00.00.00 Ventilation/Air handling system DucoBox Energy 400 Premium

sequence no. 1

Description:

DucoBox Energy 400 Premium is an individual mechanical ventilation unit with principle D heat recovery.

Demand-controlled balanced ventilation/heat recovery unit with a supply fan and central extract unit featuring intelligent frost protection, modulating bypass and an HR plastic crossflow heat exchanger. Semi-automatic configuration ensures the device can be installed quickly and guarantees high-quality calibration.

Operation:

It supplies fresh air mechanically to and extracts contaminated air mechanically from the home with the help of integrated fans. During this process, the heat is recovered from the extracted air and transferred to the air supplied.

Material:

Casing: Double-walled steel box with 30 mm of insulation.
Inside: PP, ABS (without cold bridges) and insulation material with a closed-cell structure (EPP). Integrated heat exchanger: Plastic (100% recyclable; made out of recycled material).

Configuration:

Connections: The air ducts for the dwelling connection can be connected at the top of the DucoBox Energy Premium.
5 top connections (in EPP):
- Supply to the dwelling (2x).
- Extraction from the dwelling.
- Extraction to outside.
- Intake from outside.

Air side: 5 x 160 mm ID – 190 mm OD. Exhaust duct from unit to outside:
- Insulated duct.
- Quantity (ea.): 1, individual.

Outside air supply duct to unit:
- Insulated duct.
- Quantity (ea.): 1, individual.

Number of zones on supply side: Choice of 1-zone or 2-zone. Integrated 2-zone system with demand control ensures extremely quiet, intelligent and energy-efficient operation.

Frost protection: Featuring automatic intelligent energy-saving frost protection as standard by means of speed control on supply/temporary imbalance and flow restriction. This ensures frost-free operation of the DucoBox Energy Premium, thus guaranteeing good ventilation throughout the winter period. Option of incorporating an additional proportional heater (pre-heater).

Variant: Can be supplied with a right or left-hand dwelling connection.

Technical specifications:

(Total) flow rate (m^3/h): Maximum: 400 m^3/h 150 Pa, to be set in accordance with contractor's / installer's / preliminary ventilation design calculation, in compliance with Belgian standard NBN D 50-001.

Head (Pa): 150.

(Temperature) efficiency (%): At 301 m³/h: 85 %.
At 351 m³/h: 85 %.
At 401 m³/h: 84 %.
Per EN 308-1997.

Noise level Lw/Sound power level (dB(A)):
Casing emission (dB(A)): 52,5.
Supply (dB(A)): 57,0.
Extraction (dB(A)): 55,0.
Flow rate (m³/h): 400.
Pressure (Pa): 150.

Maximum (absorbed) power: 120 W at 325 m³/h – 150 Pa (2 x 60 W).

Maximum heater power (W): 1000.

Dimensions (mm): W: 740.
H: 957 (including connections). D:
585 (including mounting
bracket).

Weight (kg): 47.

Fans: The EC direct-current fans have robust backward-curved blades, which makes the easier to clean. The fans are mounted vertically and are very quiet. The unique positioning of the fan, i.e. before the heat exchanger and the 2-zone valve, results in optimum sound absorption on the supply side.

Fan type: DC.

Heat exchanger type: The crossflow heat exchanger is characterised by low resistance, as a result of which it also contributes to minimal noise level and energy consumption. The heat exchange consists of polystyrene.

Energy class: A+.

Air filter/Dust/grease filter: Supply and extraction side, featuring 2x class G4 as standard (F7 optional) / removable.

- Standard: G4 / Coarse 65% (ISO 16890).
- Optional: F7 / ePM1 70% (ISO 16890).

The filters are easily accessible thanks to a filter drawer mounted diagonally. The filters in the DucoBox Energy Premium are electrostatic and antibacterial. They filter pollen as well as coarse and fine dust out of the air. The filters have been selected for a replacement interval of 6 months.

(Supply) voltage (V): 230 V, 50 Hz.

Electrical connection: Fitted with a 2 m cord with side earth

contacts/Europlug. Protection rating: IP 40.

Colour: Green (RAL 6018) with white (RAL 9016)

cover. Surface treatment: Coated (Sendzimir galvanised).

Condensate drain: A condensate drain (32 mm (1 ¼") diameter tube, integrated external screw thread) is provided to discharge condensate. This condensate drain requires to be connected to the inside drainage system via a water seal (trap) with a 60 mm minimum difference in level.

The condensate drain is to be connected to the discharge pipe by means of a trap with a sufficiently large odour seal, e.g. DucoBox Energy Premium (flat) siphon.

Functionalities:

Control:	Adaptive / demand-controlled, expandable with humidity control and/or CO_2 control. - Timed control: Facility for programming a set schedule. - Unoccupied setting: The unoccupied setting can be activated for extended periods of absence so the ventilation system runs at its most energy-efficient setting.
Control:	Direct current constant volume with flow control ensures that balanced airflows and flow rates will be kept constant at all times.
Automatic control:	The DucoBox Energy Premium unit features a constant volume setting. The air volume setting is automatically controlled independently of ducting resistance and of filter contamination. The air volume to be ventilated is distributed automatically in the following ratios: - Setting 1: 25% of maximum setting. - Setting 2: 50 % of maximum setting. - Setting 3: maximum setting (to be set).
(Summer) bypass:	Featuring an automatic 100% modulating bypass as standard. Can be activated automatically or manually. The bypass operates entirely automatically based on indoor and outdoor temperatures. The bypass directs the air around the heat exchanger. In this way the dwelling will be cooled naturally during summer nights.
NightBoost:	Duco's NightBoost function is used to set the ventilation system during the summer to assist in cooling down high indoor temperatures. This fully automatic smart (night) cooling function temporarily deactivates demand control and causes the system to operate at nominal value. Not only does this reduce the risk of overheating, it also brings about a drop in the need for cooling. Smart NightBoost algorithms ensure energy-efficient operation without disturbing night rest.
Filter alert:	The unit features an automatic filter alert based on the volume of ventilated air. If the filters are due for replacement, the LED on the switch will light up orange when it is operated. The filter alert can be reset via the RF switch. - Via smartphone. - On the integrated control unit. - On an optional external control. - Time controlled.
Setting / operation:	4 speeds: low, medium and high setting plus automatic setting.
Communication: network.	Wireless communication via RF protocol with other control components in the Duco network. Wired communication via Duco protocol, 5 x 0.8 mm² solid core (power supply 2 x 0.8 mm² + communication 3 x 0.8 mm² (A-B-GND)) with other control components in the Duco network.

Accessories:

Control unit:
- With integrated control.
- Indication of active program.
- - Ability to alter all necessary parameters.

Fixing bracket for wall mounting.
Installation manual.

User manual.
Condensate drain adapter, 32 mm dia. tube with screw thread.
2 x DucoBox Energy Premium G4 filter (ISO 16890 Coarse 65%).
1 x DucoBox Energy Premium Blanking cap.

Options:

Expandable with Communication Print for:
- Control via Duco Ventilation App.
- ModBus, PWM-IN, PWM-OUT, Switch Sensor (3x), Ethernet (ability to control the DucoBox Energy Premium via tablet/smartphone), Micro SD card slot.

DucoBox Energy Premium Humidity Boxsensor.
DucoBox Energy Premium Mounting plinth, for ease of installation on the floor.
DucoBox Energy Premium (Flat) Trap.

Design flow rate:

Extraction points:	Kitchen(s):	Min. 75 m^3/h.
	Bathroom(s):	50 m^3/h.
	Toilet(s):	25 m^3/h.
	Laundry room:	50 m^3/h.
	Flow rate (m^3/h): per Belgian standard NBN DSO-001 (1991).	
Supply points:	- Occupied rooms respectively per NBN D 50-001 (1991).	
	- - Flow rate (1 l/s/m or 3.6 $m^3/h/m$) per NBN D 50-001 (1991).	
	- - Air supply points to be installed as far as possible in the walking area.	
	- - 'Clean sector' vents to be used with air supply points < 30 cm out of the wall.	
	- - Standard vents can be used with air supply points ≥ 30 cm out of the wall.	
	Flow rate (m^3/h): per Belgian standard NBN DSO-001 (1991).	

Controls and switchgear:

Room operating units with RF communication. Room operating units with wired communication. Sensors with RF communication such as CO_2/RH. Sensors with wired communication such as CO_2/RH. Switch Sensor with RF communication.

Control components can be paired with the DucoBox Energy Premium (= master unit).

Application:

The individual mechanical ventilation unit with heat recovery for (residential) applications with a 325 m^3 operating volume per DucoBox Energy Premium at 150 Pa.
Applicable as standard in the following Duco ventilation systems:
Duco Energy Premium System.

Fitting:

Location: In accordance with manufacturer's instructions included. Indoors with adequate measures adopted to comply with the 30 dB(A) $L_{iA,k}$ [A-weighted characteristic installation sound level] requirement in compliance with the Building Decree 2012 (NEN 5077):
Location: In the attic/in the CH cupboard/in an enclosed installation space.
- The DucoBox Energy Premium is suitable for both wall and floor mounting.
- On a solid wall (minimum mass 200 kg/m^2) by means of hanger bracket included.
- To be fitted on mounting plinth.

Connections:
- Connections with ducts.
- Outlet side: rigid and fixed duct leading as straight and direct as possible to the outside, 190 mm.
- Sound absorbing measures between the unit and the connecting ducts to and from the dwelling.

- 1 metre of flexible acoustic hose.

- Terminations to be finished with Armaflex tape.
- Roof side:
  - Duct between mechanical ventilation unit with heat recovery and HR roof vent flange for ventilation extraction to be insulated thermally and vapour-proof.
  - Duct between mechanical ventilation unit with heat recovery and wall grille / HR roof vent flange for ventilation extraction to be insulated thermally and vapour-proof.
- Dwelling side:
  - Flexible sound absorbing hose between extraction duct and mechanical ventilation unit with heat recovery.
  - Flexible sound absorbing hose between supply duct and mechanical ventilation unit with heat recovery.

Connection method: Consult your regional dealer or the Duco 'Ventilation & Sun Control' project department for sales and technical assistance (assembly and fitting instructions).

Servicing and Maintenance:

Maintain a minimum service space of 500 mm to allow for servicing and maintenance of the mechanical ventilation unit with heat recovery.

Warranty:

Standard: 24 months from date of manufacture.
After online registration or Duco VIP: 36 months from date of manufacture.

Certificates:

Certificates/EPBD databank
- The DucoBox Energy Premium has been approved in accordance with standards EN 308/EN 1314-7. For Belgium, this is also in accordance with EN 308 Appendix G.
- The unit in the list of accredited EPB product information databank; "4.4 fan and fan group" with code 4.4.2 Double airflow with heat recovery.
- The DucoBox Energy Premium has the CE label and complies with the low-voltage directive 2006/95/EC, EMC directive 2004/108/EC and R&TTE directive 1999/5/EC.
  If this ventilation system is brought into compliance with the provisions of the European requirements, following submission of a IIA declaration of the machinery directive on this entire system, then machinery directive 2006/42/EC will be applicable.

<table>
<tr><td colspan="2">Supply</td><td colspan="4">Dry rooms</td></tr>
<tr><td rowspan="7">Control</td><td>CO_2 measurement in living room/open kitchen</td><td colspan="4">CO_2 Room sensor</td></tr>
<tr><td>CO_2 measurement in bedroom(s)/dry rooms</td><td colspan="2">CO_2 Room sensor in master bedroom</td><td colspan="2">CO_2 Room sensor in each dry room</td></tr>
<tr><td>Humidity sensing in bathroom</td><td>X</td><td rowspan="2">Humidity Boxsensor or Humidity Sensor</td><td>X</td><td rowspan="2">Humidity Boxsensor or Humidity Sensor</td></tr>
<tr><td>Humidity measurement in washing and drying area</td><td>X</td><td>X</td></tr>
<tr><td>Toilet</td><td>X</td><td>Switch Sensor</td><td>X</td><td>Switch Sensor</td></tr>
<tr><td>Room operating unit</td><td colspan="2">Living room + master bedroom (via Room sensor)</td><td colspan="2">All dry rooms (via Room sensor)</td></tr>
</table>

Feedthrough		DoorVent			
Extraction		DucoBox Energy Premium			
$f_{reduc,vent}$	1 ZONE	0.87 (heat) 1.00 (cool) 1.00 (overheat)	0.81 (heat) 1.00 (cool) 1.00 (overheat)	0.61 (heat) 1.00 (cool) 1.00 (overheat)	0.56 (heat) 1.00 (cool) 1.00 (overheat)
Valid for building application as from 01/01/2015	2 ZONE	0.53 (heat) 1.00 (cool) 1.00 (overheat)	0.48 (heat) 1.00 (cool) 1.00 (overheat)	0.49 (heat) 1.00 (cool) 1.00 (overheat)	0.45 (heat) 1.00 (cool) 1.00 (overheat)