FRESHBOX 100

SINGLE-ROOM AIR HANDLING UNITS

Features

- Efficient solution for supply and exhaust ventilation of enclosed spaces.
- Electric preheating or reheating is available for cold climate conditions.
- Units with enthalpy heat exchangers are available for use in hot and wet climates.
- Low-energy EC motors.
- Silent operation.
- Supply air purification ensured by two built-in G4 and F8 filters (optionally F8 C and H13).
- Upgradeable with an exhaust duct to provide air extraction from the bathroom.
- Easy installation.
- Compact size.

Air flow:
up to 100 m³/h
28 l/s

Heat recovery efficiency:
up to 98 %

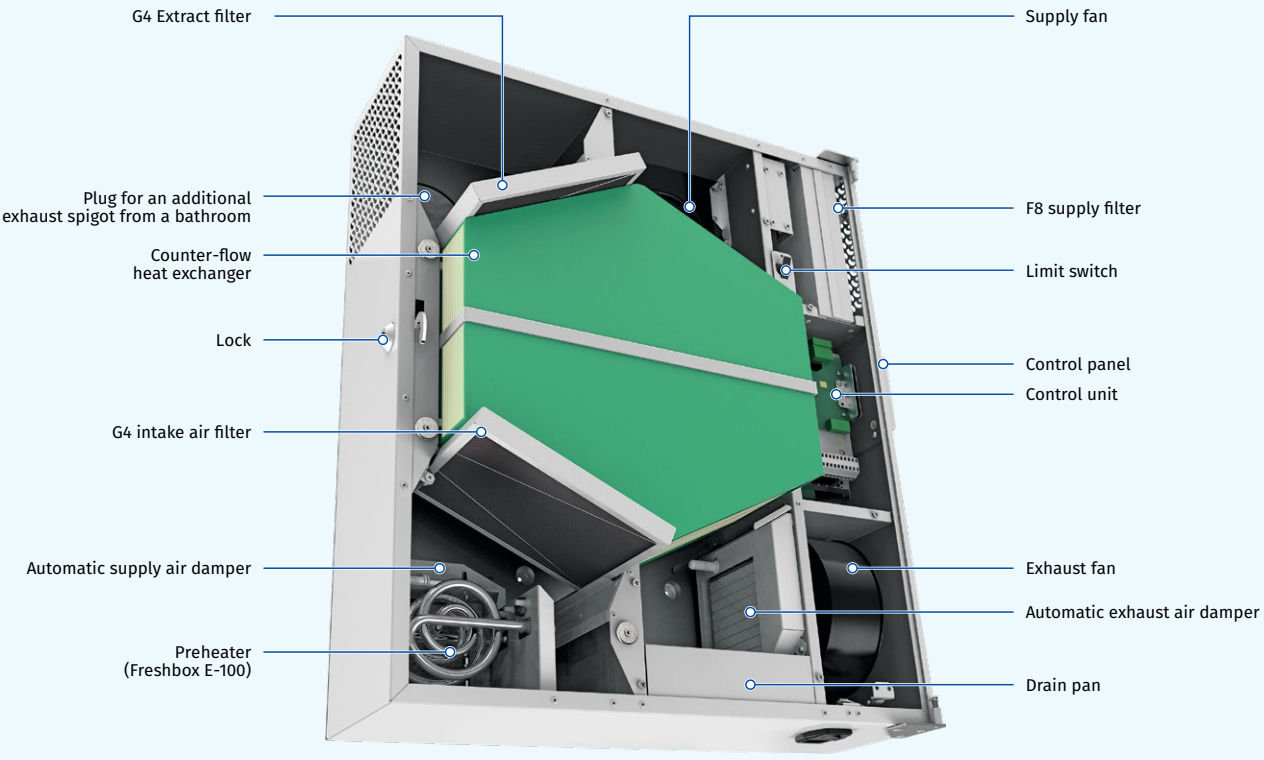
EC motor · ErP 2016 · ErP 2018

Design

- Polymer coated metal casing decorated with an acrylic front panel. Heat and noise insulation is ensured by a layer of 10 mm cellular synthetic rubber.
- The front panel provides convenient access for filter maintenance and has a lock for extra security.
- The unit has two ∅ 100 mm pipes for fresh air intake and stale air extraction outside. The third ∅ 100 mm pipe (included in the scope of delivery) can be additionally fitted to the unit to connect the exhaust air duct from the bathroom.

Motors

- The units feature efficient electronically commutated (EC) motors with an external rotor and impellers with forward curved blades. These state-of-the-art motors are the most advanced solution in energy efficiency today.
- EC motors are characterised with high performance and optimum control across the entire speed range. In addition to that the efficiency of electronically commutated motors reaches very impressive levels of up to 90 %.



Designation key

Model	Heater		Rated air flow [m³/h]	Heat exchanger type	Colour
Freshbox	**_:** no heater **E:** preheater	–	**100**	**_:** heat recovery **ERV:** energy recovery	**_:** white casing **Black:** black casing

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Air dampers

- The unit is equipped with supply and exhaust air dampers which activate automatically to prevent drafts while the unit is off.

Air filtration

- Supply air cleaning is provided by the G4 and F8 panel filters (PM2.5 > 75 %). To meet more stringent air purity requirements the F8 filter can be replaced with an H13 (PM2.5 > 99 %) (purchased separately). Exhaust air is cleaned by the panel filter G4.

Heaters

PREHEATING

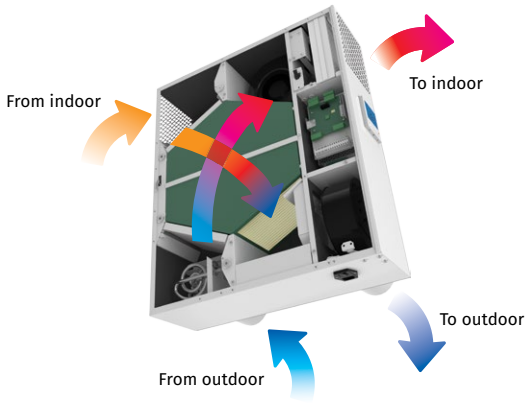
- **Freshbox E-100** units are equipped with an electric preheater which protects the heat exchanger from freezing.

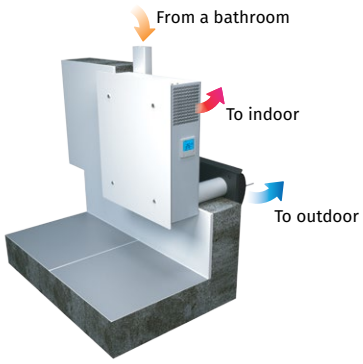
HEATER FOR CONDENSATE FREEZE PROTECTION

- Operation in a cold climate may result in condensate freezing in the exhaust air duct and the external hood. Therefore, it is recommended to install the **EH Freshbox 100** (optional) heater (purchased separately) to prevent icing.

Operating principle

- **The cold outdoor air** passes through the filters and the heat exchanger and then is delivered to the serviced space by the supply centrifugal fan.
- **Warm polluted air from the premise** flows through the filter and the heat exchanger and is exhausted outside with an extract centrifugal fan through an air duct in the wall.
- **The supply and exhaust air** flows are fully separated which helps eliminate the possibility of odour or microbial transfer between the streams.





Operating principle with extra spigot for bathroom exhaust ventilation

Heat exchanger

- The **Freshbox 100** units are equipped with a counter-flow heat exchanger with a polystyrene core.
  - **In the cold season** the exhaust air heat is captured and transferred to the supply air stream which reduces the ventilation-generated heat losses. Some condensate may form during heat recovery. The condensate is collected in the drain pan and is removed from the exhaust air duct.
  - **In the warm season** the intake air heat is transferred to the extract air stream. This allows for a considerable reduction of the supply air temperature which, in turn, reduces the air conditioning load.

- The **Freshbox 100 ERV** units are equipped with a counter-flow heat exchanger with an enthalpy membrane at the core.
  - **In the cold season** the exhaust air heat and moisture are transferred to the supply air stream through the enthalpy membrane reducing the heat losses through ventilation.
  - **In warm season** the heat and humidity of the outdoor air is absorbed by extract air flow through the enthalpy membrane. This way the supply air temperature and humidity decreases and heat recovery reduces operation loads for the air conditioner.

Control

- The unit is equipped with a control panel.
- The remote control is supplied as standard.

FUNCTIONS

	Freshbox 100	Freshbox E-100
Speed changeover	•	•
Filter replacement indication	•	•
Alarm indication	•	•
Speed setting	•	•
Timer	•	•
Weekly schedule	•	•
Preheating enabled/disabled		•

FREEZE PROTECTION

- There are two types of freeze protection available to protect the heat exchangers in the cold season.
- **Freshbox 100** features an exhaust air temperature sensor downstream of the heat exchanger which disables the supply fan to let the warm extract air warm up the heat exchanger. After that the supply fan is turned on and the unit reverts to the normal operation mode.
- The **Freshbox E-100** units are equipped with an electric preheater which warms up the supply air upstream of the heat exchanger to prevent its freezing.
- These features ensure a continuous balanced air exchange regardless of ambient air temperature variations.

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Technical data

Parameters	Freshbox 100			Freshbox 100 ERV			Freshbox E-100			Freshbox E-100 ERV		
Speed	1	2	3	1	2	3	1	2	3	1	2	3
Voltage [V / 50-60 Hz]	1~ 110–240			1~ 110–240			1~ 230			1~ 230		
Max. unit power without electric heater [W]	12	21	45	12	21	45	12	21	45	12	21	45
Integrated electric preheater power [W]	-			-			700			700		
Integrated electric reheater power [W]	-			-			-			-		
Max. unit current without electric heater [A]	0.4			0.4			0.4			0.4		
Max. unit current with electric heater [A]	-			-			3.6			3.6		
Maximum air flow [m³/h (l/s)]	30 (8)	60 (17)	100 (28)	30 (8)	60 (17)	100 (28)	30 (8)	60 (17)	100 (28)	30 (8)	60 (17)	100 (28)
RPM [min⁻¹]	2200			2200			2200			2200		
Sound pressure level at 3 m distance [dBA]	13	27	39	13	27	39	13	27	39	13	27	39
Max. operating temperature [°C]	-20...+40			-20...+40			-20...+40			-20...+40		
Case material	polymer coated steel			polymer coated steel			polymer coated steel			polymer coated steel		
Insulation [mm]	10			10			10			10		
Extract filter	G4			G4			G4			G4		
Supply filter	G4, F8 (Option: F8 C, H13)			G4, F8 (Option: F8 C, H13)			G4, F8 (Option: F8 C, H13)			G4, F8 (Option: F8 C, H13)		
Connected air duct diameter [mm]	100			100			100			100		
Weight [kg]	31			31			31			31		
Heat recovery efficiency [%] *	98	92	89	96	89	83	98	92	89	90	86	83
Heat exchanger type	counter-flow			counter-flow			counter-flow			counter-flow		
Heat exchanger material	polystyrene			enthalpic membrane			polystyrene			enthalpic membrane		
SEC class	A			A			A			A		

*Heat recovery efficiency is specified in compliance with EN 13141-8.

Sound-power level, A - weighted	Total	Octave frequency band [Hz]								Sound pressure level at 3 m, A-filter applied	Sound pressure level at 1 m, A-filter applied
		63	125	250	500	1000	2000	4000	8000		
L_{WA} to environment [dBA]	**49**	45	40	44	38	33	29	27	22	**28**	**38**

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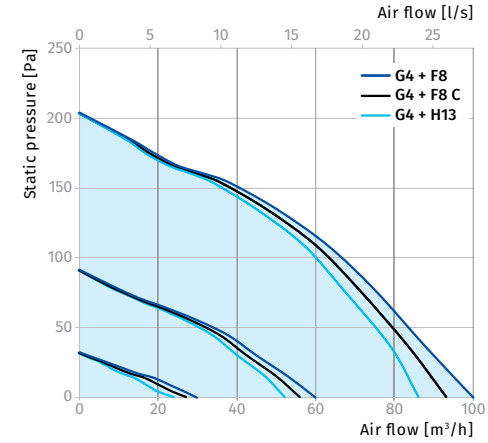
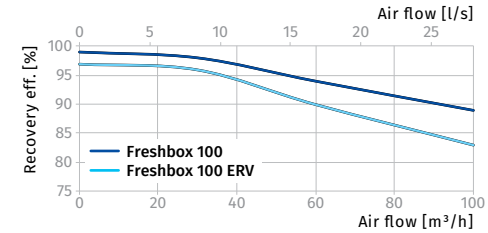
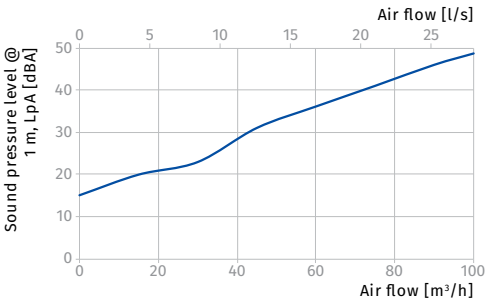
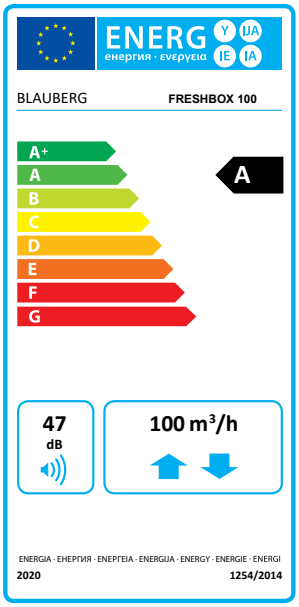
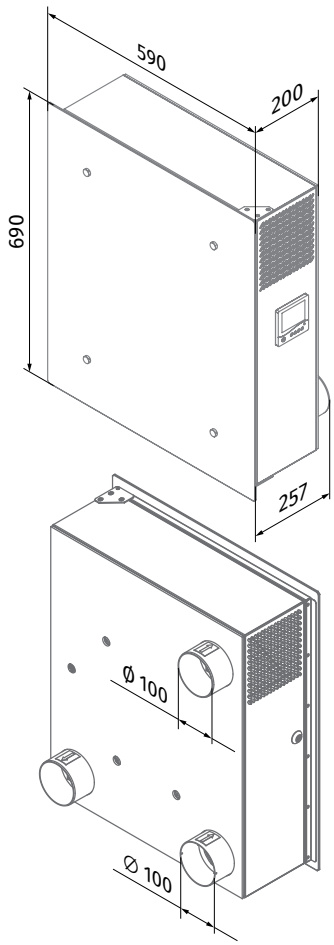








Overall dimensions [mm]



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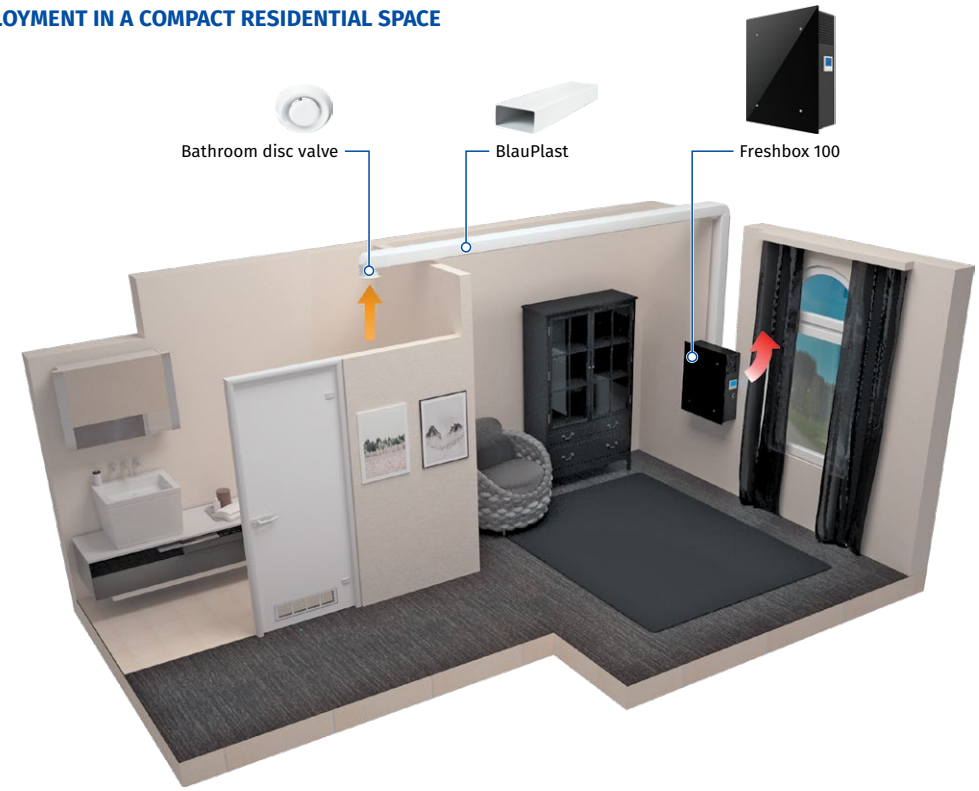
Mounting example

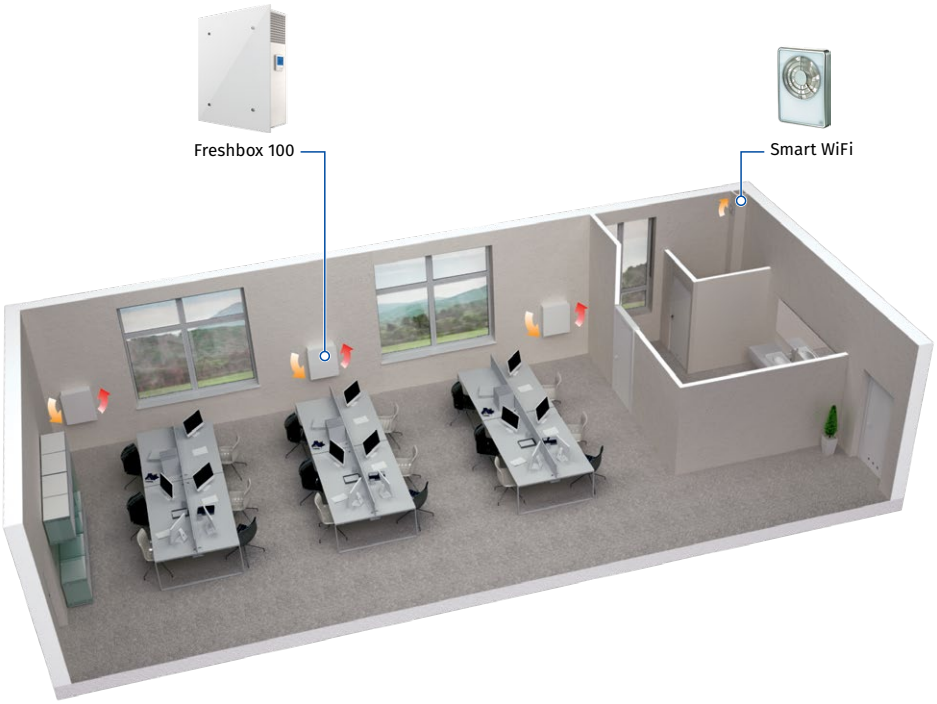
Each space requiring ventilation is equipped with one or several Freshbox 100 units.
A single unit is capable to ensure efficient ventilation in spaces with floor area up to 75 m².

Freshbox 100 units can be upgraded with a bathroom exhaust air duct. To enable such a configuration the units can be additionally equipped with the optional ∅ 100 mm spigot (supplied as standard).

FRESHBOX 100 DEPLOYMENT IN A COMPACT RESIDENTIAL SPACE



FRESHBOX 100 MOUNTING EXAMPLE IN THE OFFICE



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Accessories

Name		Description
MS Freshbox 100 chrome		Mounting kit: • Two ∅ 100 mm air ducts, 500 mm long • Ventilation outer hood made of polished steel • Cardboard template
MS Freshbox 100 white		Mounting kit: • Two ∅ 100 mm air ducts, 500 mm long • Ventilation outer hood, painted white • Cardboard template
AH Freshbox 100 chrome		Ventilation outer hood made of polished steel
AH Freshbox 100 white		Ventilation outer hood, painted white
EH Freshbox 100		Heater to prevent condensate freezing in the drain pipe and outer ventilation hood
FP 193x158x18 G4 PPI		G4 filter
FP 193x158x47 F8		F8 filter
FP 193x158x47 F8 C		F8 carbon filter
FP 193x158x47 H13		H13 HEPA filter
HR-S		Humidity sensor
CD-1		CO_2 sensor with LED CO_2 indication and a sensor button for operation mode selection
CD-2		CO_2 sensor