



**HIGH EFFICIENCY
HEAT RECOVERY
VENTILATION EVB - HiE**



Maintaining the microclimat in premises with minimum energy consumption is a major factor in the management of operation costs in buildings. High efficiency heat recovery installations provide flow of fresh air with temperature, close to this in the room. The need of additional heating is minimized.

The heat recovery units manufactured by TANGRA are designed for installation in:

- Apartments and family houses
- Offices
- Stores and boutiques
- Hotels and restaurants
- Small factories

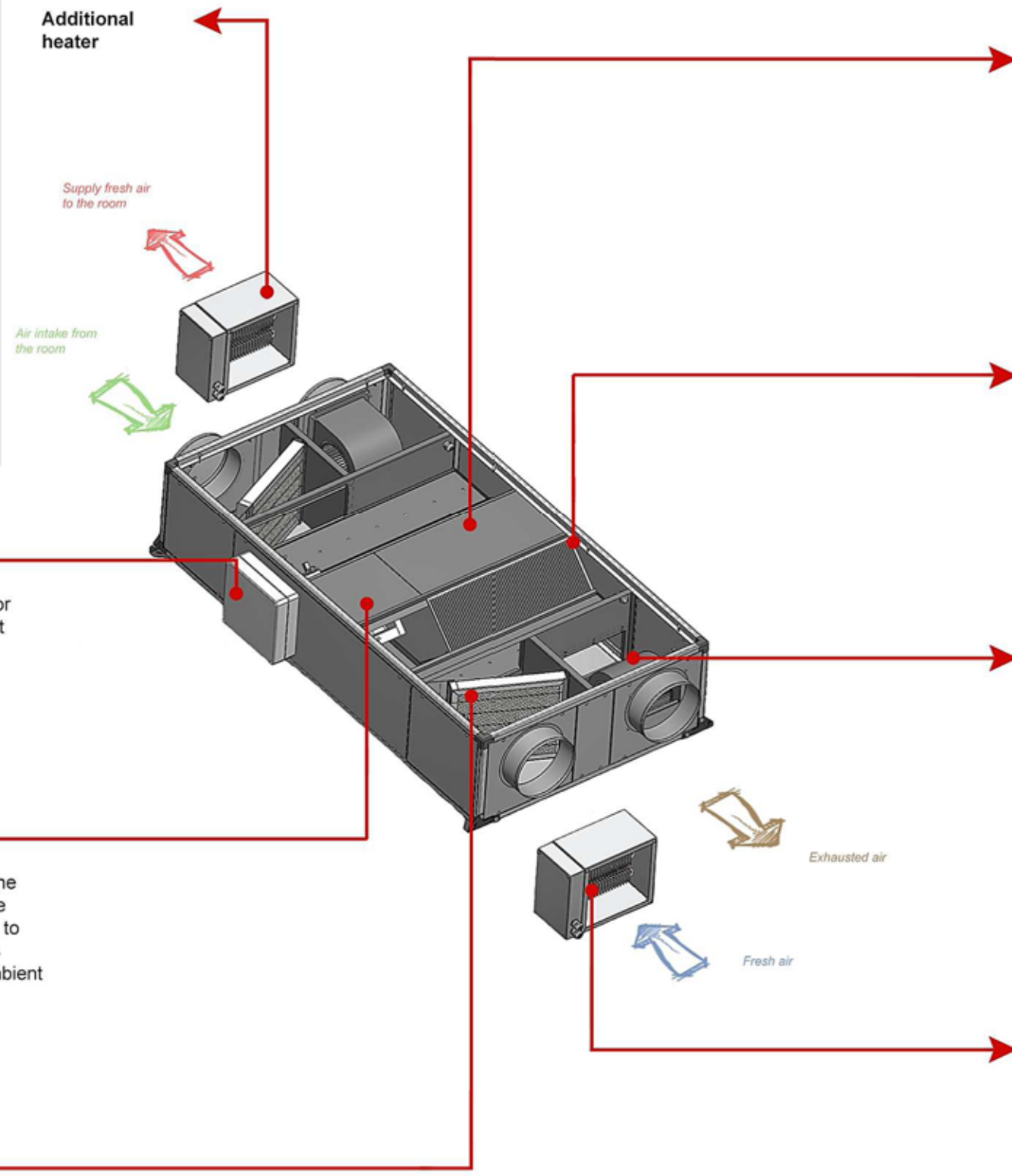


Plate heat exchanger - reuperator
 Manufactured of aluminium lamellas. Ensure heat exchange between fresh and exhausted air, with efficiency **up to 85%**. There is no odors (smells) and moisture transfer between the two streams. Operating temperature from -40°C to +90°C.

Construction and insulation
 Construction of anodized aluminium profiles. Side panels produced in two versions:
 - Single panel with inner insulation (13mm). (as standard)
 - Double panels "sandwich" type with 25mm insulation (on request).
 It is possible to change the directions of fresh and exhausted air) - see p.4.
 On the bottom side of the unit are formed drain connections.

Fans
 Double inlet direct drive centrifugal fans with air flow between 250 - 3500 m3/h. All motors are designed according to the requirements of Ecodesign Directive 2009/125/EC (ErP Directive). All fans are single speed and single phase. All motors are speed controlable.

Pre-heater
 The high efficiency leads to remarcable cooling of the exhausted air stream in winter. When the temperature of this air is below 0°C, there are circumpstances for freezing of the plate heat exchanger (ice blockage). The pre-heater is installed in the fresh air duct system. It turns on automatically and work until the heat exchanger is fully defrosted.

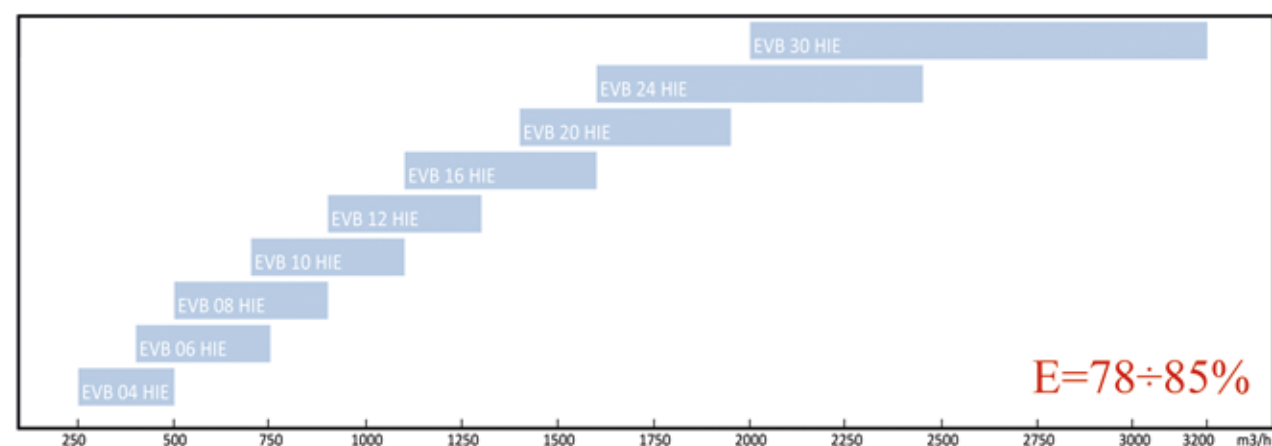
Electric board
 Power supply of fans, electric heaters and bypass actuator are leaded to an electrical board, installed outside the unit housing. In this board are also included sensors for temperature, pressure and programmable controller. For more information about the controller - see p.8.

Bypass
 Under certain temperature conditions, a device controls the ON/OFF function of the automatic bypass. In this way, the fresh air passes through the filter and is directly supplied to the room, without going through the heat exchanger. This mode is called "free-cooling" and as standard is set at ambient temperature between 16 + 24°C.

Air filter
 As standard the unit is delivered with filter G4 EN 779:2002, for fresh and exhausted air. As an option, the unit could be produced with F7 fine filter, which leads to reduction of the external pressure of the unit.

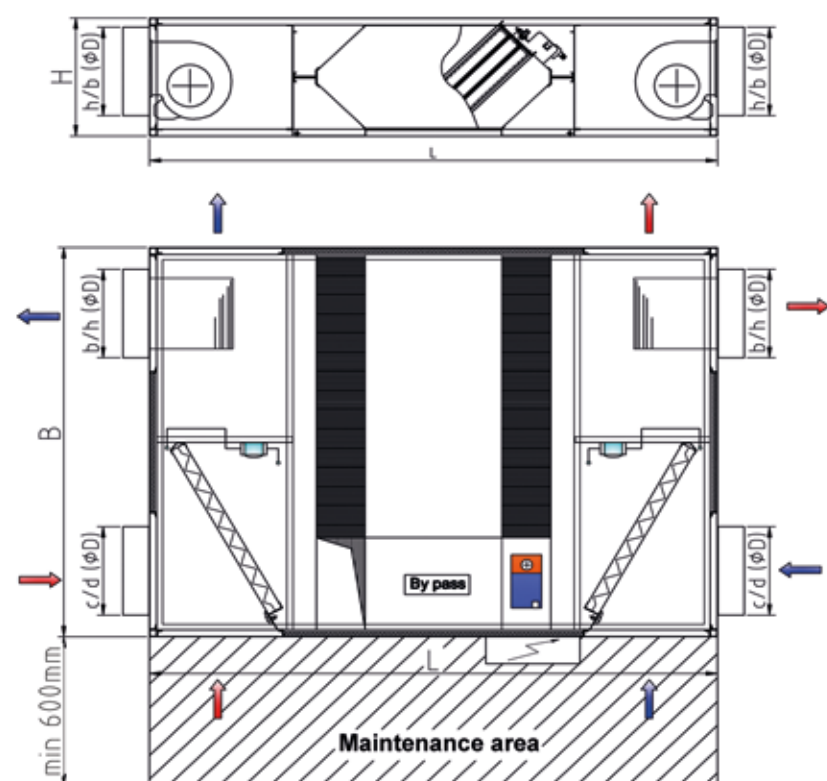
Efficiency
 up to **85%**

Product range



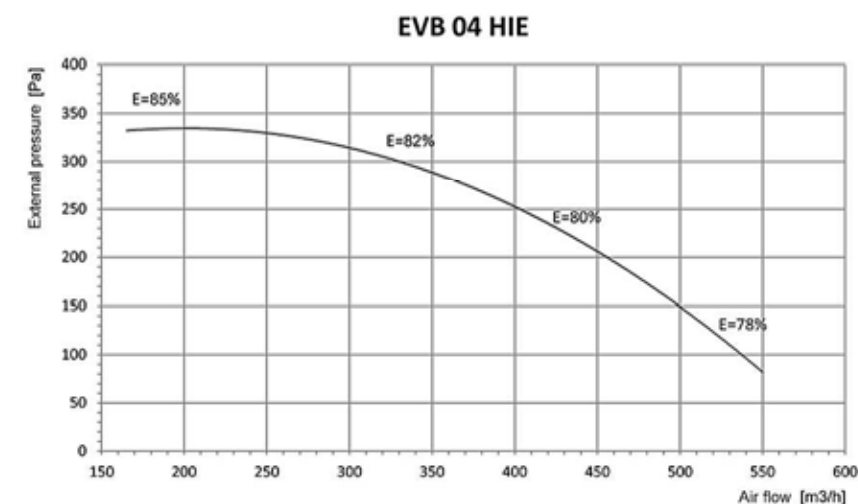
Dimensions

Overall and joined dimensions



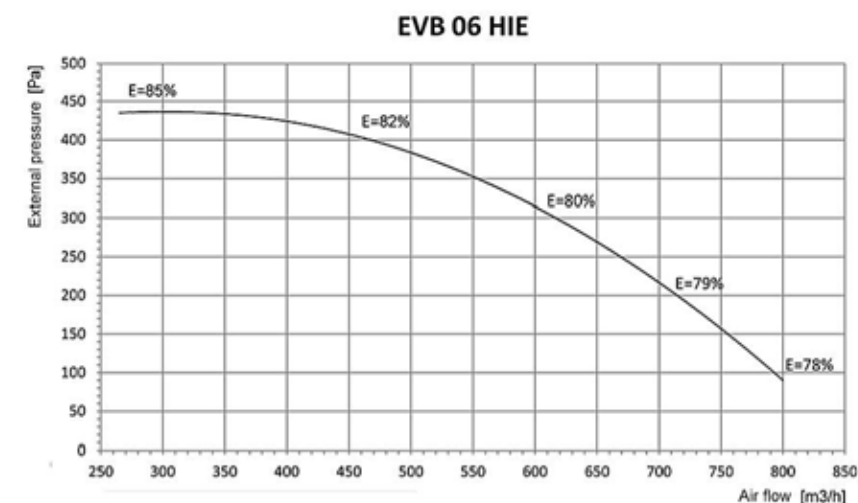
Model	Air flow [m ³ /h]	B [mm]	H [mm]	L [mm]	b [mm]	h [mm]	ØD [mm]	c [mm]	d [mm]	Weight [kg]
EVB 04 HIE	400	790	335	1480	200	200	200	200	200	90
EVB 06 HIE	600	890	335	1480	250	200	250	250	200	100
EVB 08 HIE	800	1090	335	1480	250	200	250	250	200	110
EVB 10 HIE	1000	1490	335	1480	250	200	250	250	200	136
EVB 12 HIE	1200	1290	550	1980	300	260	315	300	300	213
EVB 16 HIE	1600	1490	550	1980	300	260	315	300	300	229
EVB 20 HIE	2000	1590	550	1980	300	260	315	300	300	250
EVB 24 HIE	2400	1790	550	1980	265	290	355	350	350	269
EVB 30 HIE	3000	2290	550	2180	335	290	355	400	350	330

Side panels of the supply and suction side of the unit are interchangeable. In this way, it is possible to make different configurations. As standard this units are produced with round connections.



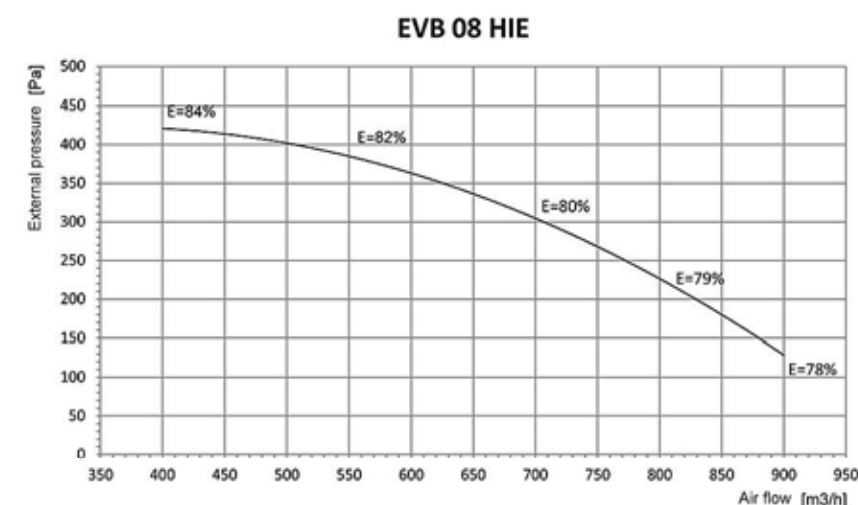
Absorbed power [W]	2x180
Voltage [V]	230
Operation temperature [C°]	-20°+ 40°
Nominal abs. current [A]	2x0.85
Level of protection	IP44
Pre-heater capacity [kW]*	1.5
Additional heater capacity [kW]*	1.5

*Both heaters are single speed with power supply 230V.



Absorbed power [W]	2x300
Voltage [V]	230
Operation temperature [C°]	-20°+ 55°
Nominal abs. current [A]	2x1.38
Level of protection	IP 44
Pre-heater capacity [kW]*	1.5
Additional heater capacity [kW]*	1.5

* Both heaters are single speed with power supply 230V.



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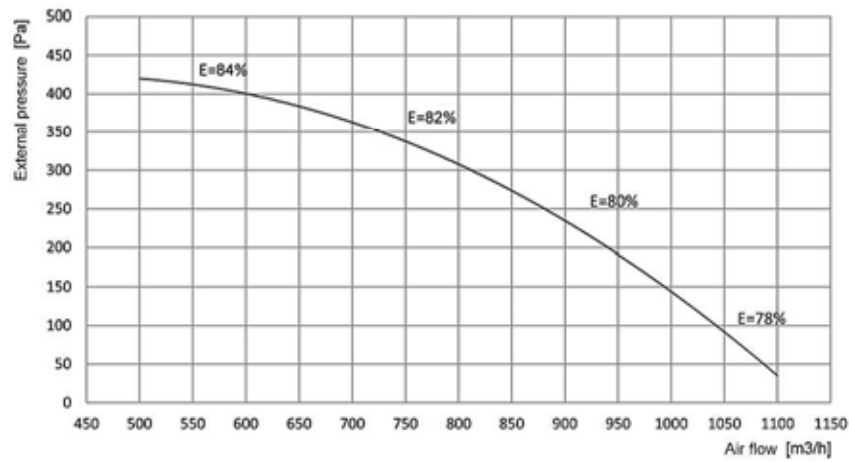
* Both heaters are single speed with power supply 230V.

Note: Efficiency data are valid at equal mass flows of both flows and without condensation. If there is a condensation, the efficiency will increase with 3+5%.

We reserve the right to introduce alternations both in design and technical data without prior notice, due to continued product development.

Technical data

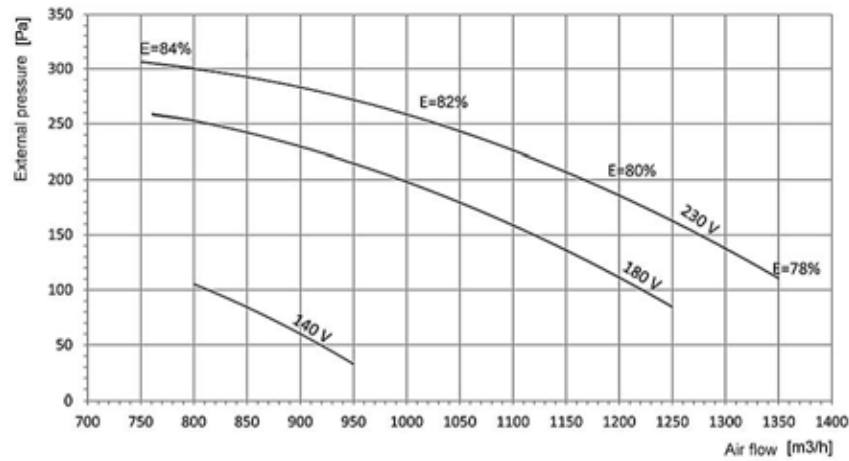
EVB 10 HIE



Absorbed power [W]	2x300
Voltage [V]	230
Operation temperature [C°]	-20°+ 55°
Nominal abs. current [A]	2x1.38
Level of protection	IP 44
Pre-heater capacity [kW]*	2.25
Additional heater capacity [kW]*	2.25

* Both heaters are single speed with power supply 230V.

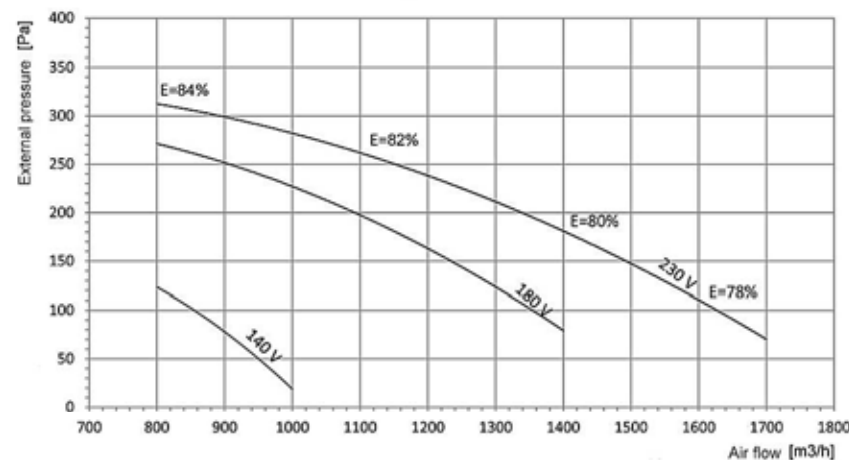
EVB 12 HIE



Absorbed power [W]	2x373
Voltage [V]	230
Operation temperature [C°]	-20°+ 40°
Nominal abs. current [A]	2x3.85
Level of protection	IP 44
Pre-heater capacity [kW]*	3
Additional heater capacity [kW]*	3

* Both heaters are single speed with power supply 230V.

EVB 16 HIE



Absorbed power [W]	2x373
Voltage [V]	230
Operation temperature [C°]	-20°+ 40°
Nominal abs. current [A]	2x3.85
Level of protection	IP 44
Pre-heater capacity [kW]*	3
Additional heater capacity [kW]*	3

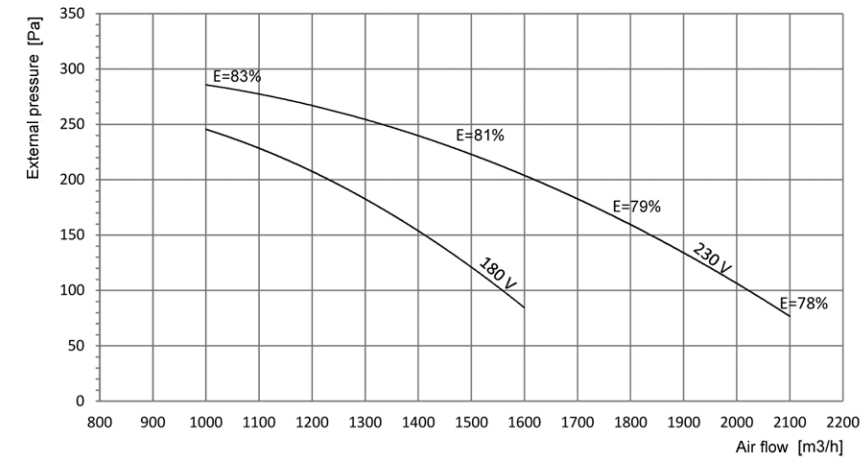
* Both heaters are single speed with power supply 230V.

Note: Efficiency data are valid at equal mass flows of both flows and without condensation. If there is a condensation, the efficiency will increase with 3+5%.

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Technical data

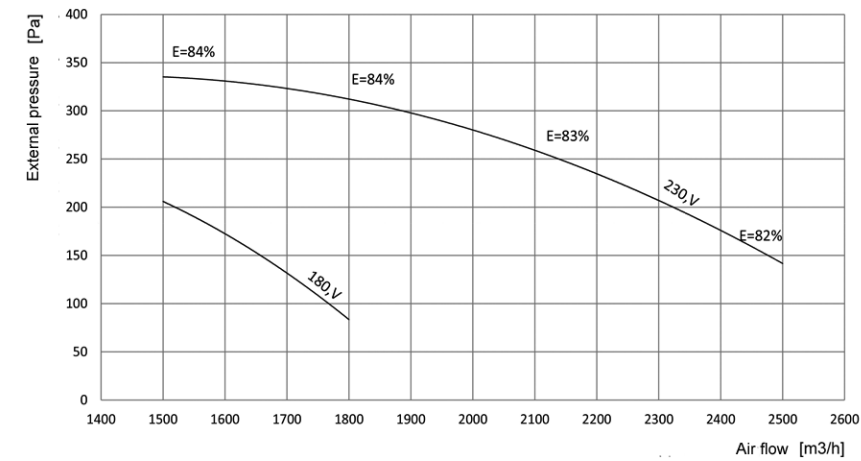
EVB 20 HIE



Absorbed power [W]	2x373
Voltage [V]	230
Operation temperature [C°]	-20°+ 40°
Nominal abs. current [A]	2x3.85
Level of protection	IP 44
Pre-heater capacity [kW]*	4.5
Additional heater capacity [kW]*	4.5

* Both heaters are single speed with power supply 380V.

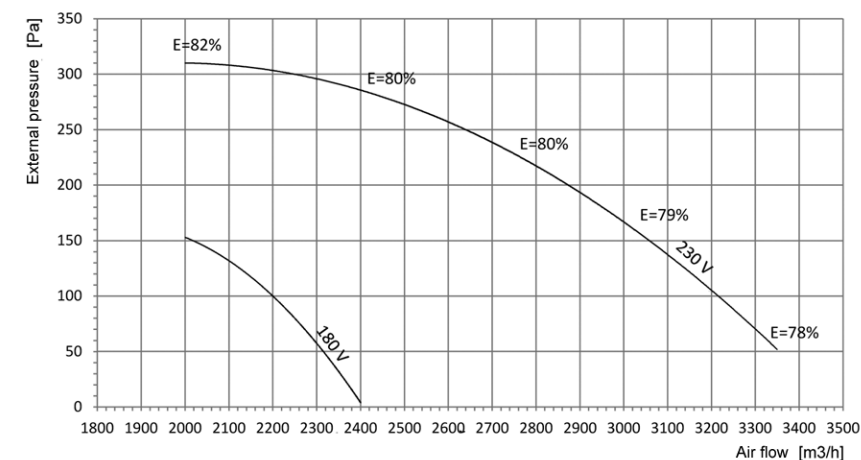
EVB 24 HIE



Absorbed power [W]	2x373
Voltage [V]	230
Operation temperature [C°]	-20°+ 40°
Nominal abs. current [A]	2x3.58
Level of protection	IP 20
Pre-heater capacity [kW]*	4.5
Additional heater capacity [kW]*	4.5

* Both heaters are single speed with power supply 380V.

EVB 30 HIE



Absorbed power [W]	2x550
Voltage [V]	230
Operation temperature [C°]	-20°+ 40°
Nominal abs. current [A]	2x4.3
Level of protection	IP 44
Pre-heater capacity [kW]*	6
Additional heater capacity [kW]*	6

* Both heaters are single speed with power supply 380V.

Note: Efficiency data are valid at equal mass flows of both flows and without condensation. If there is a condensation, the efficiency will increase with 3+5%.

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High efficiency heat recovery units offer the following options for control:

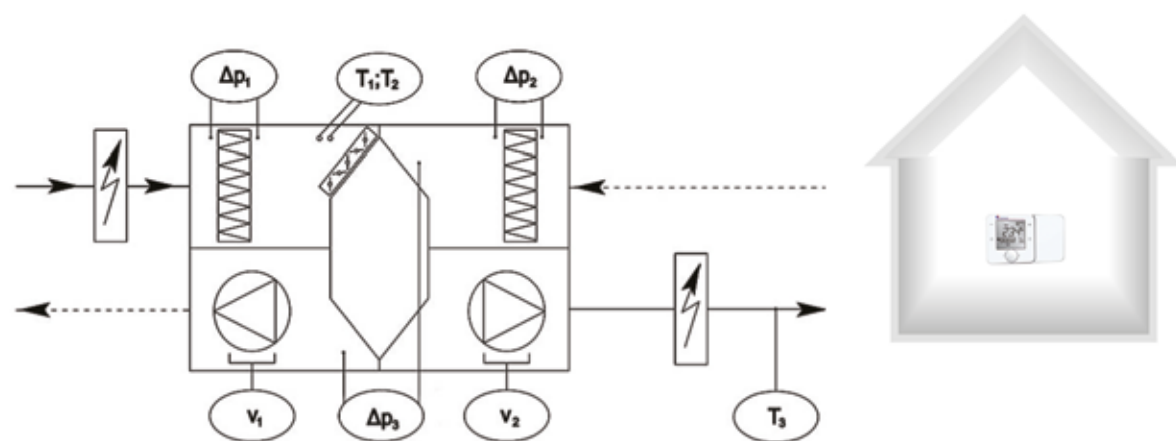
TANGRA TH

TH - integrated control module (controller, installed in the electrical board and LCD display, installed in the room) offers the following options:

- v1 - change the speed of the suction fan 30% - 60% - 100%.
- v2 - change the speed of the supply fan 30% - 60% - 100%.
- $\Delta p1$ - alert, if the fresh air filter is dirty.
- $\Delta p2$ - alert, if the exhausted air filter is dirty
- $\Delta p3$ - defrosting - turn the pre-heater on and reduce the air flow of the fan to 60%.
- T1 - alert for automatic opening of the bypass valve. As standard Text = 16°C.
- T2 - alert for automatic closing of the bypass valve. As standard at 24°C with possibility to manage the parameter.
- T3 - Controls additional heater on temperature, selected by the customer.



This control unit could be connected to BMS system.



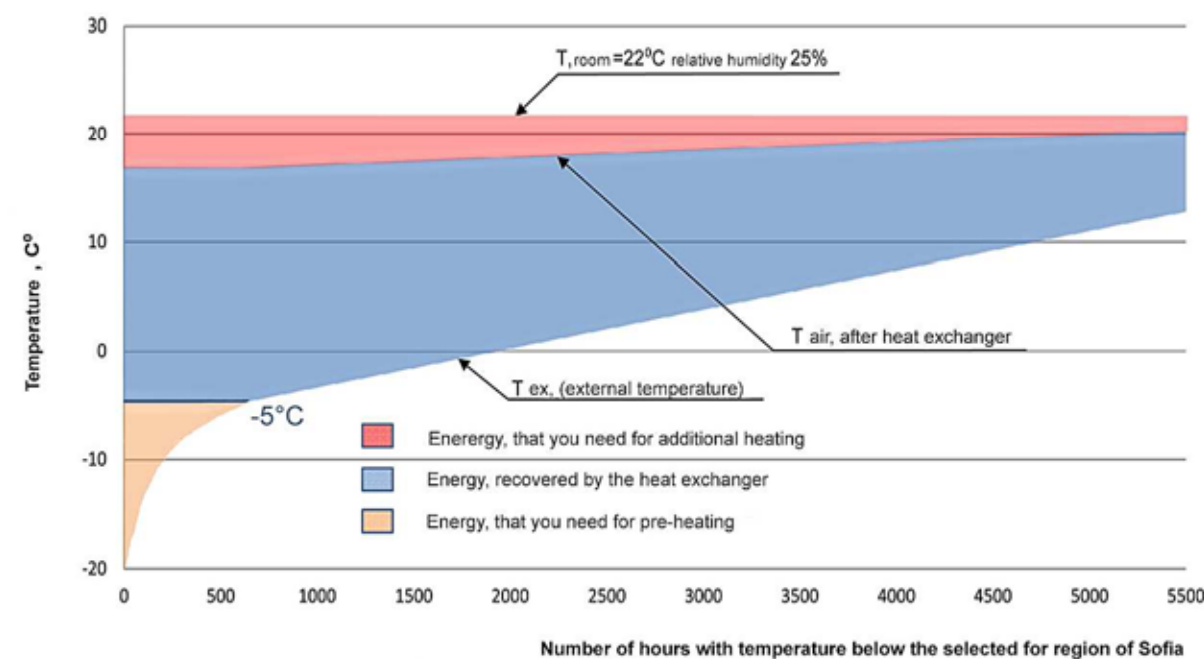
TANGRA ETY

- Only fan speed control
- Bypass valve operates automatically, according to signals T1 и T2.
- The pre-heater turns on automatically on signal for freezing.

SQA

- Air quality sensor with integrated timer. The unit allows to set a level of pollution of the environment, when the fan turns on and duration of the operation period.
- Bypass valve operates automatically, according to signals T1 и T2.
- The pre-heater turns on automatically on signal for freezing.

Annual division of energy costs



There are circumstances for freezing of the heat exchanger when the external air temperatures is below -5°C, which requires the installation of pre-heater.

The calculation of fresh air volume is based on the room area, number of people and room categorie.

Categorie	Fresh air quantity per perpson [m ³ /h]	Air volume for 1m ² floor area [m ³ /h]
A	36.0	6.1 ÷ 57.8
B	25.2	4.3 ÷ 40.3
C	14.4	2.5 ÷ 23.0

The lowest requirements of fresh air per 1sq.m are in open space office areas and the highest are in high halls, kindergartens and restaurants.

Heat recovery units are designed for horizontal indoor installation. the attachment to the building constructions in done with mounting profiles and anti-vibration supports. In front of the inspection doors and the electrical board to be ensured 600mm free space. On request is possible to produce the unit for outdoor or vertical installation.



Accessories

Sound attenuator - with rectangular or round shape. Reduce the noise level, transferred by the duct system.



Filter F7 - As standard, the unit is produced with filter G4 EN 779:2002, for fresh and exhausted air. As an option it is possible to produce the unit with filter, class F7, which leads to reduction of the external pressure of the unit.



Electric heaters:

- Pre-heater - work in ON-OFF system (freezing protection).
- The capacity of the additional heater is automatically regulated until the selected temperature of supply air is achieved.



Duct system

Made of rectangular or round ducts, sized according to the air volume which is needed for room ventilation. All ducts should be thermally insulated.



Heat recovery unit

Heat recovery unit with efficiency up to 85%.



Supply and suction ventilation grills

Ensure supply and suction of air into the room. Recommended air velocity <1m/s.





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