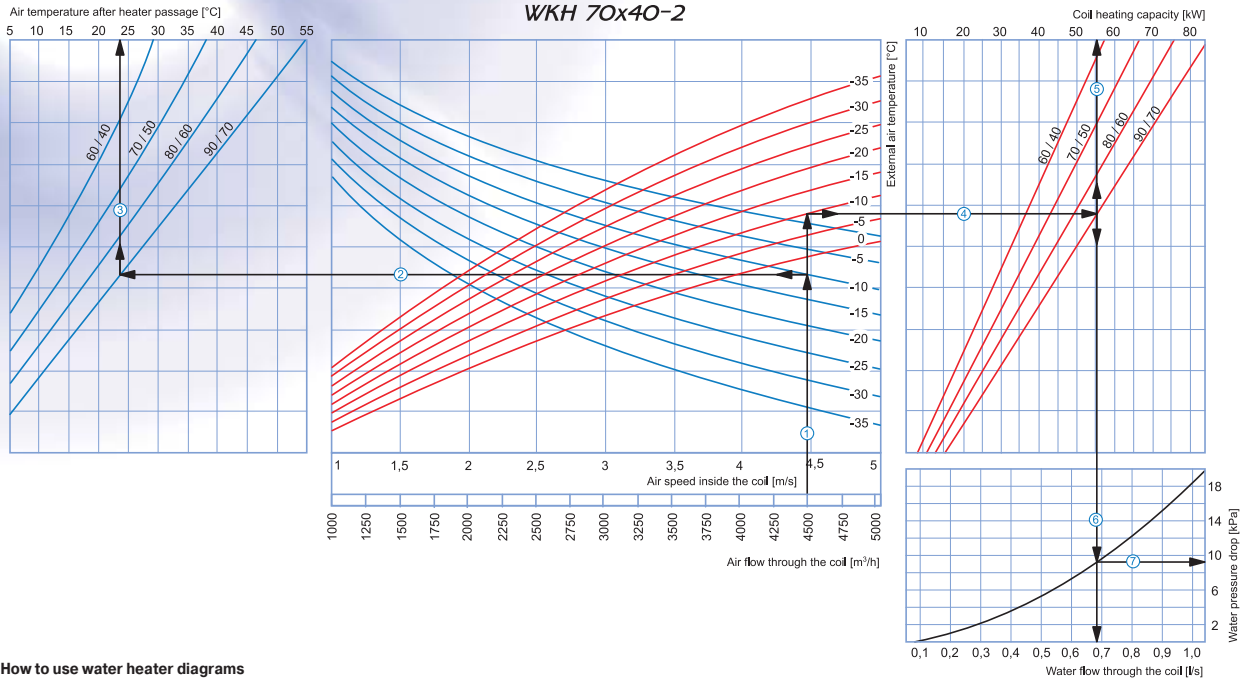


How to use water heater diagrams

System Parameters: Air flow = 3500 m³/h. Outside air temperature = -25 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 3500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.65 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -25 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+24 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -25 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (68 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.84 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (18 kPa).

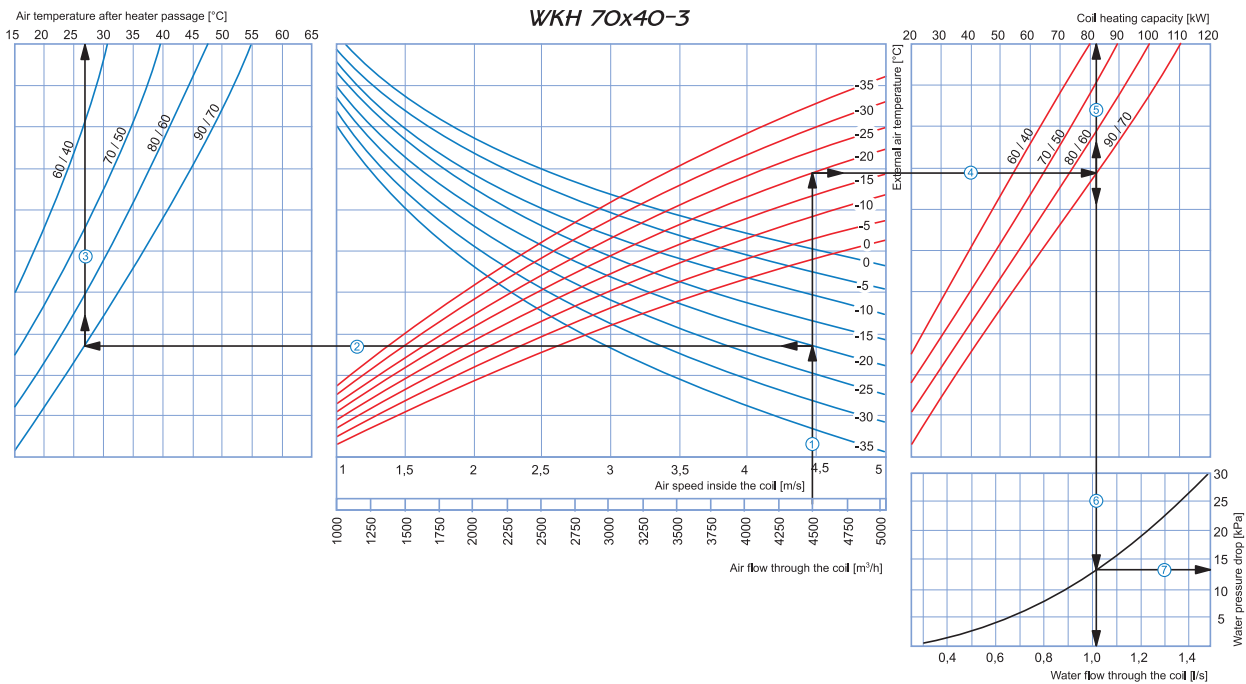
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 4500 m³/h. Outside air temperature = -10 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 4500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -10 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+24 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -10 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (55 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.68 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (9.2 kPa).

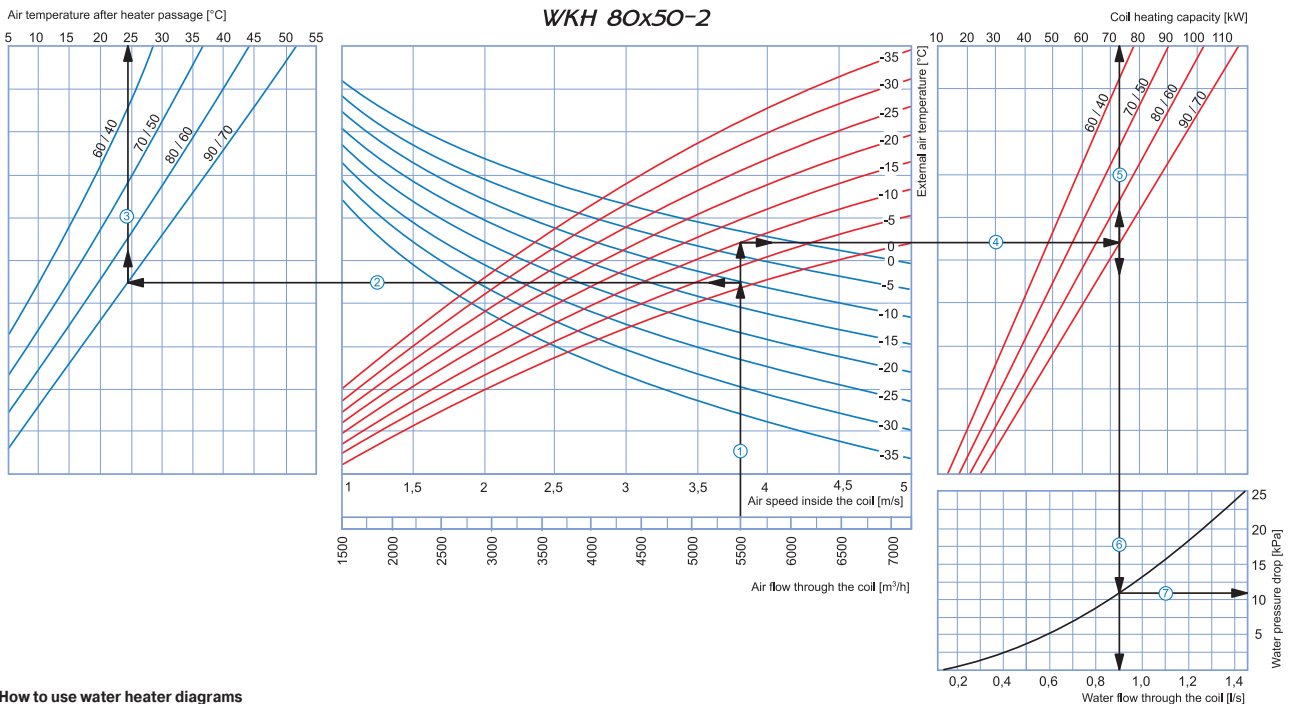


How to use water heater diagrams

System Parameters: Air flow = 4500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 4500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.45 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+27 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (82 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.02 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (13 kPa).

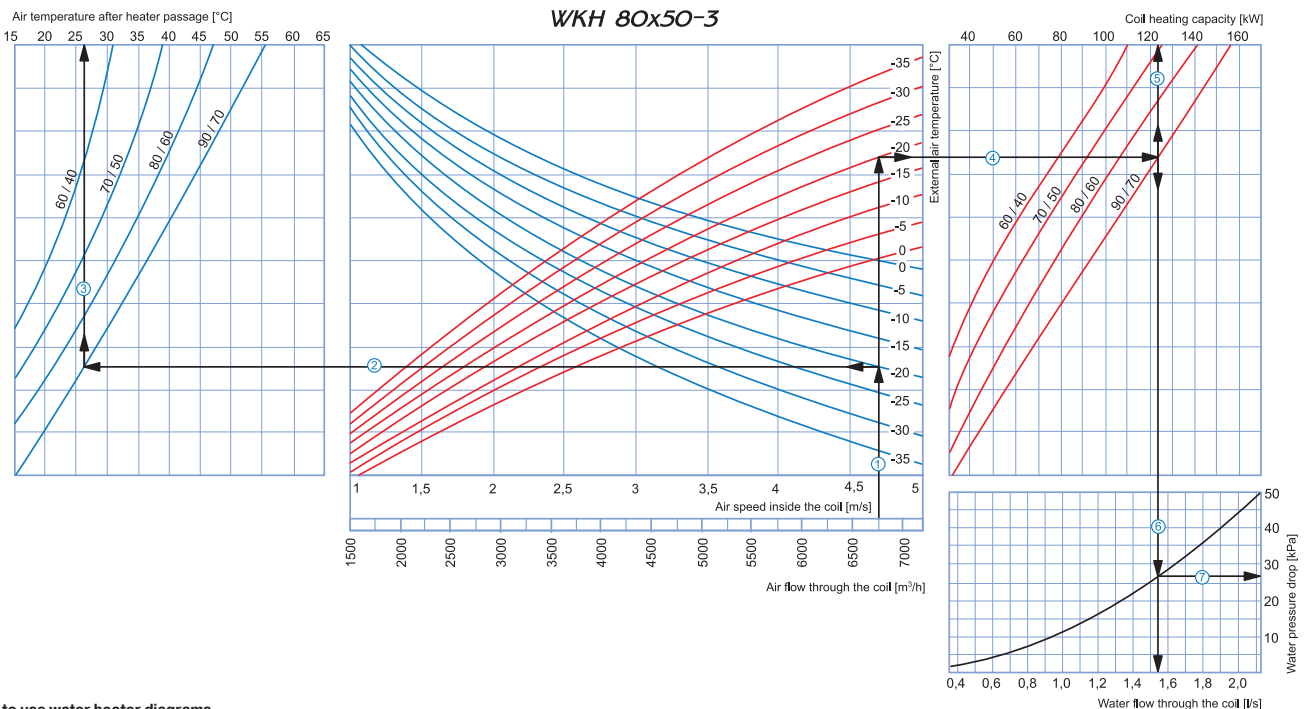
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 5500 m³/h. Outside air temperature = -10 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 5500 m³/h on the air flow scale draw a vertical line 1. This line crosses the air speed axis and shows a value of about 3.8 m/s.
- **Supply air temperature:** Prolong the line 1 up to the point where it crosses the outside air temperature (blue curve, e.g., -10 °C); then draw a horizontal line 2 from this point to the left until it crosses the water in/out temperature curve (e.g., 90/70 °C). From this point draw a vertical line 3 to the supply air temperature axis on top of the graphic (+24.5 °C).
- **Heating coil capacity:** Prolong the line 1 up to the point where it crosses the outside air temperature (e.g., -10 °C, red curve) and draw a horizontal line 4 from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line 5 up to the scale representing the heating coil capacity (73 kW).
- **Water flow:** Prolong the line 5 down to the water flow axis 6 at the bottom of the graphic (0.9 l/s).
- **Water pressure drop:** Draw the line 7 from the point where the line 6 crosses the black curve to the pressure drop axis (11 kPa).

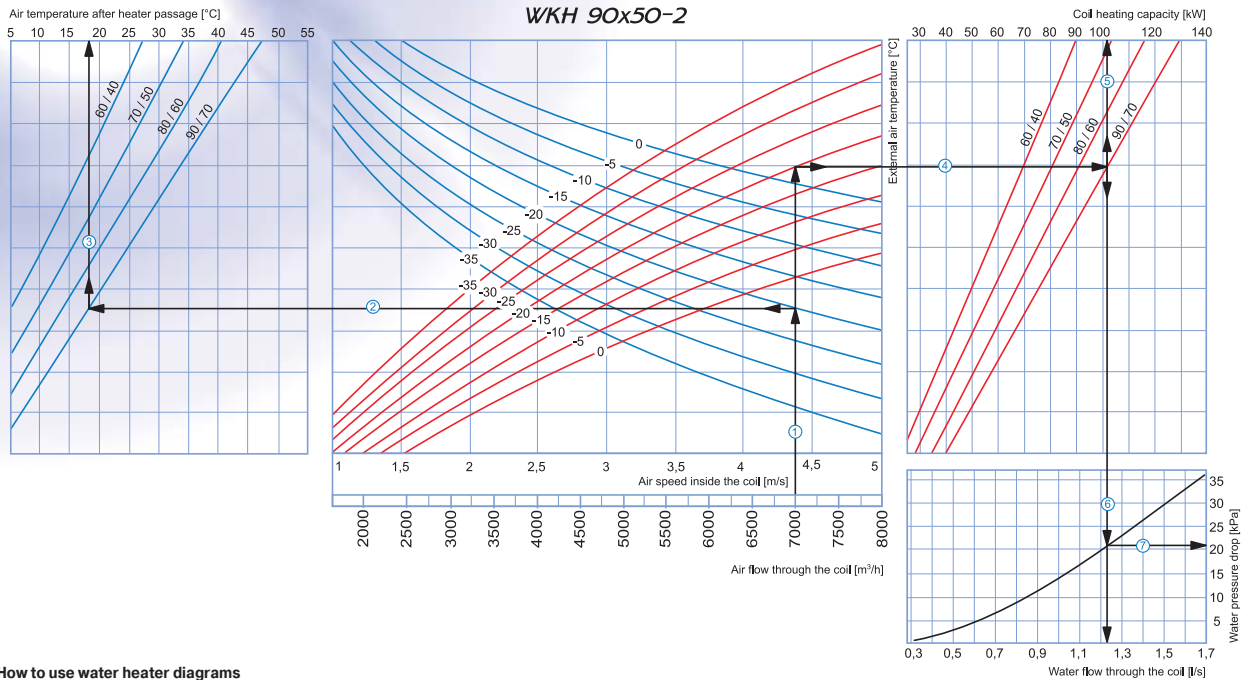


How to use water heater diagrams

System Parameters: Air flow = 6750 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 6750 m³/h on the air flow scale draw a vertical line 1. This line crosses the air speed axis and shows a value of about 4.7 m/s.
- **Supply air temperature:** Prolong the line 1 up to the point where it crosses the outside air temperature (blue curve, e.g., -20 °C); then draw a horizontal line 2 from this point to the left until it crosses the water in/out temperature curve (e.g., 90/70 °C). From this point draw a vertical line 3 to the supply air temperature axis on top of the graphic (+26 °C).
- **Heating coil capacity:** Prolong the line 1 up to the point where it crosses the outside air temperature (e.g., -20 °C, red curve) and draw a horizontal line 4 from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line 5 up to the scale representing the heating coil capacity (123 kW).
- **Water flow:** Prolong the line 5 down to the water flow axis 6 at the bottom of the graphic (1.54 l/s).
- **Water pressure drop:** Draw the line 7 from the point where the line 6 crosses the black curve to the pressure drop axis (27 kPa).

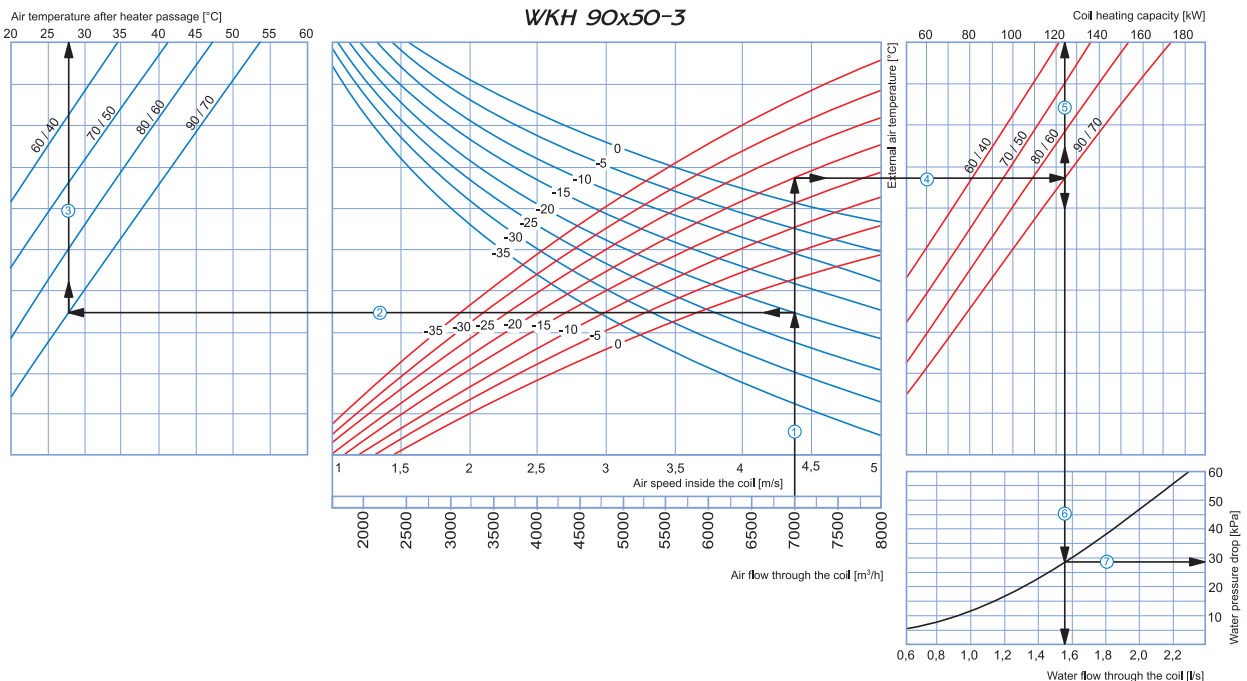
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 7000 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 7000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+18 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (102 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.23 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (21 kPa).

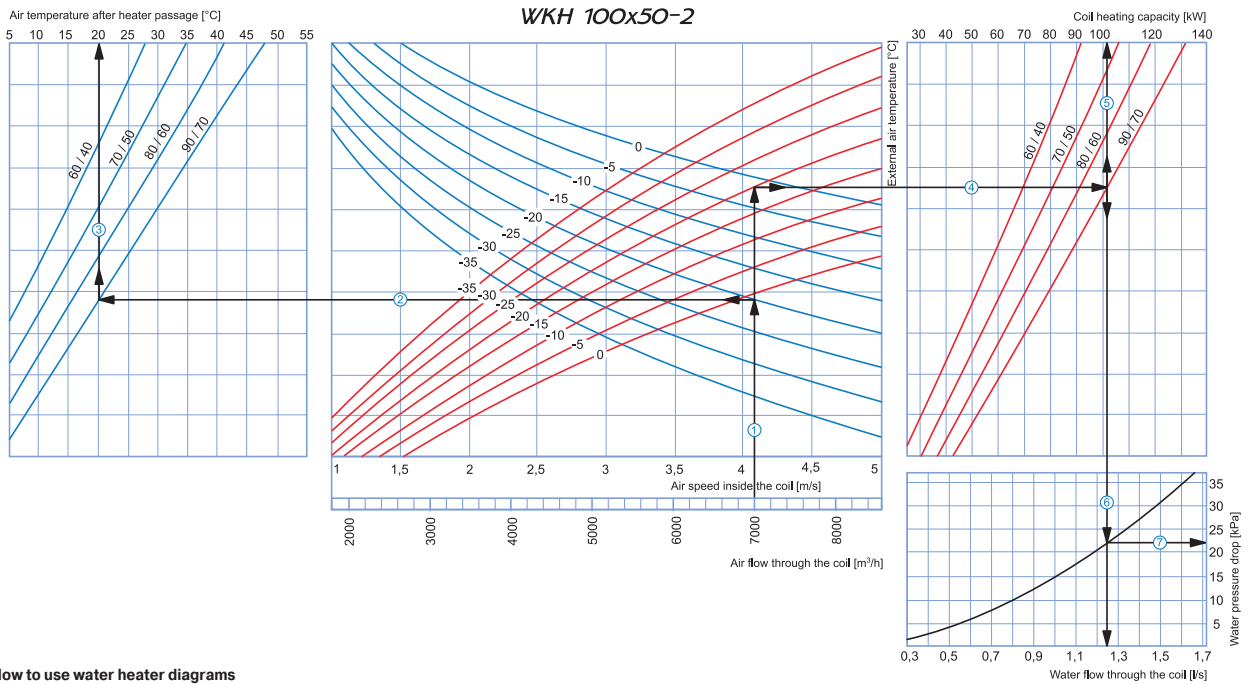


How to use water heater diagrams

System Parameters: Air flow = 7000 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 7000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+28 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (124 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.55 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (28 kPa).

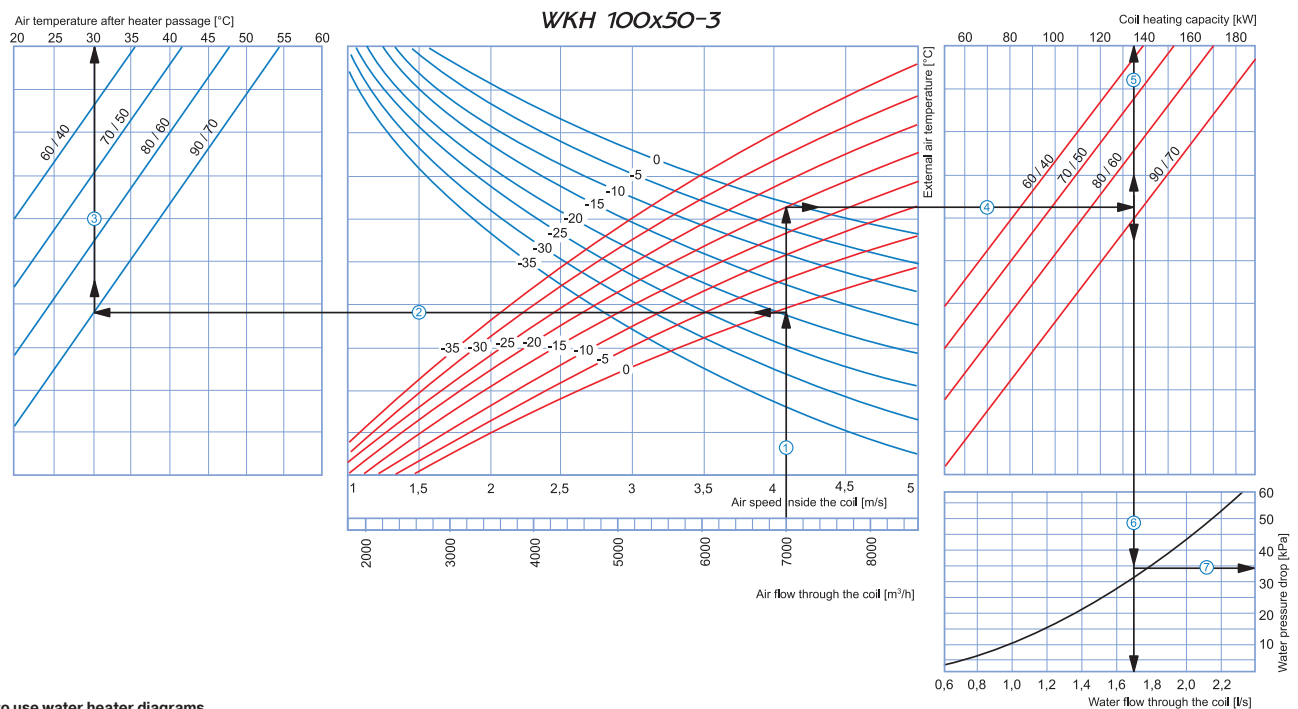
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 7000 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 7000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.1 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+20 °C).
- **Heating coil capacity:** Prolong the line ③ up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (101 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.25 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (22 kPa).



How to use water heater diagrams

System Parameters: Air flow = 7000 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 7000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.1 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+20 °C).
- **Heating coil capacity:** Prolong the line ③ up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (135 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.7 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (34 kPa).



Duct water cooling units

KWK

for rectangular air ducts

Use

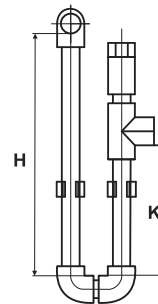
- Supply air cooling for ventilation systems in various premises.
- Suitable for installation into supply ventilation or into air handling units to provide air cooling.

Design

- Galvanized steel casing.
- The cooling elements are made of copper tubes and aluminum plates.
- Available in three-coil modifications and rated for maximum operating pressure 1.5 MPa (15 bar).
- Polypropylene droplet separator and drain pan for condensate drainage and removal included.
- Droplet separator is efficient at an air flow not exceeding 4 m/s.

Mounting

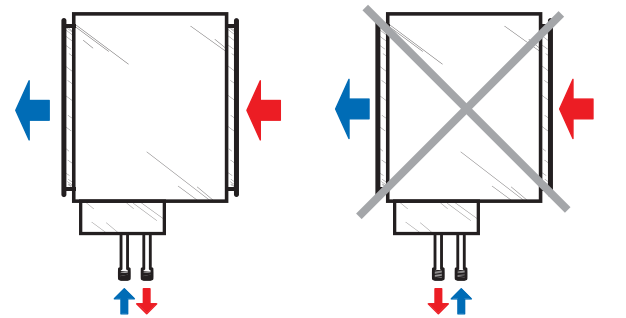
- Only horizontal mounting by means of flanged connection. Air evacuation and condensate drainage must be provided.
- Air filter installation upstream of the cooling unit to prevent the unit soiling.
- Installation position must ensure uniform air flow distribution in the section.
- Installation upstream or downstream of the supply fan. The minimum air duct length downstream of the fan must be 1-1.5 m to ensure air flow stabilization.
- The maximum cooling capacity is attained if the cooling unit is connected on counter-flow basis. The attached charts are valid for counter-flow connection.
- If water is used as a cooling agent, the cooling unit is suitable for indoor use only with the ambient temperature not below 0 °C.
- If antifreezing solution, for example, ethylene glycol solution, is used as a cooling agent, the cooling unit is suitable for outdoor use as well.
- While mounting the cooling unit provide condensate drainage through the U-trap. The U-trap height must be selected with respect to the total fan pressure, refer to the table and diagram below.



H [mm]	K [mm]	P [Pa]
100	55	600
200	105	1100
260	140	1400

H – U-trap height
K – drain height
P – total fan pressure

- For a proper and safe operation of the cooling unit it should be connected to a control system for integral control and automatic cooling capacity regulation.



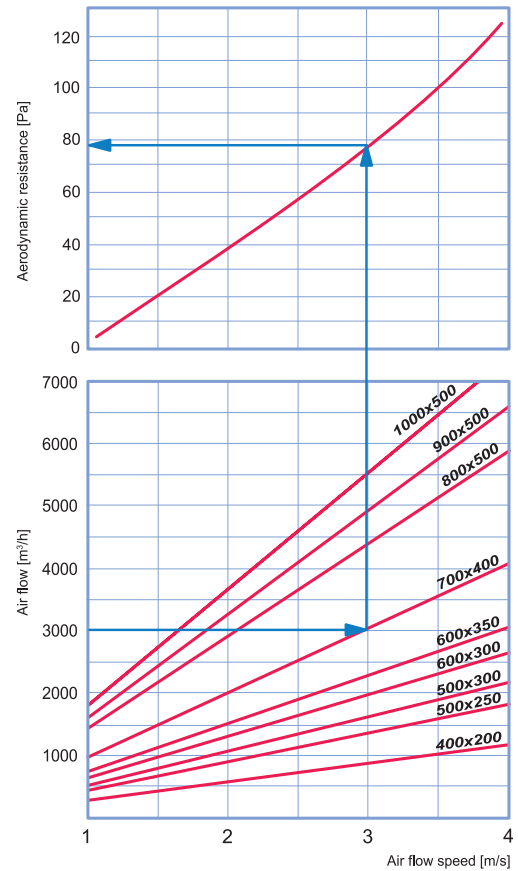
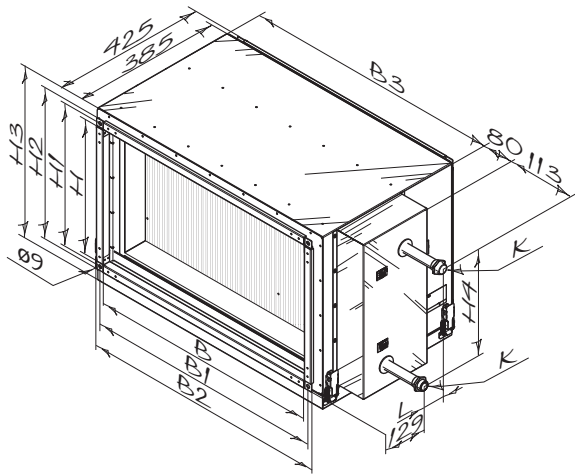
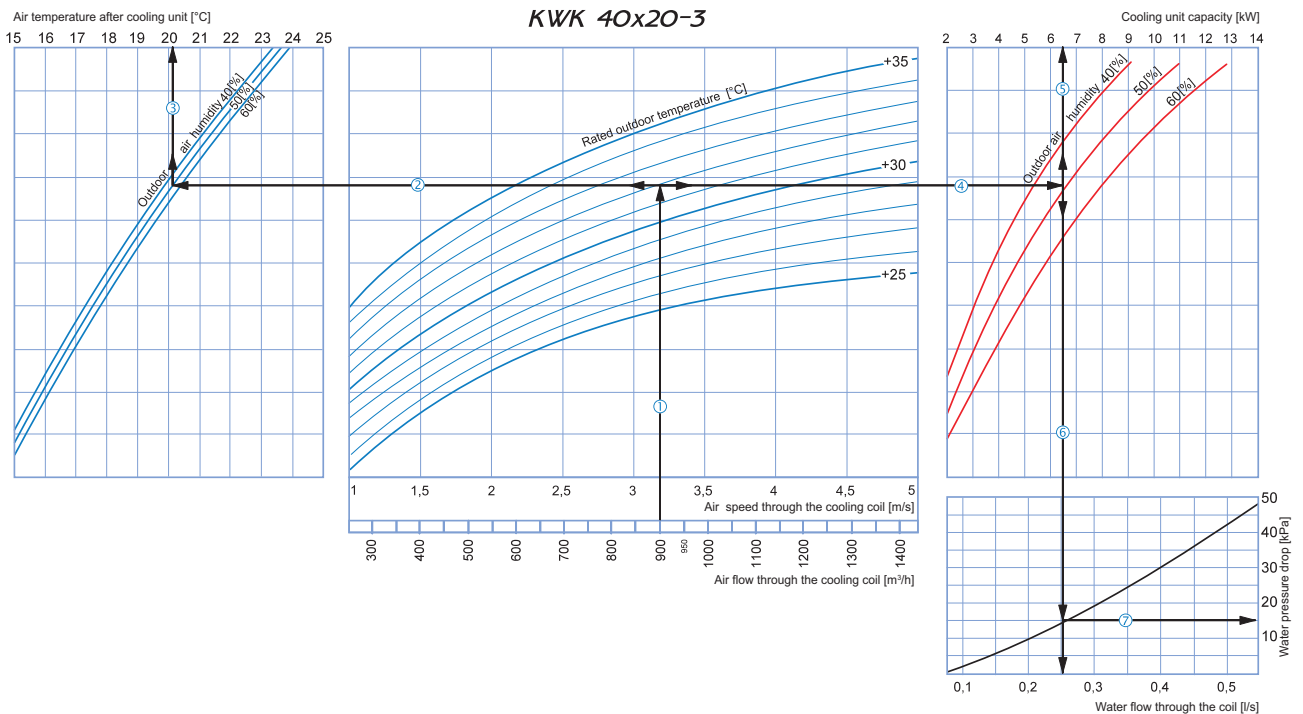
Counter air flow connection

Air flow streamwise connection

Overall dimensions

Type	Dimensions [mm]										
	B	B1	B2	B3	H	H1	H2	H3	H4	L	K
KWK 40x20-3	400	420	440	470	200	220	240	295	124	56	G 3/4"
KWK 50x25-3	500	520	540	570	250	270	290	345	188	45	G 3/4"
KWK 50x30-3	500	520	540	570	300	320	340	395	252	56	G 3/4"
KWK 60x30-3	600	620	640	670	300	320	340	395	252	56	G 3/4"
KWK 60x35-3	600	620	640	670	350	370	390	445	268	56	G 3/4"
KWK 70x40-3	700	720	740	770	400	420	440	495	314	56	G 3/4"
KWK 80x50-3	800	820	840	870	500	520	540	595	442	56	G 3/4"
KWK 90x50-3	900	920	940	970	500	520	540	595	442	56	G 3/4"
KWK 100x50-3	1000	1020	1040	1070	500	520	540	595	442	56	G 1"

Pressure losses in water cooling coils

KWK

DX cooling unit calculation diagram

How to use water cooling coil diagrams:

Sample parameters: Air flow = 900 m³/h, air flow speed through the cooling coil = 3.2 m/s ①.

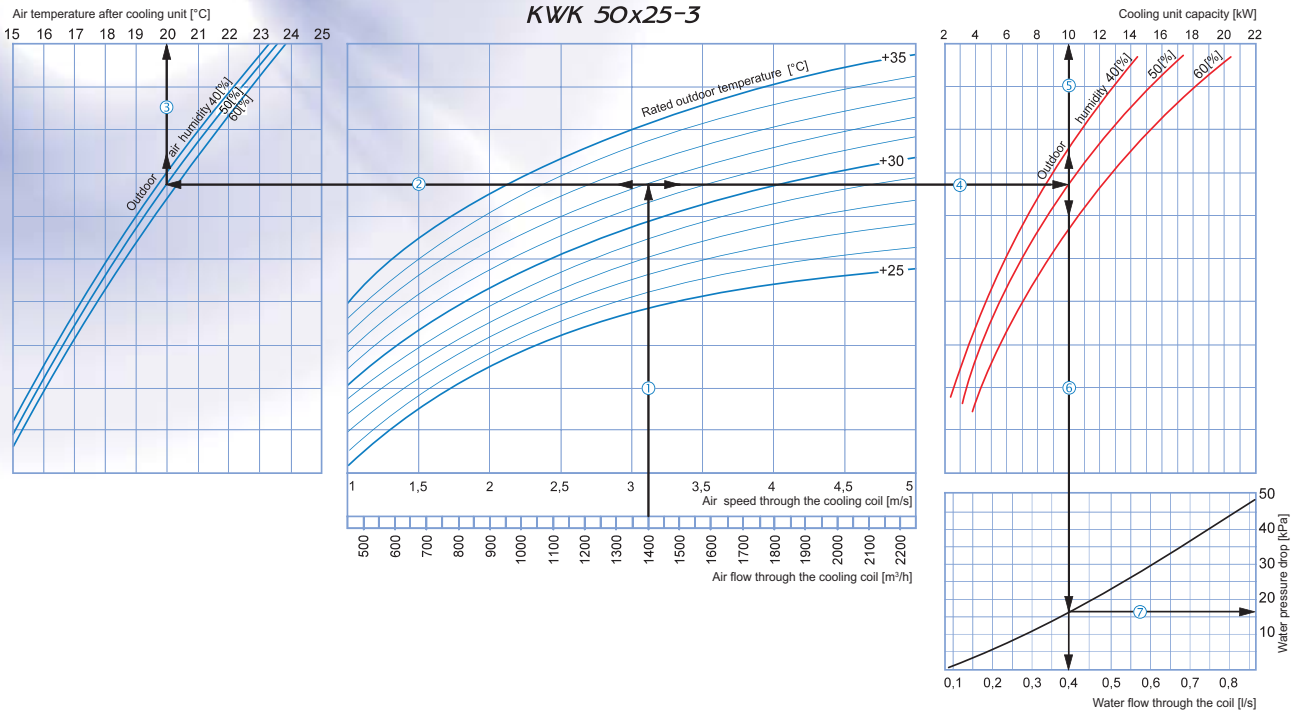
■ **Supply air temperature:** prolong the line of air flow (e.g. 900 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (20.1 °C).

■ **Cooling coil capacity:** Prolong the line ③ up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (6.5 kW).

■ **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.26 l/s).

■ **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (15.0 kPa).

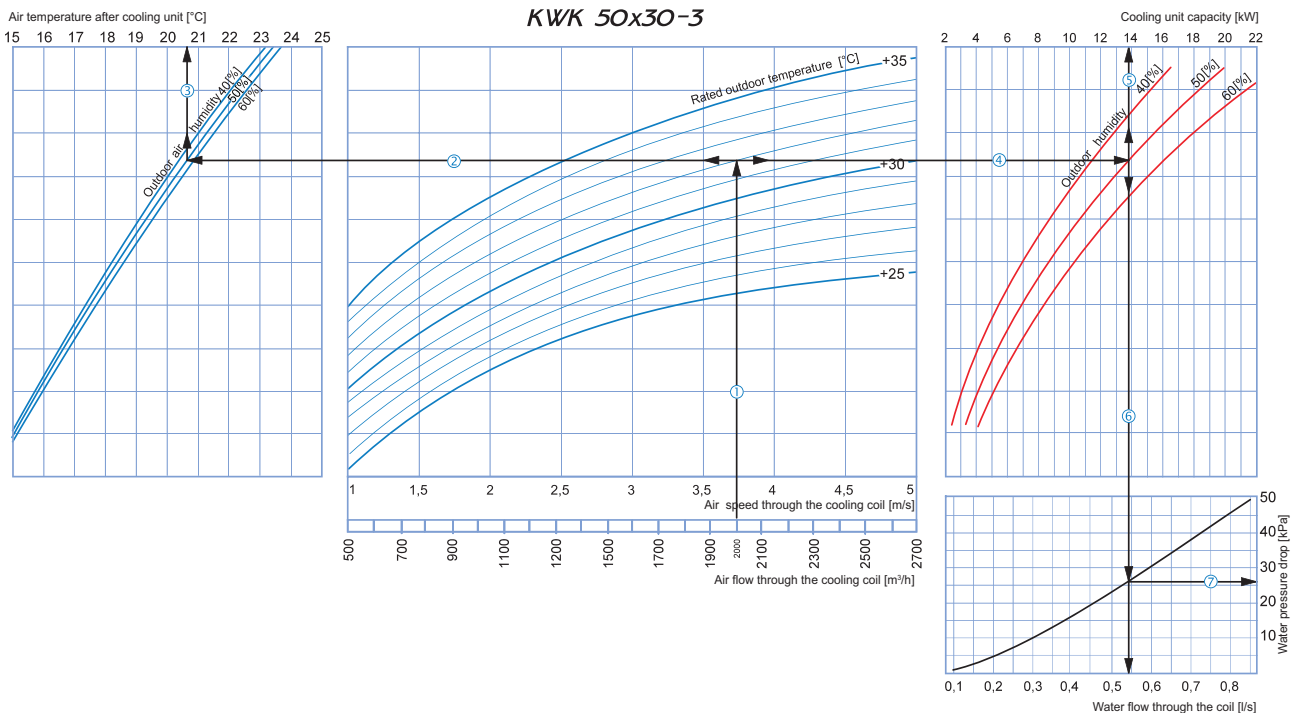
Water cooling unit calculation diagram



How to use water cooling coil diagrams:

Sample parameters: Air flow = 1400 m³/h, air flow speed through the cooling coil = 3.1 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 1400 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (20 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (10.0 kW).
- **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.4 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (17.0 kPa).

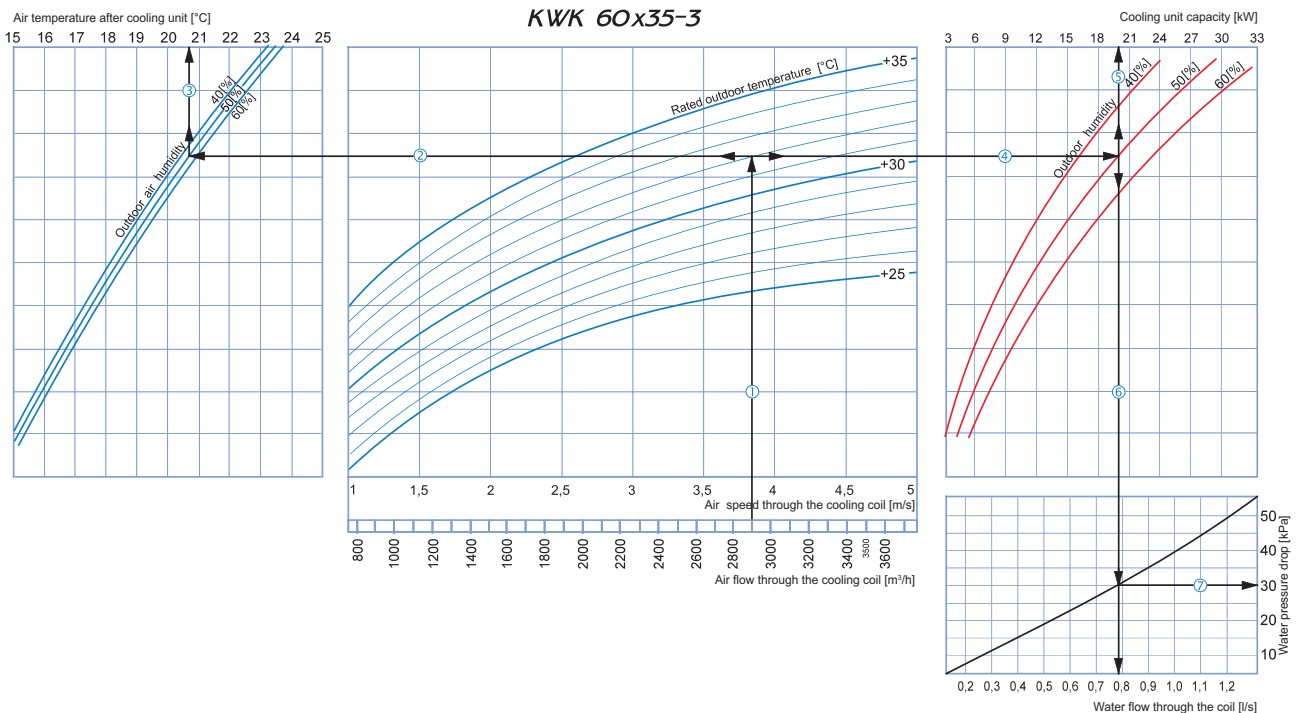
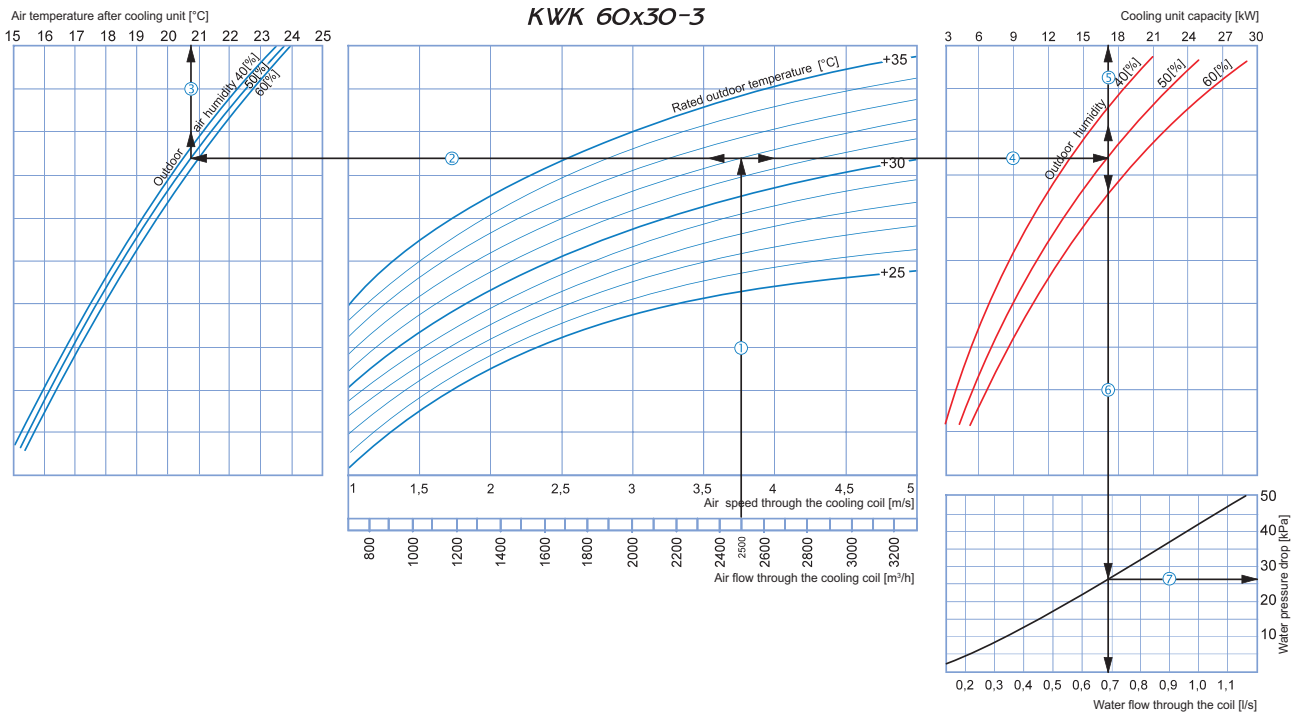


How to use water cooling coil diagrams:

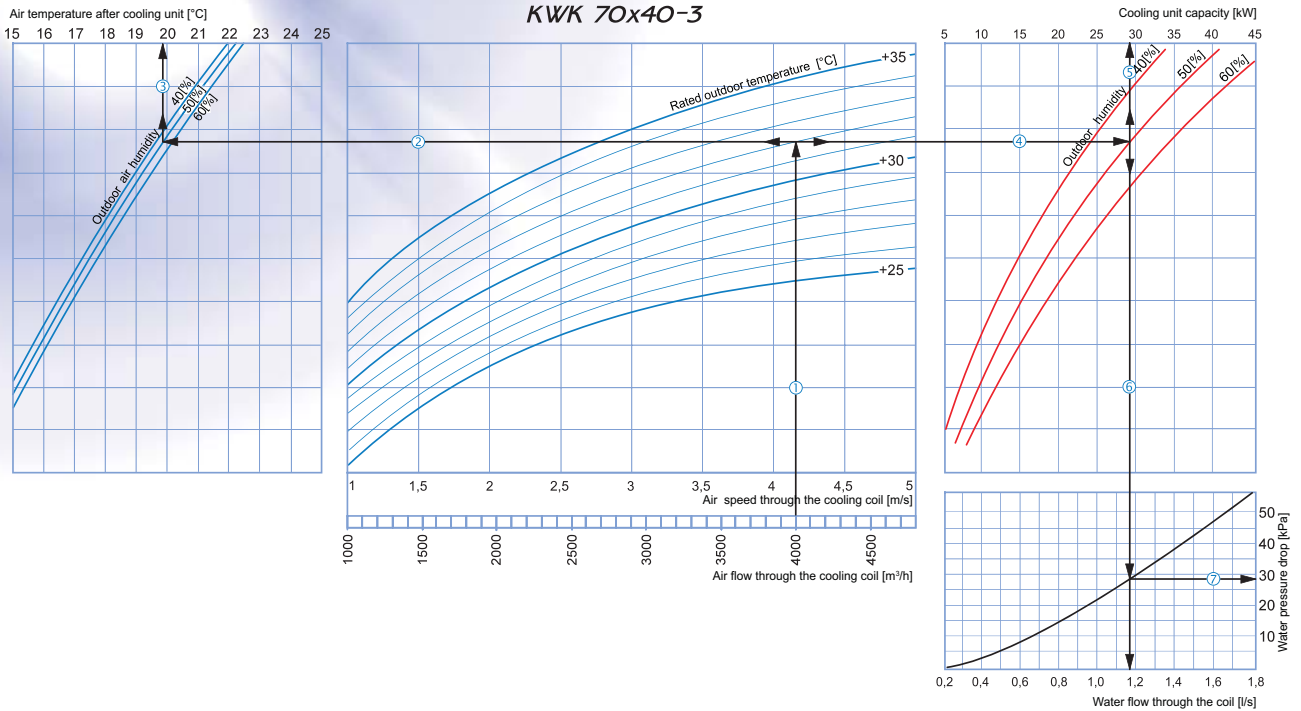
Sample parameters: Air flow = 2000 m³/h, air flow speed through the cooling coil = 3.75 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 2000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ up to the supply air temperature axis on top of the graphic (20.6 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (13.6 kW).
- **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.54 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (27 kPa).

Water cooling unit calculation diagram



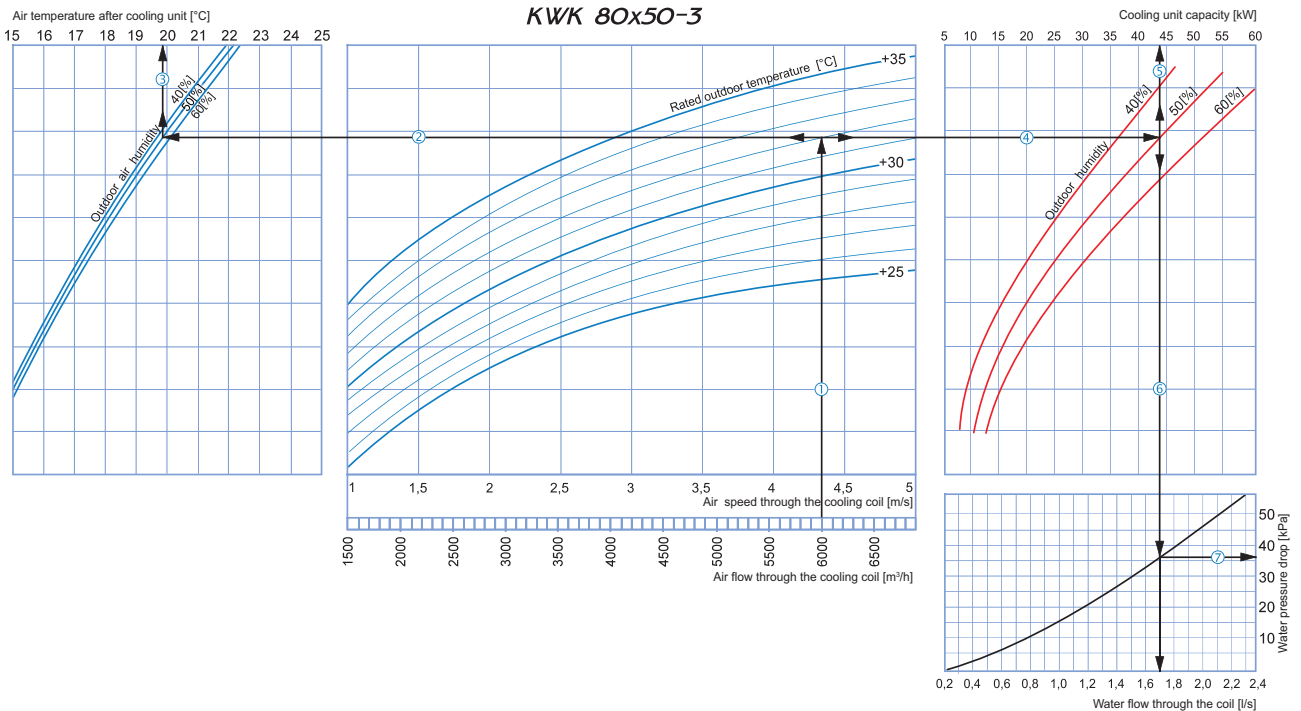
Water cooling unit calculation diagram



How to use water cooling coil diagrams:

Sample parameters: Air flow = 4000 m³/h, air flow speed through the cooling coil = 4.15 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 4000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (19.8 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (28.5 kW).
- **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.14 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (28 kPa).

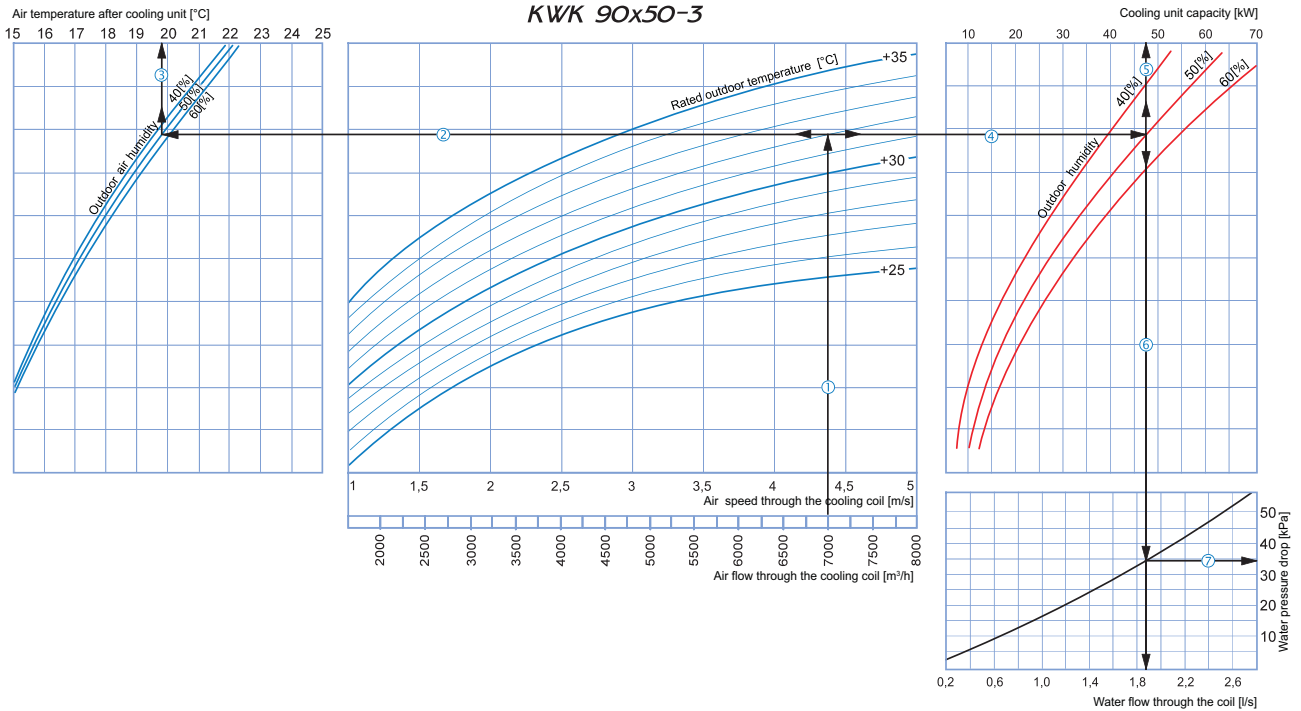


How to use water cooling coil diagrams:

Sample parameters: Air flow = 6000 m³/h, air flow speed through the cooling coil = 4.35 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 6000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (19.9 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (43 kW).
- **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.7 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (36 kPa).

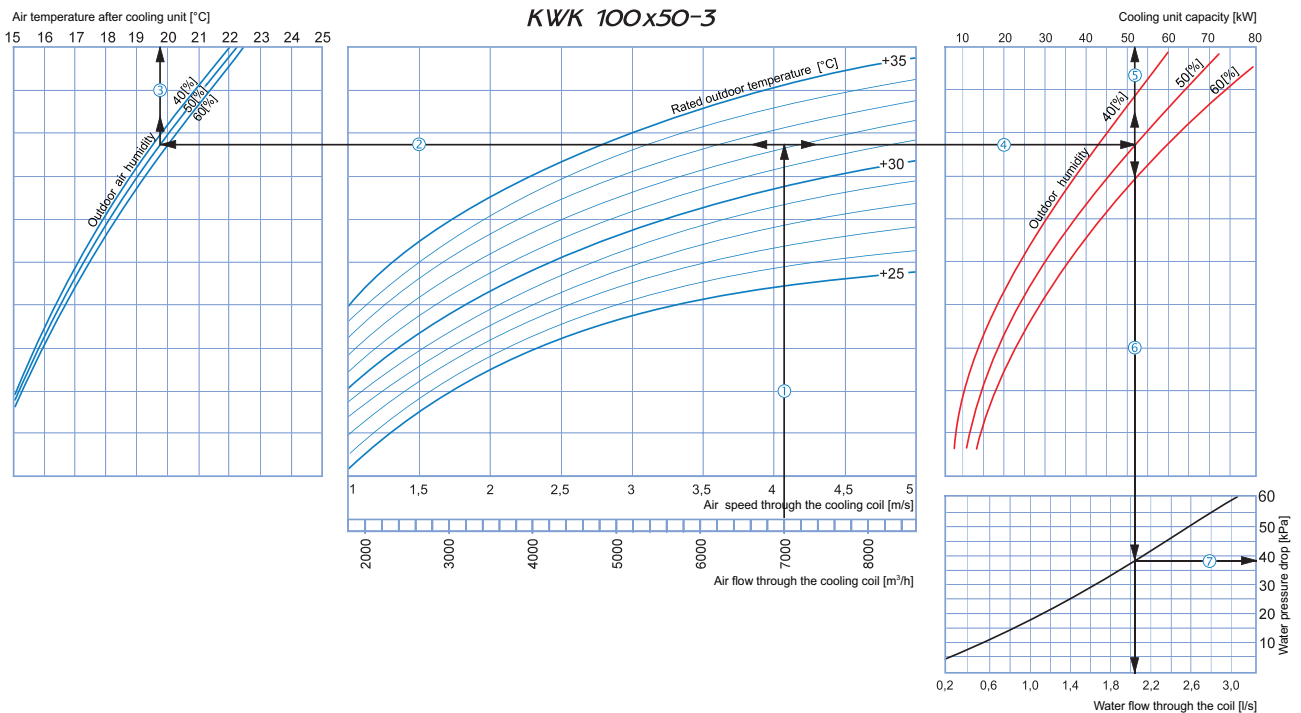
Water cooling unit calculation diagram



How to use water cooling coil diagrams:

Sample parameters: Air flow = 7000 m³/h, air flow speed through the cooling coil = 4.4 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 7000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (19.7 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (47 kW).
- **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (1.9 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (34 kPa).



How to use water cooling coil diagrams:

Sample parameters: Air flow = 7000 m³/h, air flow speed through the cooling coil = 4.1 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 7000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +32 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (19.6 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +32 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (52 kW).
- **Water flow through the coil:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (2.05 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (37 kPa).



Duct DX cooling units

KFK

for rectangular air ducts

Use

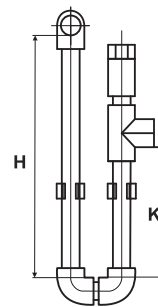
- Supply air cooling for ventilation systems in various premises.
- Suitable for installation into supply or air handling units to provide air cooling.

Design

- Galvanized steel casing.
- The cooling elements are made of copper tubes and aluminum plates.
- Available in three-coil modifications and rated for operation with R123, R134a, R152a, R404a, R407c, R410a, R507, R12, R22 refrigerants.
- Polypropylene droplet separator and drain pan for condensate drainage and removal included.
- Droplet separator operates efficiently at air flow below 4 m/s.

Mounting

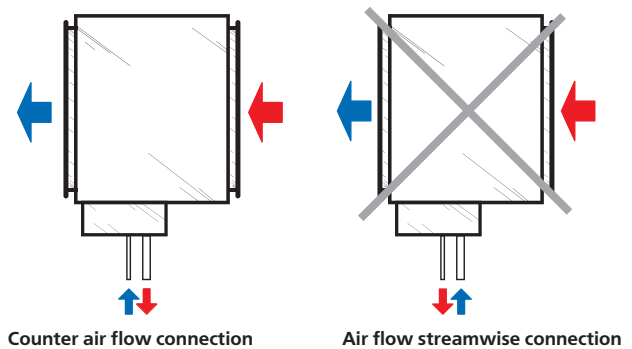
- Only horizontal mounting by means of flanged connection. Condensate drainage must be provided.
- Air filter must be installed upstream of the cooling unit to prevent the unit soiling.
- Installation position must ensure uniform air flow distribution through the entire cross section.
- Installation upstream or downstream of the supply fan. The minimum air duct length downstream of the fan must be 1-1.5 m to ensure air flow stabilization.
- The maximum cooling capacity is attained if the cooling unit is connected on counter-flow basis. The attached charts are valid for counter-flow connection.
- While mounting the cooling unit provide condensate drainage through the U-trap. The U-trap height must be selected with respect to the total fan pressure, refer to the table and diagram below.



H [mm]	K [mm]	P [Pa]
100	55	600
200	105	1100
260	140	1400

H - U-trap height
K - drainage height
P - total fan pressure

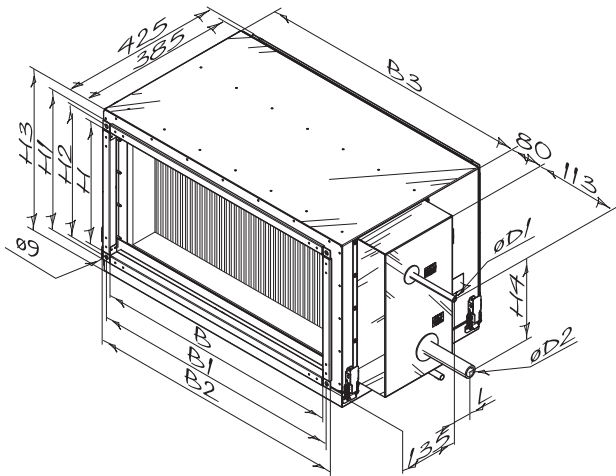
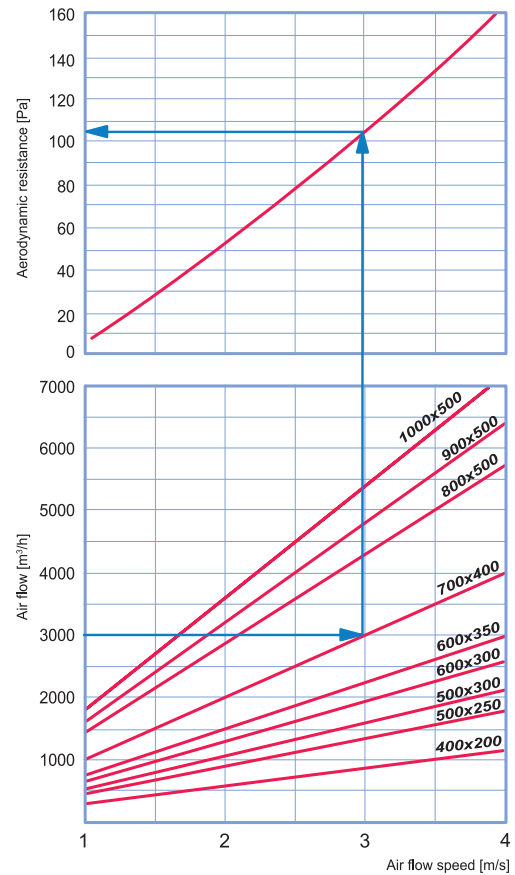
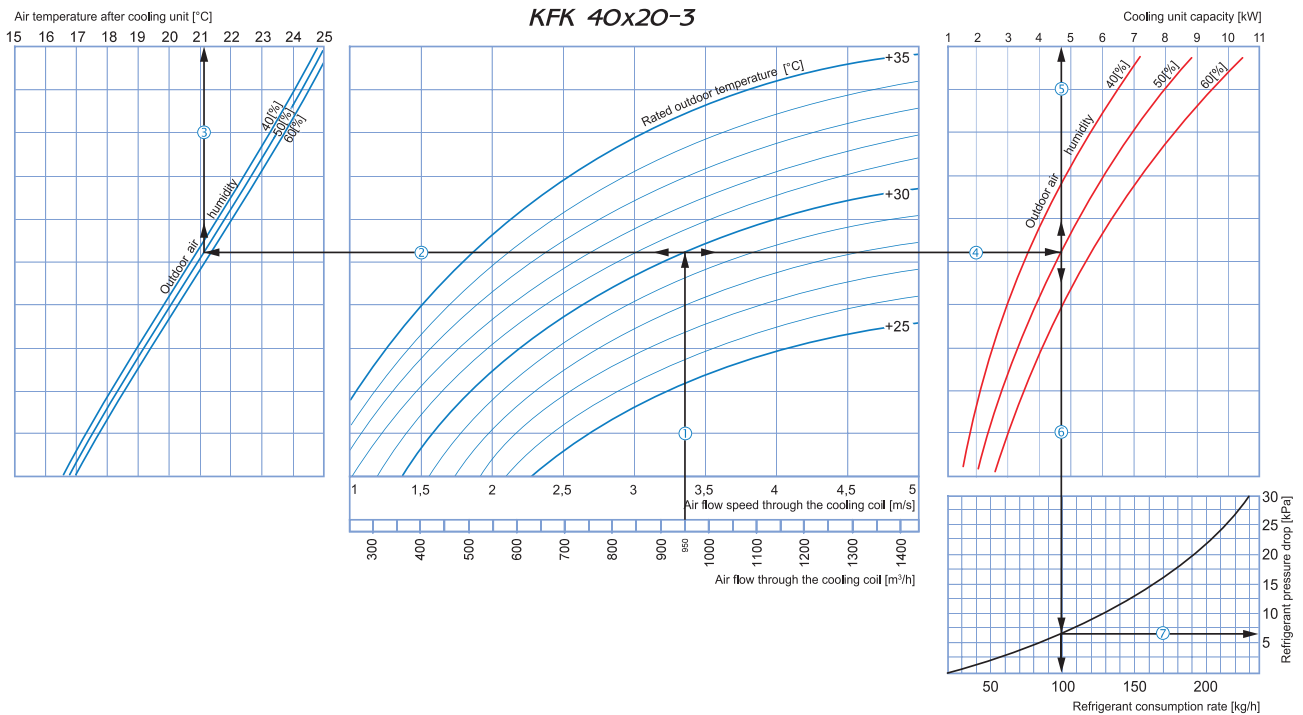
- For a proper and safe operation of the cooling unit it should be connected to a control system for integral control and automatic cooling capacity regulation.



Overall dimensions

Type	Dimensions [mm]											
	B	B1	B2	B3	H	H1	H2	H3	H4	L	D1	D2
KFK 40x20-3	400	420	440	470	200	220	240	295	103	44	12	22
KFK 50x25-3	500	520	540	570	250	270	290	345	155	44	12	22
KFK 50x30-3	500	520	540	570	300	320	340	395	210	33	12	22
KFK 60x30-3	600	620	640	670	300	320	340	395	199	44	18	28
KFK 60x35-3	600	620	640	670	350	370	390	445	199	44	18	28
KFK 70x40-3	700	720	740	770	400	420	440	495	224	44	22	28
KFK 80x50-3	800	820	840	870	500	520	540	595	340	44	22	28
KFK 90x50-3	900	920	940	970	500	520	540	595	340	44	22	28
KFK 100x50-3	1000	1020	1040	1070	500	520	540	595	325	44	22	28

Air pressure losses in DX cooling coils


KFK

Water cooling unit calculation diagram

How to use DX cooling coil diagrams:

Sample parameters: Air flow = 950 m³/h, air flow speed through the cooling coil = 3.35 m/s ①.

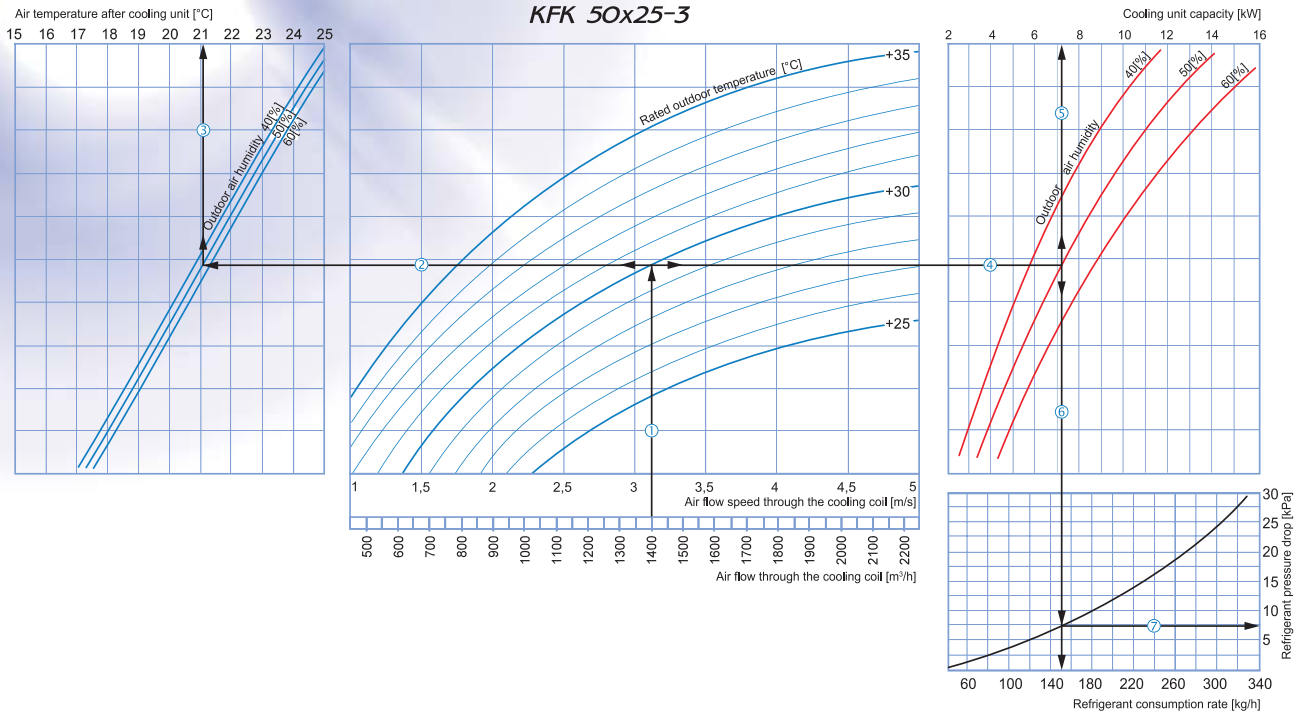
■ **Supply air temperature:** prolong the line of air flow (e.g. 950 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+21.1 °C).

■ **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (4.7 kW).

■ **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (100 kg/h).

■ **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (6.5 kPa).

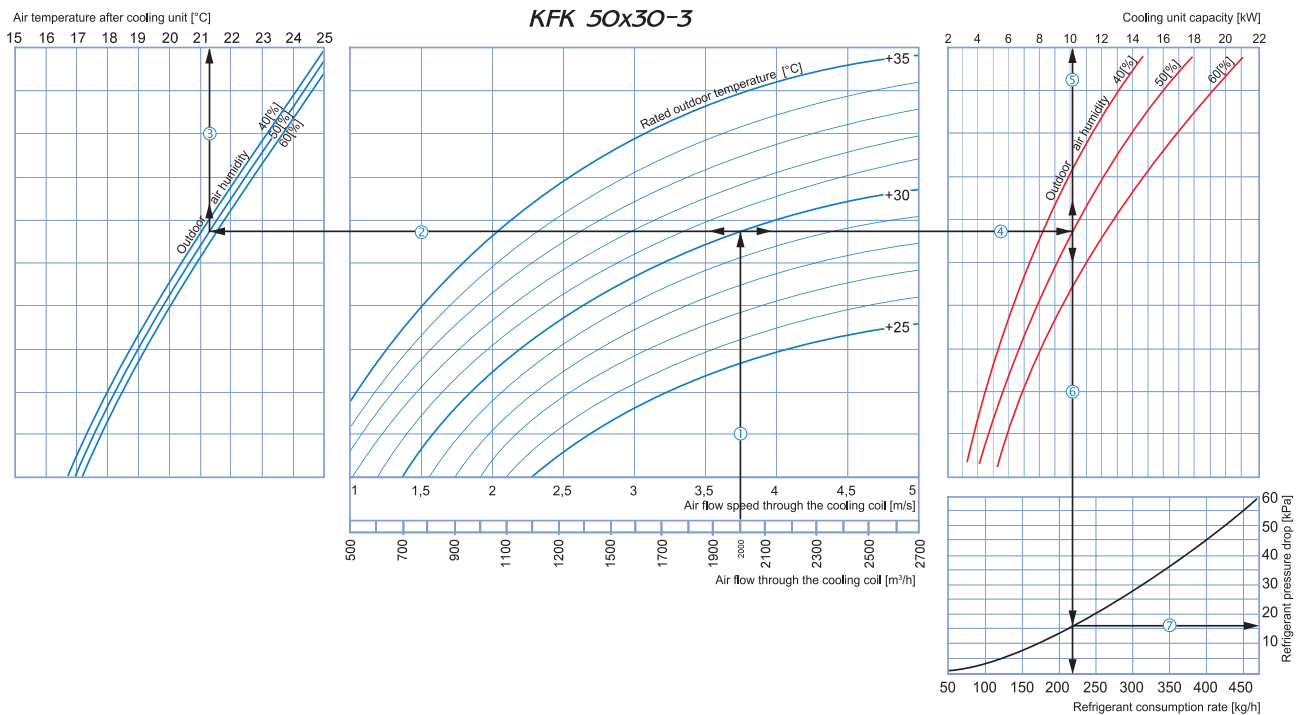
Water cooling unit calculation diagram



How to use DX cooling coil diagrams:

Sample parameters: Air flow = 1400 m³/h, air flow speed through the cooling coil = 3.1 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 1400 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+21.1 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (7.2 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (152 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (7.5 kPa).

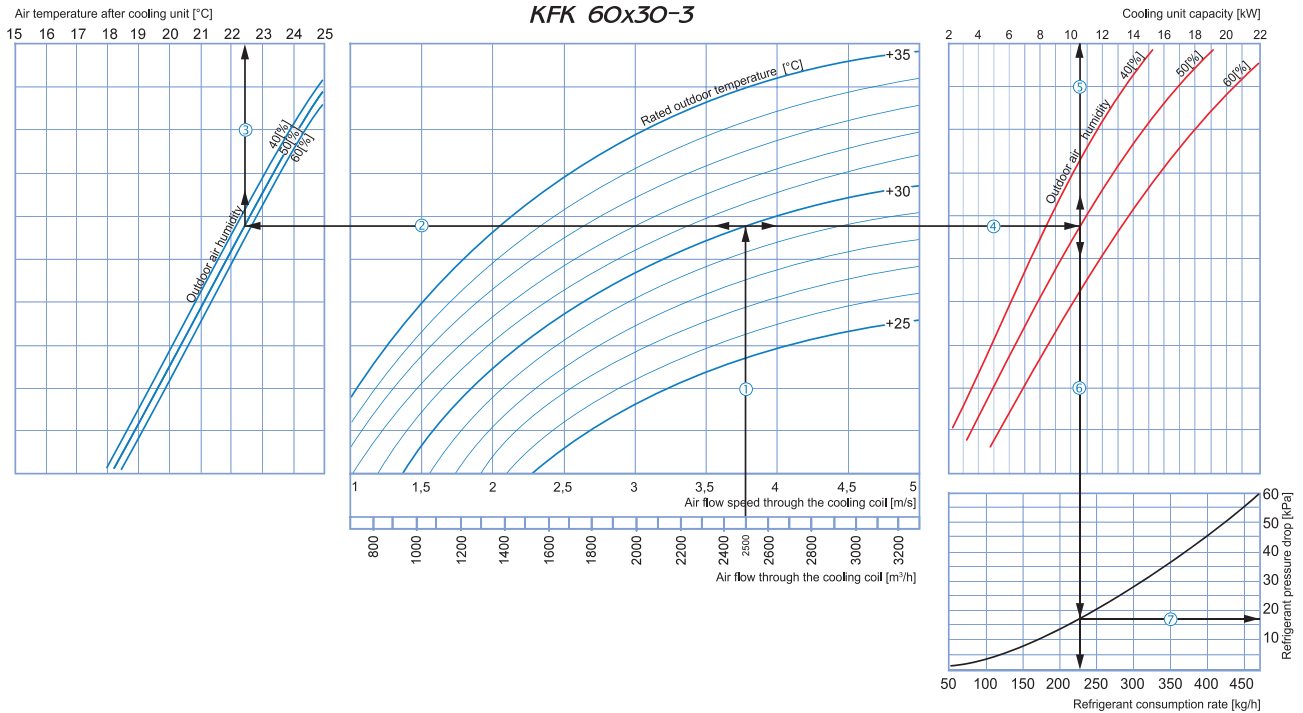


How to use DX cooling coil diagrams:

Sample parameters: Air flow = 2000 m³/h, air flow speed through the cooling coil = 3.75 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 2000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+21.2 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (10 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (215 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (16 kPa).

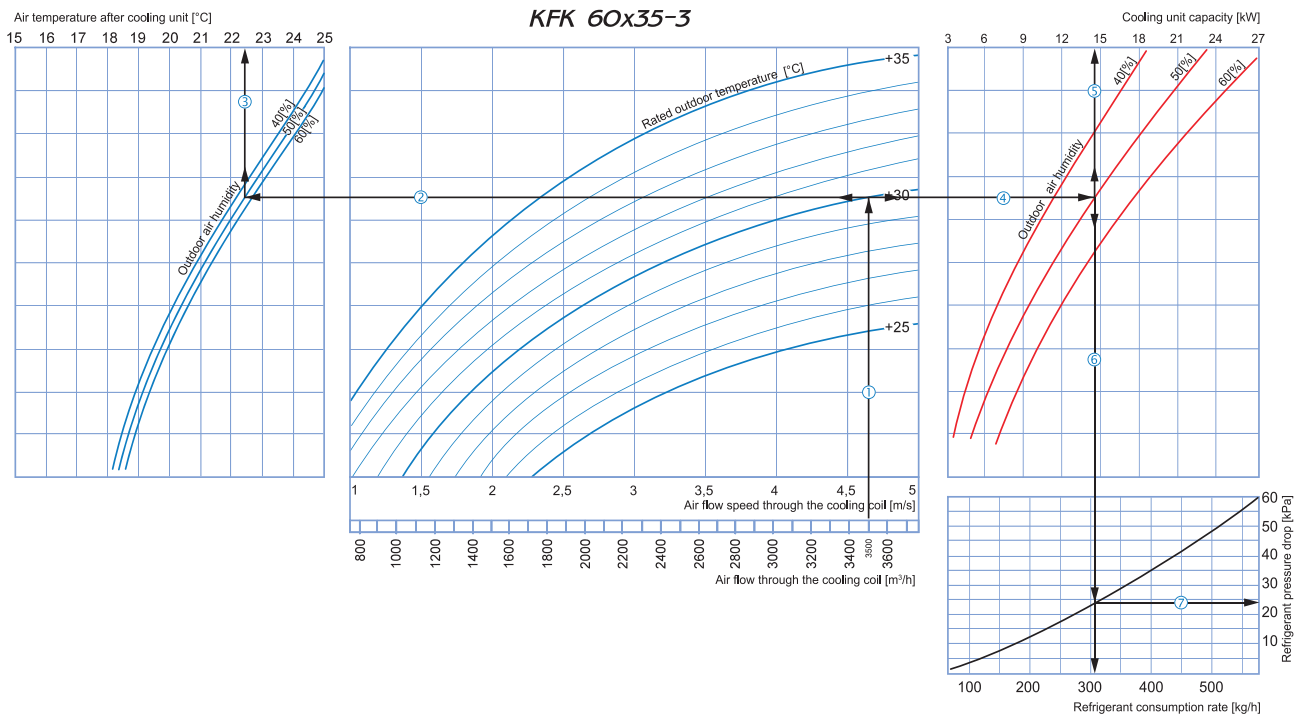
Water cooling unit calculation diagram



How to use DX cooling coil diagrams:

Sample parameters: Air flow = 2500 m³/h, air flow speed through the cooling coil = 3.75 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 2500 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+22.5 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (10.5 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (225 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (17 kPa).

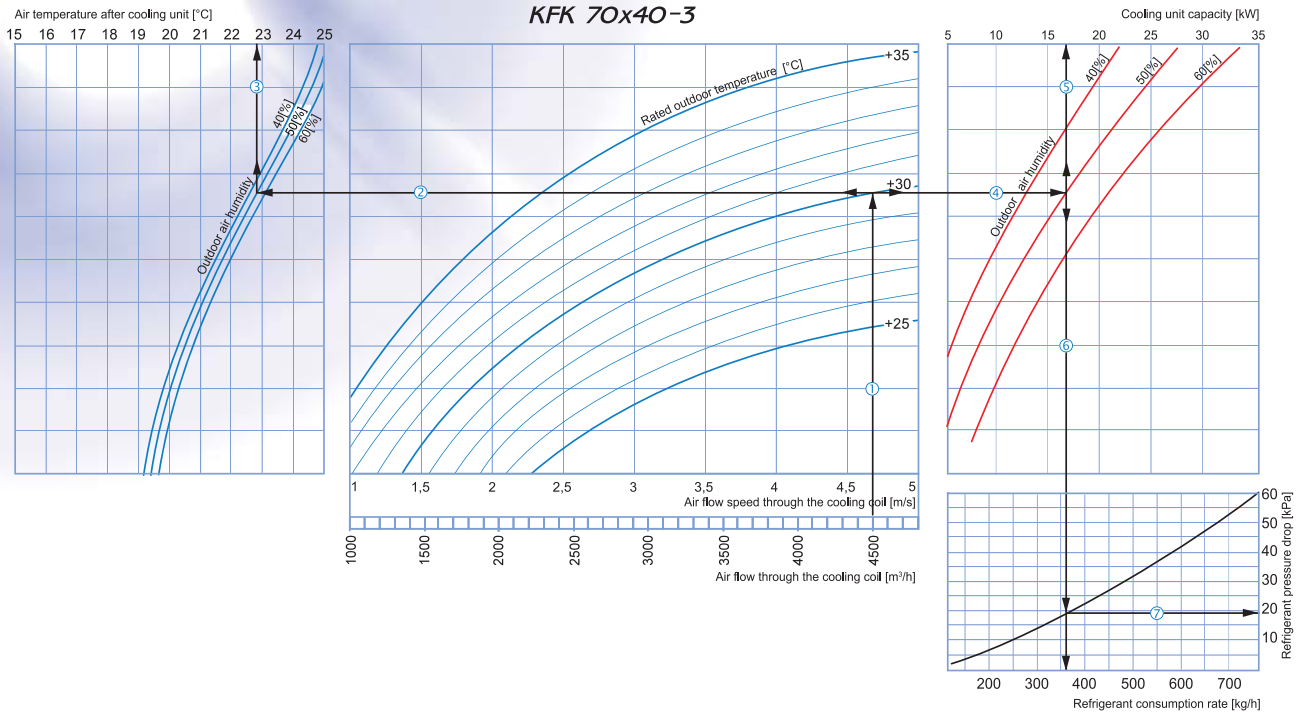


How to use DX cooling coil diagrams:

Sample parameters: Air flow = 3500 m³/h, air flow speed through the cooling coil = 4.65 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 3500 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+22.5 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (14.5 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (310 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (24 kPa).

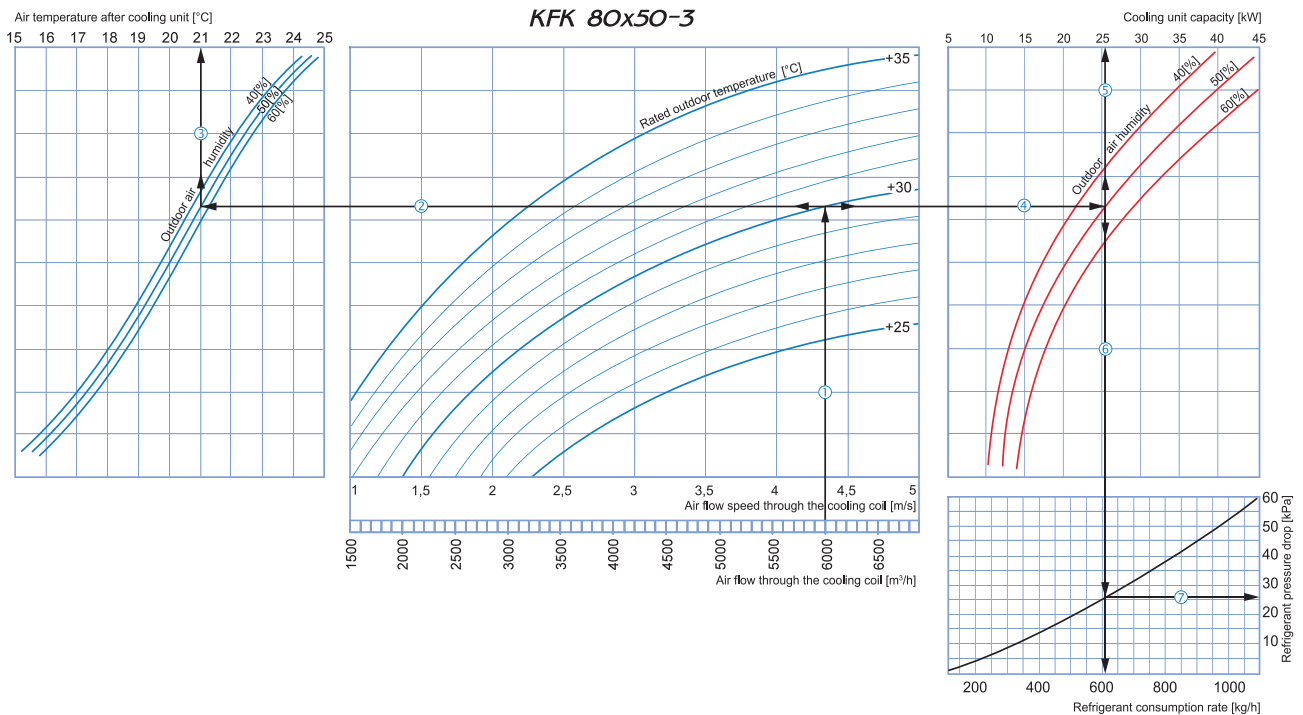
Water cooling unit calculation diagram



How to use DX cooling coil diagrams:

Sample parameters: Air flow = 4500 m³/h, air flow speed through the cooling coil = 4.7 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 4500 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+22.8 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (17 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (360 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (19 kPa).

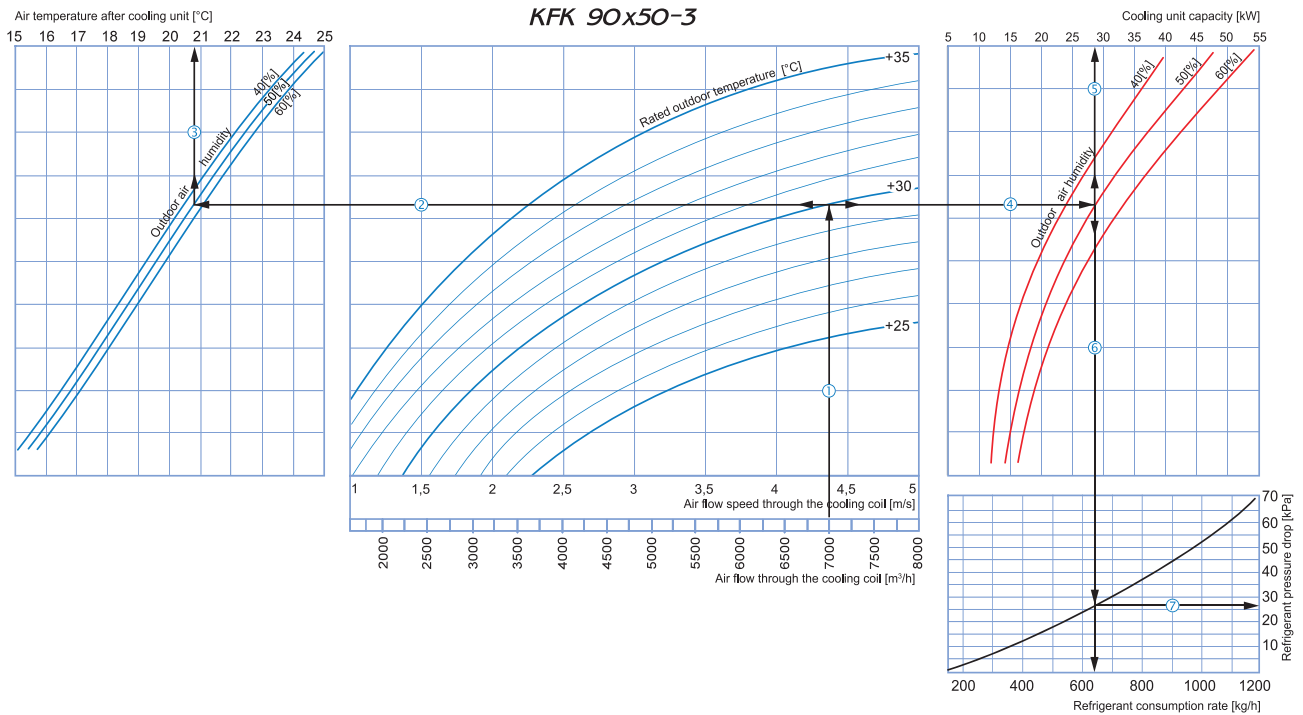


How to use DX cooling coil diagrams:

Sample parameters: Air flow = 6000 m³/h, air flow speed through the cooling coil = 4.35 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 6000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+21.0 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (25.5 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (605 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (26 kPa).

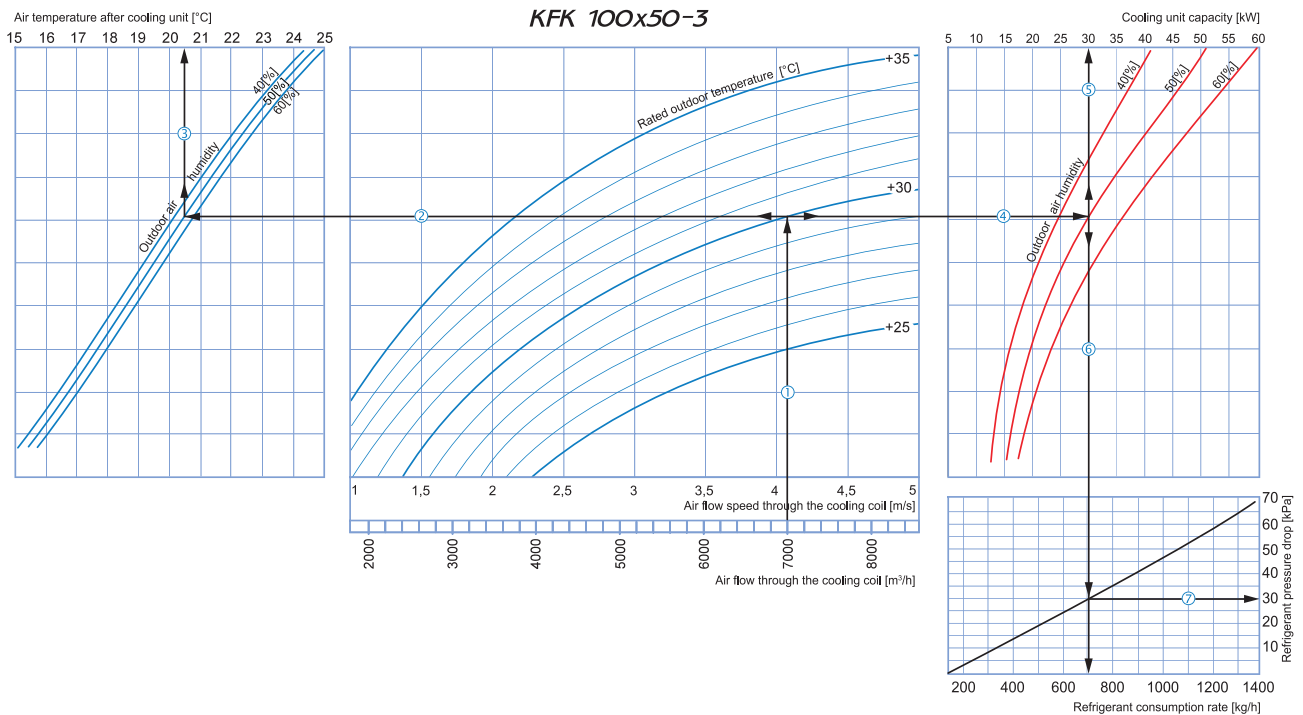
Water cooling unit calculation diagram



How to use DX cooling coil diagrams:

Sample parameters: Air flow = 7000 m³/h, air flow speed through the cooling coil = 4.4 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 7000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+20.7 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (28 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (640 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (26 kPa).



How to use DX cooling coil diagrams:

Sample parameters: Air flow = 7000 m³/h, air flow speed through the cooling coil = 4.1 m/s ①.

- **Supply air temperature:** prolong the line of air flow (e.g. 7000 m³/h) ① up to the point where it crosses the outside air temperature (e.g. +30 °C); then draw a horizontal line ② from this point to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line ③ to the air temperature after cooling unit axis on top of the graphic (+20.5 °C).
- **Cooling coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. +30 °C) and draw a horizontal line ④ from this point to the right until it crosses the outdoor air humidity curve (e.g. 50 %). From here draw a vertical line ⑤ up to the scale representing the cooling coil capacity (30 kW).
- **Refrigerant consumption through the coil:** Prolong the line ⑤ down to the refrigerant consumption axis ⑥ at the bottom of the graphic (710 kg/h).
- **Refrigerant pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the curve to the refrigerant drop axis (30 kPa).



Water mixing units

WMG

for water heating and cooling units

Use

- Smooth heating medium flow regulation and supply air set temperature maintaining in ventilation systems with water heating or cooling coils.
- Compatible with the WKH duct water heating coils and the KWK duct cooling coils.
- Compatible with all water heating or cooling coils installed in BLAUBOX supply units and KOMFORT air handling units.

Design

- The water mixing unit consists a circulation pump, a three-way electrically actuated heat medium control valve and a recirculation pipe.



- The three-way valve is designed for smooth mixing of the heat medium stream from the heating (cooling) system and the return heat

medium in a required proportion to regulate the heat medium temperature supplied to the water heating or cooling coils.

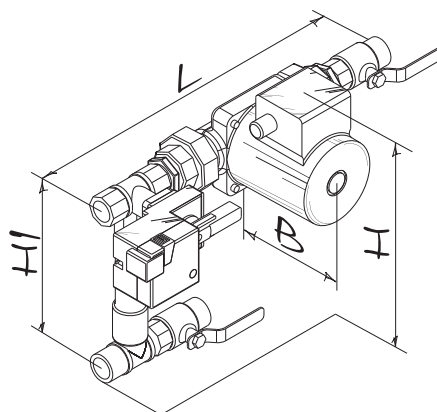
- The three-way way is actuated with a control 0-10 V signal from the ventilation control system.
- The mixing unit is rated for heat medium operating pressure in the mixing set 10 bar.

Connection to water circuit

- Connection of the mixing unit to the water heating or cooling coils and to the water heating/cooling network through the pipes or flexible hoses of respective diameter, refer to the technical data table.
- In case of applying flexible hoses the mixing unit must be rigidly fixed.
- While installing the mixing unit the motor shaft must be installed horizontally. No mechanical loads from the pipes are allowed.

Overall dimensions

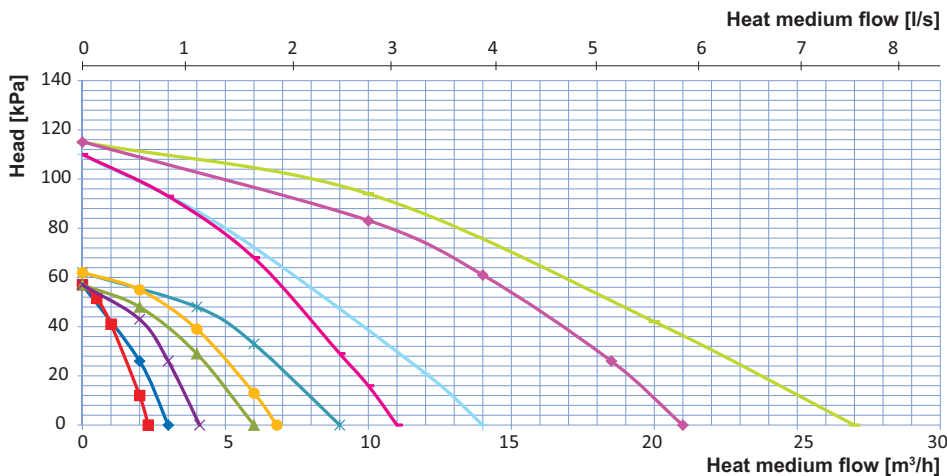
Type	Dimensions [mm]				Weight [kg]
	B	H	H1	L	
WMG 3/4-4	150	290	180	460	4.1
WMG 3/4-6	150	290	180	460	4.1
WMG 1-6	175	320	210	490	6.8
WMG 1-10	175	320	210	490	6.8
WMG 1 1/4-10	175	355	240	500	7.4
WMG 1 1/4-16	175	355	240	500	7.4
WMG 1 1/2-16	266	420	255	610	23.0
WMG 1 1/2-25	266	420	255	610	23.0
WMG 2-25	312	474	290	660	31.0
WMG 2-40	312	474	290	660	31.0



Specifications

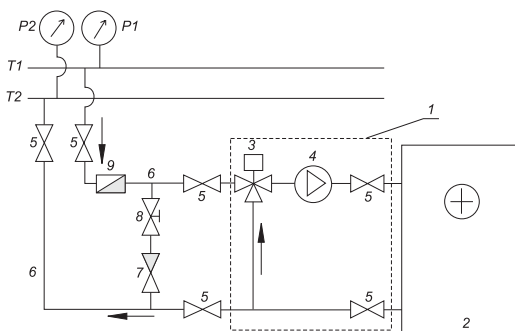
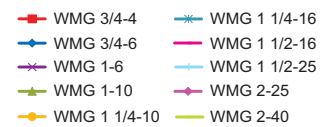
Parameters	WMG 3/4-4	WMG 3/4-6	WMG 1-6	WMG 1-10	WMG 1 1/4-10	WMG 1 1/4-16	WMG 1 1/2-16	WMG 1 1/2-25	WMG 2-25	WMG 2-40
Circulation pump	DAB VA65/180		DAB A50/180XM		DAB A56/180XM		DAB BPH 120/250.40M		DAB BPH 120/280.50T	
Three-way valve control way	0...10 V									
Electrically actuated three-way valve	R317	R318	R322	R323	R329	R331	R338	R339G	R348	R349G
Three-way valve actuator Belimo	LR24A-SR						NR24A-SR	SR24A-SR	NR24A-SR	SR24A-SR
Connection type	Threaded connection						Flanged connection			
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 heat medium transmission factor (K_{vs}^*)	4	6.3	6.3	10	10	16	16	25	25	40
Max. mixing unit flow capacity [m ³ /h]	2.3	3.0	4.1	6.0	6.8	9.0	11.0	14.0	21.0	27.0
Developed head [kPa]	57	57	57	57	62	62	110	110	115	115
Connected spigot diameter	3/4"	3/4"	1"	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	2"	2"
Transported heat medium temperature [°C]	-10...+110						-10...+120			
Max. glycol content in the transported heat medium [%]	30	30	30	30	30	30	30	30	30	30
Number of pump speeds	3	3	3	3	3	3	3	3	3	3
Phase / Pump supply voltage / 50 Hz [V]	1 ~ 230								3 ~ 400	
Max. pump power [W]	78	78	184	184	271	271	510	510	898	898

* heat medium transmission factor $K_{vs} = \frac{V_{100}}{\sqrt{\frac{\Delta p_{V_{100}}}{100}}}$, where $\Delta p_{V_{100}}$ – pressure loss when the heat medium valve is fully opened; V_{100} – rated heat medium flow at $\Delta p_{V_{100}}$.



Mixing unit calculation diagram

Mixing unit selection: find the required heat medium flow through the heating (cooling) unit as well as heat medium pressure drop (available head). These parameters are determined using the heating or cooling unit calculation diagram for each water heating or cooling unit.



Recommended connection to water network

T1 and T2 – heat medium supply and return pipeline;
 P1 and P2 – water pressure gauges for supply and return pipes.

1 – mixing unit;
 2 – water heater;
 3 – electrically actuated three-way valve;
 4 – circulation pump;
 5 – shut-off valve;

6 – supply and return pipes from the heat distribution system to the water heater;
 7 – non-return valve;
 8 – balancing valve;
 9 – coarse filter.



Silencers

SD

for round ducts

■ Use

- For attenuation of noise produced by a ventilation system and spreaded along ventilation ductworks.
- Used jointly with sound-insulated fans in premises with high requirements to noise level produced by ventilation equipment.
- Compatible with Ø 100 mm up to 315 mm round air ducts.

■ Design

- Galvanized steel case is filled with non-flammable sound-absorbing material with protecting covering against fiber blowing.
- Airtight connection with air ducts due to connecting flanges with rubber seals.
- A great variety of standard ranges with several length options.

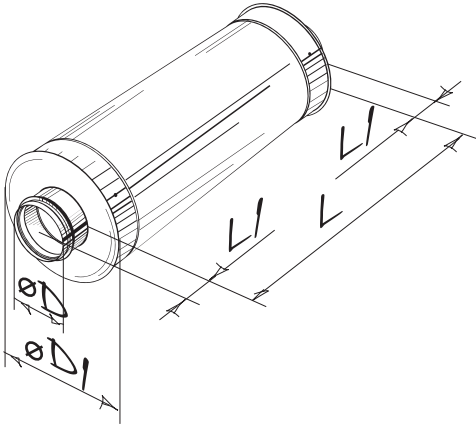
■ Mounting

- Fixing to round ducts with clamps.
- Any mounting position.
- For better sound absorption install the silencers in series.

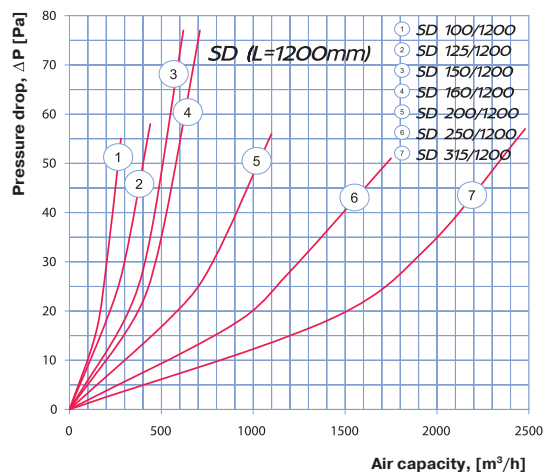
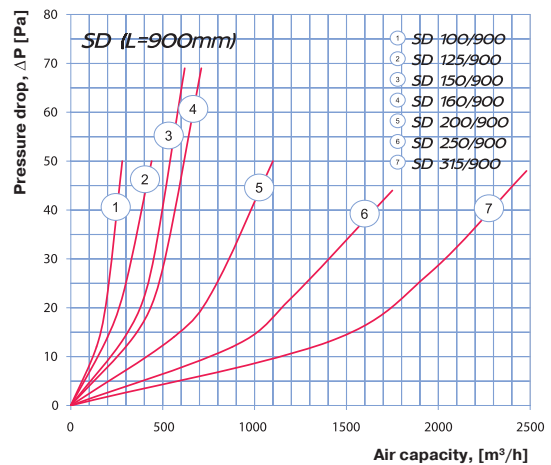
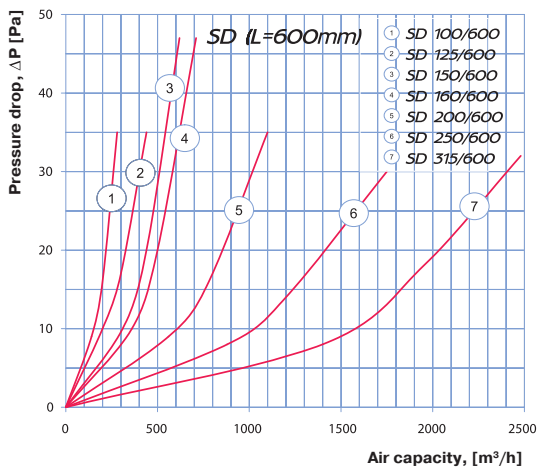
Noise level reduction, dB (octave-frequency band [Hz])

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SD 100/600	4	8	10	20	34	30	13	14
SD 100/900	5	10	15	23	44	30	16	15
SD 100/1200	6	11	19	28	50	34	20	18
SD 125/600	3	5	6	15	28	17	10	9
SD 125/900	4	9	12	22	43	22	16	12
SD 125/1200	4	9	16	27	48	27	21	17
SD 150/600	2	4	8	16	32	11	7	7
SD 150/900	3	5	9	18	36	25	13	14
SD 150/1200	4	8	14	25	43	30	18	19
SD 160/600	2	4	8	17	33	11	7	7
SD 160/900	2	5	10	19	37	25	13	15
SD 160/1200	4	10	14	24	42	30	19	20
SD 200/600	2	4	6	10	27	13	7	7
SD 200/900	3	7	11	20	39	23	8	7
SD 200/1200	4	10	14	23	40	26	13	12
SD 250/600	4	5	6	11	22	12	7	6
SD 250/900	4	5	7	16	32	20	12	10
SD 250/1200	4	6	8	17	34	22	14	12
SD 315/600	2	4	5	10	17	9	6	5
SD 315/900	3	5	8	17	30	14	10	8
SD 315/1200	4	7	11	22	36	18	14	10

Overall dimensions



Type	Dimensions [mm]				Weight [kg]
	øD	øD1	L	L1	
SD 100/600	99	200	600	50	2.2
SD 100/900	99	200	900	50	3.2
SD 100/1200	99	200	1200	50	4.3
SD 125/600	124	225	600	50	2.7
SD 125/900	124	225	900	50	4.1
SD 125/1200	124	225	1200	50	5.4
SD 150/600	149	250	600	50	2.8
SD 150/900	149	250	900	50	4.2
SD 150/1200	149	250	1200	50	5.6
SD 160/600	159	260	600	50	3.1
SD 160/900	159	260	900	50	4.6
SD 160/1200	159	260	1200	50	6.2
SD 200/600	199	300	600	50	3.5
SD 200/900	199	300	900	50	5.3
SD 200/1200	199	300	1200	50	7.1
SD 250/600	249	350	600	50	4.2
SD 250/900	249	350	900	50	6.2
SD 250/1200	249	350	1200	50	8.3
SD 315/600	314	415	600	50	4.7
SD 315/900	314	415	900	50	7.1
SD 315/1200	314	415	1200	50	9.4





Flexible silencers

SDF

for round ducts

Use

- For attenuation of noise produced by a ventilation system and spreaded along ventilation ductworks.
- Used jointly with sound-insulated fans in premises with high requirements to noise level produced by ventilation equipment.
- Compatible with Ø 100 mm up to 315 mm round air ducts.

Design

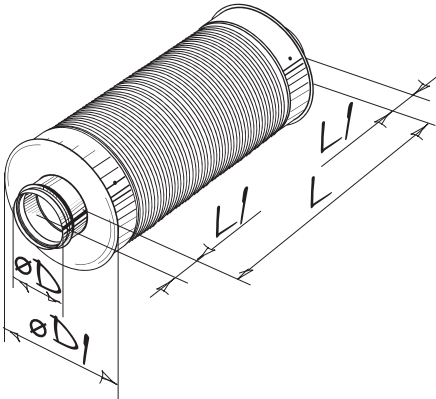
- Consists of outer and inner flexible spiral seam air ducts made of aluminium alloy and filled with non-flammable sound-absorbing material.
- Internal surface is perforated and covered with protection coating to prevent fiber blowing-out.
- A great variety of standard ranges with several length options.

Mounting

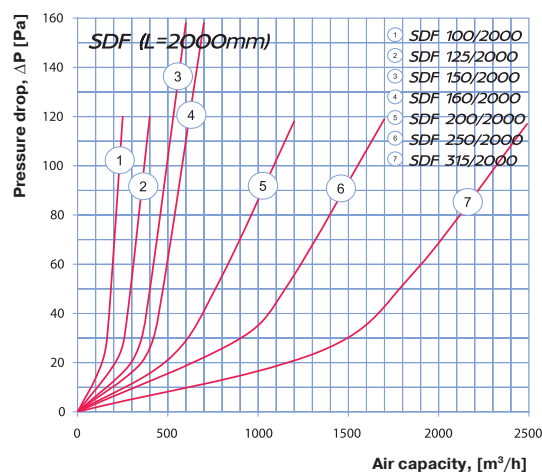
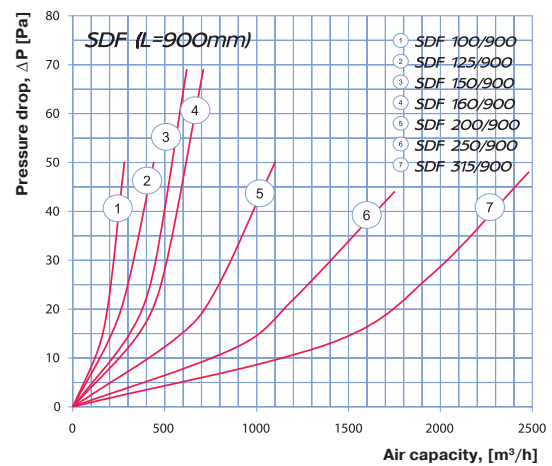
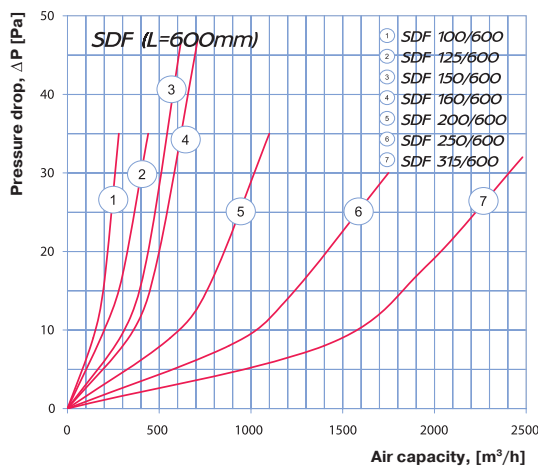
- Fixing to round ducts with clamps.
- Any mounting position.
- For better sound absorption install the silencers in series.
- Fixing on both ends and in the middle to prevent sagging.

	Noise level reduction, dB (octave-frequency band [Hz])							
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SDF 100/600	6	8	13	22	28	34	17	20
SDF 100/900	8	10	15	25	33	40	21	23
SDF 100/2000	10	15	24	48	53	51	39	36
SDF 125/600	4	7	14	20	31	31	13	12
SDF 125/900	5	9	16	23	36	37	17	16
SDF 125/2000	7	15	23	47	55	50	28	25
SDF 150/600	3	7	12	32	40	40	19	20
SDF 150/900	4	8	14	40	48	49	26	25
SDF 150/2000	5	10	21	42	50	48	26	25
SDF 160/600	3	7	12	20	25	24	10	12
SDF 160/900	3	8	13	21	28	28	13	16
SDF 160/2000	5	11	20	40	48	48	25	25
SDF 200/600	2	5	12	20	26	21	10	10
SDF 200/900	3	6	12	22	28	24	12	13
SDF 200/2000	4	11	22	42	51	34	19	23
SDF 250/600	2	3	8	16	22	13	10	10
SDF 250/900	2	4	9	18	25	16	11	12
SDF 250/2000	3	6	16	30	39	27	17	22
SDF 315/600	2	4	9	18	21	12	7	9
SDF 315/900	2	5	11	21	24	14	8	10
SDF 315/2000	4	7	17	34	39	24	14	18

Overall dimensions



Type	Dimensions [mm]				Weight [kg]
	øD	øD1	L	L1	
SDF 100/600	99	220	600	55	1.6
SDF 100/900	99	220	900	55	2.4
SDF 100/2000	99	220	2000	55	5.2
SDF 125/600	124	270	600	55	2.0
SDF 125/900	124	270	900	55	3.0
SDF 125/2000	124	270	2000	55	6.6
SDF 150/600	149	270	600	55	2.1
SDF 150/900	149	270	900	55	3.1
SDF 150/2000	149	270	2000	55	6.8
SDF 160/600	159	270	600	55	2.1
SDF 160/900	159	270	900	55	3.2
SDF 160/2000	159	270	2000	55	7.0
SDF 200/600	199	320	600	55	2.6
SDF 200/900	199	320	900	55	3.9
SDF 200/2000	199	320	2000	55	8.6
SDF 250/600	249	370	600	55	3.0
SDF 250/900	249	370	900	55	4.5
SDF 250/2000	249	370	2000	55	10.1
SDF 315/600	314	420	600	55	3.4
SDF 315/900	314	420	900	55	5.1
SDF 315/2000	314	420	2000	55	11.4





Silencers

SD

for rectangular ducts

■ Use

- For attenuation of the noise produced by a ventilation system and spreaded along ventilation ductworks.
- Used jointly with sound-insulated fans in premises with high requirements to noise level produced by ventilation equipment.
- Compatible with 400x200 up to 1000x500 rectangular air ducts.

■ Design

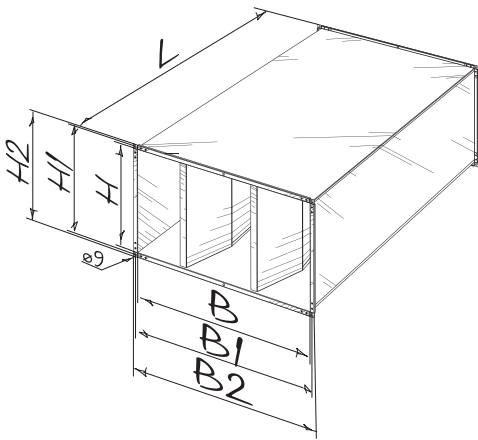
- Galvanized steel case and sleeves.
- The plates are filled with non-flammable sound-absorption material with protecting coating to prevent fiber blowing.

■ Mounting

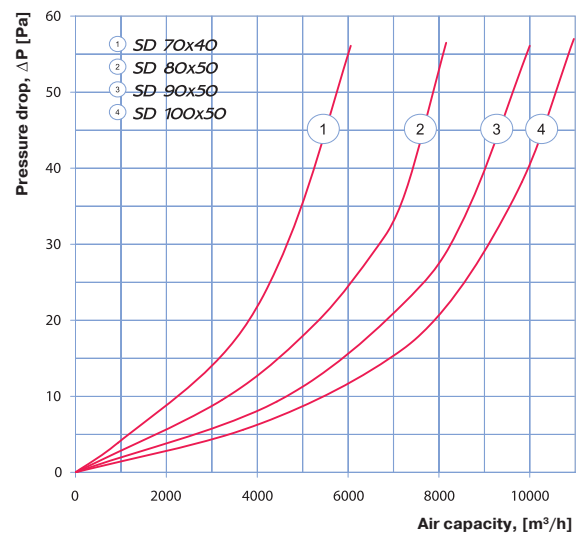
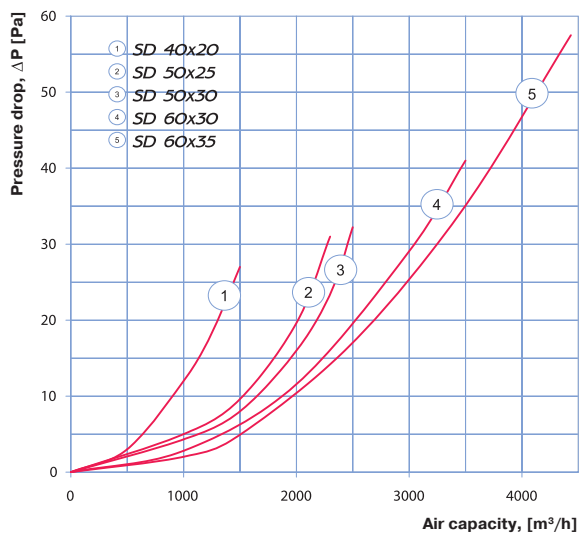
- Fixing to rectangular ducts with flange connection.
- For maximum sound absorption capacity provide a straight air duct section at least 1 m long towards the silencer.
- For better sound absorption install the silencers in series.

	Noise level reduction, dB (octave-frequency band [Hz])							
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SD 40x20	3	7	10	23	27	30	25	22
SD 50x25	3	6	11	22	26	25	27	22
SD 50x30	3	6	10	23	24	25	23	18
SD 60x30	3	6	10	21	24	30	24	17
SD 60x35	3	5	11	22	25	29	24	21
SD 70x40	4	7	10	15	22	19	21	18
SD 80x50	5	6	11	17	21	20	22	20
SD 90x50	3	6	10	16	20	20	21	15
SD 100x50	4	6	11	16	21	21	23	17

Overall dimensions



Type	Dimensions [mm]							Weight [kg]
	B	B1	B2	H	H1	H2	L	
SD 40x20	400	420	440	200	220	240	950	18.5
SD 50x25	500	520	540	250	270	290	950	20.5
SD 50x30	500	520	540	300	320	340	950	24.5
SD 60x30	600	620	640	300	320	340	950	26.5
SD 60x35	600	620	640	350	370	390	950	28.7
SD 70x40	700	720	740	400	420	440	1010	36.7
SD 80x50	800	820	840	500	520	540	1010	50.0
SD 90x50	900	920	940	500	520	540	1010	51.7
SD 100x50	1000	1020	1040	500	520	540	1010	57.3





Shutters

VK

for round ducts

Use

- For manual regulation of air flow volume in the air ducts.
- Compatible with \varnothing 80 to 450 mm round air ducts.

Design

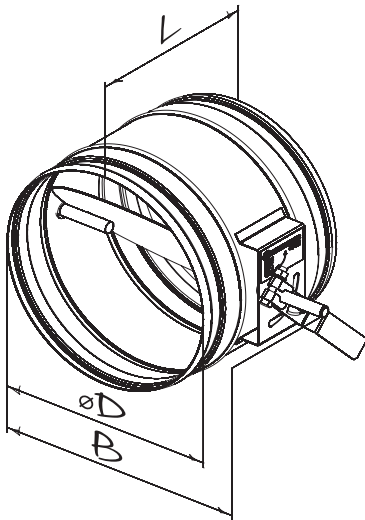
- The casing and the rotary blade are made of galvanized steel.
- Airtight connection to air ducts due to rubber seals.

- Air flow manual regulation with a metal handle equipped with a lever and a locking device for fixing the position of the rotary blades.
- In closed position about 10 % of cross section is left open.

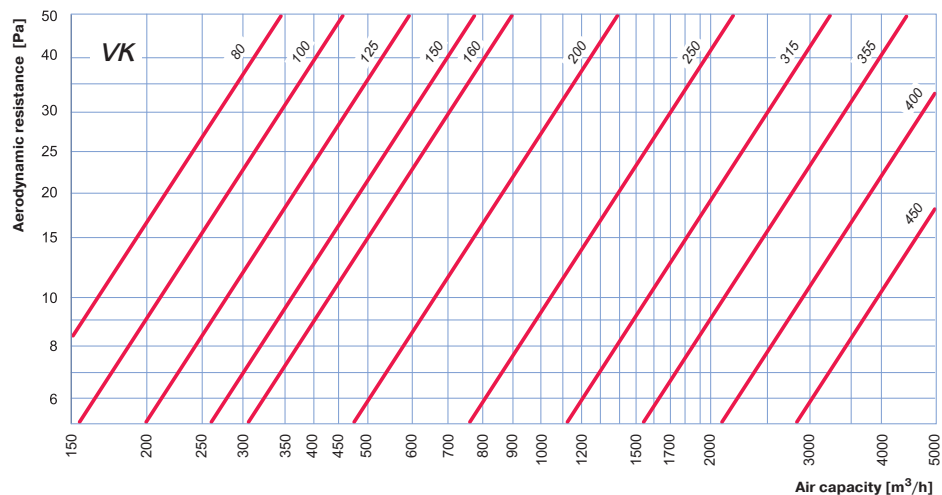
Mounting

- Fixing to round ducts with clamps.

Overall dimensions



Model	Dimensions [mm]			Weight [kg]
	\varnothing D	B	L	
VK 80	79	140	160	0.43
VK 100	99	170	160	0.55
VK 125	124	195	160	0.69
VK 150	149	220	160	0.83
VK 160	159	230	160	0.90
VK 200	199	270	160	1.14
VK 250	249	320	200	1.65
VK 315	314	385	250	2.45
VK 355	348	425	300	3.21
VK 400	399	470	350	3.90
VK 450	449	520	400	5.1





Shutters

VKA

for round ducts

Use

- For automatic shut-off of air ducts installed in ventilation systems of various premises.
- Compatible with \varnothing 80 to 450 mm round air ducts.

Design

- The casing and the rotary blade are made of galvanized steel.
- Airtight connection to air ducts due to rubber seals.

- A shaft and a mounting pad are provided for BELIMO electric actuator. Compatible actuators are shown in the table below.

Mounting

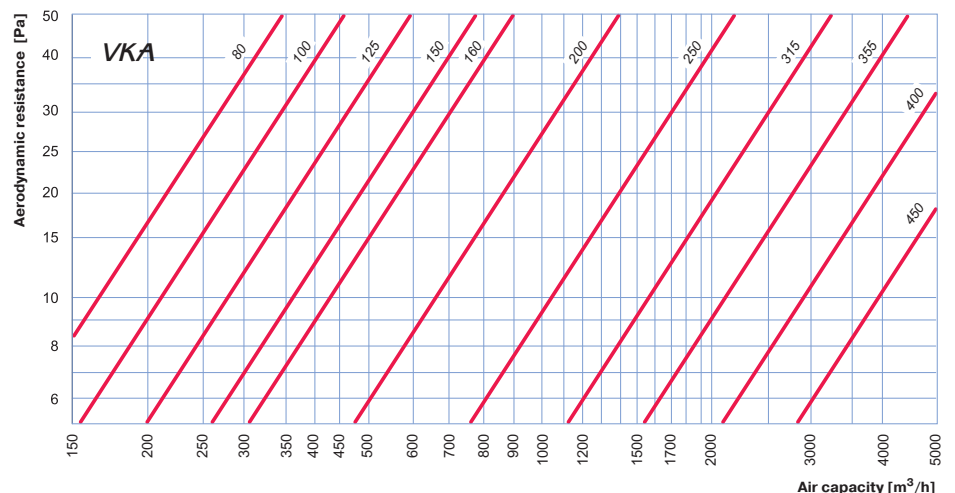
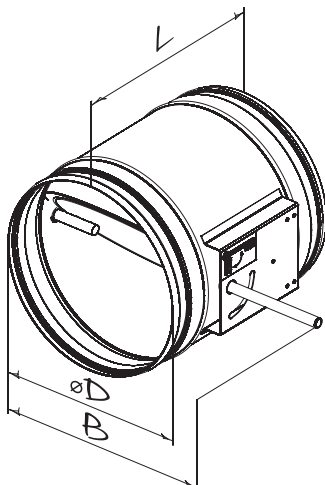
- Fixing to round ducts with clamps.
- While mounting provide enough space for accessing the electric actuator.

Overall dimensions

Model	Dimensions [mm]			Weight [kg]
	\varnothing D	B	L	
VKA 80	79	190	220	0.64
VKA 100	99	220	220	0.75
VKA 125	124	245	220	0.91
VKA 150	149	270	220	1.08
VKA 160	159	280	220	1.18
VKA 200	199	320	220	1.45
VKA 250	249	370	220	1.85
VKA 315	314	435	250	2.51
VKA 355	348	475	300	3.26
VKA 400	399	520	350	3.51
VKA 450	449	570	400	5.00

Compatibility table of air dampers with electric actuators

Model	Actuator type			
	Electric actuator, 230 V	Electric actuator with spring return, 230 V	Electric actuator, 24 V	Electric actuator with spring return, 24 V
VKA 80	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 100			CM24 / LM24A	TF24
VKA 125	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 150			CM24 / LM24A	TF24
VKA 160	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 200			CM24 / LM24A	TF24
VKA 250	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 315			CM24 / LM24A	TF24
VKA 355	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 400				
VKA 450				





Shutters

VK

for rectangular ducts

Use

- For manual regulation of air flow or shut-off of air ducts.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.

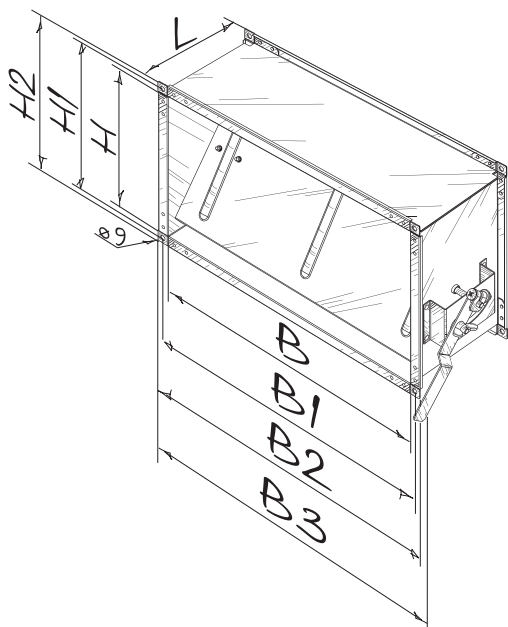
Design

- Galvanized steel case and rotary blade.
- Manual regulation with a metal handle equipped with a lever and a locking device for fixing the position of the rotary blade.

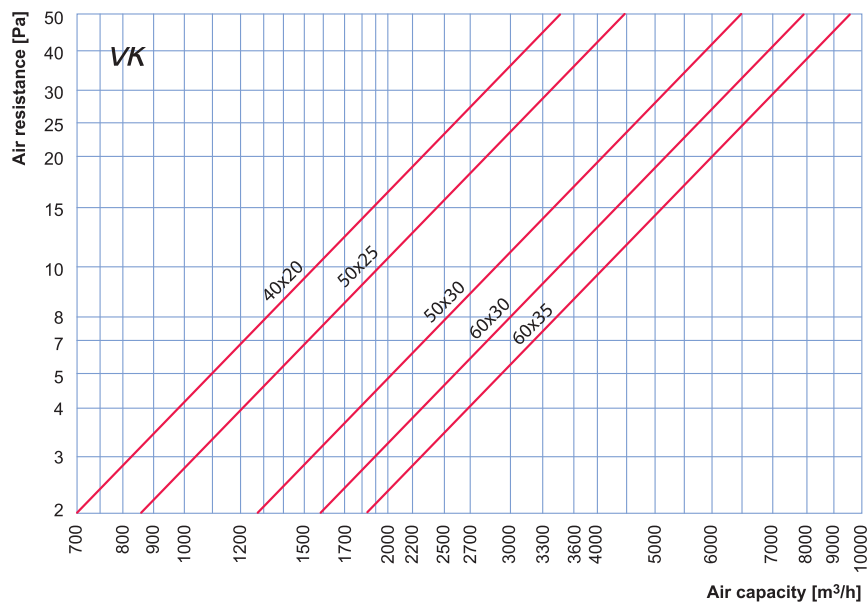
Mounting

- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air shutter to the mating flanges of the air ducts or any other ventilation system components.

Overall dimensions



Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	B3	H	H1	H2	L	
VK 40x20	400	420	440	460	200	220	240	202	3.0
VK 50x25	500	520	540	560	250	270	290	202	3.8
VK 50x30	500	520	540	560	300	320	340	202	3.1
VK 60x30	600	620	640	660	300	320	340	202	4.2
VK 60x35	600	620	640	660	350	370	390	202	5.1





Shutters

AVK

for rectangular ducts

Use

- For automatic regulation of air flow volume or shut-off of air ducts installed in various premises.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.

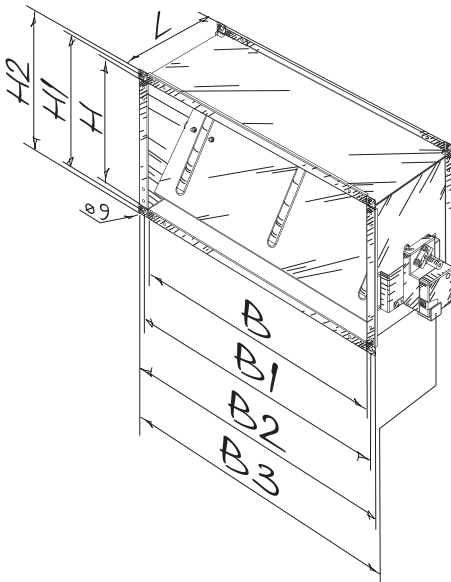
Design

- Galvanized steel case and rotary blade.
- Automatic control of the regulating mechanism with a servo actuator installed on the damper shaft. Three-point circuit provides regulation of the rotary blade; adjustable with mechanical stop blocks, maximum angle 95°. The servo actuator has overheating protection.
- Switching to manual control mode if required.

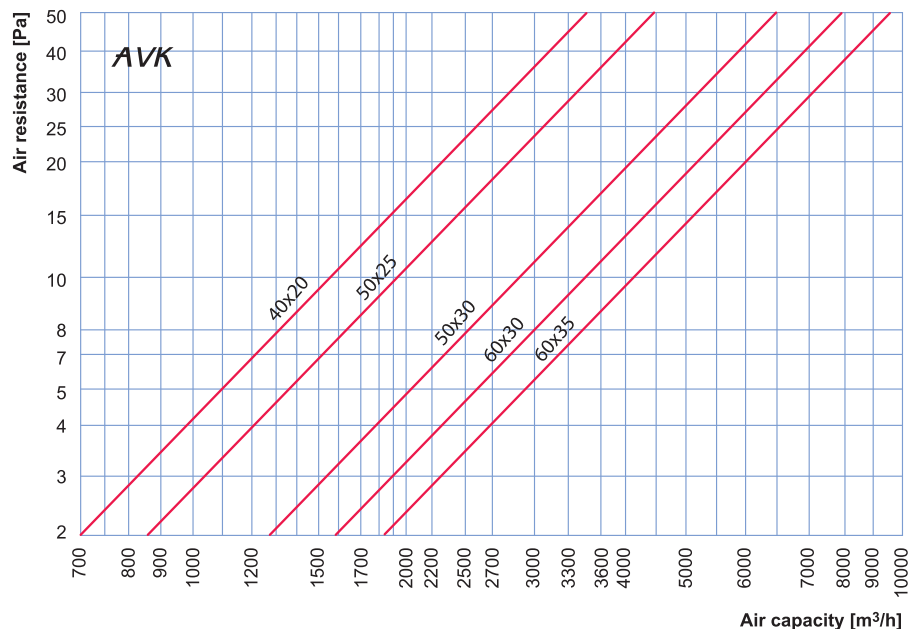
Mounting

- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air shutter to the mating flanges of the air ducts or any other ventilation system components.
- While mounting provide enough space for accessing the servo actuator.

Overall dimensions



Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	B3	H	H1	H2	L	
AVK 40x20	400	420	440	503	200	220	240	202	3.6
AVK 50x25	500	520	540	603	250	270	290	202	4.4
AVK 50x30	500	520	540	603	300	320	340	202	4.8
AVK 60x30	600	620	640	703	300	320	340	202	5.4
AVK 60x35	600	620	640	703	350	370	390	202	5.8





Gravity dampers VG for rectangular ducts

Use

- For automatic shutoff of air ducts installed in various premises when the fan is off.
- Gravitationally actuated.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.

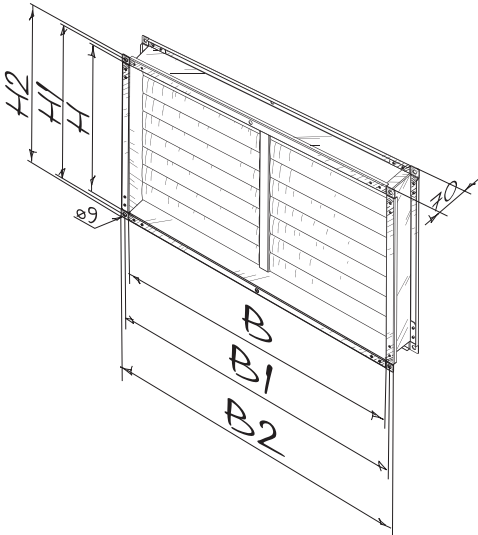
Design

- Galvanized steel case.
- Equipped with pivoted gravity louvre shutters made of PVC built into a frame.
- Louvre shutters are opened by air pressure and are closed automatically when the fan is off.

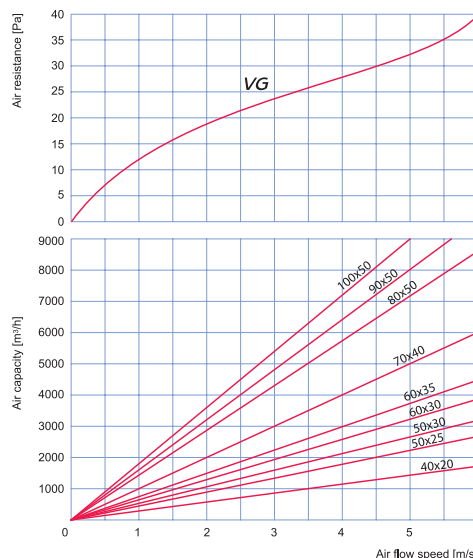
Mounting

- Fixing to rectangular ducts in upright position.
- Provide free gravity actuating of the louvre shutters.
- While mounting into the ventilation system match air flow direction.

Overall dimensions



Type	Dimensions [mm]						Weight [kg]
	B	B1	B2	H	H1	H2	
VG 40x20	400	420	440	200	220	240	1.29
VG 50x25	500	520	540	250	270	290	1.58
VG 50x30	500	520	540	300	320	340	1.83
VG 60x30	600	620	640	300	320	340	2.05
VG 60x35	600	620	640	350	370	390	2.21
VG 70x40	700	720	740	400	420	440	3.0
VG 80x50	800	820	840	500	520	540	3.6
VG 90x50	900	920	940	500	520	540	3.8
VG 100x50	1000	1020	1040	500	520	540	4.0





Gravity dampers

VG

for round ducts

■ Use

- For automatic shutoff of air ducts installed in various premises when the fan is off.
- Gravitationally actuated.
- Compatible with \varnothing 100 up to 315 mm round air ducts.

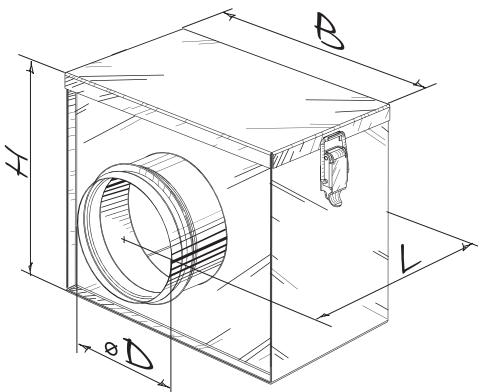
■ Design

- Galvanized steel case.
- Equipped with pivoted gravity louvre shutters made of PVC built inside the inner frame.
- Louvre shutters are opened by air pressure and are closed automatically when the fan is off.
- The spigot is equipped with rubber seals.

■ Mounting

- Fixed inside round ventilation ducts.
- Provide free gravity actuating of the louvre shutters.
- While mounting into the ventilation system match air flow direction.

■ Overall dimensions



Type	Dimensions [mm]				Weight [kg]
	D	B	H	L	
VG 100	99	225	216	232	1.814
VG 125	124	225	216	232	1.794
VG 140	139	225	216	232	1.798
VG 150	149	225	216	232	1.774
VG 160	159	225	216	232	1.699
VG 200	199	295	316	232	2.764
VG 250	249	295	316	232	2.624
VG 315	314	365	366	232	3.238



Air flow dampers SL for rectangular ducts

■ Use

- For manual regulation of air flow volume or shut-off of air ducts installed in ventilation systems of various premises.
- Compatible with 400x200 mm up to 1000x500 mm rectangular air ducts.

■ Design

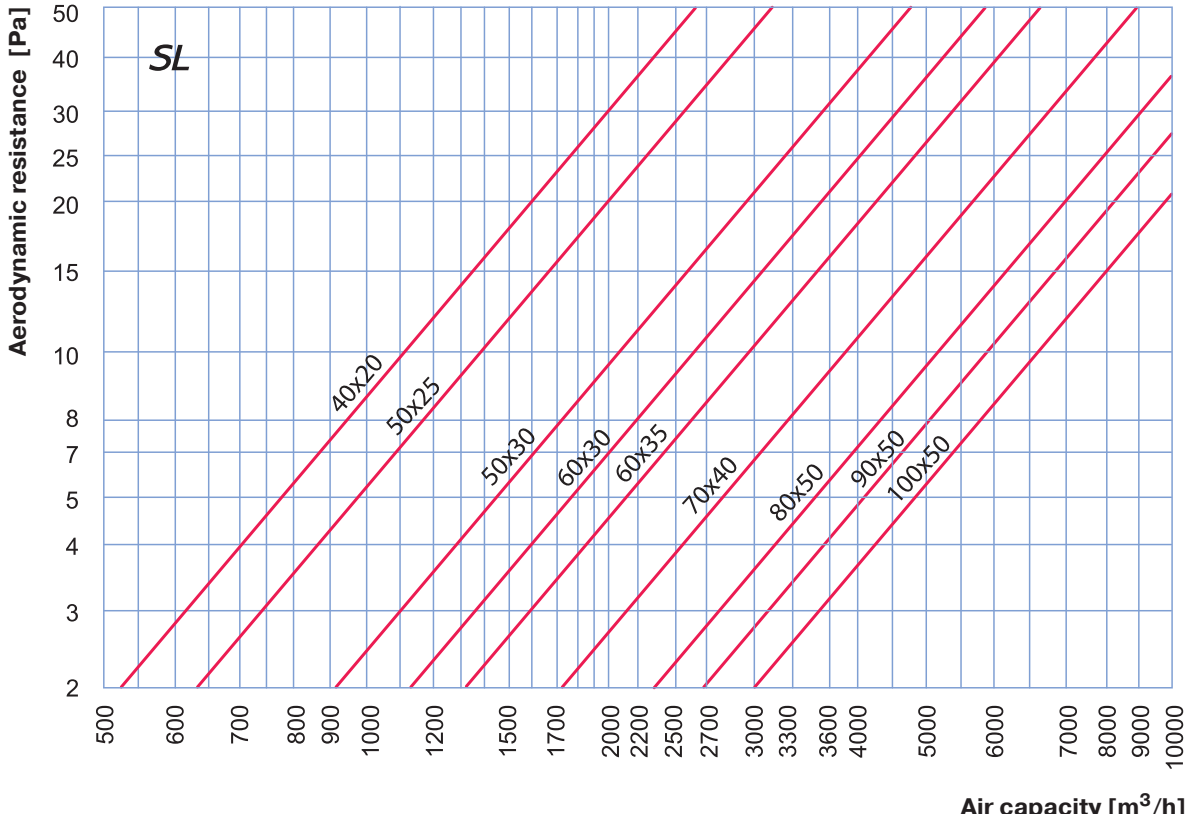
- The multi-blade design with the counter-rotated blades.
- The casing is made of galvanized steel.
- The rotary blades from aluminium profile are rotated with the gears.
- Air flow manual regulation with a metal handle equipped with a lever and a locking device to fix position of the rotary blades.
- A shaft and a mounting pad are provided for BELIMO electric actuator. Compatible actuators are shown in the table below.

■ Mounting

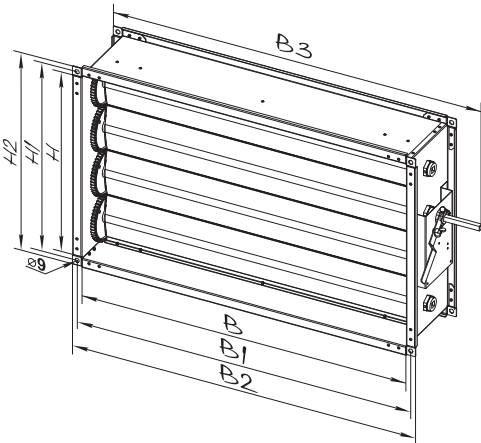
- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air flow regulators to the mating flanges of the air ducts or any other ventilation system components.

■ Compatibility table of air dampers with electric actuators

Model	Actuator type			
	Electric actuator, 230 V	Electric actuator with spring return, 230 V	Electric actuator, 24 V	Electric actuator with spring return, 24 V
SL 40x20	CM230 / LM230A	TF230 / LF230	CM24 / LM24A	TF24 / LF24
SL 50x25				
SL 50x30				
SL 60x30				
SL 60x35				
SL 70x40	LM230A	LF230	LM24A	LF24
SL 80x50				
SL 90x50				
SL 100x50				



Overall dimensions



Model	Dimensions [mm]								Weight [kg]
	B	B1	B2	B3	H	H1	H2	L	
SL 40x20	400	420	440	540	200	220	240	170	3.5
SL 50x25	500	520	540	640	250	270	290	170	4.2
SL 50x30	500	520	540	640	300	320	340	170	4.9
SL 60x30	600	620	640	740	300	320	340	170	5.4
SL 60x35	600	620	640	740	350	370	390	170	5.7
SL 70x40	700	720	740	840	400	420	440	170	7.7
SL 80x50	800	820	840	940	500	520	540	170	8.8
SL 90x50	900	920	940	1040	500	520	540	170	9.6
SL 100x50	1000	1020	1040	1140	500	520	540	170	10.3



Flexible anti-vibration connectors

EVA

for round ducts

Use

- For damping vibration generated by fans or ventilation equipment and transferred to air ducts.
- For partial compensation of ductwork distortion resulting from temperature changes.
- Compatible with \varnothing 100 up to 500 mm round air ducts.

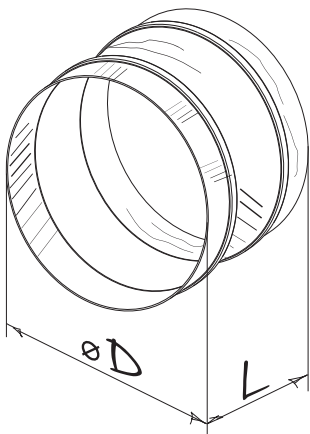
Design

- Two galvanized steel flanges.
- Connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.
- Not designed for mechanical load and cannot be used as a load-carrying structure.

Mounting

- Flexible vibration damping connectors are fixed to air ducts with clamps.

Overall dimensions



Type	Dimensions [mm]		Weight [kg]
	$\varnothing D$	L	
EVA 100	101	130	0.14
EVA 125	126	130	0.17
EVA 150	151	130	0.21
EVA 160	161	130	0.22
EVA 200	201	130	0.28
EVA 250	251	130	0.35
EVA 315	316	130	0.44
EVA 355	356	130	0.50
EVA 400	401	130	0.56
EVA 450	451	130	0.64
EVA 500	501	130	0.71



Flexible anti-vibration connectors

EVAF

for round ducts

Use

- For damping the vibration generated by fans or ventilation equipment and transferred to air ducts in ventilation systems of various premises.
- For partial compensation of ductworks temperature deformation.
- Compatible with \varnothing 200 up to 630 mm round air ducts with flanges.

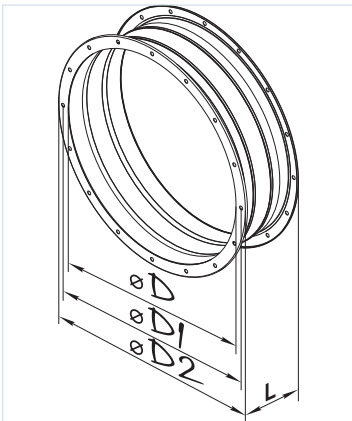
Design

- Two flanges are made of galvanized steel.
- The connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.
- Not designed for mechanical load and cannot be used as a load carrying structure.

Mounting

- Flexible vibration damping connectors are fixed to air ducts with flange connection.

Overall dimensions



Model	Dimensions [mm]				Weight [kg]
	$\varnothing D$	$\varnothing D1$	$\varnothing D2$	L	
EVAF 200	205	235	255	160	1.29
EVAF 250	260	286	306	160	1.21
EVAF 300	310	356	382	160	1.90
EVAF 350	362	395	421	160	2.06
EVAF 400	412	438	465	160	2.57
EVAF 450	462	487	515	160	2.88
EVAF 500	515	541	570	160	3.81
EVAF 550	565	605	636	160	4.53
EVAF 630	645	674	715	160	5.13



Flexible anti-vibration connectors

EVA

for rectangular ducts

Use

- For damping of vibration generated by fans or ventilation equipment and transferred to air ducts for ventilation systems installed in various premises.
- For partial temperature distortion compensation in the ductworks.
- Compatible with rectangular 400x200 up to 1000x500 mm air ducts.

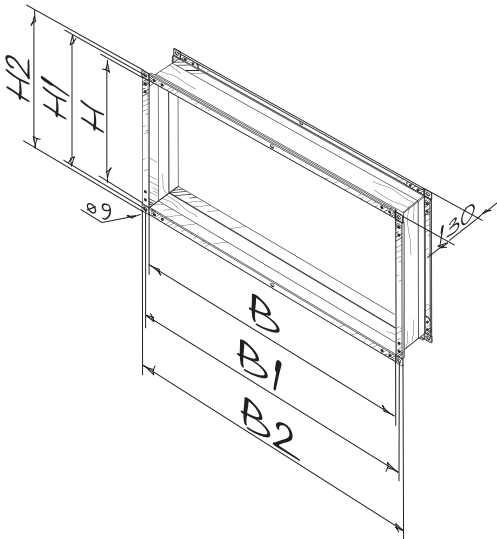
Design

- Two galvanized steel flanges.
- Connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.
- Not designed for mechanical load and cannot be used as a load-carrying structure.

Mounting

- Mounting with galvanized bolts and clamps that fix the end flanges of the connector to the mating flanges of the air ducts or any other ventilation system components.

Overall dimensions



Type	Dimensions [mm]						Weight [kg]
	B	B1	B2	H	H1	H2	
EVA 40x20	400	420	440	200	220	240	1.1
EVA 50x25	500	520	540	250	270	290	1.4
EVA 50x30	500	520	540	300	320	340	1.6
EVA 60x30	600	620	640	300	320	340	1.82
EVA 60x35	600	620	640	350	370	390	1.95
EVA 70x40	700	720	740	400	420	440	2.4
EVA 80x50	800	820	840	500	520	540	2.8
EVA 90x50	900	920	940	500	520	540	3.0
EVA 100x50	1000	1020	1040	500	520	540	3.2



Backdraft dampers with spring

VRV

for round ducts

Use

- For automatic shut-off of the air ducts and prevention of back drafting when the fan is off. Suitable for installation in various premises.
- Compatible with \varnothing 100 up to 315 mm round air ducts.

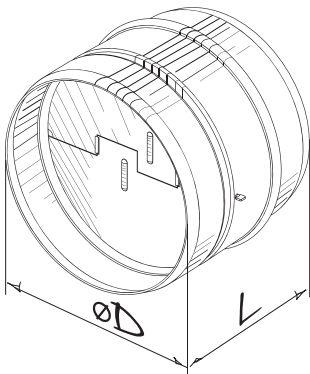
Design

- Galvanized steel case.
- Two spring-loaded blades made of aluminium.
- Blades are opened by air pressure and are closed with a spring.

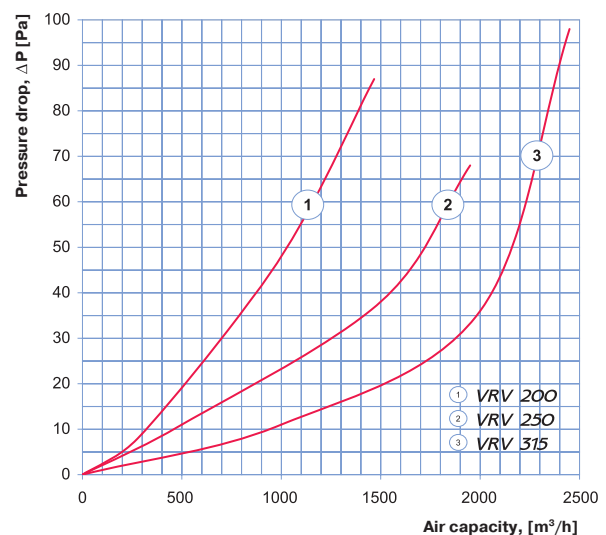
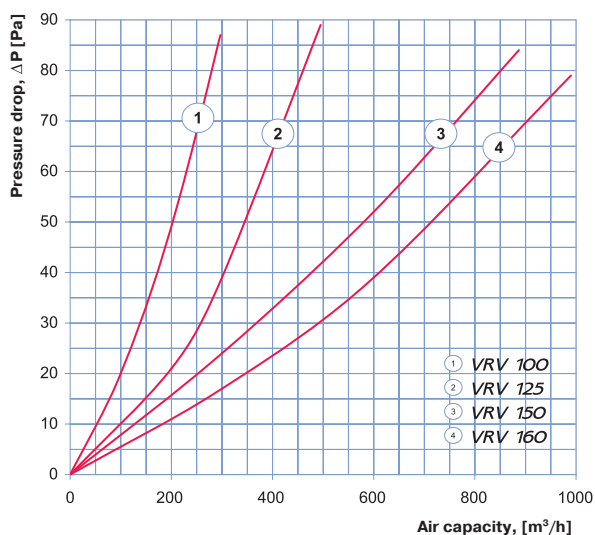
Mounting

- Fixing to round ducts with clamps.
- Provide vertical position of blade axis.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

Overall dimensions



Type	Dimensions [mm]		Weight [kg]
	$\varnothing D$	L	
VRV 100	99	80	0.18
VRV 125	124	100	0.27
VRV 150	149	115	0.38
VRV 160	159	120	0.42
VRV 200	199	145	0.63
VRV 250	249	165	0.90
VRV 315	314	190	1.31





Backdraft dampers

VRVS

for round ducts

Use

- For automatic shut-off of the air ducts and prevention of back drafting when the fan off. Suitable for installation in various premises.
- Compatible with \varnothing 100 up to 315 mm round air ducts.

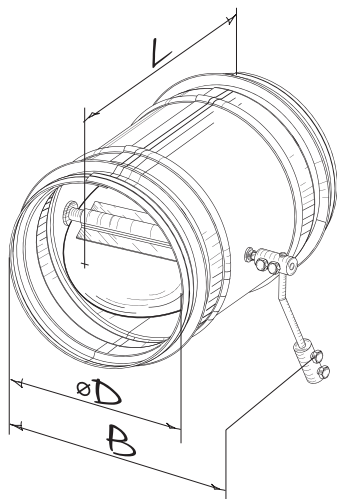
Design

- Galvanized steel case and rotary gravity-actuated blade.
- Airtight connection with the air ducts due to rubber seals.
- The damper blade is opened with air pressure and reset automatically when the fan is off and no air pressure is produced.
- Manual handle with a counterweight to regulate the damper opening-closing sensitivity.

Mounting

- Fixing to round ducts with clamps.
- Provide free gravity actuated movement of the blade.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

Overall dimensions



Type	Dimensions [mm]			Weight [kg]
	\varnothing D	B	L	
VRVS 100	99	139	150	0.65
VRVS 125	124	162	170	0.81
VRVS 150	149	194	180	0.97
VRVS 160	159	204	190	1.06
VRVS 200	199	238	220	1.57
VRVS 250	249	290	270	2.2
VRVS 315	314	356	340	3.24

Backdraft dampers

VRVS

for rectangular ducts



Use

- For automatic shut-off of the air ducts and prevention of back drafting when the fan off. Suitable for installation in various premises.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.

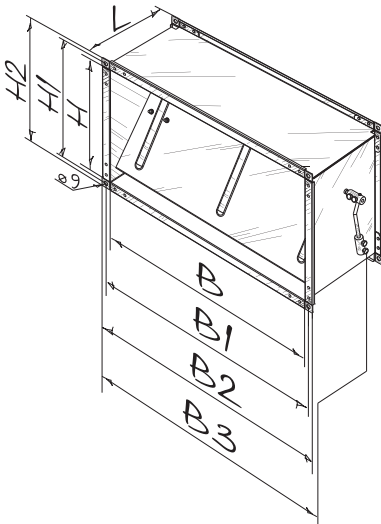
Design

- Galvanized steel case and rotary gravity-actuated blade.
- The damper blade is opened with air pressure and reset automatically when the fan is off and no air pressure is produced.
- Manual handle with a counterweight to regulate the damper opening-closing sensitivity.

Mounting

- Fixing to rectangular ducts in upright position.
- Provide free gravity actuated movement of the blade.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

Overall dimensions



Type	Dimensions [mm]								Weight [kg]
	B	B1	B2	B3	H	H1	H2	L	
VRVS 40x20	400	420	440	461	200	220	240	202	2.9
VRVS 50x25	500	520	540	561	250	270	290	202	3.73
VRVS 50x30	500	520	540	561	300	320	340	202	4.1
VRVS 60x30	600	620	640	661	300	320	340	202	4.64
VRVS 60x35	600	620	640	661	350	370	390	202	5.03



Filter boxes

KFBK

for round ducts

Use

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with \varnothing 100 up to 315 mm round air ducts.

Design

- Galvanized steel case.
- Airtight connection of the filter-box with air ducts due to connecting flanges with a rubber seal.
- Equipped with a flat filter cartridge made of synthetic non-woven cloth with filtration class G4.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on the casing.

Mounting

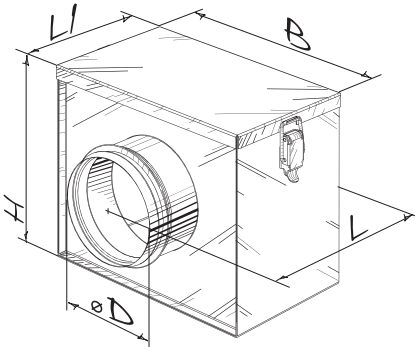
- Fixing to round ducts with clamps.
- Any mounting position.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

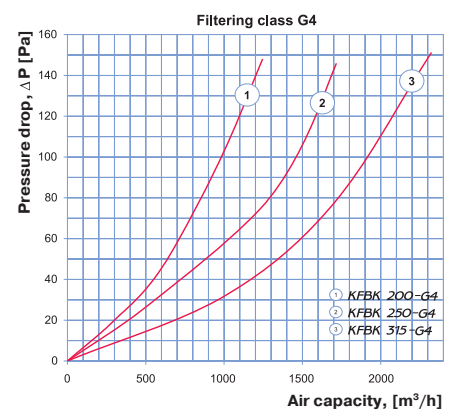
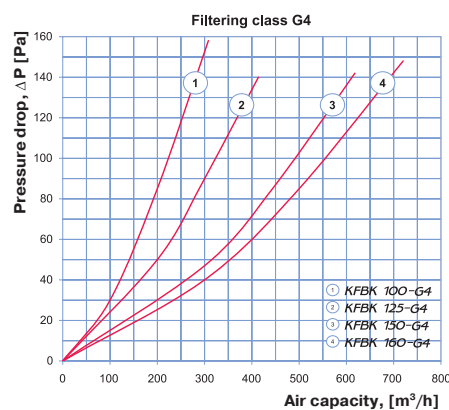
- G4 replaceable flat filter cartridges made of synthetic non-woven cloth series **FP-KFBK**.



Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	$\varnothing D$	B	H	L	L1	
KFBK 100	99	210	175	215	123	1.4
KFBK 125	124	220	209	235	143	1.7
KFBK 150	149	270	237	250	158	2.5
KFBK 160	159	270	237	250	158	2.3
KFBK 200	199	320	279	275	183	3.1
KFBK 250	249	370	327	325	233	4.5
KFBK 315	314	430	392	425	333	6.7





Filter boxes with V-filter

KFBV

for round ducts

Use

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with \varnothing 100 up to 315 mm round air ducts.

Design

- Galvanized steel case.
- Airtight connection of the filter-box with air ducts due to connecting flanges with a rubber seal.
- Equipped with a V-shaped filter cartridge with increased filter surface made of synthetic non-woven cloth with G4 filtration class.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Mounting

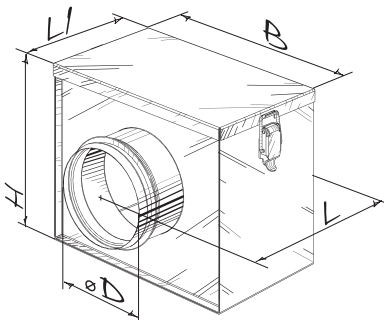
- Fixing to round ducts with clamps.
- Any mounting position.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

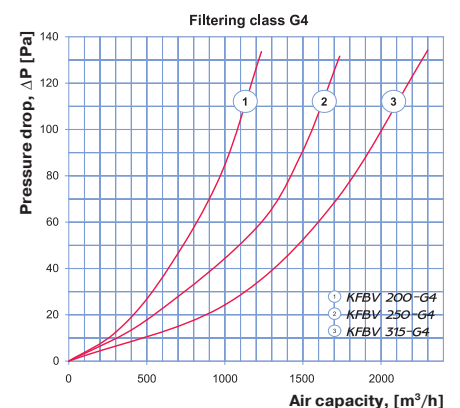
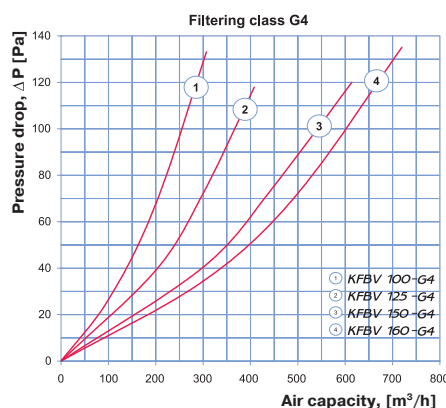
- G4 replaceable V-shaped filter cartridges made of synthetic non-woven cloth series **FP-KFBV**.



Overall dimensions



Type	Dimensions [mm]					Weight [kg]
	$\varnothing D$	B	H	L	L1	
KFBV 100	99	233	175	215	123	1.4
KFBV 125	124	243	209	235	143	1.7
KFBV 150	149	293	237	250	158	2.2
KFBV 160	159	293	237	250	158	2.2
KFBV 200	199	343	279	275	183	3.1
KFBV 250	249	393	327	325	233	4.2
KFBV 315	314	453	392	425	333	6.3





Filter boxes with bag filter

KFBT

for round ducts

Use

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with \varnothing 100 up to 315 mm round air ducts.

Design

- Galvanized steel case.
- Airtight connection of the filter-box with air ducts due to connecting flanges with a rubber seal.
- Equipped with a replaceable filter bag made of synthetic non-woven cloth with filtration class G4, F5, F7.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

- In case of vertical mounting position provide air stream downwards to avoid filter jamming.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

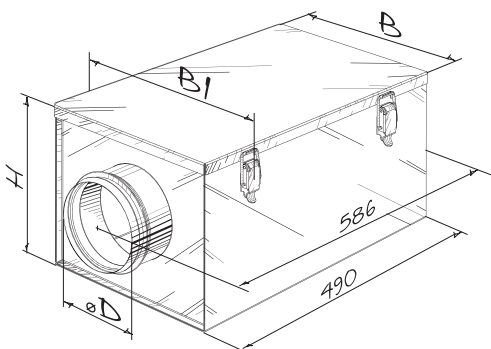
- G4, F5, F7 replaceable filter bags made of synthetic non-woven cloth series **FP-KFBT**.



Mounting

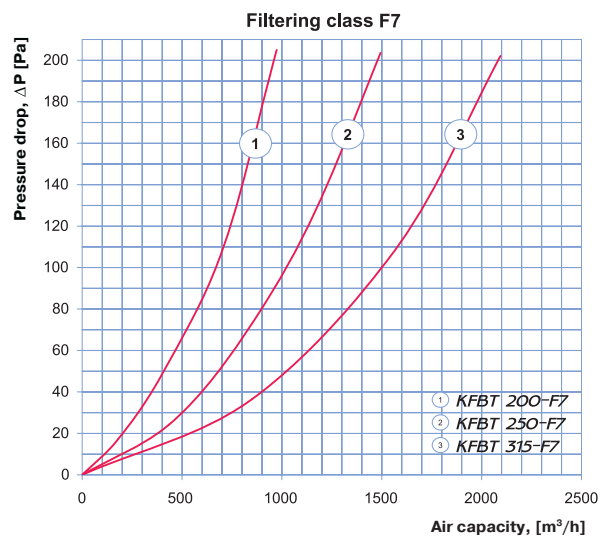
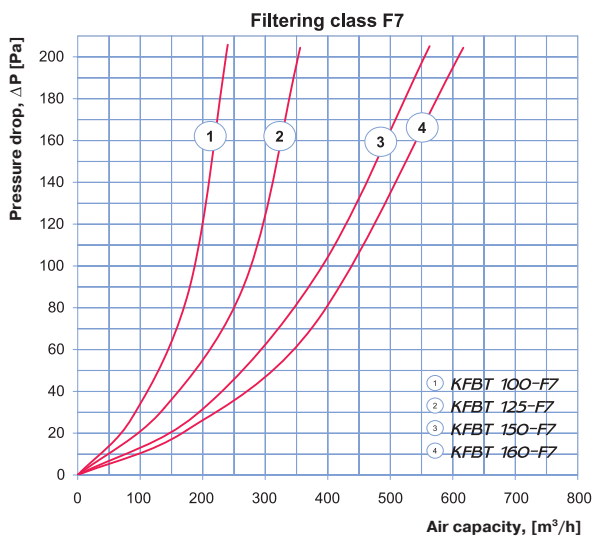
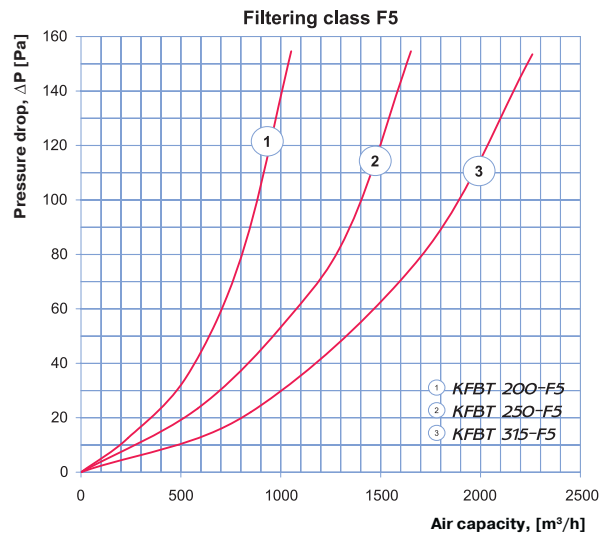
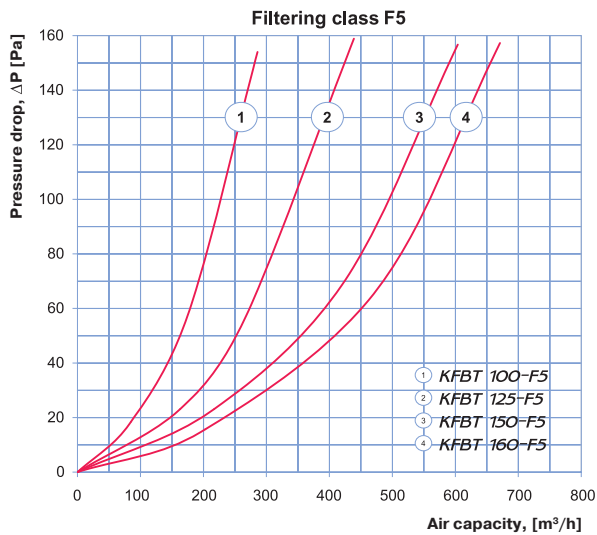
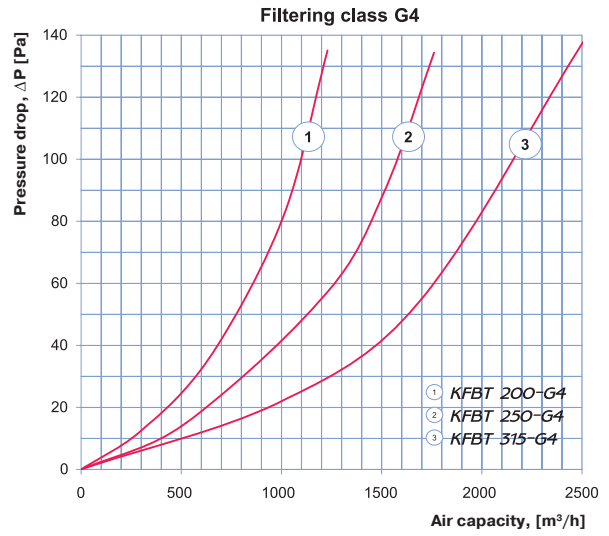
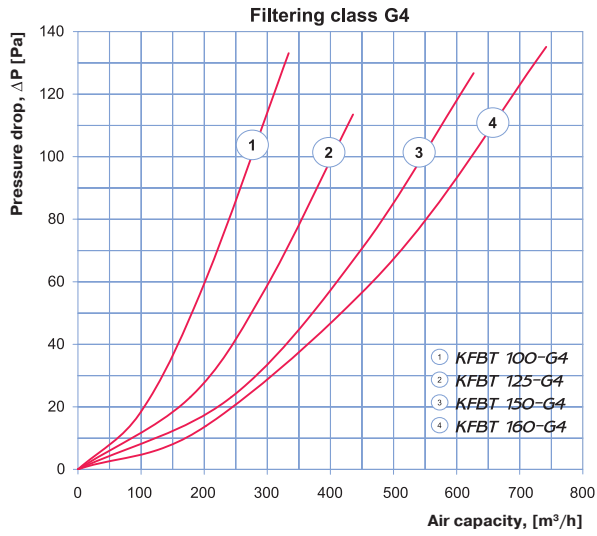
- Fixing to round ducts with clamps.
- Any mounting position.

Overall dimensions



Type	Dimensions [mm]				Weight [kg]
	$\varnothing D$	B	B1	H	
KFBT 100	99	210	230	170	2.41
KFBT 125	124	220	240	206	2.69
KFBT 150	149	270	290	236	3.20
KFBT 160	159	270	290	236	3.26
KFBT 200	199	320	340	276	3.76
KFBT 250	249	370	390	386	4.39
KFBT 315	314	430	450	390	5.17

■ Specifications





Filter boxes with bag filter

KFBT

for rectangular ducts

Use

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.

Design

- Galvanized steel case.
- Equipped with a replaceable filter bag made of synthetic non-woven cloth with filtration class G4, F5, F7.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Mounting

- Fixing to rectangular ducts with flange connection.
- Any mounting position.

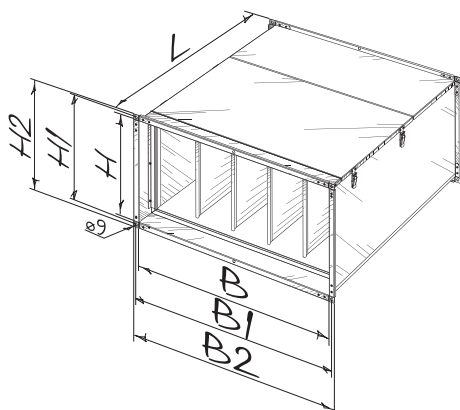
- In case of vertical mounting position provide air stream downwards to avoid filter jamming.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

- G4, F5, F7 replaceable filter bags made of synthetic non-woven cloth series **FP-KFBT**.

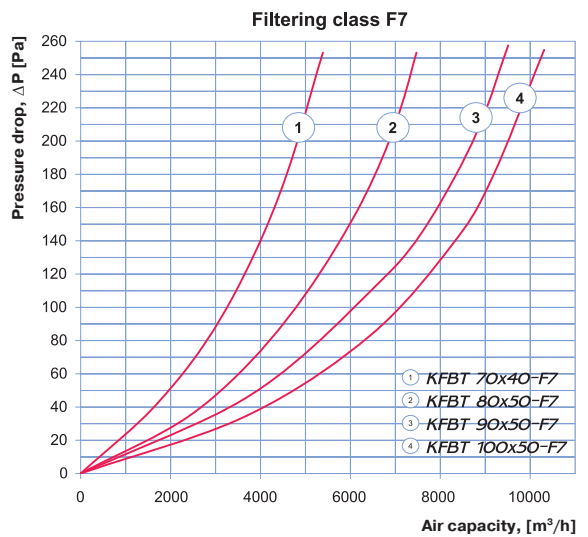
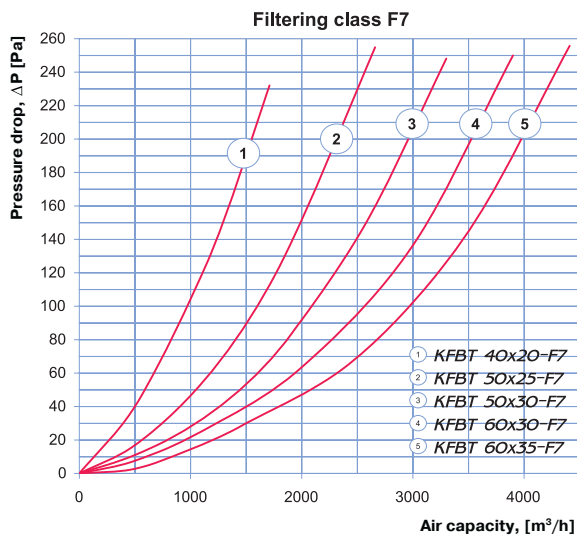
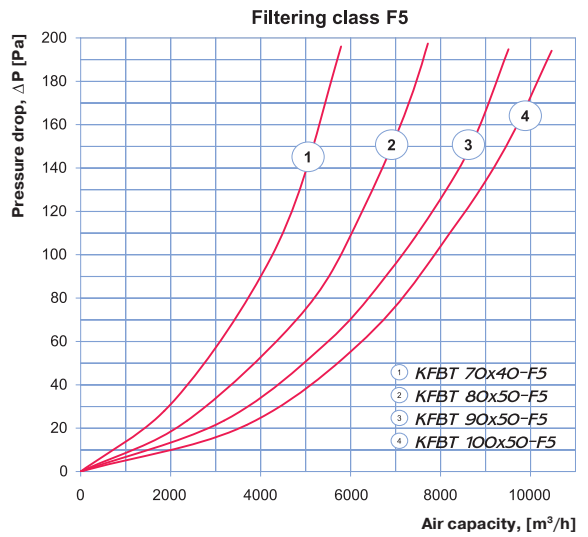
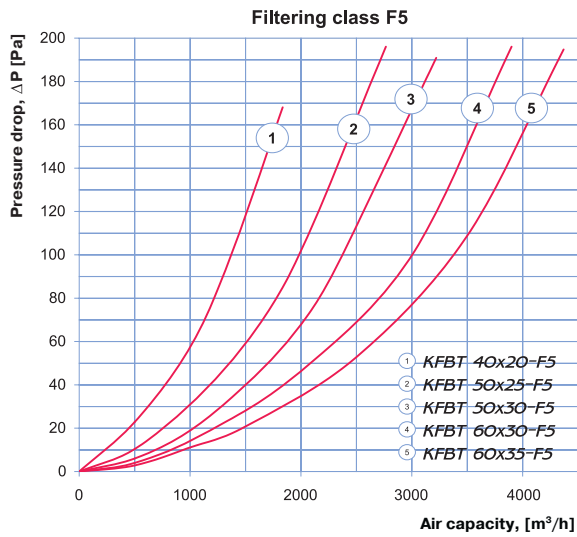
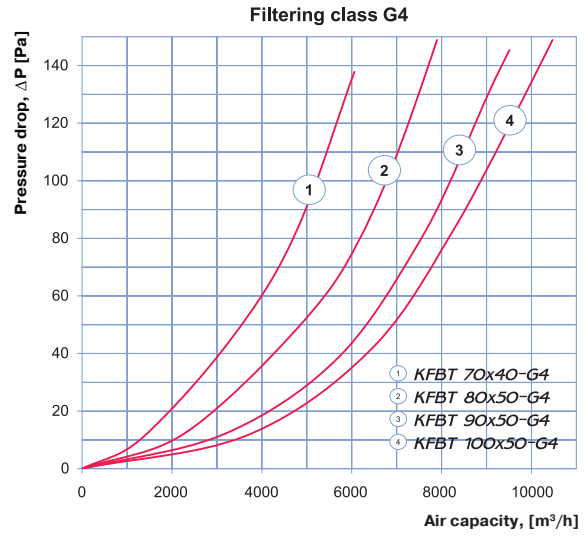
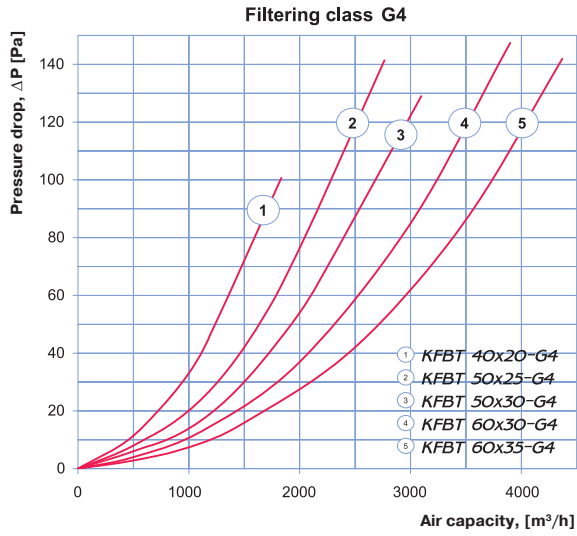


Overall dimensions



Type	Dimensions [mm]							Weight [kg]
	B	B1	B2	H	H1	H2	L	
KFBT 40x20	400	420	440	200	220	240	500	6.2
KFBT 50x25	500	520	540	250	270	290	600	7.8
KFBT 50x30	500	520	540	300	320	340	600	8.3
KFBT 60x30	600	620	640	300	320	340	600	8.9
KFBT 60x35	600	620	640	350	370	390	600	9.5
KFBT 70x40	700	720	740	400	420	440	720	16.2
KFBT 80x50	800	820	840	500	520	540	800	20.4
KFBT 90x50	900	920	940	500	520	540	800	21.7
KFBT 100x50	1000	1020	1040	500	570	540	800	23.5

■ Specifications





Filter boxes

KFBK

for rectangular ducts

Use

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.

Design

- Galvanized steel case.
- Equipped with a filter cartridge made of synthetic non-woven cloth with filtration class G4.
- Filter cartridge has manifold bending to increase the filtration surface and protected with a metal net against deformation with air pressure.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Mounting

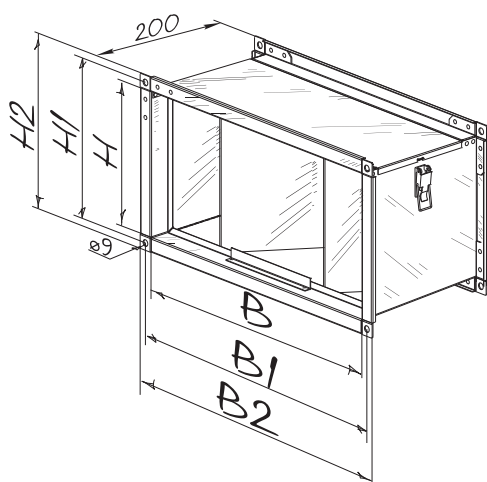
- Fixing to rectangular ducts with flange connection.
- Installed upstream to heater and fan following the air flow direction.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

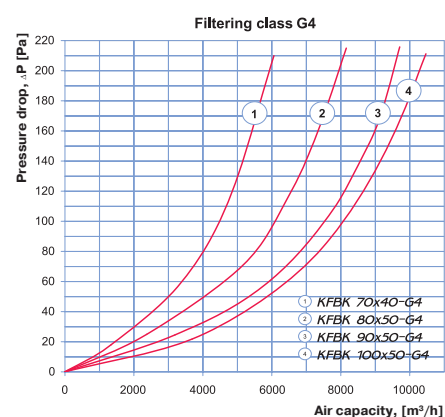
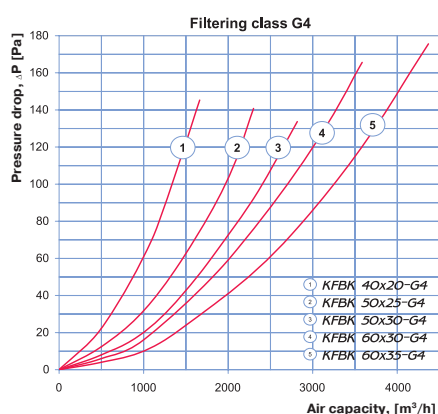
- G4 replaceable filter cartridges made of synthetic non-woven cloth series **FP-KFBK**.



Overall dimensions



Type	Dimensions [mm]						Weight [kg]
	B	B1	B2	H	H1	H2	
KFBK 40x20	400	420	440	200	220	240	2.4
KFBK 50x25	500	520	540	250	270	290	4.1
KFBK 50x30	500	520	540	300	320	340	4.4
KFBK 60x30	600	620	640	300	320	340	5.2
KFBK 60x35	600	620	640	350	370	390	5.8
KFBK 70x40	700	720	740	400	420	440	6.7
KFBK 80x50	800	820	840	500	520	540	7.9
KFBK 90x50	900	920	940	500	520	540	8.4
KFBK 100x50	1000	1020	1040	500	520	540	8.9





Clamps

KZ

for round ducts

Use

- For reliable fixing of ventilation system components.
- Compatible with 100 up to 315 mm round ventilation system components.

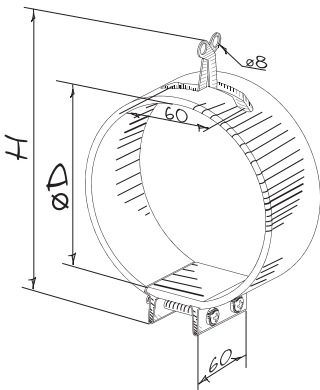
Design

- Made of galvanized steel band.
- Sealed with microporous rubber from inside for vibration absorption.

Mounting

- Fixed on round ventilation system components.
- Round ventilation system components are fixed by a clamp with two bolts.

Overall dimensions



Type	Dimensions [mm]		Weight [kg]
	øD	H	
KZ 100	100	172	0.206
KZ 125	125	198	0.232
KZ 150	150	224	0.296
KZ 160	160	232	0.358
KZ 200	200	274	0.42
KZ 250	250	326	0.55
KZ 315	315	380	0.65

Clamps

KZH

for round ducts



Use

- For reliable fixing of ventilation system components installed in various premises.
- Compatible with 100 up to 315 mm round ventilation system components.

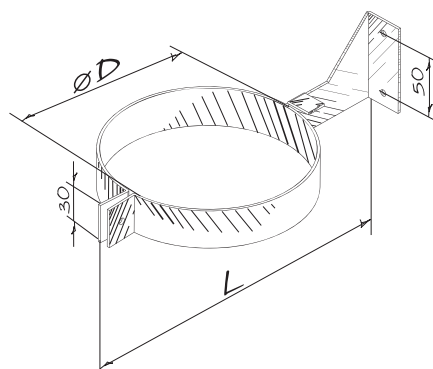
Design

- Made of galvanized steel band.
- Sealed with microporous rubber from inside for vibration absorption.
- Equipped with a mounting bracket for fixing on wall or ceiling.

Mounting

- Fixed on round ventilation system components.
- Round ventilation system components are fixed by a clamp with a bolt.
- For installation on wall or ceiling use a mounting bracket fixed with dowels.

Overall dimensions



Type	Dimensions [mm]		Weight [kg]
	$\varnothing D$	L	
KZH 100	100	204	0.21
KZH 125	125	229	0.22
KZH 150	150	254	0.25
KZH 160	160	264	0.26
KZH 200	200	304	0.31
KZH 250	250	354	0.35
KZH 315	315	419	0.42

Control unit for fans MCD 60/0.3



Use

- Automatic regulation of residential fans.
- Includes automatic control functions performed by timer, humidity sensor, photo sensor, motion sensor.

Design

- Control unit casing made of high-quality plastic.
- Front panel equipped with light indicators. Display of control unit operation modes.
- Equipped with a cord switch.
- IP34 ingress protection rating.

Control

- Setting of automatic functions by built-in switches.
- Several fans can be controlled from one unit provided that the total current consumption does not exceed the permissible control unit current.

Mounting

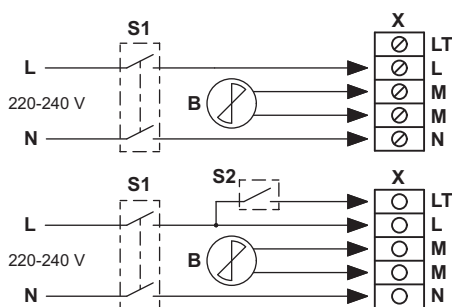
- The control unit is designed for indoor wall surface installation close to the fan or remote installation.
- For selecting the installation place consider motion sensor sensitivity area, furniture location and walking routes.

Functions:

- Run-out timer:** Keeps the fan operating after switch-off within pre-set time period. Adjustable from 5 sec to 30 min.

Wiring diagram

B - fan;
S1 - automatic circuit breaker; S2 - external switch;
X - input terminal block BU.



- Interval timer:** Switches the fan on/off. Operating cycle with time intervals from 5 sec to 30 min.

- Humidity sensor:** Individually adjustable humidity set point. Switches the fan on when humidity level exceeds set point and switches the fan off when humidity level drops to set point.

- Photo sensor:** Automatically switches the fan on depending upon illumination level in the room due to the integrated photo switch. Two operation modes.

"Dark mode": The control unit switches the fan on after light is turned off in the room. Operating period is adjustable from 5 sec up to 30 min. Photo sensor set point is adjustable from the control unit.

"Light mode": The control unit switches the fan on after light is turned on in the room. After light is turned off the fan continues operating and is switched off by the run-out timer adjustable between 5 sec and 30 min. If light in the room is on more than 60 min the fan switches automatically off. The photo sensor set point is adjustable from the control unit.

- Motion sensor:** Automatically switches the fan on in case of motion detection within the sensitivity area (operating distance 5 m, viewing angle 130°). The control unit switches the fan off after a preset time period from 5 sec to 30 min when no motion is detected.

Specifications

	MCD 60/0.3
Voltage, 50 Hz [V]	1 ~ 230
Max. power [W]	60
Maximum load current [A]	0.3
Overall dimensions AxBxC [mm]	151x46x27
Max. operating temperature [°C]	+40
Ingress Protection	IP34
Weight [kg]	0.075



Sensor speed switch SGR-3/1

Use

- On/off switch and speed selection for multi-speed fans.

Design

- Casing made of high-quality plastic.
- Glass sensor operating panel with three touch buttons for speed selection with light indication.
- Wall flush mounting.
- IP30 ingress protection rating.

Control

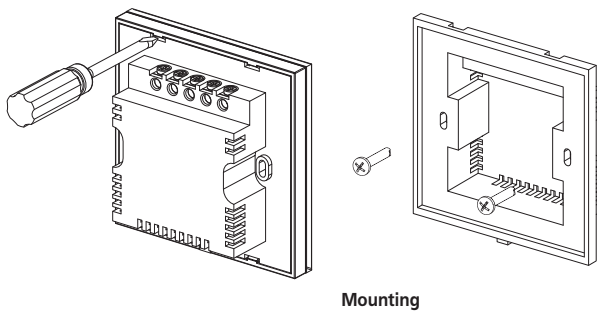
- Required speed is activated by touching the respectively marked speed button.
- The fan is turned off by touching the current speed button.

Mounting

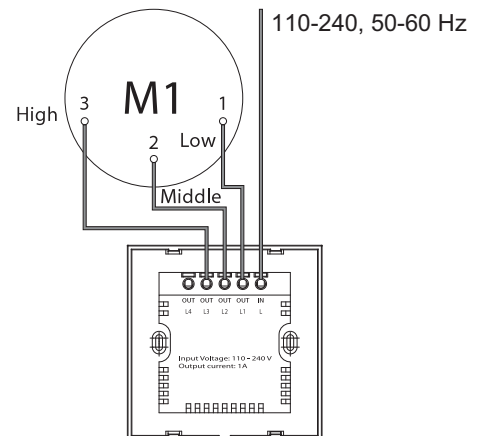
- Designed for wall mounting in a flush mounting box.

Specifications

Parameters	SGR-3/1
Voltage, 50-60 Hz [V]	110-240
Max. current load [A]	1
Number of speeds	3
Cable cross section [mm ²]	from 0.35 up to 1
Temperature range [°C]	from -10 up to +45
Operating humidity range [%]	from 5 up to 80 (no condensation)
Service life	100 000 operations
Ingress Protection	IP30
Weight [g]	138

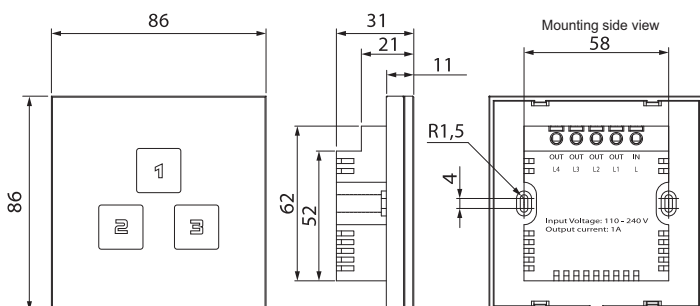


Mounting



Wiring diagram

Overall dimensions:



Sensor speed controller

SGS E1



■ Use

- On/off switch and speed control for single-phase voltage controlled fans.

■ Design

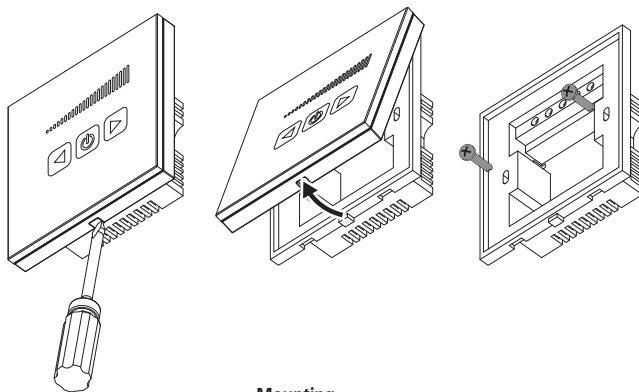
- Casing made of high-quality plastic.
- Glass sensor panel with an ON/OFF button and two speed control buttons.
- The adjustable speed is displayed with the LED indicator.
- Wall flush mounting.
- IP30 ingress protection rating.

■ Mounting

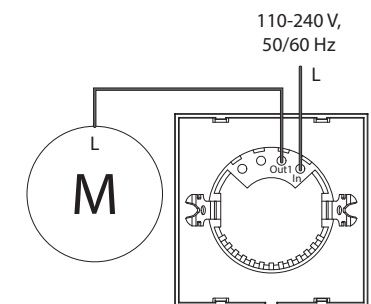
- Designed for wall mounting in a flush mounting box.

■ Specifications

Parameters	SGR-3/1
Voltage. 50-60 Hz [V]	230
Max. current load [A]	1
Cable cross section [mm ²]	from 0.35 up to 1
Temperature range [°C]	from -10 up to +45
Operating humidity range [%]	from 5 up to 80 (no condensation)
Service life	100 000 operations
Ingress Protection	IP30
Weight [g]	138



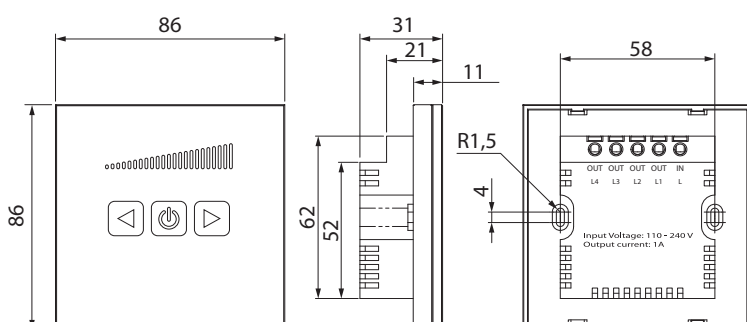
Mounting



M – ventilation equipment motor

Wiring diagram

Overall dimensions:





Multi-speed switch CDP-2/5 CDP-3/5

■ Use

- On/off switch and speed switch for multi-speed fans.

■ Design

- Casing made of high-quality plastic.
- Flush wall mounting.
- IP40 ingress protection rating.

■ Control

- Switching of fan speed according to diagram 1 and switching of fan speed in parallel with switching the light in the room, diagram 2.

■ Mounting

- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

■ Specifications

Parameters	CDP-2/5	CDP-3/5
Voltage, 50 Hz [V]	1 ~ 230	
Rated current [A]	3.0	
Number of speeds	2	3
Overall dimensions AxBxC [mm]	88x88x51	
Max. operating temperature [°C]	40	
Ingress Protection	IP40	

■ Wiring diagram options

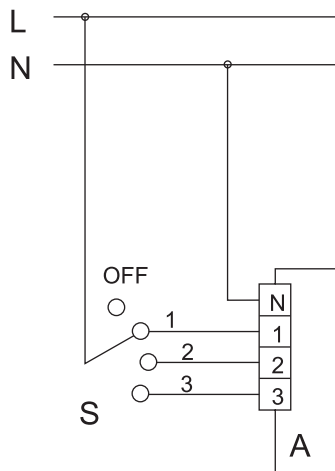


Diagram 1. The external switch S (CDP-3/5) switches the fan to one of three speeds and switches it off.

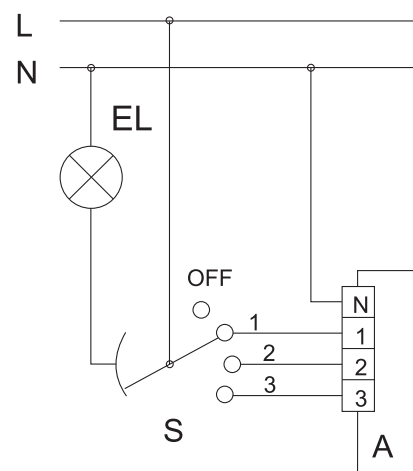


Diagram 2. The external switch S (CDP-3/5) switches the fan to one of three speeds and switches it off with parallel switching on/off the light in the room.

Multi-speed switch CDP-2/10



Use

- Speed on/off switch and speed changeover for multi-speed fans

Design

- Casing made of high-quality plastic
- Wall flush mounting
- IP20 ingress protection rating

Control

- Direct fan speed switching

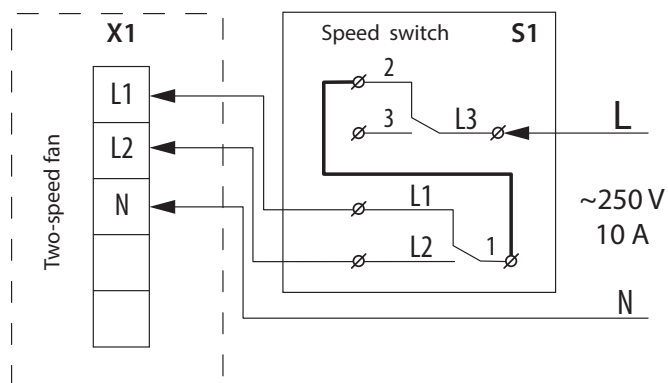
Mounting

- Wall mounting in a flush mounting box
- Suitable for installation in standard electric junction boxes

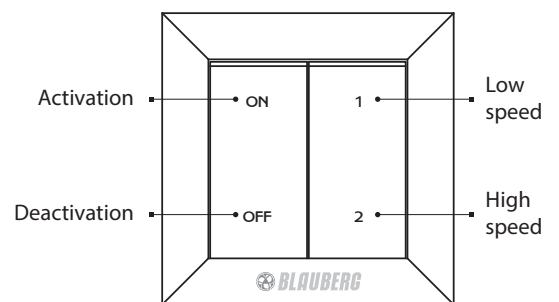
Specifications

Parameters	CDP-2/10
Max. supply power, 50/60 Hz [V]	250
Max. load current [A]	10
Cable cross section [mm ²]	from 0.35 up to 0.75
Operating temperature range [°C]	from -10 up to +45
Operating humidity range [%]	from 5 up to 80 (no condensation)
Service life	1 000 000 switching operations
Ingress Protection	IP20
Weight [g]	98

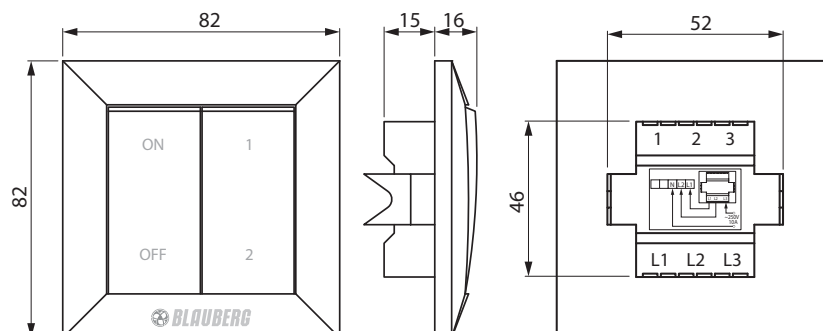
Wiring diagram



Control



Overall dimensions, mm





Thyristor speed controller CDT E1.8

Use

- For switching fans on/off and for speed control of single-phase frequency controlled motors. For ventilation systems in various premises.

Design

- The casing is made of high-quality plastic.
- Mounting junction box for wall flush mounting.
- IP40 ingress protection rating.

Control

- Switching on/off by the control knob.
- Smooth speed control from minimum to maximum value. Minimum speed is set by a variable resistor on the control panel.
- Several fans can be controlled from one unit provided that the total current consumption does not exceed the permissible controller current.
- High efficiency and control accuracy.

Protection

- Input circuit protected with a thermal fuse.
- Equipped with a transient filter.

Mounting

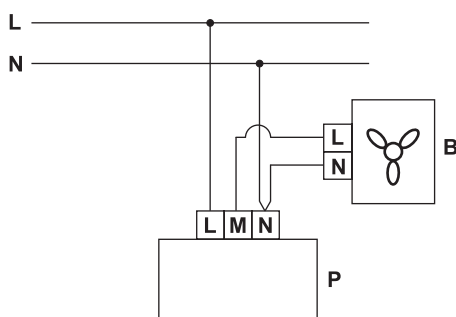
- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

Options

- Mounting box EDR-E for wall surface mounting available upon separate order.



Wiring diagram



Specifications

Parameters	CDT E1.8
Voltage, 50/60 Hz [V]	1 ~ 230
Rated current [A]	1.8
Overall dimensions AxBxC [mm]	80x80x63
Max. operating temperature [°C]	35
Ingress Protection	IP40
Weight [kg]	0.11



Speed control for EC motors CDT E/0-10

■ Use

- For switching fans on/off and for speed control of EC motors with 0-10 V control voltage input.

■ Design

- Casing made of high-quality plastic.
- Mounting junction box for wall flush mounting.
- IP40 ingress protection rating.

■ Control

- Switching on/off by the control knob.
- Speed control from minimum to maximum value.
- Featured with high efficiency and control accuracy.

■ Mounting

- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

■ Options

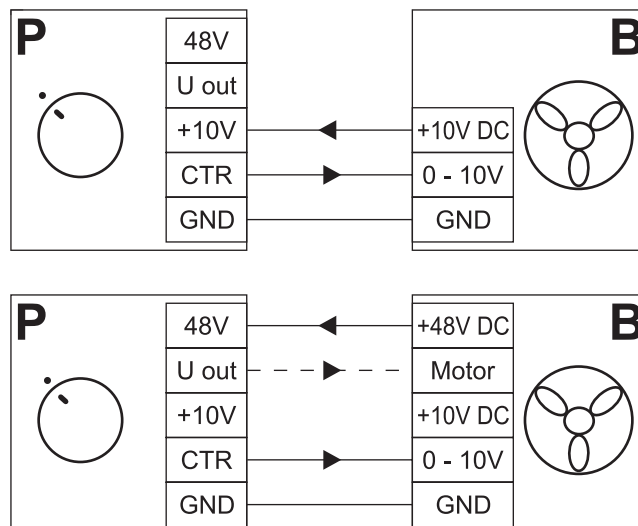
- Mounting box EDR-E for wall surface mounting available upon separate order.



■ Specifications

Parameters	CDT E/0-10
Voltage [V]	10-48VDC
Control input [V]	0-10
Overall dimensions AxBxC [mm]	80x80x63
Max. ambient temperature [°C]	35
Ingress Protection	IP40
Weight [kg]	0.12

■ Wiring diagram





Thyristor speed controller CDTE E1.8

■ Use

- For switching fans on/off and for speed control of single-phase frequency controlled motors. For ventilation systems in various premises.

■ Design

- Casing made of high-quality plastic.
- Surface box for mounting.
- IP40 ingress protection rating.

■ Control

- Switching on/off by control knob.
- Smooth speed control from minimum to maximum value. The minimum rotation speed is set by a variable resistor on the control panel.
- Several fans can be controlled from one unit provided that the total current consumption does not exceed the permissible controller current.
- Featured with high efficiency and control accuracy.

■ Protection

- Input circuit protected with a thermal fuse.
- Equipped with a transient filter.

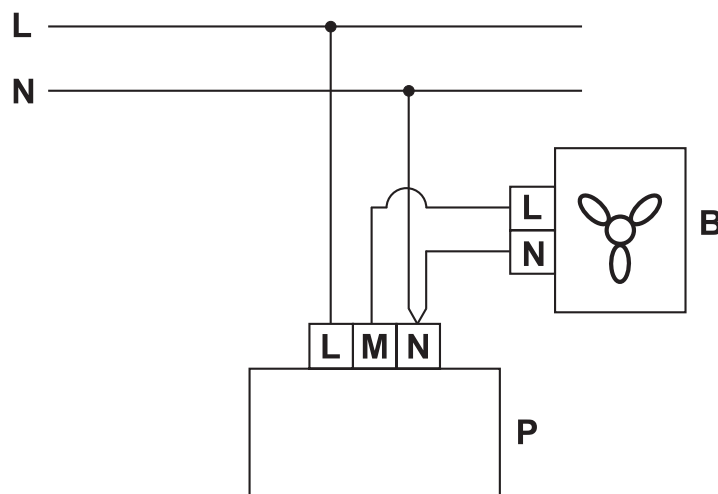
■ Mounting

- Indoor wall mounting.

■ Specifications

Parameters	CDTE E1.8
Voltage. 50/60 Hz [V]	1 ~ 230
Rated current [A]	1.8
Overall dimensions AxBxC [mm]	80x80x64
Max. operating temperature [°C]	35
Ingress Protection	IP40
Weight [kg]	0.11

■ Wiring diagram





Speed controller for EC motors CDTE E/0-10

■ Use

- For switching the fan on/off and for speed control of EC motors with 0-10 V control voltage input.

■ Design

- Casing made of high-quality plastic.
- Surface box for mounting.
- IP40 ingress protection rating.

■ Control

- Switching on/off by control knob.
- Speed control from minimum to maximum value.
- Featured with high efficiency and control accuracy.

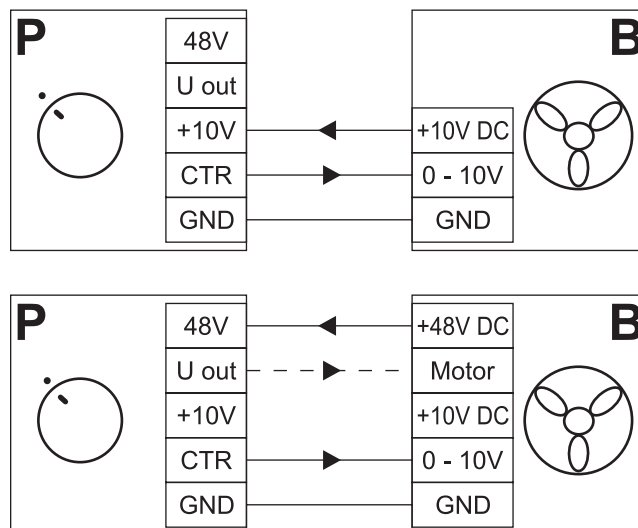
■ Mounting

- Indoor wall mounting.

■ Specifications

Parameters	CDTE E/0-10
Voltage [V]	10-48VDC
Control input [V]	0-10
Overall dimensions AxBxC [mm]	80x80x64
Max. ambient temperature [°C]	35
Ingress Protection	IP40
Weight [kg]	0.12

■ Wiring diagram



Room temperature regulators MLC E2 / MLCD E2



Use

- Automatic or manual temperature control in ventilation and air conditioning systems installed in various premises.
- Automatic regulation of heating/cooling rate.
- Control of fans, fancoil dampers and air heating units equipped with three-speed 230 V fans.

Design

- Casing made of high-quality plastic.
- Equipped with a temperature sensor.
- LED display with illumination and control knobs incorporated in front panel.
- The display shows: set and current indoor temperature; operation mode for cooling, heating or auto; fan speed.
- IP40 ingress protection rating.

Control

- Control by control buttons on regulator casing or by remote control panel (MLCD E2 model).
- Manual or automatic regulation of indoor temperature. Fan speed high/medium/low. On automatic mode fan speed is regulated by indoor temperature.
- Automatic regulation of heating/cooling rate in «Night mode»:

Cooling mode: 30 min after activation of the night mode the set temperature for the room automatically starts rising by 1°C per hour

within two hours and stays at this level. After 8 hours the timer turns off and the set temperature resets to initial position.

Heating mode: 30 min after activation of the night mode the set temperature for the room automatically starts dropping by 1°C per hour within three hours and stays at this level. After 8 hours the timer turns off and the set temperature resets to initial position.

- The set control functions are saved when the thermal regulator is switched off.

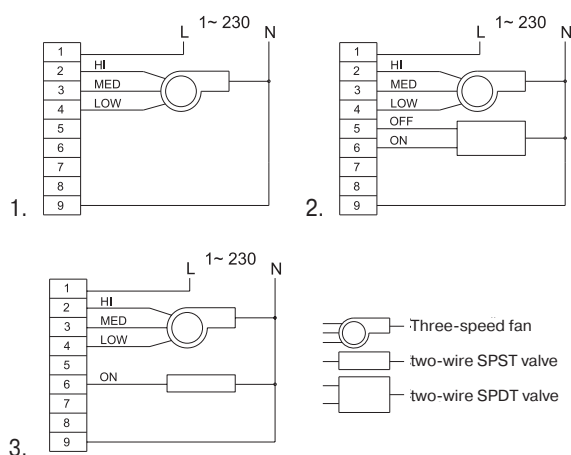
Mounting

- Indoor installation.
- Recommended installation height is 1,5 m above the floor level.
- Do not install the regulator close to windows, heating or cooling equipment.

Modification and options

- Model MLCD E2 – the regulator is equipped with a remote control panel.

Regulator connection options



1. Ventilation with heating and cooling
2. Ventilation with heating and cooling three-wire system of SPDT valves
3. Ventilation with heating and cooling two-wire SPDT valve system

Specifications

Parameters	MLC E2/ MLCD E2
Voltage, 50 Hz [V]	1 ~ 230
Rated current [A]	2.0
Number of speeds	3
Temperature regulating range, °C	+10...+30
Overall dimensions AxBxC [mm]	88x88x51
Max. ambient temperature [°C]	40
Ingress Protection	IP40
Remote control panel	no/yes



Room thermostat TS E10

■ Use

- For comfortable indoor temperature conditions and control of ventilation, heating and air conditioning systems.

■ Design

- Casing made of high-quality plastic.
- Temperature regulator on front panel and switch for operation mode selection on side panel.
- Supplied in casing for wall mounting.
- IP40 ingress protection rating.

■ Control

- Temperature regulation range from +10 up to +30 °C.
- The regulator has two operating patterns:
 - the contacts close when a temperature set point is reached and the fan turns on;
 - the contacts open when a temperature set point is reached and the fan turns off.

■ Mounting

- Indoor wall surface installation in mounting box.
- Recommended installation height is 1,5 m above the floor level.
- Do not install the regulator close to windows, heating or cooling equipment.

■ Regulator connection options

■ Specifications

Parameters	TS E10
Voltage [V]	1 ~ 220-240
Rated current per Fig. 1 [A]	10
Rated current per Fig. 2 [A]	6
Overall dimensions AxBxC [mm]	84x84x35
Max. ambient temperature, °C	40
Ingress Protection	IP40

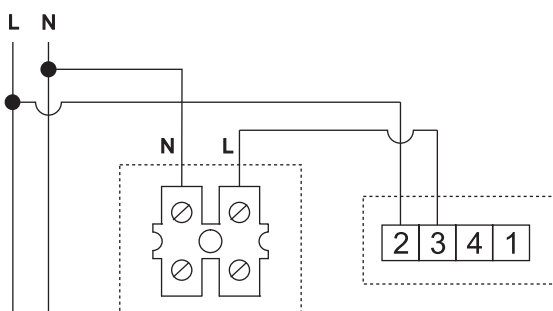


Fig. 1. The fan operates until the temperature threshold set by the thermostat is reached.

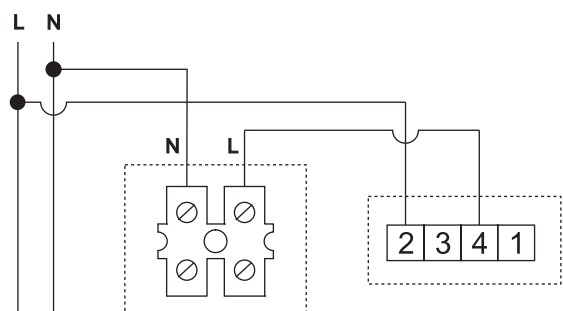


Fig. 2. The fan turns on when the temperature threshold set by the thermostat is reached.

Step-down transformer AT-25 220/12



Use

- Low-voltage step-down transformers are used to ensure safe 12 V / 50 Hz power supply for residential fans with maximum motor power 16 W (25 VA) and maximum load current 2 A.

Design

- Casing made of high-quality plastic.
- Supplied with external fuse blocks.

Protection

- The transformer has overload protection by thermal fuse.
- IP40 ingress protection rating except for the fuse blocks.

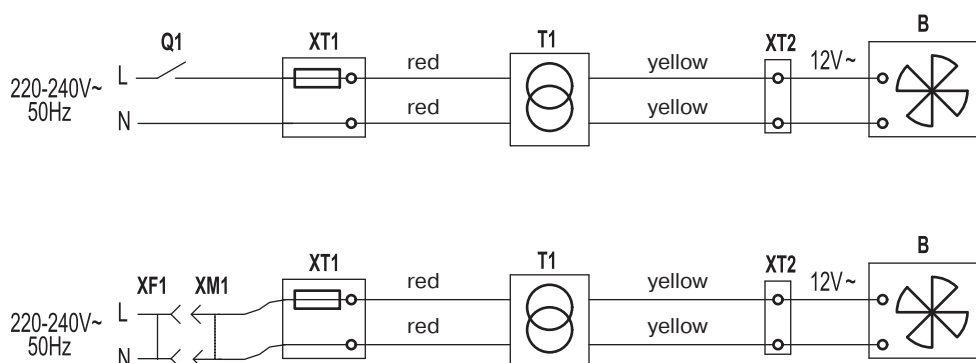
Mounting

- Indoor installation in areas not subjected to high temperature and humidity.
- Suitable for flush mounting behind the false ceiling or wall recess mounting provided that sufficient ventilation is ensured to prevent overheating.
- Do not install the transformer above heating equipment.

Specifications

Parameters	AT-25 220/12
Voltage. 50 Hz [V]	1 ~ 230
Output voltage. 50 Hz [V]	12
Max. power [W]	16 (25 VA)
Maximum load current [A]	2.0
Overall dimensions AxBxC [mm]	91x58x62
Transformer:	110x40x40
Fuse block:	
Max. operating temperature [°C]	+40
Ingress Protection	IP40
Weight [kg]	0.8

Transformer wiring diagram



- Q1 – external switch integrated into the fixed wiring system;
- XT1 – input fuse block with a built-in thermal fuse in a protecting casing;
- XF1 – socket integrated into the fixed wiring system;
- XM1 – standard plug;
- T1 – transformer;
- XT2 – output fuse block for safe 12 V fan connection;
- B – fan with safe 12 V voltage.



Step-down transformer ATK-25 220/12

Use

- Low-voltage step-down transformers are used to ensure safe 12 V / 50 Hz power supply for residential fans with maximum motor power 16 W (25 VA) and maximum load current 2 A.

Design

- Compact casing made of high-quality plastic.
- ATK-25 220/12 S** – the transformer is equipped with a pull-cord switch and a light indicator.

Protection

- The transformer has overload protection by thermal fuse.

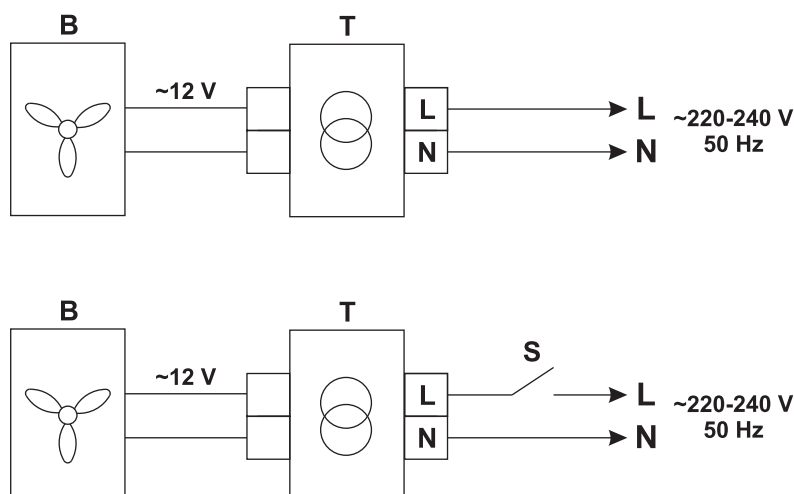
Mounting

- Indoor installation in areas not subjected to high temperature and humidity.
- Designed for wall surface mounting. Provide free air circulation for cooling of internal circuits.
- Do not install the transformer above the heating equipment.

Specifications

Parameters	ATK-25 220/12
Voltage, 50 Hz [V]	1 ~ 230
Output voltage, 50 Hz [V]	12
Max. power [W]	16 (25VA)
Maximum load current [A]	2.0
Overall dimensions AxBxC [mm]	80x162x63
Max. operating temperature [°C]	+40
Ingress Protection	IP40
Weight [kg]	0.85

Wiring diagram



B – fan with safe 12 V voltage;
 T – protecting transformer;
 S – external switch.



Step-down transformers AT-40 230/12

Use

- Low-voltage step-down transformers are used to ensure safe 12 V / 50 Hz power supply for the ventilation products with maximum load power 40 W and load current not exceeding 3.3 A.
- Compatible with Vento air handling units.

Design

- Compact casing made of high-quality plastic.
- The casing includes two sealed electric lead-ins and 2x0.75 m² power cables.
 - 3 m power cable and a standard electric plug at the transformer input for connection to 220-240 V / 50 Hz power mains.
 - 2 m 12 V / 50 Hz power cable with a special contact socket for the Vento air handling unit connection at the transformer output.

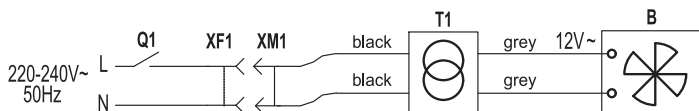
Mounting

- Indoor installation.
- Flush mounting behind the suspended ceiling or wall recess mounting in a well ventilated areas to prevent overheating.
- No installation above heating equipment.

Specifications

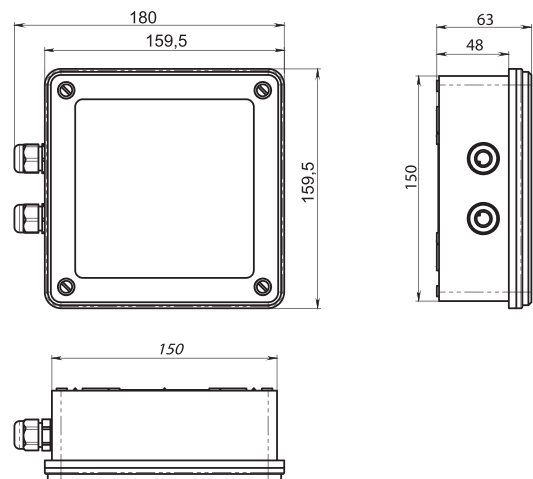
Parameters	AT-40 230/12
Input voltage. 50 Hz [V]	220-240
Output voltage. 50 Hz [V]	12
Max. load power [W]	40
Max. current load [A]	3.0
Max. ambient temperature [°C]	+40
Ingress Protection	IP65
Weight [kg]	1.1

Wiring diagram



- T1 – transformer;
 B – 12 V / 50 Hz ventilation equipment;
 XM1 – standard plug;
 XF1 – socket integrated into the fixed wiring system;
 Q1 – external switch integrated into fixed wiring system.

Overall dimensions





Multi-speed switches

CDPI-2 E5 CDPI-3 E5

■ Use

- On/off switch and speed selection for multi-speed fans.

■ Design

- Casing made of high-quality plastic.
- The casing includes an ON/OFF button, speed regulator and an operation light.
- Wall flush mounting.
- IP40 ingress protection rating.

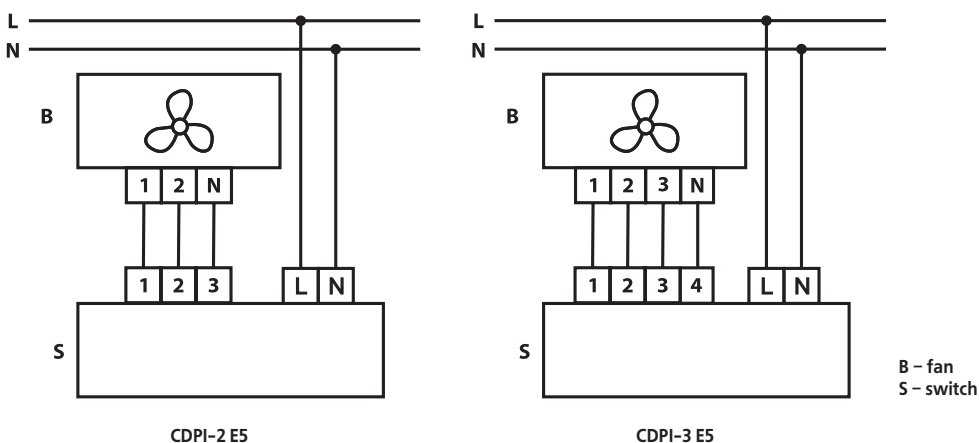
■ Mounting

- Designed for wall mounting in a flush mounting box.

■ Specifications

Parameters	CDPI-2 E5	CDPI-3 E5
Voltage, 50 Hz [V]	1 ~ 230	1 ~ 230
Rated current [A]	5.0	5.0
Number of speeds	2	3
Overall dimensions [mm]	162x80x70	162x80x70
Max. ambient temperature [°C]	40	40
Ingress Protection	IP40	IP40
Weight [kg]	0.25	0.25

■ Wiring diagram





Multi-speed switches

CDPE-2 E5 CDPE-3 E5

■ Use

- On/off switch and speed selection for multi-speed fans.

■ Design

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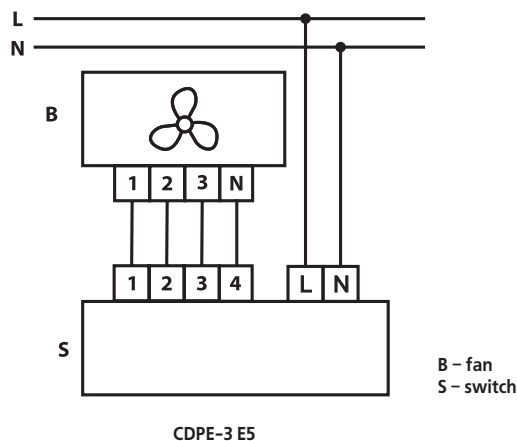
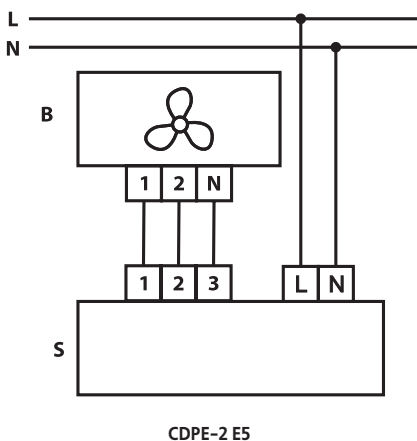
■ Mounting

- Designed for wall surface mounting.

■ Specifications

Parameters	CDPE-2 E5	CDPE-3 E5
Voltage, 50 Hz [V]	1 ~ 230	1 ~ 230
Rated current [A]	5.0	5.0
Number of speeds	2	3
Overall dimensions [mm]	162x80x70	162x80x70
Max. ambient temperature [°C]	40	40
Ingress Protection	IP40	IP40
Weight [kg]	0.25	0.25

■ Wiring diagram



B – fan
S – switch

Timers

TE/TI 1.5

Sensors

HSE/HSI 1.5 LSE/LSI 1.5 IRSE/IRSI 1.5



Run-out timer TE/TI 1.5

■ Use

- Automatic regulation of residential fans.
- Keeping the fan running within pre-set time period adjustable between 2 and 30 min after pressing the turn-off button. The run-out timer switches the fan off after the set time expires.
- Setting of ventilation cycle for bathrooms, WC, kitchens and other residential premises.

■ Design and mounting

- Casing made of high-quality plastic.
- Indoor installation.
- Model TE 1.5 – supplied in casing for wall surface mounting.
- Model TI 1.5 – supplied in casing for flush mounting.

Humidity sensor with timer HSE/HSI 1.5

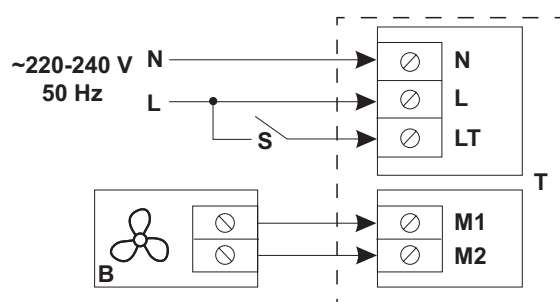
■ Use

- Automatic regulation of residential fans.
- Setting of individually adjustable indoor humidity threshold value. Automatically switches the fan on if humidity level in the room exceeds pre-set value.
- Bathrooms, shower rooms, kitchens, water pools and other humid premises.

■ Design and mounting

- The casing is made of high-quality plastic.
- Indoor installation.
- Model HSE 1.5 – supplied in casing for wall surface mounting.
- Model HSI 1.5 – supplied in casing for flush mounting.

■ Wiring diagram



B – fan; S – external switch; T – sensor.

Photo sensor with integrated timer LSE/LSI 1.5

■ Use

- Automatic regulation of residential fans.
- Bathrooms, WC, kitchens and other periodically occupied premises.
- The integrated photo sensor responds to illumination level changes in the room and switches the fan automatically on or off.
- When the light is turned off the fan continues operating from 2 to 30 min according to timer settings and then is switched off.

■ Design and mounting

- Casing made of high-quality plastic.
- Indoor installation.
- Model LSE 1.5 – supplied in casing for wall surface mounting.
- Model LSI 1.5 – supplied in casing for flush mounting.

Motion sensor with timer IRSE/IRSI 1.5

■ Use

- Automatic regulation of residential fans.
- Bathrooms, WC, kitchens and other periodically occupied premises.
- The integrated infra-red sensor responds to motion registered in the sensitivity area and automatically switches the fan on.
- The fan is turned off from 2 to 30 min after no motion is registered in the sensitivity area. The run-out time is pre-set.

■ Design and mounting

- Casing made of high-quality plastic.
- Indoor installation.
- Model IRSE 1.5 – supplied in casing for wall surface mounting.
- Model IRSI 1.5 – supplied in casing for flush mounting.

■ Specifications

Parameters	TE/TI 1.5; HSE/HSI 1.5; LSE/LSI 1.5; IRSE/IRSI 1.5
Voltage, 50 Hz [V]	1 ~ 220-240
Max. output power. [VA]	330
Max. load current [A]	1.5
Overall dimensions AxBxC [mm]	162x80x70
Timer operating conditions [°C]	1...+45
Ingress Protection	IP30
Weight [kg]	0.4



CO₂ sensors CD-1/ CD-2

Application

- Indoor carbon dioxide concentration measurement.
- Air capacity control depending on CO₂ concentration.
- Efficient energy saving device.

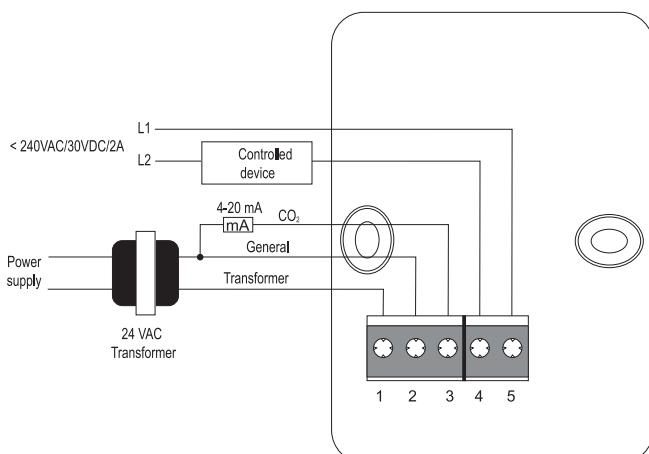
Design

The sensor has two separate outputs, a normally opened dry relay contact and an analogue output 0–10 V that is adjustable to 2–10 V/ 0–20 mA/4–20 mA. The relay output is used to turn the fan on/off depending on indoor CO₂ concentration and the analogue output is used for smooth fan speed control for a fan with EC motor or a fan with extra speed controller with 0–10 V input. In case of smooth fan speed control the fan speed varies proportionally to carbon dioxide emissions. Due to the relay and analogue outputs the sensor is compatible with any ventilation system. The self-calibration system ensures reliable sensor operation during the sensor service life.

Modifications

- CD-1: integrated LED lights for indication of CO₂ concentration and a touch button for operation mode switching (mode 1: on, mode 2: off, mode 3: operation according to CO₂ concentration). The button is used to turn the fan on or turn it off when CO₂-based ventilation is not required.
- CD-2: no integrated LED-lights and no touch button. This model is recommended for premises requiring permanent ventilation as school classes and other public premises.

Sensor wiring diagram



Mounting and power supply

- Wall surface mounting.
- 24 VAC low current power supply.
- The sensor has a socket for AT power unit offered as an accessory (AT-220/25 or AT-120/25 models).



Technical data

Parameters	Value
Power supply / Consumption	24 VAC (50/60 Hz ± 10 %), 24 VDC/1.6 W Max
Gas sensing element	Non-dispersive infrared detector (NDIR) with self-calibration system
CO ₂ measuring range	0–2,000 ppm (parts per million)
Accuracy at 25 °C, 2,000 ppm	±30 ppm + 3 % of reading
Response time	max. 2 min
Warm up time for each turning-on	2 hours (first time), 2 minutes (operation)
Analogue output	0–10 VDC (default), 4–20 mA selectable by jumpers
On/Off output	1X2A switch load Four set points selectable by jumpers
6 LED lights for CO ₂ concentration indication (for CD-1 model)	1st green indicator lights when CO ₂ concentration is below 600 ppm 1st and 2nd green indicators light when CO ₂ concentration is 600–800 ppm 1st yellow indicator lights when CO ₂ concentration is 800–1200 ppm 1st and 2nd yellow indicators light when CO ₂ concentration is 1200–1400 ppm 1st red indicator lights when CO ₂ concentration is 1400–1600 ppm 1st and 2nd red indicators light when CO ₂ concentration is above 1600 ppm
Operating conditions / Storage regulations	0–50 °C; 0–95 % RH non condensing/ 0–50 °C
Weight/Dimensions	0.120 kg/100 mm x 80 mm x 30 mm



Electric actuator **BELIMO** CM230/CM24

■ Use

- For controlling air dampers with cross section up to 0.4 m² installed in various ventilation and air conditioning systems.

■ Design

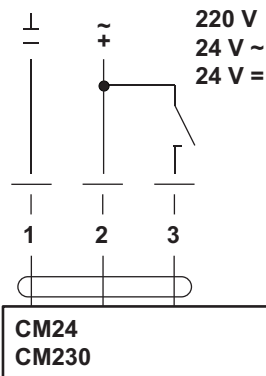
- The electric actuator is provided with a 2 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The angle of rotation is adjusted by mechanical end stops.

■ Control

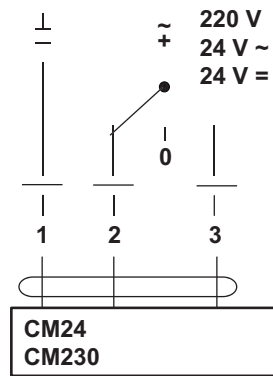
- The air flow control damper can be controlled by means of the three-point or open-close controlling.

■ Wiring diagram

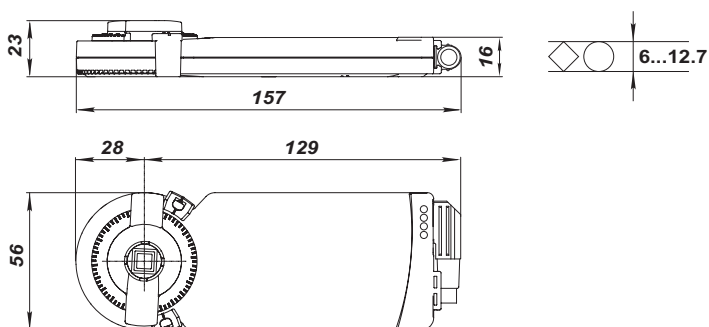
Open-Close controlling



3 point controlling



■ Overall dimensions



■ Technical data

	CM24	CM230
Voltage	24 B ~ 50/60 Hz, 24 V=	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28.8 ~ 19.2...28.8 =	85...265 ~
Rated power [VA]	1	2
Power consumption in operation / at rest [W]	0.5 / 0.5	1 / 1
Connecting cable	1 m long, 3 x 0.75 mm ²	
Positioning accuracy	± 5 %	
Direction of rotation	determined by terminal connection	
Torque [Nm]	2 (at nominal voltage)	
Angle of rotation: – no end stop – with an end stop	endless fixed 315° / adjustable 0...287.5° in 2.5° increments	
Swing time	75 sec / 90°	
Position indication	mechanical	
Ingress protection rating	IP54 at any mounting position	
Electrical protection class	III low voltage II totally insulated	
Operation temperature [°C]	-30...+50	
Storage temperature [°C]	-40...+80	
Ambient humidity	95 %, no condensation	
Noise level [dBA]	35	
Maintenance	not required	
Weight [kg]	0.13	



Electric actuator BELIMO LM230A/LM24A

Use

- For controlling air dampers with cross section up to 1 m² installed in various ventilation and air conditioning systems.

Design

- The electric actuator is provided with a 5 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The angle of rotation is adjusted by mechanical end stops.

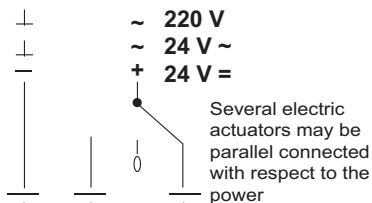
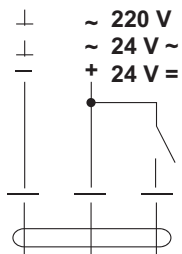
Control

- The air flow control damper can be controlled by means of the three-point or open-close controlling.

Wiring diagram

Open-Close controlling

3 point controlling

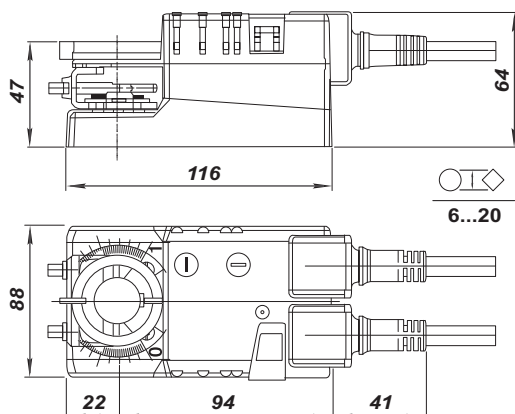


Several electric actuators may be parallel connected with respect to the power

LM230A
LM24A

LM230A
LM24A

Overall dimensions



Technical data

	LM24A	LM230A
Voltage	24 V ~ 50/60 Hz, 24 V=	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28.8 ~ 19.2...28.8 =	85...265 ~
Rated power [VA]	2	4
Power consumption [W]	1	1,5
Feedback potentiometer	integrated 5 kOhm ± 5 %	
Connecting cable	1 m long, 3 x 0.75 mm ²	
Direction of rotation	selected by 0/1 switch positioning	
Mechanical control	self-resetting button	
Torque [Nm]	5 (at nominal voltage)	
Angle of rotation:	max. 95°, adjustable with mechanical end stops	
Swing time	150 sec	
Position indication	mechanical	
Ingress protection rating	IP54 at any mounting position	
Electrical protection class	III low voltage II totally insulated	
Operation temperature [°C]	-30...+50	
Storage temperature [°C]	-40...+80	
Ambient humidity	95 %, no condensation	
Noise level [dBA]	35	
Maintenance	not required	
Weight [kg]	0.6	



Electric actuator **BELIMO** TF230/TF24

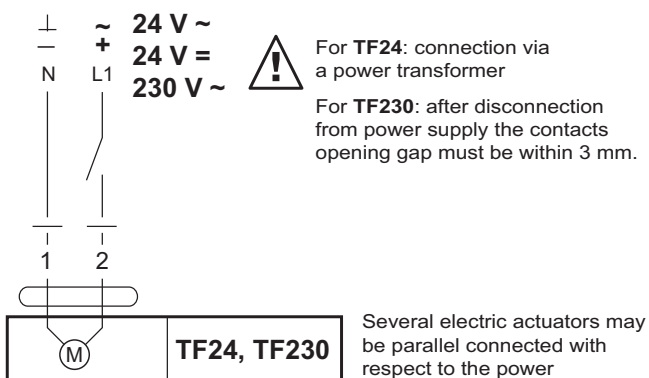
■ Use

- For controlling air dampers with cross section up to 0.4 m² installed in various ventilation and air conditioning systems and performing protection functions.

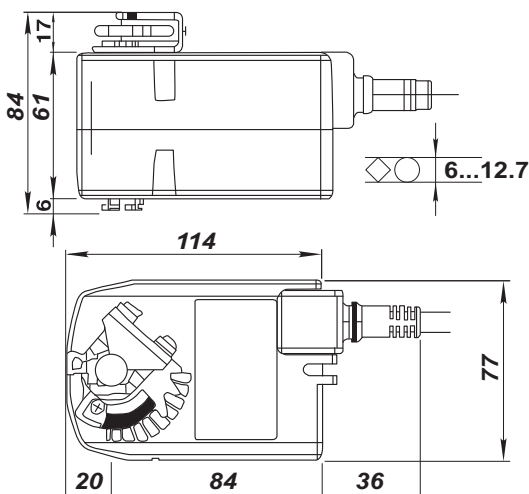
■ Design

- The electric actuator is provided with a 2 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The actuator is equipped with a return spring, which moves the damper to its operating position while tensioning the return spring at the same time. In case of power supply cut-off, the damper moves back to its safe position by the spring energy.
- The angle of rotation is adjusted by mechanical end stops.

■ Wiring diagram



■ Overall dimensions



■ Technical data

	TF24	TF230
Voltage	24 V ~ 50/60 Hz, 24 V=	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28.8 ~ 21.6...28.8 V=	85...265 ~
Rated power [VA]	4 (max. I 5.8 A at t = 5 ms)	4 (max. I 150 mA at t = 10 ms)
Power consumption in operation / at rest [W]	2 / 1.3	2 / 1.3
Connecting cable	1 m long, 2 x 0.75 mm ²	
Direction of rotation	determined by L/R positioning	
Torque (motor / spring) [Nm]	2 (at nominal voltage) / 2	
Angle of rotation:	max. 95°, adjustable 37...100 % with a mechanical end stop	
Swing time (motor / spring) [sec]	40...75 (0...2 Nm) / < 25 at -20...50 °C	
Service life	60 000 switching operations	
Ingress protection rating	IP42	
Electrical protection class	III low voltage II totally insulated	
Operation temperature [°C]	-30...+50	
Storage temperature [°C]	-40...+80	
Ambient humidity	95 %, no condensation	
Noise level (motor/ spring) [dBA]	50 / ≈ 62	
Maintenance	not required	
Weight [kg]	0.6	



Electric actuator BELIMO LF230/LF24

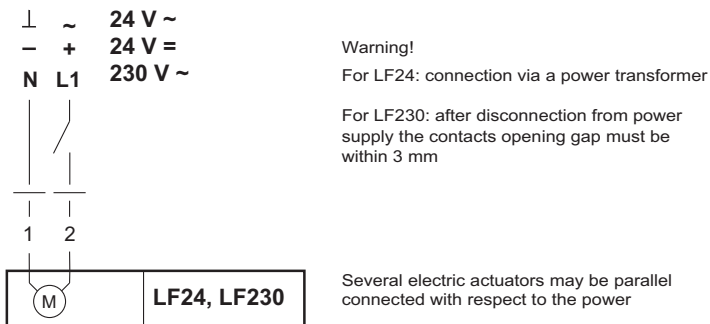
■ Use

- For controlling air dampers with cross section up to 0.8 m² installed in various ventilation and air conditioning systems and performing protection functions.

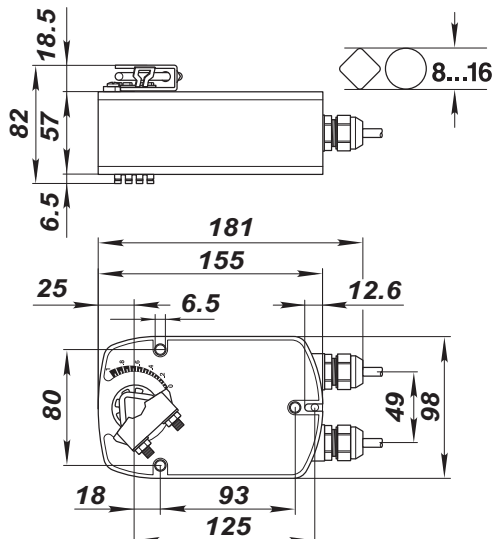
■ Design

- The electric actuator is provided with a 4 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The actuator is equipped with a return spring, which moves the damper to its operating position while tensioning the return spring at the same time. In case of power supply cut-off, the damper moves back to its safe position by the spring energy.
- The angle of rotation is adjusted by mechanical end stops.

■ Wiring diagram



■ Overall dimensions



■ Technical data

	LF24	LF230
Voltage	24 V ~ 50/60 Hz, 24 V=	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28.8 ~ 21.6...28.8 V=	198...264 ~
Rated power [VA]	7 (max. I 5.8 A at t = 5 ms)	7 (max. I 150 mA at t = 10 ms)
Power consumption in operation / at rest [W]	5 / 2,5	5 / 3
Connecting cable	1 m long, 2 x 0.75 mm ²	
Direction of rotation	determined by L/R positioning	
Torque (motor / spring) [Nm]	4 (at nominal voltage) / 4	
Angle of rotation	max. 95°, adjustable 37...100 % with a mechanical end stop	
Swing time (motor / spring) [sec]	40...75 (0...4 Nm) / ~ 20 at -20...50 °C	
Service life	60 000 switching operations	
Ingress protection rating	IP54 (installation with cable downwards)	
Electrical protection class	III low voltage II totally insulated	
Operation temperature [°C]	-30...+50	
Storage temperature [°C]	-40...+80	
Ambient humidity	95 %, no condensation	
Noise level (motor/ spring) [dBA]	50 / ≈ 62	
Maintenance	not required	
Weight [kg]	1.4	

NOTES