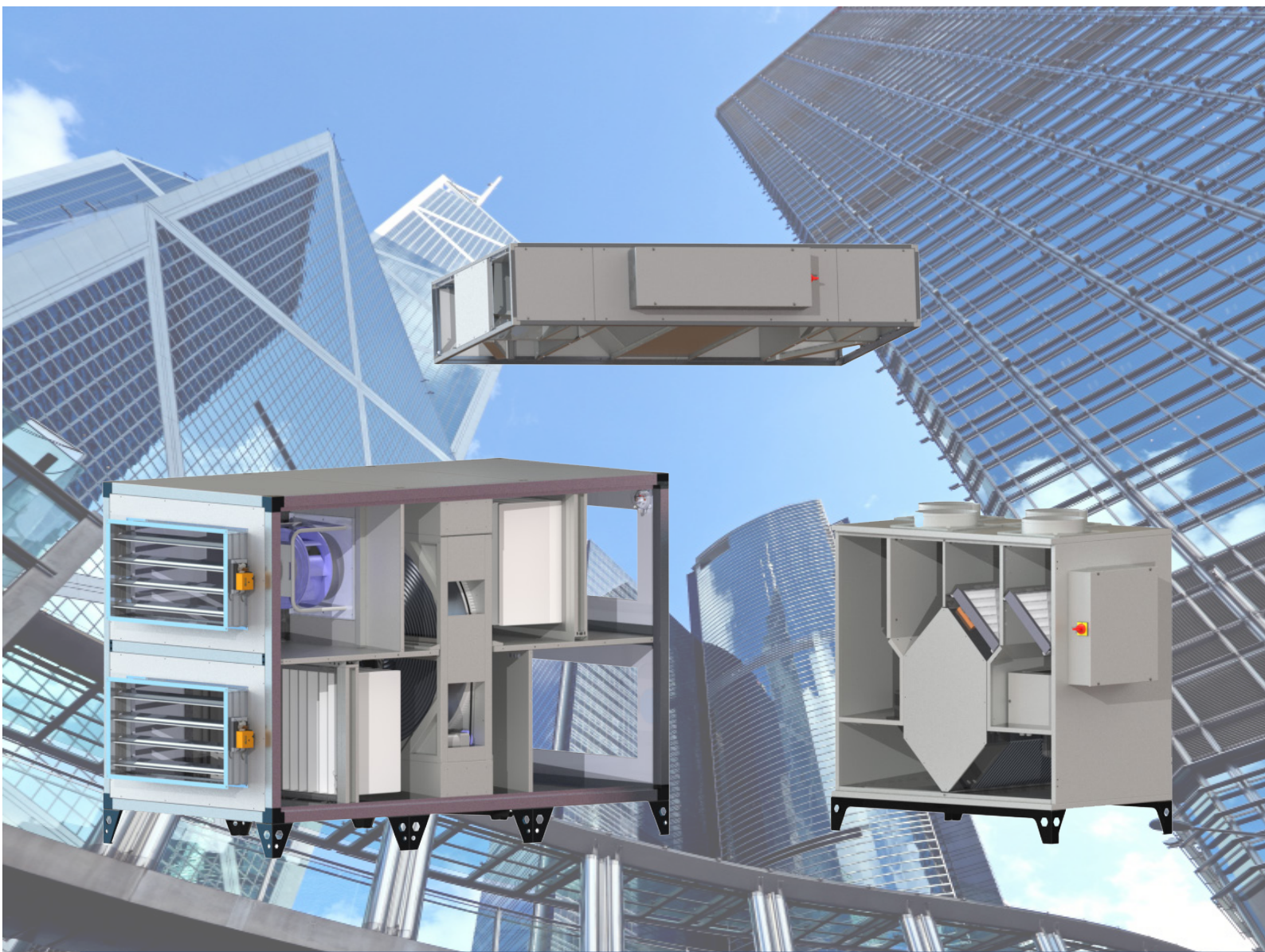




*with care for your comfort
since 1989!*



COMPACT HEAT RECOVERY UNITS

TANGRA EVB





Dipl. Eng. July Armianov MSc. Ivan Armianov Mrs. Victoria Armianova

**“We believe that satisfied customers
are our best advertisement!”**
Dipl. Eng. July Armianov

TANGRA today

TANGRA has a production plant with more than 5500 m2 and a team of more than 140 people. The company uses the top-notch class production equipment and constantly invests in its highly qualified specialists. TANGRA's portfolio also includes its own HVAC design bureau, R&D department, aerodynamic HVAC laboratory, teams for installation, service and maintenance of HVAC systems, 3 commercial centers in Sofia, Varna and Burgas, as well as a wide sales and service network in Bulgaria and Europe.

TANGRA is a company with a sense of the typical values of family-run corporations. July Armianov, Victoria Armianova and Ivan Armianov are in charge of the business growth and management of the company. TANGRA is run in constant strive for development of energy efficient equipment and projects, innovations and last but not least - maintaining the highest quality standards.

ABOUT US

TANGRA is family owned enterprise, specialized in the production and engineering of ventilation, air conditioning and heating systems

The history of the company dates back to the founding of the trade and production company “TANGRA - Lazar Armianov” in the late 1930s. After World War II the company was nationalized by the state, and private business in Bulgaria was banned. At the first opportunity on August 1989, Dipl. Eng. July Armianov restored the company of his father and established “TANGRA Armianov and Partners”, which was later restructured into “TANGRA - AV” Ltd.

AWARDS



Gold medal from
ITF Plovdiv
2003



Award of the
Germany Economy
2013



Innovative Enterprise
Award
President of Bulgaria
2016



Excellence in Innovation
Award
President of Bulgaria
2019



1938 - 1944



1989 - 1991



since 1991



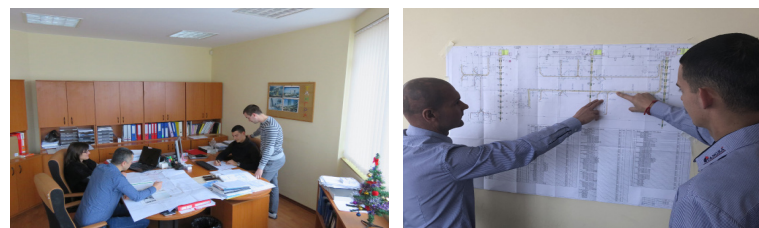


TANGRA applies the latest technologies and systems, ensuring the sustainability of executed projects and environmental protection. The financial and economic analysis of various applicable HVAC systems is a competitive advantage that the company's team provides to its customers and partners.



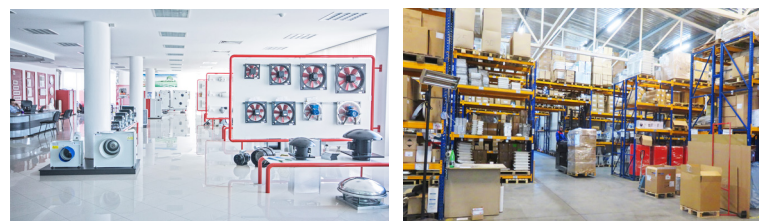
Research and Development

A team of qualified specialists is in charge with new products development, including material design, production and implementation. We are in constant contact with our partners in Europe and develop new products to meet their needs.



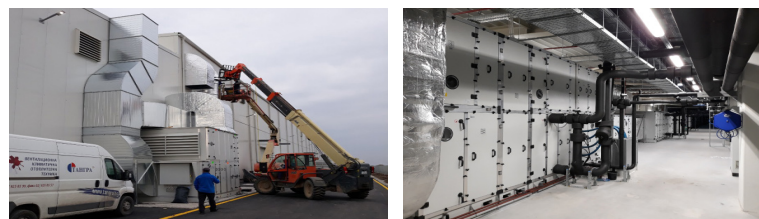
HVAC Design bureau

Highly educated engineers are responsible for the design and implementation of HVAC systems, as well as for project management. The economic analysis and energy efficiency audit is part of the services provided by the company's team.



Sales & Export Department

The centers in Sofia, Varna and Burgas give customers the opportunity for direct contact with the team of HVAC engineers, who take care to help with the right choice of equipment.



Installation & Project Execution

TANGRA teams are specialized in the installation of ventilation, air conditioning and heating systems, control and automation. Highly qualified and trained specialists perform every project from planning to management and completion of the site.



Service & Maintenance

Focused on the maintenance and reliability of HVAC systems, our experienced specialists are available 24/7. They perform periodic inspections and preventive maintenance to extend the life of the equipment.

TANGRA is distinguished by the production of high quality reliable and energy efficient products and solutions. We adhere to several basic concepts:

- Usage of the highest quality and precise production equipment;
- Manual operations performed by experienced and trained professionals;
- Raw materials and components for production are only from reliable European suppliers
- Short production times and a well-stocked warehouse with components;
- Regular production audits by the most prestigious certification bodies in Europe





TANGRA manufactures in accordance with the applicable regulations and Directives of the EU. Ecodesign Directive is followed in the production and development of the company's equipment. TANGRA's heat recovery units and air handling units comply with Directives 1253/2014 & 1254/2014, as well as with the Electricity Consumption Regulation 2009/125/EC.



ISO 9001

In all activities of TANGRA, a Quality Management System ISO 9001 is implemented. In addition, the management, the production and engineering have constant policy of improvement of products and services, in order to increase the satisfaction of our customers.



ISO 14001

Being motivated to minimize the impact on environment, TANGRA has implemented Environmental Management System ISO 14001. All processes are considered and we work to minimize our energy consumption, waste and carbon footprint.



Bulgarian Machine Building Chamber

TANGRA is member of the Bulgarian Machine Building Chamber and Dipl. Eng. July Armianov is member of the board of the chamber. TANGRA is certified for work with fluorinated greenhouse gases and Regulation 517/2014.



Bulgarian Construction Chamber

TANGRA is member of the Bulgarian Construction Chamber and is listed in the Professional Register with categories from I-st to V-th.

Eurovent Certita Certification - AHU

TANGRA is the only Bulgarian producer of air handling units, certified by Eurovent. TANGRA AHU are tested in all modifications (standard and hygienic). Check ongoing validity of the certificate: www.eurovent-certification.com



TUV Rheinland - AHU

Air Handling Units TANGRA are tested and certified by Eurovent and also by TUV Rheinland, in accordance with EN1886, EN13053, EN13779, VDI6022, and DIN1946.



Eurovent Certita Certification - AAHE

TANGRA is the only Bulgarian producer of plate heat exchangers and 11th in the world certified by Eurovent. Check ongoing validity of the certificate: www.eurovent-certification.com



Air Heaters & Coolers and Pellet boilers

The complete range of pellet boilers and air heaters/coolers, produced by TANGRA are tested for performance and characteristics by TUV Rheinland. The excellent parameters are confirmed by the results for both ranges.



Smoke Extraction

DEDAL Attestation and Certification tested and certified our Smoke and heat control systems. Annual audits are performed to guarantee the highest quality of our smoke duct systems.



Description:



TANGRA EVB range is designed for highly efficient heat recovery ventilation in premises, providing the opportunity to maintain a suitable microclimate and significantly reduce energy costs. The TANGRA heat recovery units supply fresh, filtered air to the premises, exhaust polluted air, and simultaneously recover energy from the exhaust air by heating the supplied air.

Efficiency up to 90%!



TANGRA EVB range of high-efficiency heat recovery units is manufactured with plate or rotary heat exchangers, which are tested and certified by Eurovent. They comply with the ErP directive as well as regulations 1253:2014 and 1254:2014.

Applications:

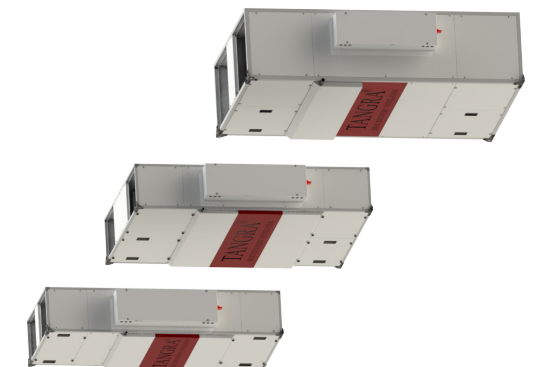
TANGRA EVB heat recovery units are the ideal solution for various applications, meeting demanding requirements while delivering high efficiency and versatile functionality.

- Single-family houses
- Restaurants & Night clubs
- Hotels & SPA centers
- Hospitals & Medical facilities
- Museums & Galleries
- Shopping centers
- Office & Administrative buildings
- Factories & Industrial premises
- Car showrooms & Service centers



TANGRA EVB HiE _ _

- 14 models with Aluminium Plate Heat Exchanger AAHE
- Air flow from 150m³/h up to 6400m³/h
- Monoblock & Split execution
- Horizontal (false ceiling) or Vertical installation
- AC or EC fans



TANGRA EVB ROT _ _

- 8 models with Rotary Wheel Heat Exchanger AARE
- Air flow from 450m³/h up to 6400m³/h
- Monoblock & Split execution
- EC fans



TANGRA EVB TOP _ _

- 8 models with Aluminium Plate Heat Exchanger AAHE
- Air flow from 150m³/h up to 4000m³/h
- Stand alone execution with all inlets & outlets on top
- AC or EC fans



DESCRIPTION:

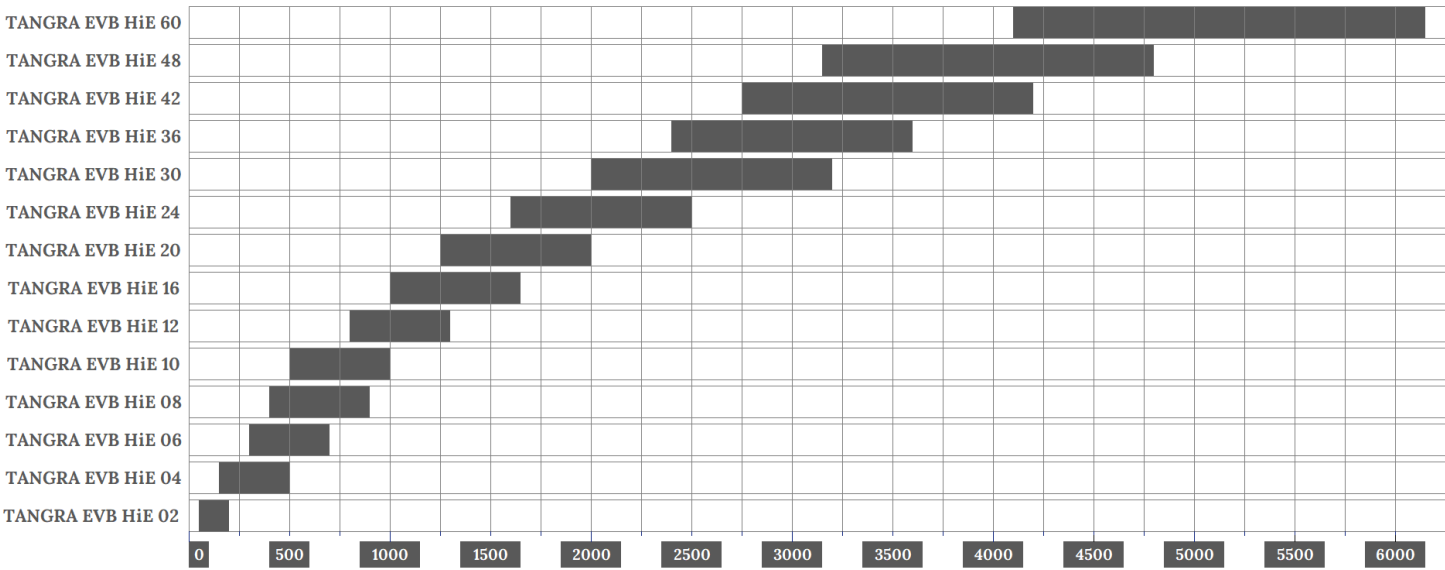


High efficiency heat recovery units TANGRA EVB HiE are developed with air-to-air aluminium plate heat exchanger certified by Eurovent. The units are produced in two versions: Horizontal, for suspended ceiling installation, or on steps and Vertical for wall or floor installation.

- Efficiency up to 90%
- Highly efficient counter flow hexagonal heat exchanger certified by Eurovent
- Energy efficient and quiet EC fans
- Plug & Play solution
- Smart control system TANGRA Smart
- Options for add-on thermal sections: heating/cooling
- Option for hygienic execution (VDI 6022)

AIR FLOW VOLUME :

TANGRA EVB HiE __ are with air flow capacity from 100m³/h to 6400m³/h



CONFIGURATIONS :

Model / Size	02	04	06	08	10	12	16	20	24	30	36	42	48	60
TANGRA EVB HiE __ HM	•	•	•	•	•	•	•	•	•					
TANGRA EVB HiE __ HS						•	•	•	•	•	•			
TANGRA EVB HiE __ VM		•	•	•	•	•	•	•	•					
TANGRA EVB HiE __ VS									•	•	•	•	•	•

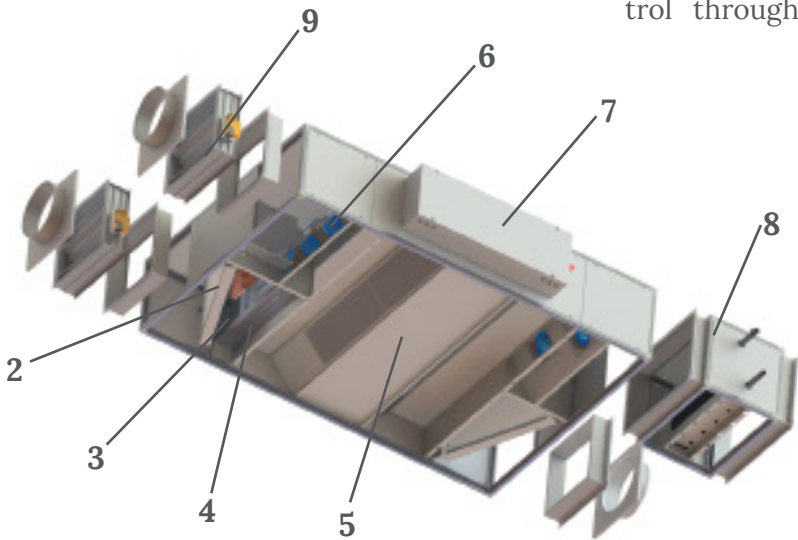
HM - Horizontal monoblock ; HS - Horizontal split ; VM - Vertical monoblock ; VS - Vertical split

1. CONSTRUCTION

TANGRA EVB HiE are produced in compact or modular construction with two types of side panels with build-in sound and thermal insulation: Single panel (13mm); Double wall panels - sandwich type 25mm (standard) or 50mm (on request)

2. AIR FILTERS (EN779 / ISO16890)

TANGRA EVB are with incorporated filters for fresh and exhaust air. The standard filters are panel or mini-pleat M5÷F7 (EN779) or ePM1÷ePM2.5 (ISO16890).



3. ANTIFREEZE PROTECTION/PRE-HEATER

Due to high efficiency of the heat exchanger in winter conditions (below -5°C) the exhaust air flow can lead freezing and ice blockage of the exchanger. In order to prevent it an electric heater for anti-freeze protection can be incorporated in the units. It turns on automatically based on the conditions and is smoothly controlled to minimize the consumption.

4. AUTOMATIC BY-PASS (EU 1253 and 1254)

Automatic bypass damper with actuator that allows free cooling (without heat recovery) or variable control when mixing section is in use.

5. HEAT EXCHANGER (Eurovent cetrified)

All heat recovery units are equipped with high efficient plate heat exchanger. No odors or moisture transfer between the two streams. The plate heat exchangers are certified by Eurovent Certita Certification S.A.S.

6. FANS

Heat recovery units TANGRA EVB are equipped with centrifugal fans with AC or EC motors. The units with AC fans with forward blade wheel are economic solution with easy variable control. The units with EC are with high performance radial freewheel impeller and IE4 or IE5 EC motors.

7. SMART CONTROL

TANGRA EVB are plug and play solution. The intelligent control systems allow quick and easy commissioning. The state of art controls have BMS connection or control through internet (Modbus, BACnet, etc.).

8. THERMAL BOX (option)

TANGRA EVB HiE can be equipped with an external module with integrated water heating or cooling coil or DX coil for connection with outdoor VRF. Removable mist eliminator is on request.

9. MULTI-LEAF DAMPERS (option)

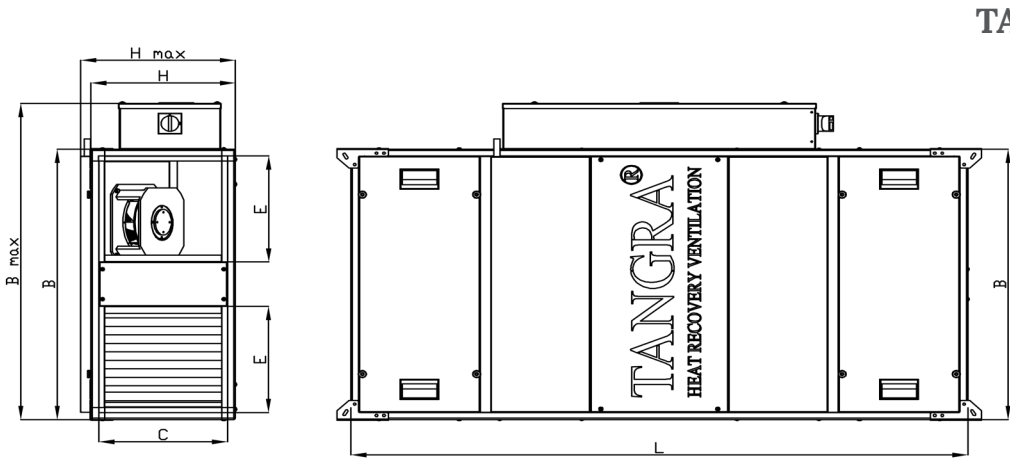
Aluminum louver dampers for tightly closing of the inlets and outlets with external servomotor actuator. Tightness category 2 to EN 1751.

10. FLEXIBLE JOINT (option)

Rectangular flexible joint for easy connection to ventilation ducts and eliminating all the vibrations between the unit and the duct system.

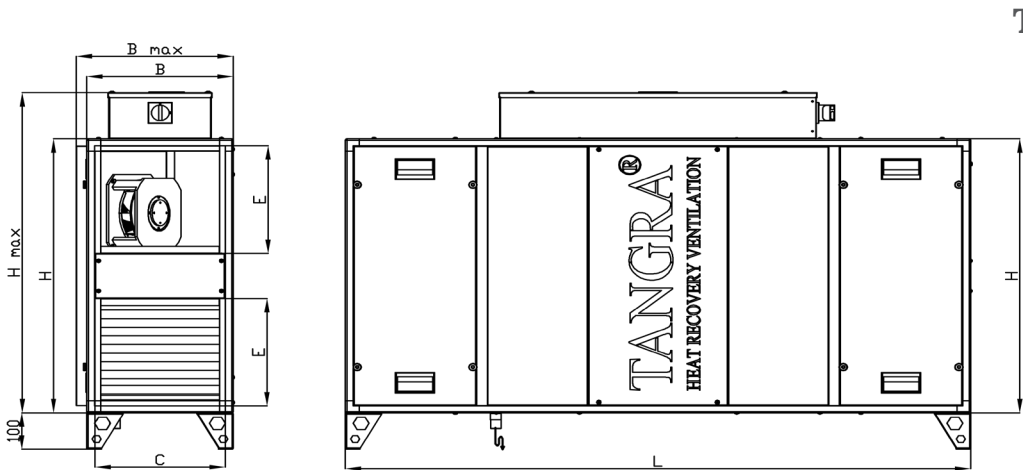
11. ROUND CONNECTOR (option)

Round connectors designed for direct connection to spiral ventilation ducts.



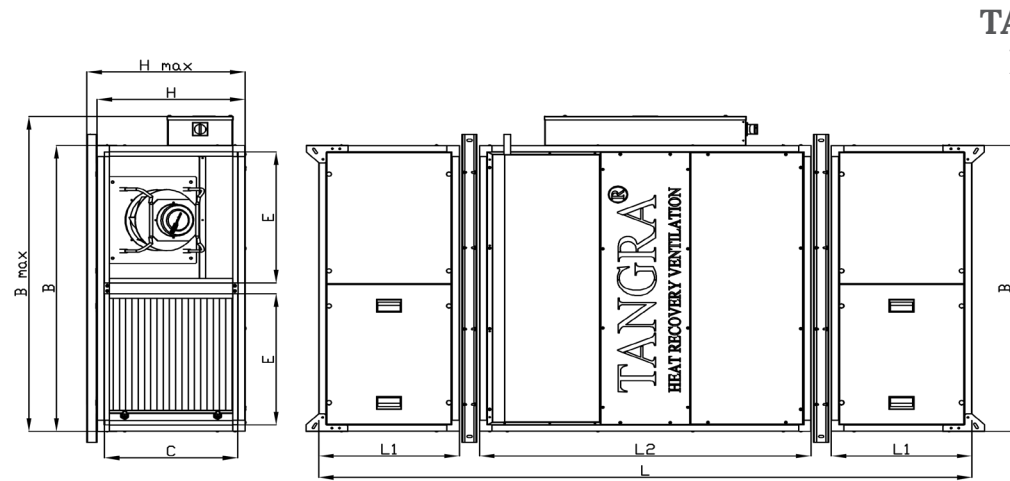
TANGRA EVB HiE __ HM
Horizontal installation,
Monoblock execution

Model	Air flow [m3/h]	B [mm]	B max [mm]	H [mm]	H max [mm]	L [mm]	E [mm]	C [mm]	D [mm]	Weight [kg]
TANGRA EVB 02 HiE HM	200	730	860	335	365	1500	230	295	200	90
TANGRA EVB 04 HiE HM	400	690	830	370	400	1880	260	330	200	100
TANGRA EVB 06 HiE HM	600	790	930	370	400	1880	310	330	250	115
TANGRA EVB 08 HiE HM	800	1090	1230	370	400	1880	360	330	250	150
TANGRA EVB 10 HiE HM	1000	1290	1430	370	400	1880	360	330	250	170
TANGRA EVB 12 HiE HM	1200	1115	1255	590	630	2200	500	530	315	250
TANGRA EVB 16 HiE HM	1600	1315	1455	590	630	2200	500	530	355	280
TANGRA EVB 20 HiE HM	2000	1515	1655	590	630	2200	500	530	400	340
TANGRA EVB 24 HiE HM	2400	1815	1955	590	630	2280	500	530	400	420



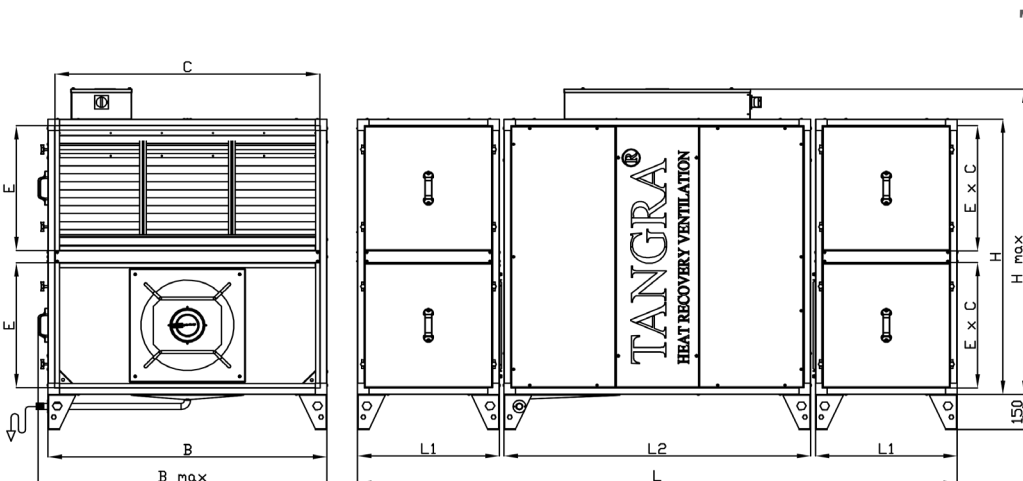
TANGRA EVB HiE __ VM
Vertical installation,
Monoblock execution

Model	Air flow [m3/h]	B [mm]	B max [mm]	H [mm]	H max [mm]	L [mm]	E [mm]	C [mm]	D [mm]	Weight [kg]
TANGRA EVB 02 HiE VM	200	335	365	730	860	1500	230	295	200	90
TANGRA EVB 04 HiE VM	400	370	400	690	830	1880	260	330	200	100
TANGRA EVB 06 HiE VM	600	370	400	790	930	1880	310	330	250	115
TANGRA EVB 08 HiE VM	800	370	400	1090	1230	1880	360	330	250	150
TANGRA EVB 10 HiE VM	1000	370	400	1290	1430	1880	360	330	250	170
TANGRA EVB 12 HiE VM	1200	590	630	1115	1255	2200	500	530	315	250
TANGRA EVB 16 HiE VM	1600	590	630	1315	1455	2200	500	530	355	280
TANGRA EVB 20 HiE VM	2000	590	630	1515	1655	2200	500	530	400	340
TANGRA EVB 24 HiE VM	2400	590	630	1815	1955	2280	500	530	400	420



TANGRA EVB HiE __ HS
Horizontal installation,
Split execution

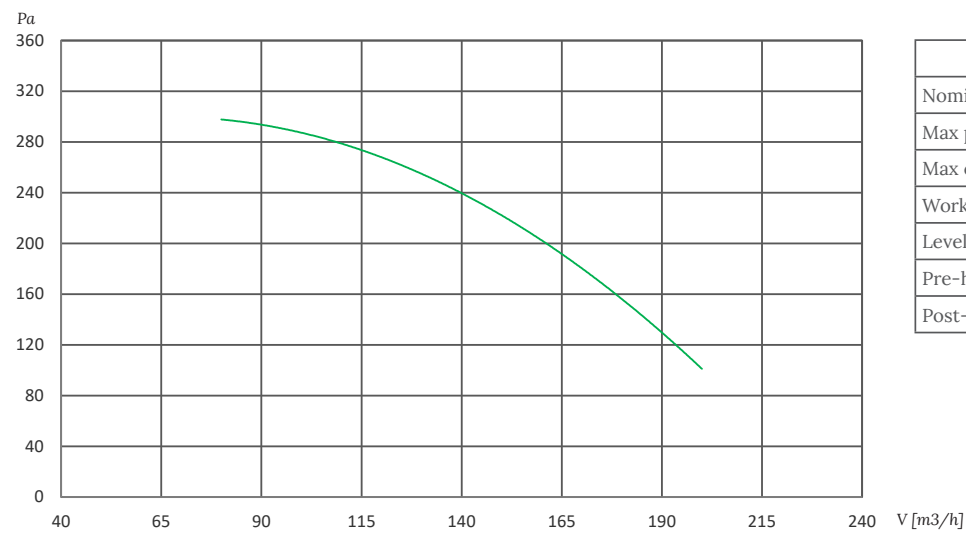
Model	Air flow [m3/h]	B [mm]	B max [mm]	H [mm]	H max [mm]	L [mm]	L1 [mm]	L2 [mm]	E [mm]	C [mm]	D [mm]	Weight [kg]
TANGRA EVB 12 HiE HS	1200	1115	1255	590	630	2440	560	1320	500	530	315	300
TANGRA EVB 16 HiE HS	1600	1315	1455	590	630	2440	560	1320	500	530	355	340
TANGRA EVB 20 HiE HS	2000	1515	1655	590	630	2440	560	1320	500	530	400	390
TANGRA EVB 24 HiE HS	2400	1815	1955	590	630	2440	560	1320	500	530	400	480
TANGRA EVB 30 HiE HS	3000	2115	2275	590	630	2640	660	1320	600	530	450	570
TANGRA EVB 36 HiE HS	3600	2315	2455	590	630	2640	660	1320	600	530	450	670



TANGRA EVB HiE __ VS
Vertical installation,
Split execution

Model	Air flow [m3/h]	B [mm]	B max [mm]	H [mm]	H max [mm]	L [mm]	L1 [mm]	L2 [mm]	E [mm]	C [mm]	D [mm]	Weight [kg]
TANGRA EVB 24 HiE VS	2400	1200	1240	1150	1300	2620	650	1320	500	1140	400	650
TANGRA EVB 30 HiE VS	3000	1200	1240	1300	1450	2820	750	1320	550	1140	450	710
TANGRA EVB 36 HiE VS	3600	1200	1240	1400	1550	2820	750	1320	600	1140	450	740
TANGRA EVB 42 HiE VS	4200	1200	1240	1550	1700	2820	750	1320	650	1140	-	780
TANGRA EVB 48 HiE VS	4800	1200	1240	1700	1850	2820	750	1320	700	1140	-	840
TANGRA EVB 60 HiE VS	6200	1200	1240	2050	2200	2820	750	1320	900	1140	-	950

TANGRA EVB HiE 02



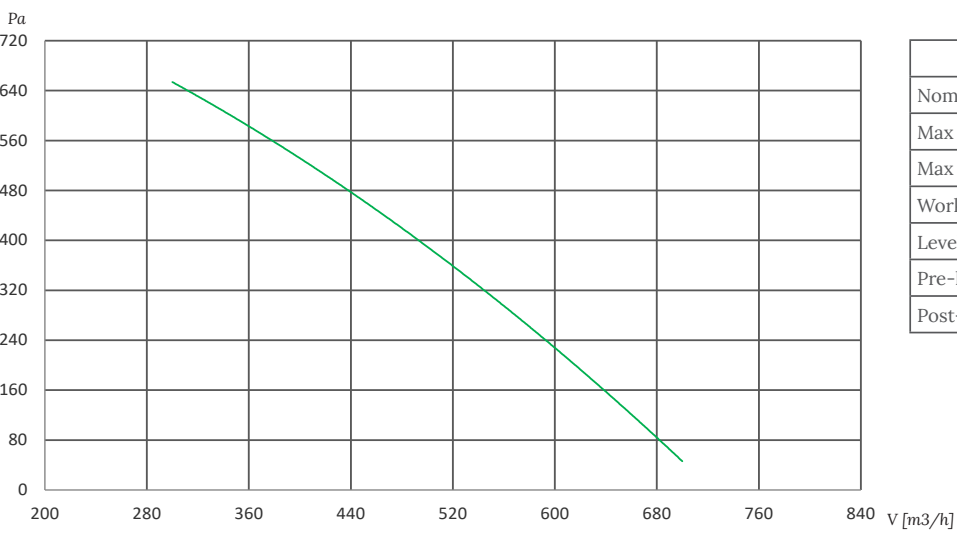
	AC	EC
Nominal Voltage [V]	-	1~ 230V
Max power [W]	-	2 x 27 W
Max current [A]	-	2 x 0.27 A
Working temperature [°C]	-	-25°C÷ 60°C
Level of protection	-	IP 54
Pre-heater capacity [kW]*	0.75 kW / 230V	
Post-heater capacity [kW]*	0.75 kW / 230V	

Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
80	88.9	93.4
120	86.7	91.9
160	85.2	90.8
200	84.1	89.9

Sound power [dB]	Octave brands [Hz] at 160 m³/h, 150 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	39	47	50	52	50	47	51	47	57
ETA	39	50	50	55	59	58	58	57	65
Casing	22	41	43	41	41	40	39	33	47

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	2

TANGRA EVB HiE 06



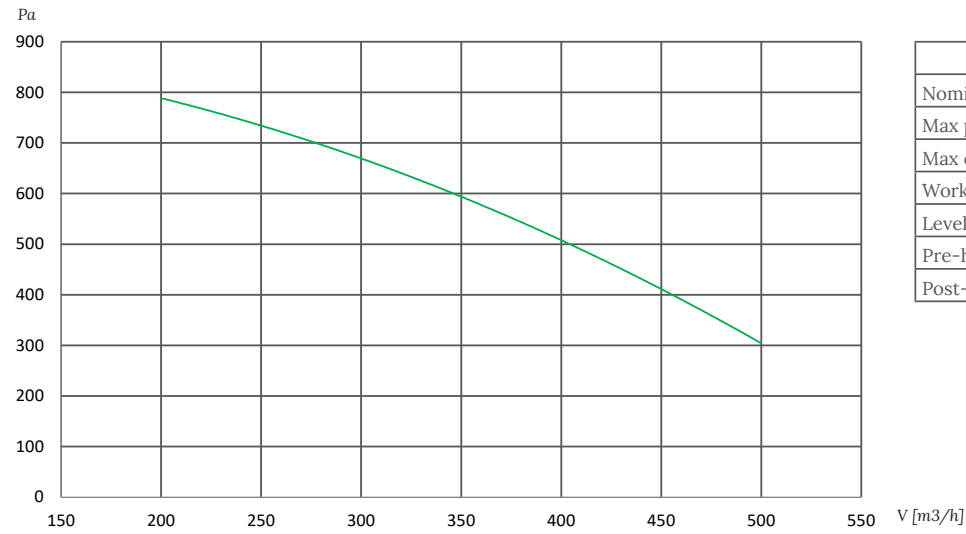
	AC	EC
Nominal Voltage [V]	-	1~ 230V
Max power [W]	-	2 x 170 W
Max current [A]	-	2 x 1.7 A
Working temperature [°C]	-	-30°C÷ 60°C
Level of protection	-	IP 54
Pre-heater capacity [kW]*	1.5 kW / 230V	
Post-heater capacity [kW]*	1.5 kW / 230V	

Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
300	80.8	83.2
400	79.7	82.1
500	78.8	81.2
600	78.1	80.3

Sound power [dB]	Octave brands [Hz] at 600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	62	61	63	71	69	71	65	62	76
ETA	56	54	55	56	54	53	48	45	59
Casing	57	51	56	55	47	49	43	34	56

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 04



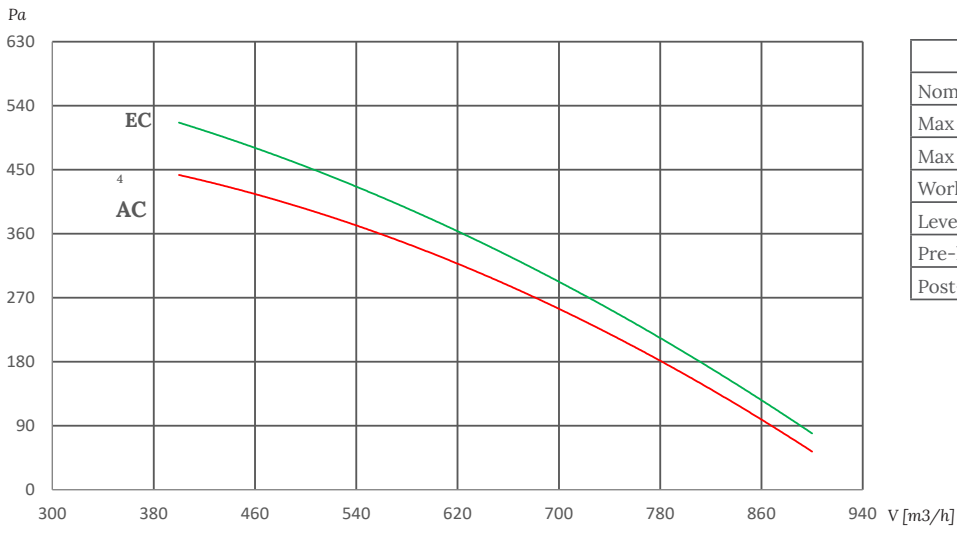
	AC	EC
Nominal Voltage [V]	-	1~ 230V
Max power [W]	-	2 x 170 W
Max current [A]	-	2 x 1.7 A
Working temperature [°C]	-	-30°C÷ 60°C
Level of protection	-	IP 54
Pre-heater capacity [kW]*	1.5 kW / 230V	
Post-heater capacity [kW]*	1.5 kW / 230V	

Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
200	81.4	84.0
300	80.1	82.5
400	79.0	81.3
500	78.1	80.3

Sound power [dB]	Octave brands [Hz] at 400 m³/h, 200 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	45	45	58	59	56	54	54	46	62
ETA	43	49	59	69	71	73	66	60	77
Casing	26	40	52	55	53	55	47	37	59

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 08



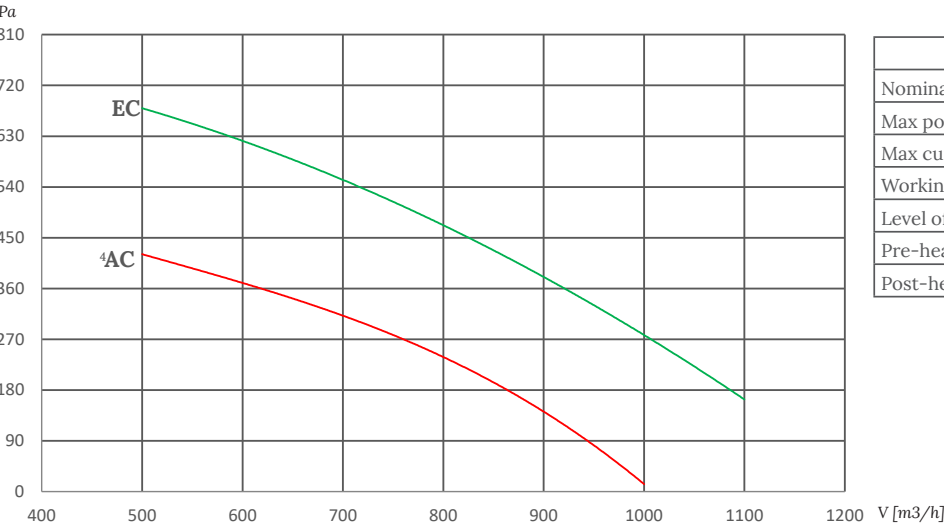
	AC	EC
Nominal Voltage [V]	1~ 230V	1~ 230V
Max power [W]	2 x 350 W	2 x 207 W
Max current [A]	2 x 1.5 A	2 x 1.4 A
Working temperature [°C]	-20°C÷ 55°C	-25°C÷ 50°C
Level of protection	IP 44	IP 44
Pre-heater capacity [kW]*	2.25 kW / 230V	
Post-heater capacity [kW]*	2.25 kW / 230V	

Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
500	80.1	82.3
600	79.3	81.6
700	78.7	81.0
800	78.1	80.4

Sound power [dB]	Octave brands [Hz] at 800 m³/h, 200 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	40	51	64	68	75	73	64	57	78
ETA	32	44	56	61	61	55	49	43	64
Casing	35	44	57	52	53	51	42	29	57

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 10



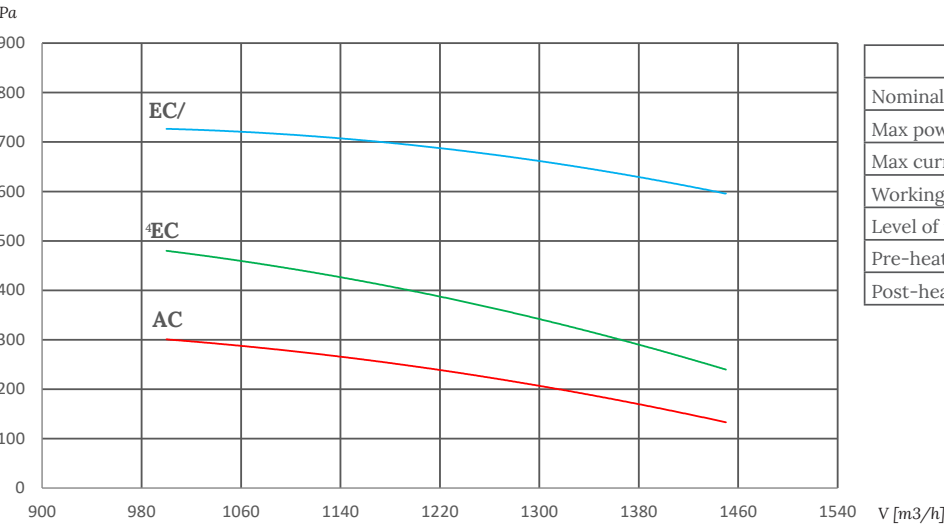
	AC	EC
Nominal Voltage [V]	1~ 230V	1~ 230V
Max power [W]	2 x 350 W	4 x 170 W
Max current [A]	2 x 1.5 A	4 x 1.7 A
Working temperature [°C]	-20°C÷ 55°C	-30°C÷ 60°C
Level of protection	IP 44	IP 44
Pre-heater capacity [kW]*	3.0 kW / 230V	
Post-heater capacity [kW]*	3.0 kW / 230V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
600	80.1	88.5
700	79.6	82.0
800	79.0	81.4
900	78.6	80.9
1000	78.1	80.8

Sound power [dB]	Octave brands [Hz] at 1000 m³/h, 200 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	72	66	69	75	73	74	67	63	79
ETA	70	61	62	61	59	57	51	47	64
Casing	67	56	62	59	51	52	45	35	60

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 12



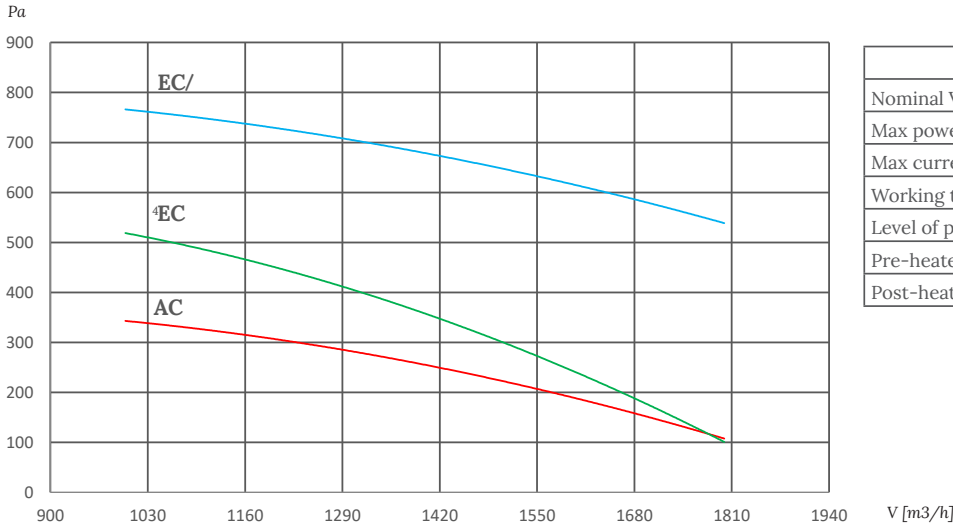
	AC	EC	EC+
Nominal Voltage [V]	1~ 230V	1~ 230V	1~ 230V
Max power [W]	2x373W	2x420W	2x780W
Max current [A]	2 x 3.6 A	2 x 1.8 A	2 x 4.0 A
Working temperature [°C]	-20°C÷40°C	-25°C÷50°C	-20°C÷55°C
Level of protection	IP 20	IP 44	IP 54
Pre-heater capacity [kW]*	3.0 kW / 230V		
Post-heater capacity [kW]*	3.0 kW / 230V		

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
1000	80.2	82.4
1100	79.9	82.0
1200	79.6	81.6
1300	76.9	78.5
1400	76.4	78.4

Sound power [dB]	Octave brands [Hz] at 1200 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	58	64	74	64	66	63	58	54	71
ETA	50	54	61	53	50	42	38	34	56
Casing	53	54	67	48	44	41	36	26	59

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 16



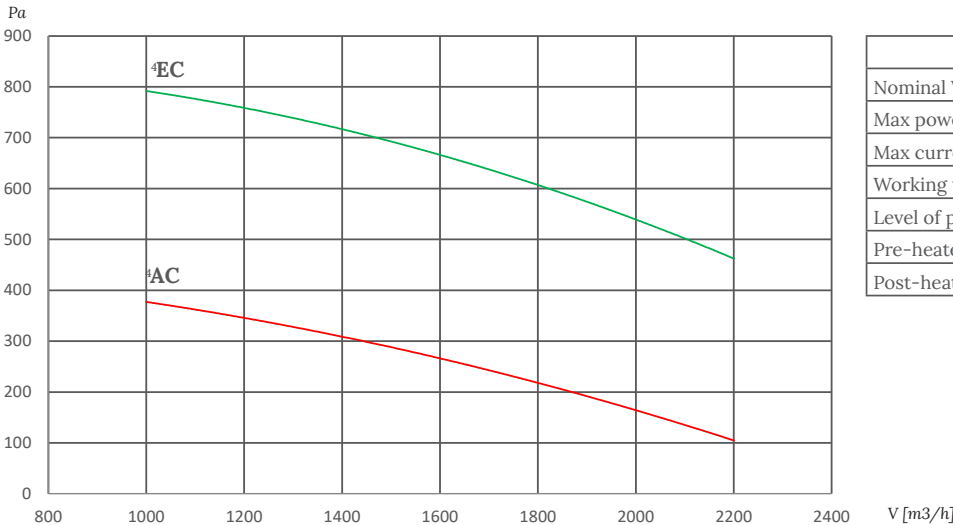
	AC	EC	EC+
Nominal Voltage [V]	1~ 230V	1~ 230V	1~ 230V
Max power [W]	2x373W	2x420W	2x780W
Max current [A]	2 x 3.6 A	2 x 1.8 A	2 x 4.0 A
Working temperature [°C]	-20°C÷40°C	-25°C÷50°C	-20°C÷55°C
Level of protection	IP 20	IP 44	IP 54
Pre-heater capacity [kW]*	4.5 kW / 400V		
Post-heater capacity [kW]*	4.5 kW / 400V		

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
1000	80.9	83.0
1200	80.3	82.5
1400	79.8	81.9
1600	79.3	81.4
1800	78.9	80.9

Sound power [dB]	Octave brands [Hz] at 1600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	60	55	69	64	68	65	62	58	72
ETA	52	44	56	53	52	43	40	38	56
Casing	55	45	62	48	46	43	39	30	56

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 20



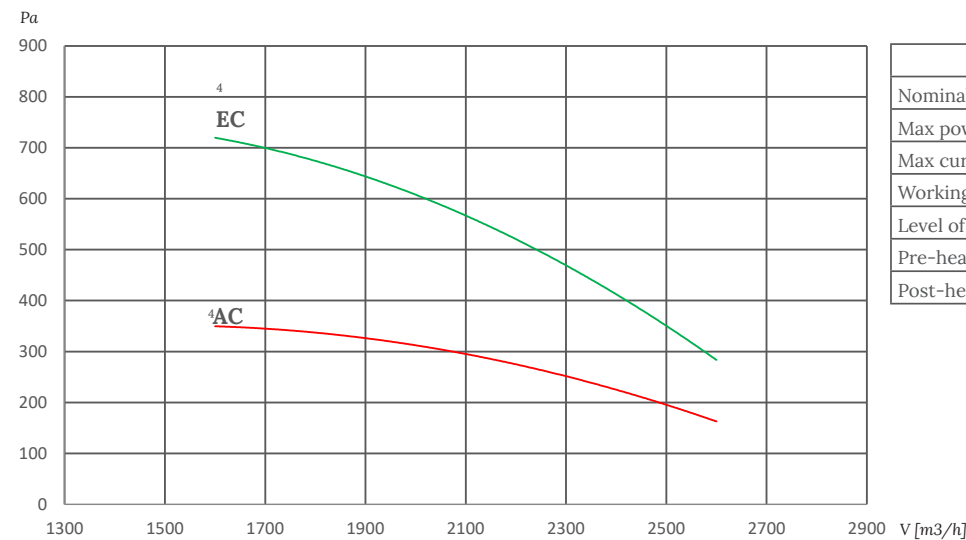
	AC	EC
Nominal Voltage [V]	1~ 230V	1~ 230V
Max power [W]	2 x 373 W	2 x 780 W
Max current [A]	2 x 3.6 A	2 x 4.0 A
Working temperature [°C]	-20°C÷ 40°C	-20°C÷ 55°C
Level of protection	IP 20	IP 54
Pre-heater capacity [kW]*	4.5 kW / 400V	
Post-heater capacity [kW]*	4.5 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
1400	80.4	82.6
1600	80.0	82.1
1800	79.6	81.7
2000	79.2	81.2
2200	78.8	80.8

Sound power [dB]	Octave brands [Hz] at 2000 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	63	59	71	67	70	67	64	64	74
ETA	55	49	58	56	54	46	44	45	58
Casing	58	49	64	51	48	45	42	36	58

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 24



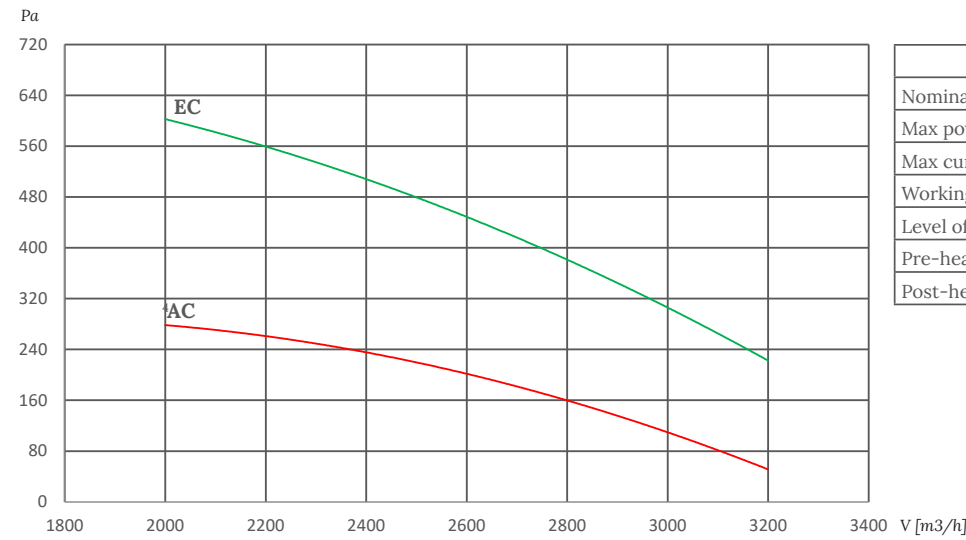
	AC	EC
Nominal Voltage [V]	1~ 230V	1~ 230V
Max power [W]	2 x 550 W	2 x 780 W
Max current [A]	2 x 4.3 A	2 x 4.0 A
Working temperature [°C]	-20°C÷ 40°C	-20°C÷ 55°C
Level of protection	IP 44	IP 54
Pre-heater capacity [kW]*	6.0 kW / 400V	
Post-heater capacity [kW]*	6.0 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
1800	80.9	82.6
2000	80.0	82.1
2200	79.7	81.8
2400	79.3	81.4
2600	79.0	81.1

Sound power [dB]	Octave brands [Hz] at 2400 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	66	62	72	70	73	69	66	69	77
ETA	56	54	61	59	56	48	47	51	61
Casing	61	52	65	54	51	47	44	41	59

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 30



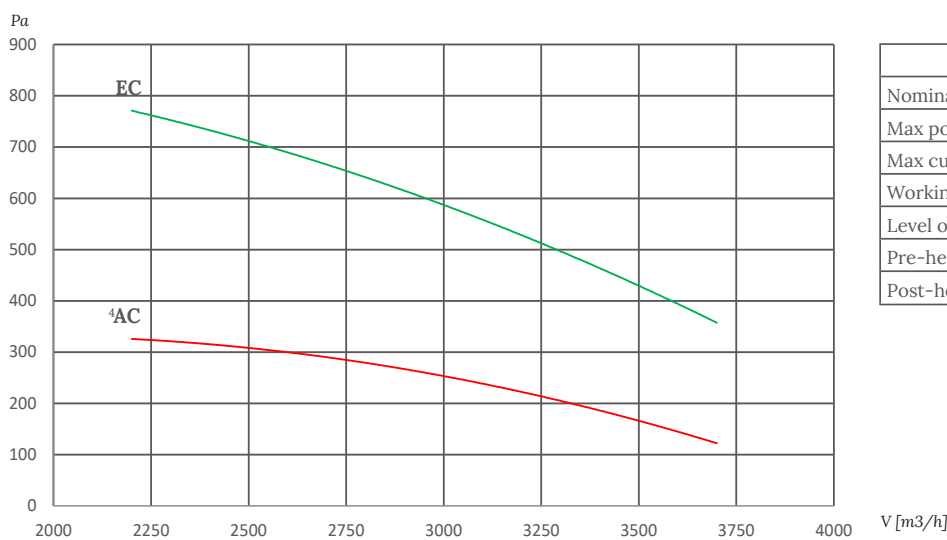
	AC	EC
Nominal Voltage [V]	1~ 230V	1~ 230V
Max power [W]	2 x 550 W	2 x 1300 W
Max current [A]	2 x 4.3 A	2 x 6.6 A
Working temperature [°C]	-20°C÷ 40°C	-20°C÷ 50°C
Level of protection	IP 44	IP 55
Pre-heater capacity [kW]*	6.0 kW / 400V	
Post-heater capacity [kW]*	6.0 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
2400	80.3	82.1
2600	79.7	81.8
2800	79.4	81.5
3000	79.2	81.2
3200	78.9	81.0

Sound power [dB]	Octave brands [Hz] at 3000 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	66	65	73	69	70	70	66	64	76
ETA	58	56	57	55	51	46	43	41	57
Casing	61	55	66	53	48	48	44	36	60

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB HiE 36



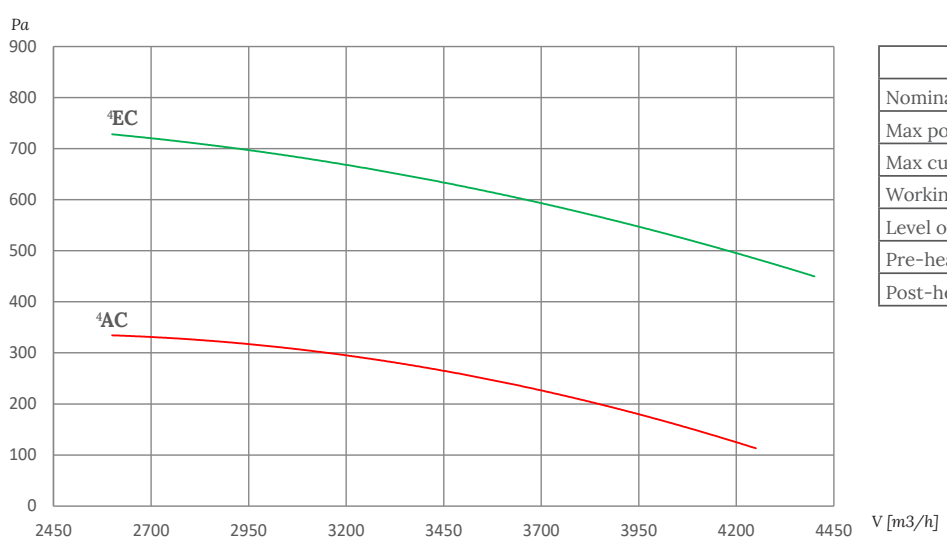
	AC	EC
Nominal Voltage [V]	1~ 230V	1~ 230V
Max power [W]	2 x 750 W	2 x 1300 W
Max current [A]	2 x 7.8 A	2 x 6.6 A
Working temperature [°C]	-20°C ÷ 40°C	-20°C ÷ 50°C
Level of protection	IP 20	IP 55
Pre-heater capacity [kW]*	9.0 kW / 400V	
Post-heater capacity [kW]*	9.0 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
2800	80.1	82.0
3000	79.6	81.7
3200	79.3	81.4
3400	79.1	81.2
3600	78.9	80.9

Sound power [dB]	Octave brands [Hz] at 3600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	69	69	75	72	73	73	69	68	79
ETA	62	61	61	59	53	49	45	46	60
Casing	64	59	68	56	51	51	47	40	62

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

TANGRA EVB HiE 42



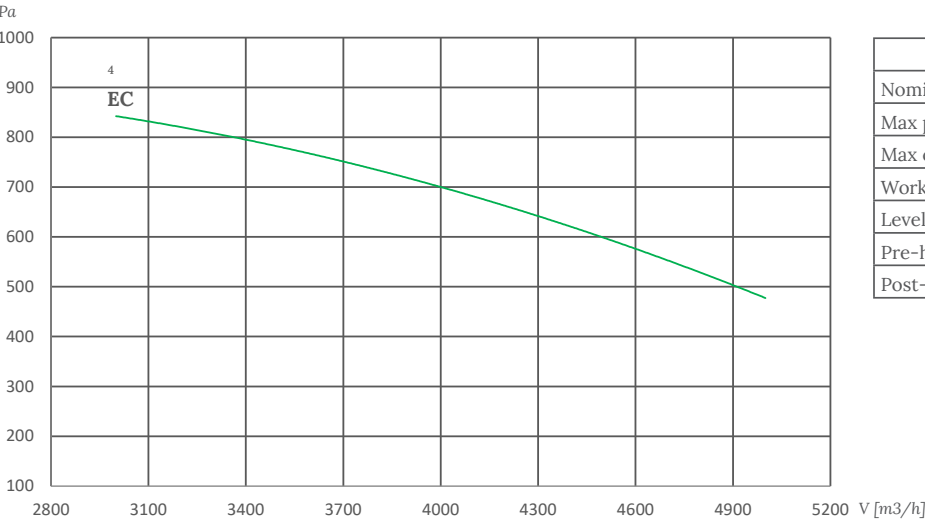
	AC	EC
Nominal Voltage [V]	1~ 230V	3~ 400V
Max power [W]	2 x 750 W	2 x 2400 W
Max current [A]	2 x 7.8 A	2 x 3.8 A
Working temperature [°C]	-20°C ÷ 40°C	-20°C ÷ 55°C
Level of protection	IP 20	IP 54
Pre-heater capacity [kW]*	9.0 kW / 400V	
Post-heater capacity [kW]*	9.0 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
3400	80.0	81.6
3600	79.5	81.4
3800	79.1	81.1
4000	78.9	80.9
4200	78.7	80.7

Sound power [dB]	Octave brands [Hz] at 4200 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	74	73	78	76	76	75	71	71	81
ETA	66	65	68	63	57	51	48	50	65
Casing	69	63	71	60	54	53	49	43	65

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

TANGRA EVB HiE 48



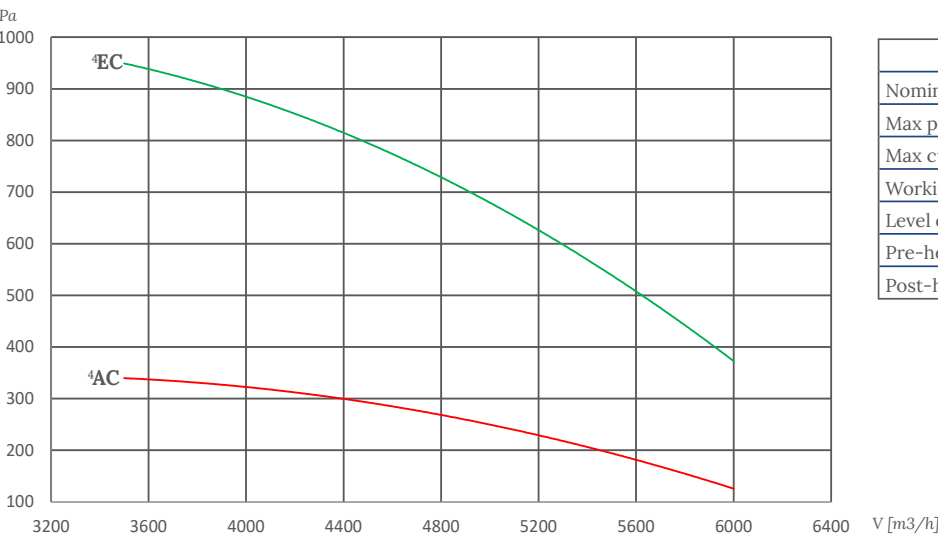
	AC	EC
Nominal Voltage [V]	-	3~ 400V
Max power [W]	-	2 x 2400 W
Max current [A]	-	2 x 3.8 A
Working temperature [°C]	-	-20°C ÷ 50°C
Level of protection	-	IP 55
Pre-heater capacity [kW]*	13.5 kW / 400V	
Post-heater capacity [kW]*	12.5 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
4000	79.2	81.0
4400	78.8	80.8
4600	78.7	80.7
4800	78.5	80.5
5000	78.3	80.3

Sound power [dB]	Octave bands [Hz] at 4800 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	79	75	82	79	80	78	74	73	87
ETA	69	67	72	68	60	54	51	51	69
Casing	74	65	75	63	58	56	52	45	69

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

TANGRA EVB HiE 60



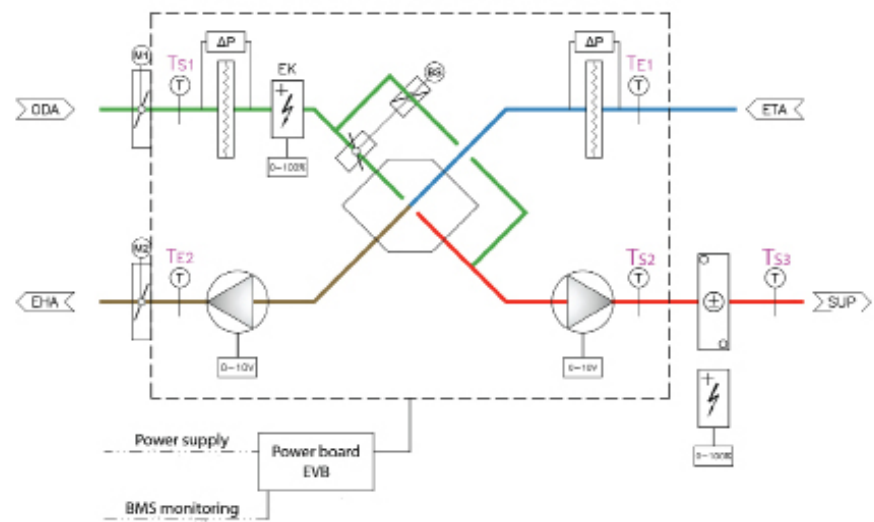
	AC	EC
Nominal Voltage [V]	3~ 400V	3~ 400V
Max power [W]	2 x 2200 W	2 x 2500 W
Max current [A]	2 x 4.3 A	2 x 4.0 A
Working temperature [°C]	-20°C ÷ 40°C	-20°C ÷ 50°C
Level of protection	IP 44	IP 55
Pre-heater capacity [kW]*	13.5 kW / 400V	
Post-heater capacity [kW]*	13.5 kW / 400V	

Air flow [m³/h]	Efficiency [%]	
	Dry	Wet
4400	79.7	81.9
4800	79.4	81.5
5200	79.1	81.2
5600	78.8	80.9
6000	78.5	80.6

Sound power [dB]	Octave bands [Hz] at 6000 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	76	77	82	80	79	76	72	72	84
ETA	70	70	70	68	61	55	51	52	68
Casing	71	67	75	64	57	54	50	44	69

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

Functional scheme & Control



INSTALLED IN THE UNIT



IN THE PREMISE

REC HiE - AAHE plate heat exchanger

M1 & M2 - Multi-leaf damper of fresh and exhaust air

T_{ODA} - Temperature sensor 1 at fresh air

T_{SUP} - Temperature sensor 2 at supply after the heat exchanger

T_{SUP + H/C} - Temperature sensor 3 at supply air after heat exchanger and additional heater

T_{ETA} - Temperature sensor 1 at extract air

T_{EHA} - Temperature sensor 2 at exhaust air after the exchanger

ΔP - Differential pressure switch on air filters for dirty filters signal-ization

EK - Anti-freeze protection - electric heater with smooth control 0-100%

BS - Automatic by-pass for free cooling

SAF - Supply air fan with smooth control 0-10V

EAF - Exhaust air fan with smooth control 0-10V

TBE - Thermal box with electric heater with smooth control 0-100%

TBWH - Thermal box with water heating coil

TBWHC - Thermal box with water heating and water cooling coils

TBDX - Thermal box with direct expansion coil.

LCD touch screen control

Tsp - Indoor temperature set point [0C]

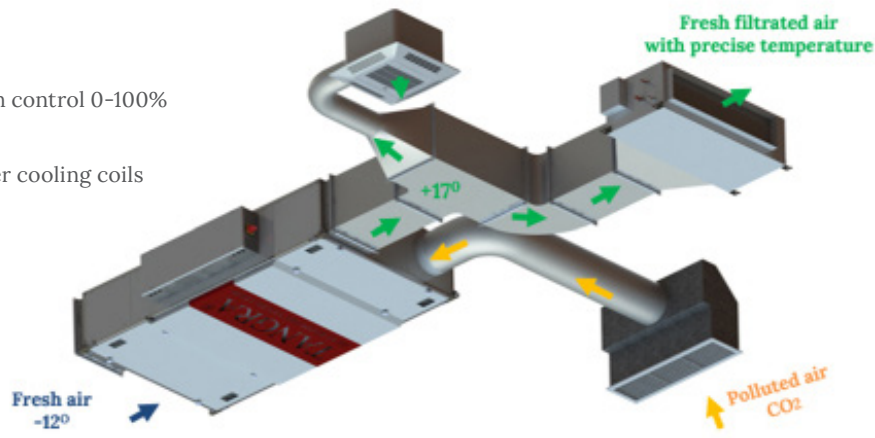
Vsp - Air speed set point [%]

S - Sensor for automatic control of the heat recovery unit, based on the values of the sensor.

SrH - Sensor for relative humidity

Svoc - Sensor for VOC (volatile organic compounds)

Sco2 - Sensor for CO2



ORDER FORM

EVB HiE

Size - 02 ÷ 60

Model:

HiE _ _ **HM** - Horizontal Monoblock

HiE _ _ **HS** - Horizontal Split

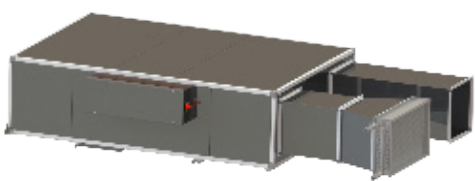
HiE _ _ **VM** - Vertical Monoblock

HiE _ _ **VS** - Vertical Split

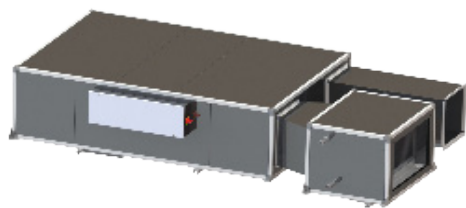
Heat recovery unit

Thermal heating / cooling sections

1. Heating coil after the unit for incorporation in the ventilation duct system



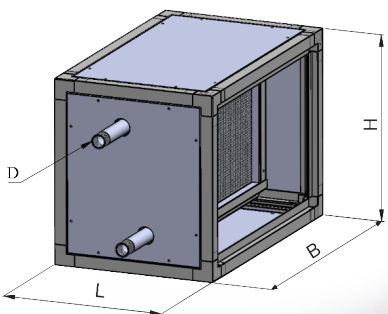
2. Thermal box for installation after horizontal units TANGRA EVB HiE __ HM or HS



3. Thermal box for installation after vertical units TANGRA EVB HiE __ _VM or VS



Model	Dimensions		
	B, mm	H, mm	L, mm
TANGRA EVB HiE 04	600	350	600
TANGRA EVB HiE 06	700	400	650
TANGRA EVB HiE 08	700	450	650
TANGRA EVB HiE 10	700	450	650
TANGRA EVB HiE 12	1075	600	750
TANGRA EVB HiE 16	1075	600	750
TANGRA EVB HiE 20	1075	700	800
TANGRA EVB HiE 24	1075	700	800
TANGRA EVB HiE 30	1280	700	800
TANGRA EVB HiE 36	1280	700	800
TANGRA EVB HiE 42	1280	800	800
TANGRA EVB HiE 48	1280	800	800
TANGRA EVB HiE 60	1355	900	900



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.



Thermal heating / cooling sections

To obtain final available static pressure of the HRU with thermal box it is necessary to find the available static pressure of the unit from corresponding diagram and to decrease it with the pressure drop of thermal box:

$$H_{final} = H_{hru} - \Delta p_{thermal\ box}$$

INCORPORATED WATER COIL

Model	Unit type		Nominal air volume [m³/h]	Water Heating				Water Cooling						
	Monoblock unit	Split unit		COT 2R	Heating, water 60/40°C, Tair in=12°C				COX 4R	Cooling, water 7/12°C, Tair in=30°C, RH=50%				
					Heating capacity [kW]	Pressure drop air, [Pa]	Pressure drop fluid, [kPa]	Water joints [D]		Cooling capacity [kW]**	Pressure drop air, [Pa]	Pressure drop fluid, [kPa]	Conden- sation [kg/h]	Water joints [D]
TANGRA EVB HiE 04	•		400	400/200	2,1	18	0,5	1/2"	400/200	2,7	45	6,3	1,5	3/4"
TANGRA EVB HiE 06	•		600	400/200	2,7	30	0,8	1/2"	500/250	4,0	44	4,4	2,1	1"
TANGRA EVB HiE 08	•		800	500/250	3,9	25	0,8	1/2"	500/300	5,2	51	5,1	2,7	1"
TANGRA EVB HiE 10	•		1000	500/250	4,5	32	0,9	1/2"	500/300	6,0	70	6,6	3,2	1"
TANGRA EVB HiE 12	•		1200	400/400	5,4	32	0,9	1/2"	700/400	8,5	40	5,7	4,6	11/4"
TANGRA EVB HiE 16	•		1600	700/400	8,8	24	1,4	3/4"	700/400	10,5	57	7,3	5,5	11/4"
TANGRA EVB HiE 20	•		2000	700/400	10,2	30	1,8	3/4"	800/500	13,7	46	8,2	7,2	11/2"
TANGRA EVB HiE 24	•	•	2400	800/500	12,7	25	1,2	1"	800/500	15,6	63	7,9	8,4	11/2"
TANGRA EVB HiE 30	•	•	3000	800/500	14,6	32	1,4	1"	1000/500	19,9	60	9,9	10,8	2"
TANGRA EVB HiE 36	•	•	3600	1000/500	17,8	30	1,3	1"	1000/500	22,4	81	12,3	12,1	2"
TANGRA EVB HiE 42		•	4200	1000/500	19,6	37	1,8	1"	1000/600	26,2	76	10,7	14	2"
TANGRA EVB HiE 48		•	4800	1000/500	21,3	48	1,8	1"	1000/600	28,6	95	12,5	15,3	2"
TANGRA EVB HiE 60		•	6000	1000/600	27,3	51	3,2	1"	1100/700	37,0	95	28	20,1	2"

**Heating capacity is the same for 4R coil with water temperaturewater 45/40°C

Glycol solution performance - on additional request.

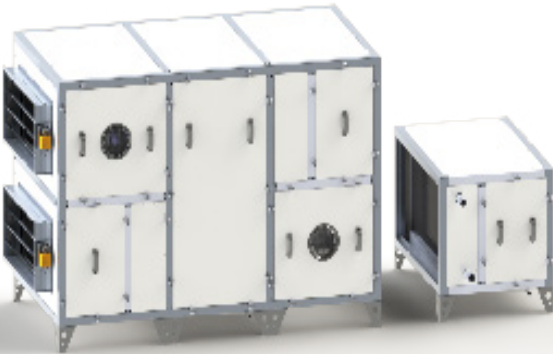
INCORPORATED DIRECT EXPANSION COIL

Model	Unit type		Nominal air volume [m³/h]	Direct Expansion - R410A								
	Monoblock unit	Split unit		DX Coil 4R	Heating, Tair in=12°C, Tcond=43°C				Cooling, Tairin=30°C, RH=50%, Tevap=6°C			
					Heating capacity [kW]	Pressure drop air [Pa]	Pressure drop fluid [kPa]	Cooling capacity [kW]	Pressure drop air [Pa]	Pressure drop fluid [kPa]	Condensa- tion [kg/h]	Refrogeran joints [D]
TANGRA EVB HiE 04	•		400									
TANGRA EVB HiE 06	•		600									
TANGRA EVB HiE 08	•		800									
TANGRA EVB HiE 10	•		1000									
TANGRA EVB HiE 12	•		1200	700/400	11,1	26	4,5	10,0	38	26	5,6	12/16
TANGRA EVB HiE 16	•		1600	700/400	13,4	39	6,4	12,2	57	39	6,8	12/16
TANGRA EVB HiE 20	•		2000	800/500	17,4	31	4,2	15,8	46	25,1	8,9	16/22
TANGRA EVB HiE 24	•	•	2400	800/500	19,6	42	5,1	17,9	61	32,7	10	16/22
TANGRA EVB HiE 30	•	•	3000	980/500	24,6	42	6,2	22,6	62	40,3	12,7	16/22
TANGRA EVB HiE 36	•	•	3600	980/500	27,6	54	7,7	25,4	82	51,9	14,2	16/22
TANGRA EVB HiE 42		•	4200	1000/600	31,3	52	7,3	28,8	80	50,3	16	22/28
TANGRA EVB HiE 48		•	4800	1000/600	33,9	64	8,4	31,2	96	60	17,3	22/28
TANGRA EVB HiE 60		•	6000	2x1100/325	41,1	70	7,8	38,3	105	54,1	21,1	2*16/22

DESCRIPTION:

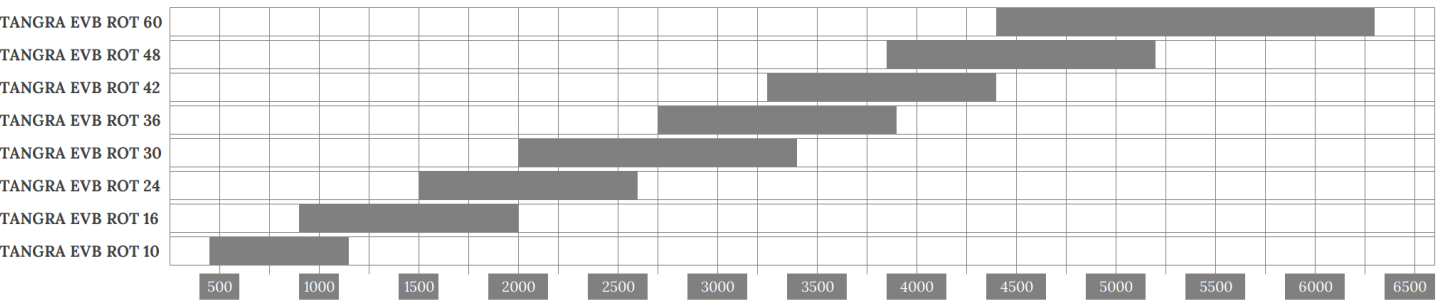
High efficiency heat recovery units TANGRA EVB ROT are developed with rotary wheel regenerative heat exchanger certified by Eurovent.

- Efficiency up to 86% (EN308)
- Highly efficient rotary wheel exchanger
- Certified AARE by Eurovent
- Energy efficient and quiet EC fans
- Plug & Play solution
- Smart control system TANGRA Smart
- Options for add-on thermal sections: heating/cooling



AIR FLOW VOLUME

TANGRA EVB ROT __ are with air flow capacity from 450m³/h to 6400m³/h



TECHNICAL CHARACTERISTICS

Model	EN 13053				Panel ST 25				Panel ST 50			
	Heat Recovery Class	Power consumption of 2 fans	Velocity class	SFP class	Mechanical strength	Casing leakage	Filter by-pass leakage	Thermal class	Mechanical strength	Casing leakage	Filter by-pass leakage	Thermal class
TANGRA EVB ROT 10	H1	P1	V1	SFP 3	D1	L2	F8	T4	Di	L2	F8	T3
TANGRA EVB ROT 16	H1	P1	V1	SFP 3	D1	L2	F8	T4	D1	L2	F8	T3
TANGRA EVB ROT 24	H1	P1	V1	SFP 3	D1	L2	F8	T4	D1	L2	F8	T3
TANGRA EVB ROT 30	H1	P1	V1	SFP 3	D1	L2	F8	T4	D1	L2	F8	T3
TANGRA EVB ROT 36	H1	P1	V1	SFP 3	D1	L2	F8	T4	D1	L2	F8	T3
TANGRA EVB ROT 42	H1	P1	V1	SFP 3	D1	L2	F8	T4	D1	L2	F8	T3
TANGRA EVB ROT 48	H1	P1	V1	SFP 4	D1	L2	F8	T4	D1	L2	F8	T3
TANGRA EVB ROT 60	H1	P1	V2	SFP 4	D1	L2	F8	T4	D1	L2	F8	T3

- Casing parameters are measured in TUV laboratory in accordance with the requirements of EN 1886.
- Heat recovery, Power consumption and Velocity classes are calculated in accordance with EN 13053.
- Rotary Wheel exchanger efficiency is tested and certified by Eurovent Certita Certification.
- SFP class in accordance with EN 16798-3.

1. CONSTRUCTION

TANGRA EVB ROT are produced in compact or modular construction with two types of side panels with build-in sound and thermal insulation:

- Double wall panels ST 25 (25mm)
- Double wall panels ST 50 (50mm)

2. AIR FILTERS (EN779 / ISO16890)

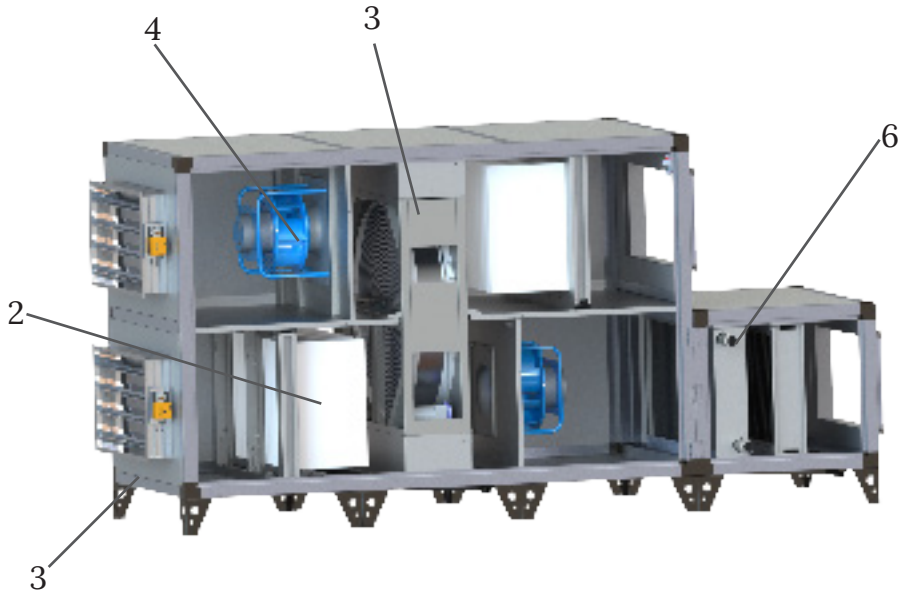
TANGRA EVB are with incorporated filters for fresh and exhaust air. The standard filters are mini-pleat or pocket filters M5÷F7 (EN779) or ePM1÷ePM2.5 (ISO16890).

4. FANS

Heat recovery units TANGRA EVB ROT are equipped with centrifugal EC fans. The fans with EC motors are with high performance radial freewheel impeller and IE4 or IE5 energy class.

5. SMART CONTROL

TANGRA EVB are plug and play solution. The intelligent control systems allow quick and easy commissioning. The state of art controls have BMS connection or control through internet (Modbus, BACnet, etc.). Option for sensors for constant flow or pressure, CO2, VOC or rH.



3. ROTARY WHEEL HEAT EXCHANGER (Eurovent cetrified)

All heat recovery units TANGRA EVB ROT are produced with high efficient rotary heat wheels with efficiency exceeding 75% (EN308). The wheel heat exchangers are certified by Eurovent Certita Certification S.A.S.

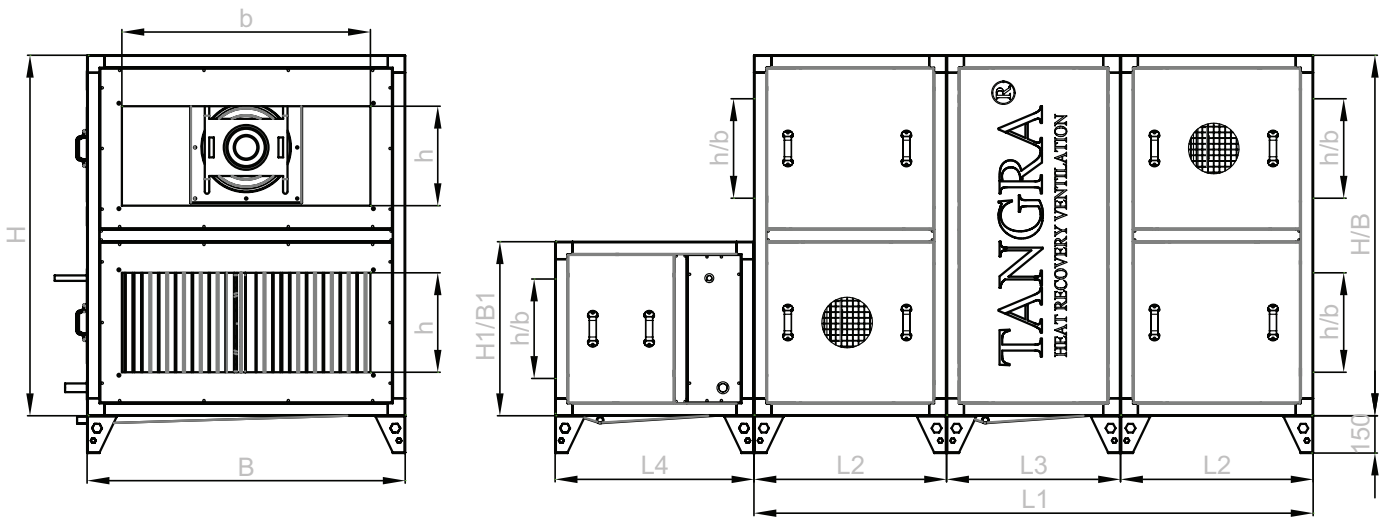
6. THERMAL BOX (option)

TANGRA EVB ROT can be equipped with an external section with integrated water heating coil or DX coil for connection with outdoor VRF. Removable mist eliminator is on request.

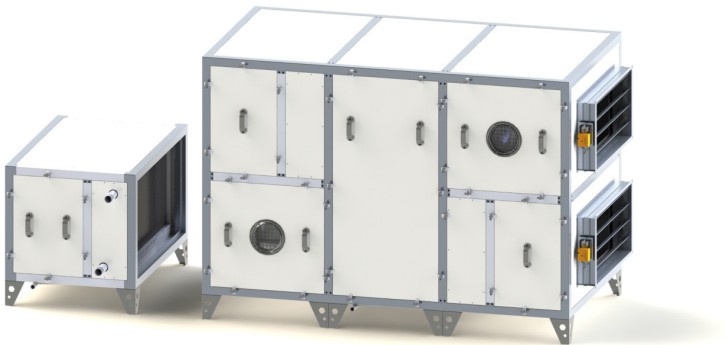
7. MULTI-LEAF DAMPERS (option)

Aluminum louver dampers for tightly closing of the inlets and outlets with external servomotor actuator. Tightness category 2 to EN 1751.

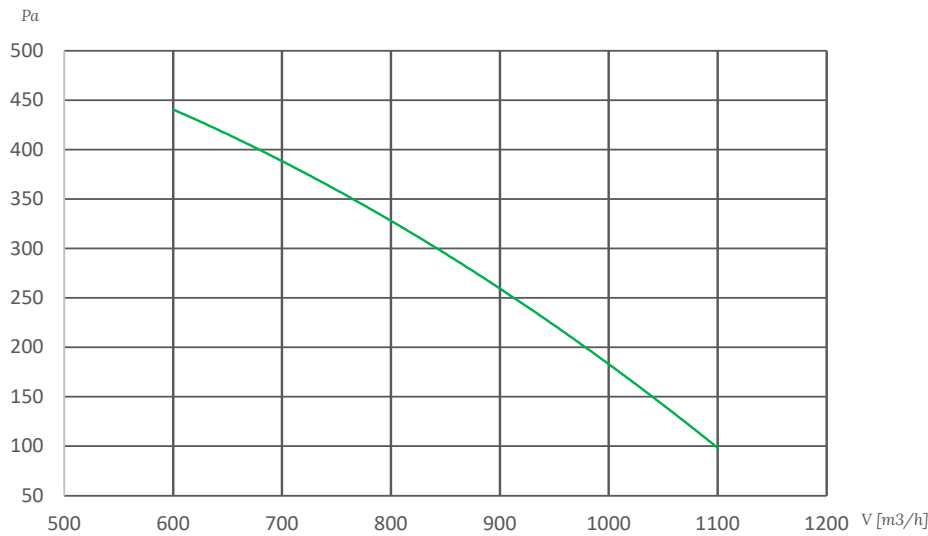
TANGRA EVB ROT _ _ M/S ST _ _
M/S - Monoblock/Slpit
ST _ _ - ST 25/ST 50



Model:	Nominal Air flow [m3/h]	B [mm]	H [mm]	L1 [mm]	L2 [mm]	L3 [mm]	B1 [mm]	H1 [mm]	L4 [mm]	b [mm]	h [mm]	Weight [kg]
TANGRA EVB ROT 10 _ ST 25	450 - 1200	660	710	1600	-	-	-	-	-	600	300	
TANGRA EVB ROT 10 _ ST 50		710	760	1650	-	-	-	-	-			
TANGRA EVB ROT 16 _ ST 25	750 - 2000	1075	1240	2250	775	700	1075	600	750	800	300	380
TANGRA EVB ROT 16 _ ST 50		1125	1290	2300	775	750	1125	640	800			410
TANGRA EVB ROT 24 _ ST 25	1200 - 2600	1075	1450	2250	775	700	1075	700	800	800	400	430
TANGRA EVB ROT 24 _ ST 50		1125	1500	2300	775	750	1125	740	850			465
TANGRA EVB ROT 30 _ ST 25	1800 - 3200	1075	1450	2250	775	700	1280	700	800	800	400	445
TANGRA EVB ROT 30 _ ST 50		1125	1500	2300	775	750	1330	740	850			480
TANGRA EVB ROT 36 _ ST 25	2600 - 3800	1280	1450	2250	775	700	1280	700	800	1000	400	480
TANGRA EVB ROT 36 _ ST 50		1330	1500	2300	775	750	1330	740	850			520
TANGRA EVB ROT 42 _ ST 25	3200 - 4400	1280	1450	2250	775	700	1280	800	800	1000	400	515
TANGRA EVB ROT 42 _ ST 50		1330	1500	2300	775	750	1330	840	850			555
TANGRA EVB ROT 48 _ ST 25	3800 - 5200	1280	1450	2250	775	700	1280	800	800	1000	400	525
TANGRA EVB ROT 48 _ ST 50		1330	1500	2300	775	750	1330	840	850			565
TANGRA EVB ROT 60 _ ST 25	4200 - 6400	1355	1450	2600	950	700	1355	900	1000	1000	400	570
TANGRA EVB ROT 60 _ ST 50		1405	1500	2650	950	750	1405	940	1050			615



TANGRA EVB ROT 10



	EC
Nominal Voltage [V]	1~ 230V
Max power [W]	4 x 170 W
Max current [A]	4 x 1.7 A
Working temperature [°C]	-30°C÷ 60°C
Level of protection	IP 44

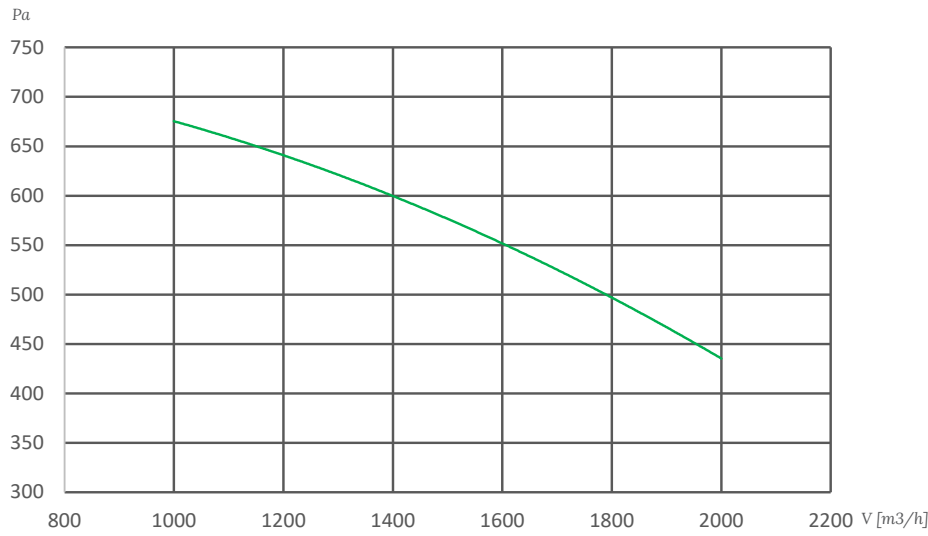
Air flow [m3/h]	Efficiency [%]
600	77.7
800	75.0
1000	72.3
1100	71.0

Thermal efficiency (EN 13053)
E_{winter}: Ambient -5°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave brands [Hz] at 1000 m³/h, 200 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	72	66	69	75	73	74	67	63	79
ETA	70	61	62	61	59	57	51	47	64
Casing	67	56	62	59	51	52	45	35	60

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB ROT 16



	EC
Nominal Voltage [V]	1~ 230V
Max power [W]	2 x 780W
Max current [A]	2 x 4 A
Working temperature [°C]	-25°C ÷ 55°C
Level of protection	IP 54

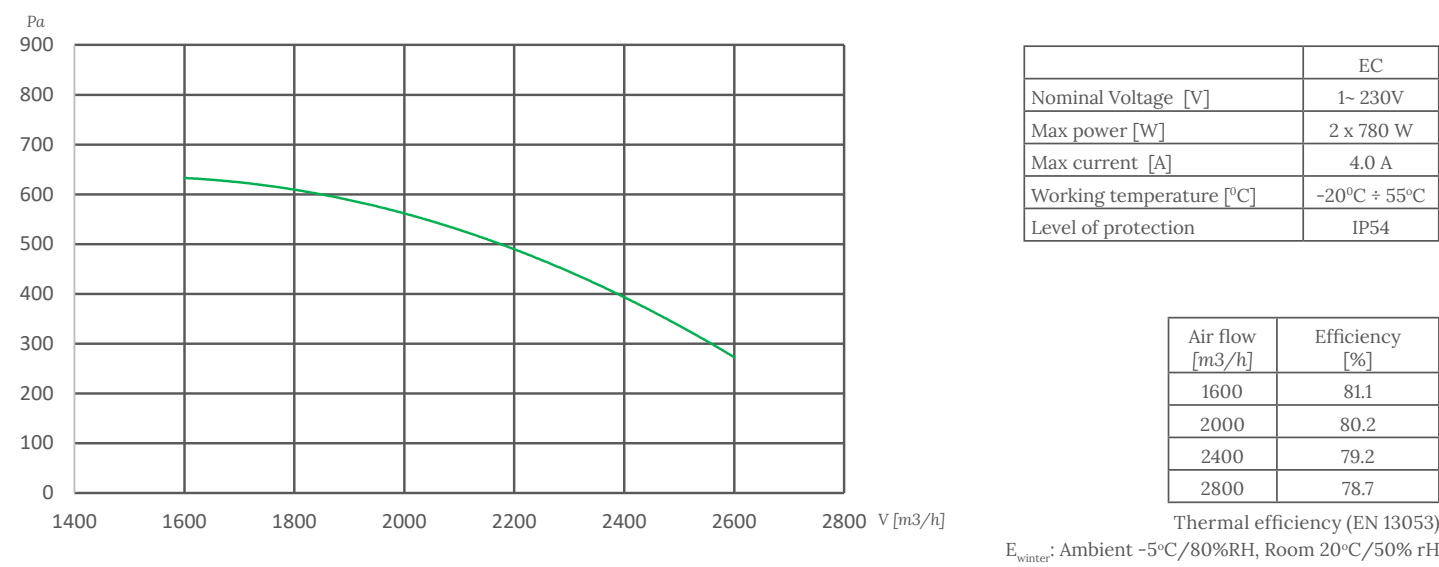
Air flow [m3/h]	Efficiency [%]
1000	81.1
1400	80.6
1600	80.0
2000	78.8

Thermal efficiency (EN 13053)
E_{winter}: Ambient -5°C/80%RH, Room 20°C/50% rH

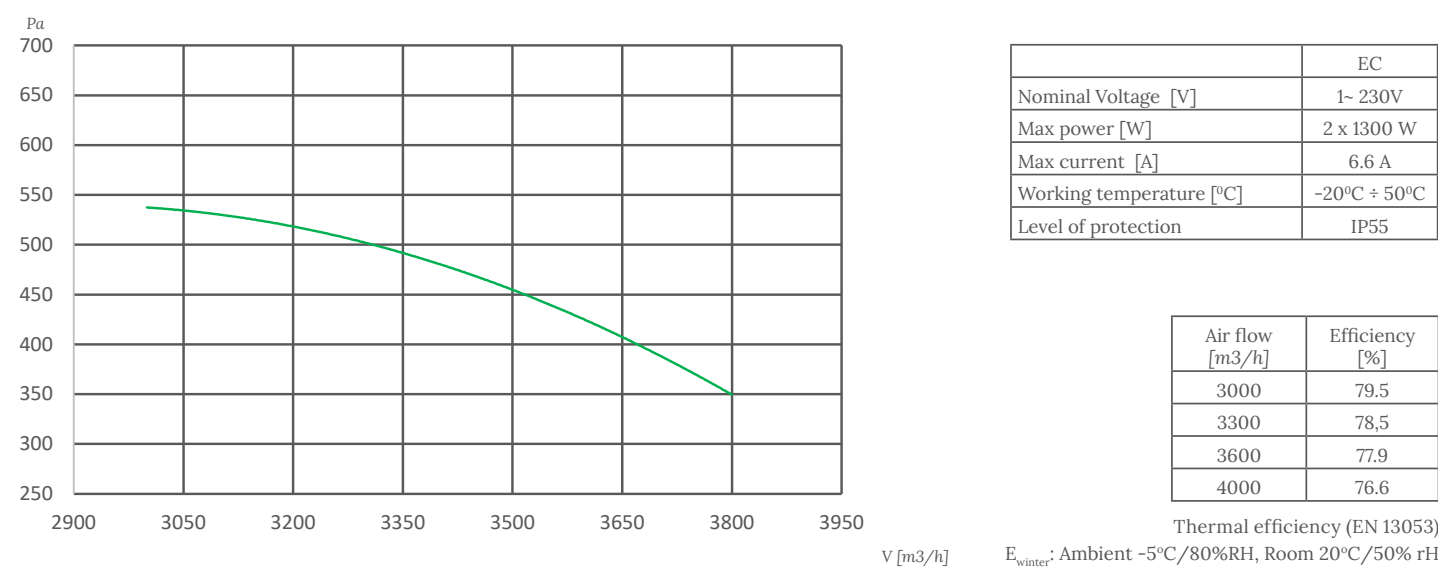
Sound power [dB]	Octave brands [Hz] at 1600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	63	59	71	67	70	67	64	64	74
ETA	55	49	58	56	54	46	44	45	58
Casing	58	49	64	51	48	45	42	36	58

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB ROT 24



TANGRA EVB ROT 36



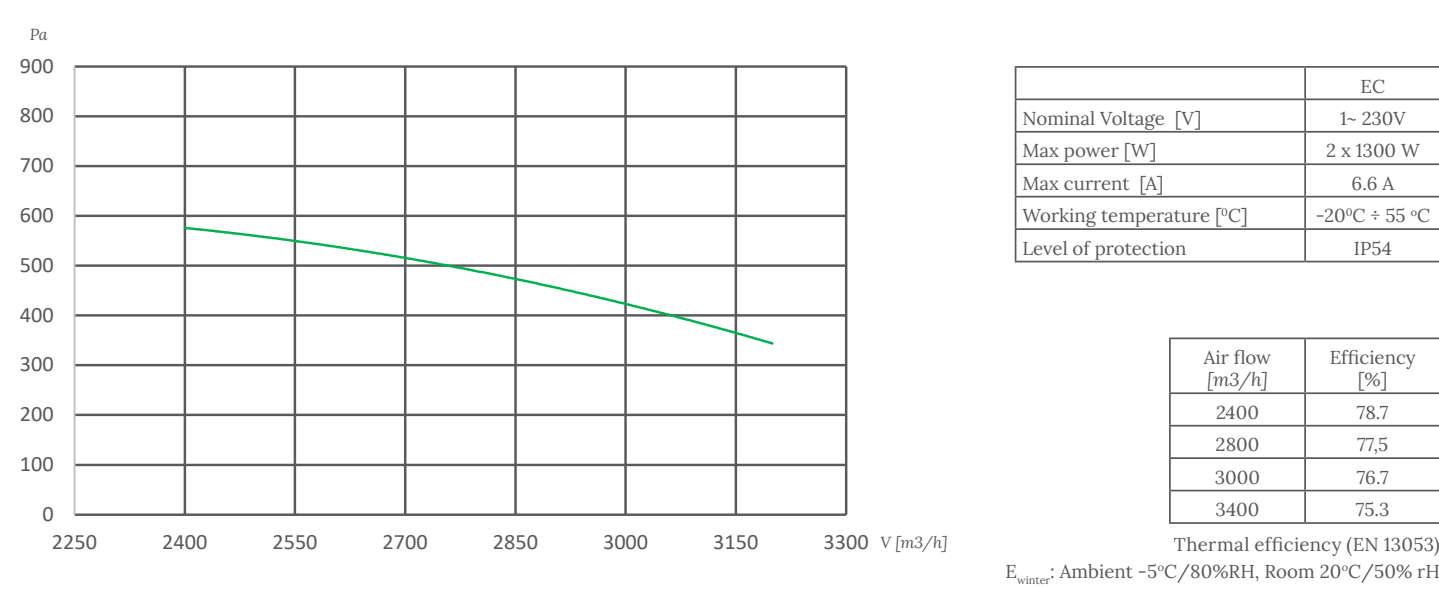
Sound power [dB]	Octave brands [Hz] at 2400 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	66	62	72	70	73	69	66	69	77
ETA	56	54	61	59	56	48	47	51	61
Casing	61	52	65	54	51	47	44	41	59

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

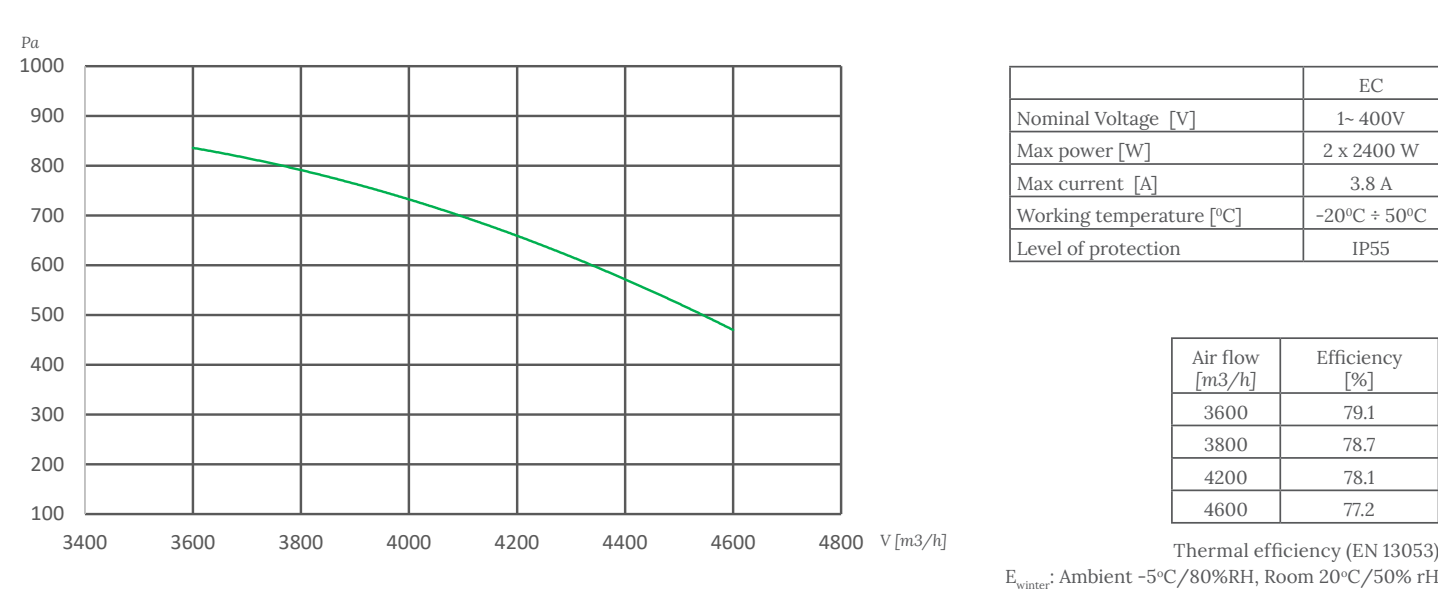
Sound power [dB]	Octave brands [Hz] at 3600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	69	69	75	72	73	73	69	68	79
ETA	62	61	61	59	53	49	45	46	60
Casing	64	59	68	56	51	51	47	40	62

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB ROT 30



TANGRA EVB ROT 42



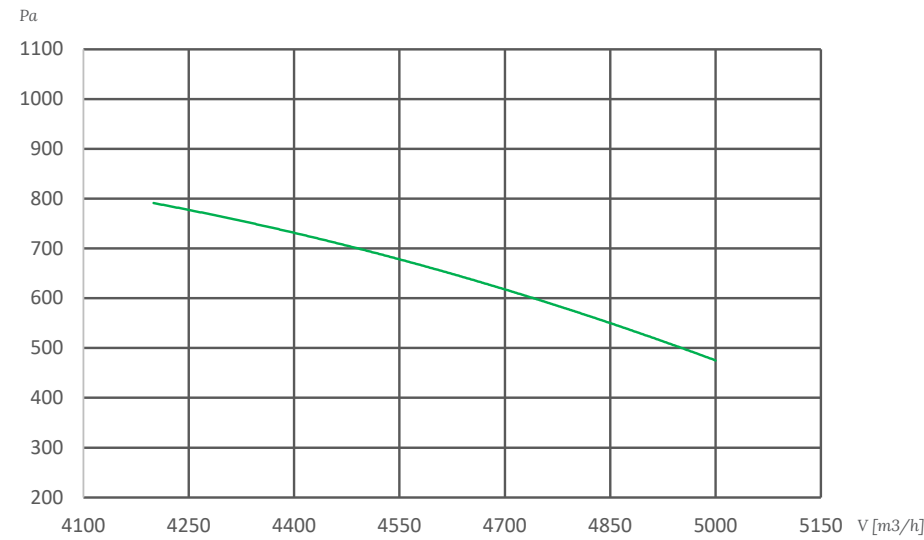
Sound power [dB]	Octave brands [Hz] at 3000 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	66	65	73	69	70	70	66	64	76
ETA	58	56	57	55	51	46	43	41	57
Casing	61	55	66	53	48	48	44	36	60

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

Sound power [dB]	Octave brands [Hz] at 4200 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	74	73	78	76	76	75	71	71	81
ETA	66	65	68	63	57	51	48	50	65
Casing	69	63	71	60	54	53	49	43	65

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

TANGRA EVB ROT 48



	EC
Nominal Voltage [V]	3~ 400V
Max power [W]	2 x 2500 W
Max current [A]	4.0A
Working temperature [°C]	-20°C ÷ 50°C
Level of protection	IP55

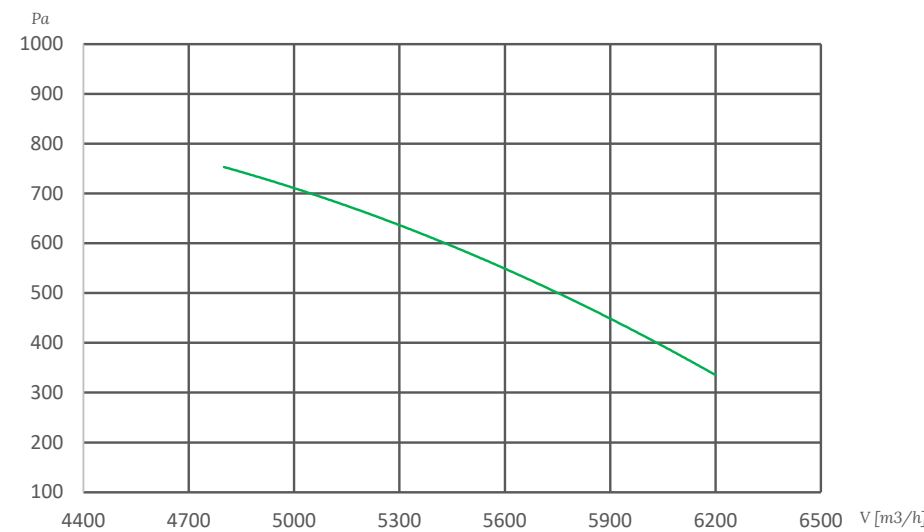
Air flow [m³/h]	Efficiency [%]
4200	78.3
4400	77.6
4800	76.8
5200	75.8

Thermal efficiency (EN 13053)
E_{winter}: Ambient -5°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave bands [Hz] at 4800 m³/h, 250 Pa								dB (A)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
SUP	79	75	82	79	80	78	74	73	87
ETA	69	67	72	68	60	54	51	51	69
Casing	74	65	75	63	58	56	52	45	69

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

TANGRA EVB ROT 60



	EC
Nominal Voltage [V]	3~ 400V
Max power [W]	2 x 2500 W
Max current [A]	4.0A
Working temperature [°C]	-20°C ÷ 50°C
Level of protection	IP55

Air flow [m³/h]	Efficiency [%]
4800	78.1
5400	77.2
6000	76.2
6200	75.9

Thermal efficiency (EN 13053)
E_{winter}: Ambient -5°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave bands [Hz] at 6000 m³/h, 250 Pa								dB (A)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
SUP	76	77	82	80	79	76	72	72	84
ETA	70	70	70	68	61	55	51	52	68
Casing	71	67	75	64	57	54	50	44	69

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	4

Thermal heating / cooling sections

To obtain final available static pressure of the HRU with thermal box it is necessary to find the availabel static pressure of the unit from corresponding diagram and to decrease it with the pressure drop of thermal box:

$H_{\text{final}} = H_{\text{hru}} - \Delta p_{\text{thermal box}}$



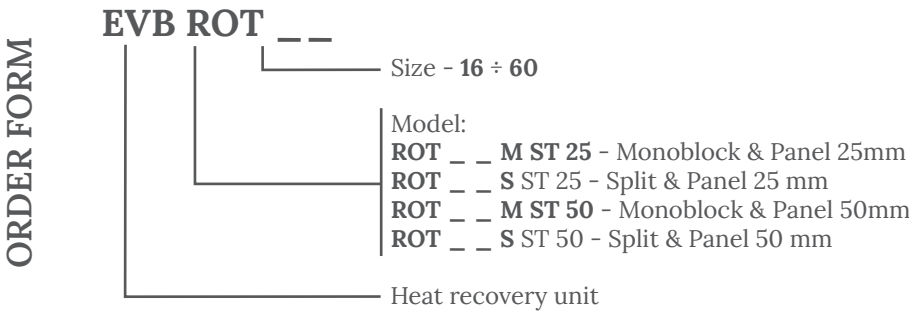
INCORPORATED WATER COIL

Model	Nominal Air Flow, [m3/h]	Water Heating/ Cooling Coil 4R	Heating mode			Cooling mode				Water connection D
			T _{water} 45/40°C			T _{water} 7/12°C				
			Q Heating	ΔP _{air}	ΔP _{water}	Q Cooling	ΔP _{air}	ΔP _{water}	Condense water	
			kW	Pa	kPa	kW	Pa	kPa	g/s	
TANGRA EVB ROT 16	1600	700/400	12.2	37	8.2	10.5	57	7.3	5.5	11/4"
TANGRA EVB ROT 24	2400	800/500	18.1	40	9.5	15.6	63	7.9	8.4	11/2"
TANGRA EVB ROT 30	3000	1000/500	22.3	45	10.7	19.9	60	9.9	10.8	2"
TANGRA EVB ROT 36	3600	1000/500	26.0	55	13.6	22.4	81	12.3	12.1	2"
TANGRA EVB ROT 42	4200	1000/600	30.5	55	12.0	26.2	76	10.7	17.0	2"
TANGRA EVB ROT 48	4800	1000/600	33.5	66	14.2	28.6	95	12.5	15.3	2"
TANGRA EVB ROT 60	6000	1100/700	42.8	63	26.7	37.0	95	28	20.1	2"

**Heating capacity is the same for 4R coil with water temperaturewater 45/40°C
Glycol solution performance - on additional request.

INCORPORATED DIRECT EXPANSION COIL

Model	Nominal Air Flow, [m3/h]	DX Heating/ Cooling Coil 4R	Heating mode			Cooling mode				Connection pipes D
			R410 - T _{cond.} = 43°C			R410 - T _{evap} = 6°C				
			Q Heating	ΔP _{air}	ΔP _{freon}	Q Cooling	ΔP _{air}	ΔP _{freon}	Condense water	
			kW	Pa	kPa	kW	Pa	kPa	g/s	
TANGRA EVB ROT 16	1600	700/400	13.4	39	6.4	12.2	57	39	6.8	12/16
TANGRA EVB ROT 24	2400	800/500	19.6	42	5.1	17.9	61	32.7	10.0	16/22
TANGRA EVB ROT 30	3000	980/500	24.6	42	6.2	22.6	62	40.3	12.7	16/22
TANGRA EVB ROT 36	3600	980/500	27.6	54	7.7	25.4	82	51.9	14.2	16/22
TANGRA EVB ROT 42	4200	1000/600	31.3	52	7.3	28.8	80	50.3	16.0	22/28
TANGRA EVB ROT 48	4800	1000/600	33.9	64	8.4	31.2	96	60.0	17.3	22/28
TANGRA EVB ROT 60	6000	1100/700	41.1	70	7.8	38.3	105	54.1	21.1	2*16/22



DESCRIPTION:

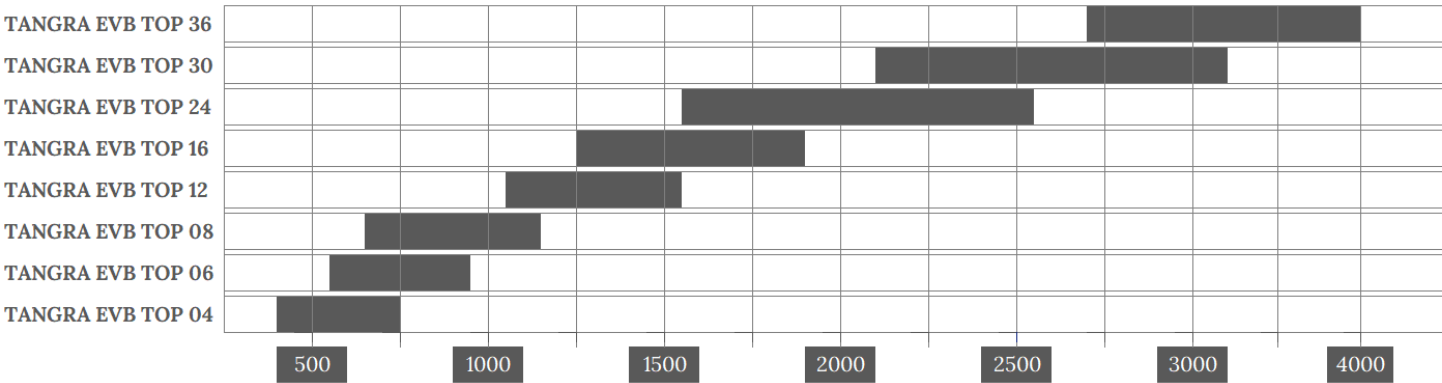


High efficiency heat recovery units TANGRA EVB TOP are developed with plate heat exchanger certified by Eurovent. The units are designed for floor standing installations and all inlets and outlets are on the top.

- Efficiency up to 88% (EN308)
- Highly efficient aluminum plate exchanger
- Certified AAHE by Eurovent
- Energy efficient and quiet EC fans
- Plug & Play solution
- Smart control system TANGRA Smart

AIR FLOW VOLUME

TANGRA EVB ROT __ are with air flow capacity from 150m³/h to 4000m³/h



1. CONSTRUCTION

TANGRA EVB TOP are produced in compact stand alone construction with 25mm build-in sound and thermal insulation.

2. AIR FILTERS (EN779 / ISO16890)

TANGRA EVB are with incorporated filters for fresh and exhaust air. The standard filters are mini-pleat or pocket filters M5÷F7 (EN779) or ePM1÷ePM2.5 (ISO16890).

3. ANTIFREEZE PROTECTION/PRE-HEATER

Due to high efficiency of the heat exchanger in winter conditions (below -5°C) the exhaust air flow can lead freezing and ice blockage of the exchanger. In order to prevent it an electric heater for anti-freeze protection can be incorporated in the units. It turns on automatically based on the conditions and is smoothly controlled to minimize the consumption.

4. PLATE HEAT EXCHANGER (Eurovent cetrifified)

All heat recovery units TANGRA EVB TOP are with high efficient plate heat exchanger with efficiency exceeding 79% (EN308). The heat exchangers are certified by Eurovent Certita Certification S.A.S.

5. FANS

Heat recovery units TANGRA EVB TOP are equipped with centrifugal fans with AC or EC motors. The units with AC fans with forward blade wheel are economic solution with easy variable control. The units with EC are with high performance radial freewheel impeller and IE4 or IE5 EC motors.

6. THERMAL SECTION

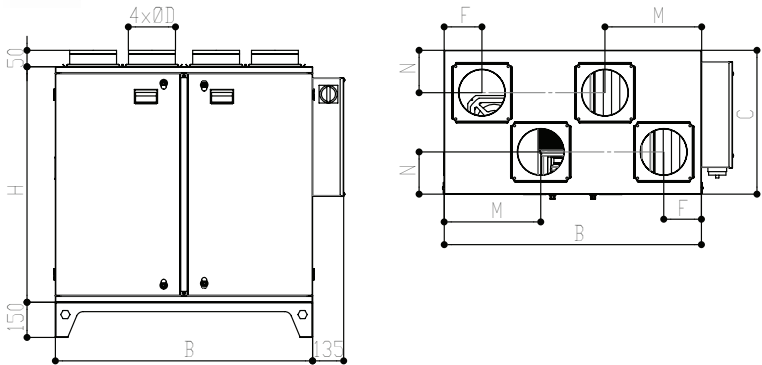
TANGRA EVB TOP can be equipped with build-in integrated water heating coil or DX coil for connection with outdoor VRF.

7. SMART CONTROL

TANGRA EVB are plug and play solution. The intelligent control systems allow quick and easy commissioning. The state of art controls have BMS connection or control through internet (Modbus, BACnet, etc.). Option for sensors for constant flow or pressure, CO2, VOC or rH.

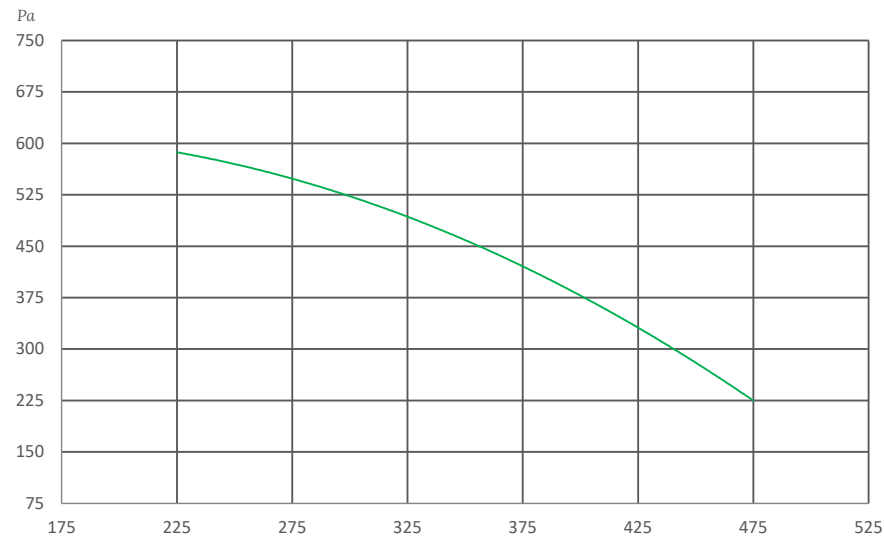


TANGRA EVB TOP __ - EC/AC
EC/AC - fans



Model	Air flow [m3/h]	B [mm]	H [mm]	C [mm]	M [mm]	N [mm]	F [mm]	S [mm]	ØD [mm]	Weight [kg]
TANGRA EVB TOP 04	200 - 500	1100	1005	615	410	180	160	200	200	125
TANGRA EVB TOP 06	300 - 600	1300	1205	715	490	200	185	250	250	140
TANGRA EVB TOP 08	400 - 900	1300	1205	815	490	220	185	280	280	150
TANGRA EVB TOP 12	800 - 1400	2000	1750	615	640	200	230	300	315	250
TANGRA EVB TOP 16	1200 - 1800	2000	1750	715	750	250	250	350	355	340
TANGRA EVB TOP 24	1600 - 2600	2000	1750	815	750	270	270	400	400	370
TANGRA EVB TOP 30	2200 - 3200	2200	1750	1025	850	320	320	450	450	455
TANGRA EVB TOP 36	2800 - 4000	2200	1750	1125	850	320	320	450	450	490

TANGRA EVB TOP 04



	AC	EC
Nominal Voltage [V]	-	1~ 230V
Max power [W]	-	2 x 170 W
Max current [A]	-	2 x 1.7 A
Working temperature [°C]	-	-25°C ÷ 60°C
Level of protection	-	IP 54
Pre-heater capacity [kW]*	1.5 kW / 230V	
Post-heater capacity [kW]*	1.5 kW / 230V	

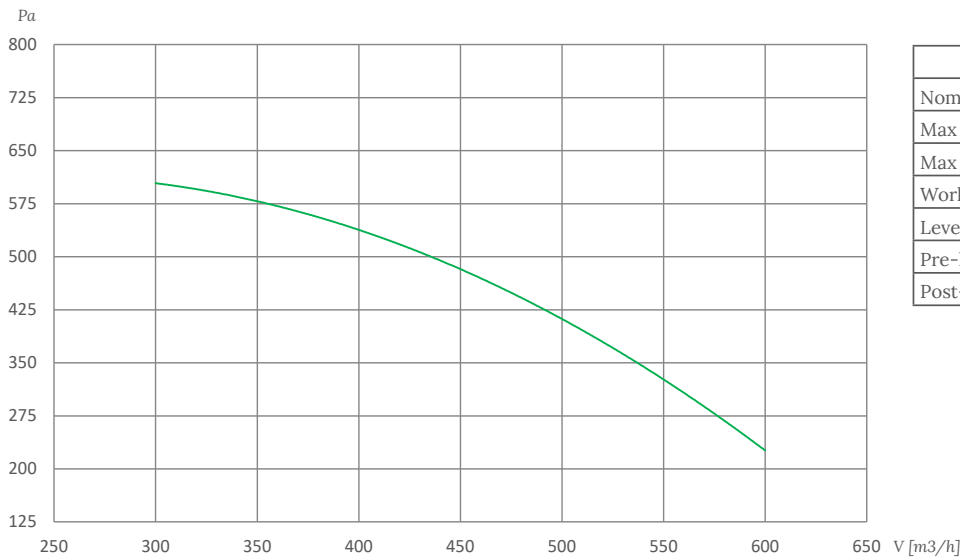
Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
200	80.8	83.0
300	79.3	82.5
400	78.1	81.5
500	77.3	79.3

Thermal efficiency (EN 13053)
E_{winter}: Ambient -7°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave brands [Hz] at 400 m³/h, 200 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	58	57	58	65	62	62	55	51	68
ETA	54	52	53	54	52	51	46	43	57
Casing	55	49	54	53	45	47	41	32	54

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB TOP 06



	AC	EC
Nominal Voltage [V]	-	1~ 230V
Max power [W]	-	2 x 170 W
Max current [A]	-	2 x 1.7 A
Working temperature [°C]	-	-30°C ÷ 60°C
Level of protection	-	IP 54
Pre-heater capacity [kW]*	1.5 kW / 230V	
Post-heater capacity [kW]*	1.5 kW / 230V	

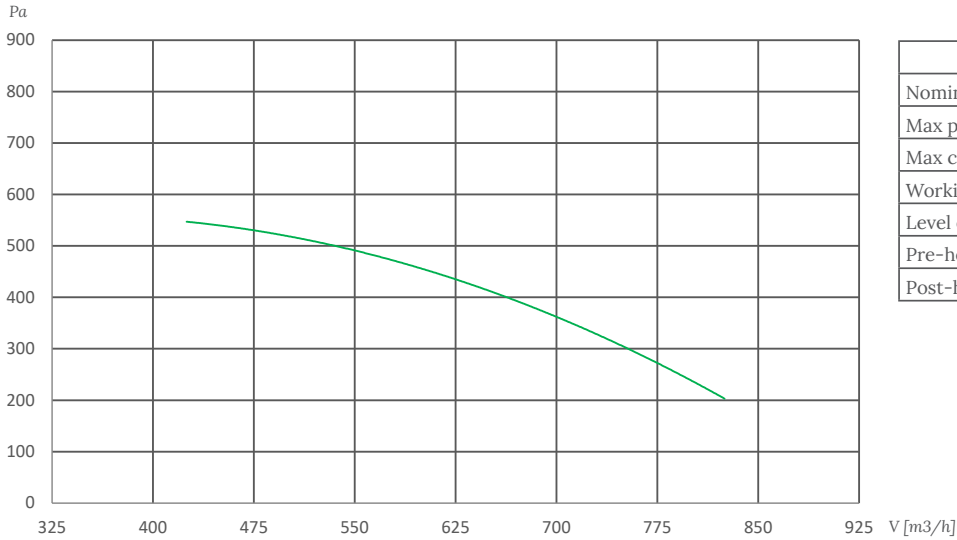
Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
400	81.6	83.6
500	81.0	83.0
600	80.4	82.3
700	80.0	79.9

Thermal efficiency (EN 13053)
E_{winter}: Ambient -7°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave brands [Hz] at 600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	60	59	60	67	64	64	57	53	70
ETA	56	54	55	56	54	53	48	45	59
Casing	57	51	56	55	47	49	43	34	56

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB TOP 08



	AC	EC
Nominal Voltage [V]	-	1~ 230V
Max power [W]	-	2 x 207 W
Max current [A]	-	2 x 1.4 A
Working temperature [°C]	-	-25°C ÷ 50°C
Level of protection	-	IP 44
Pre-heater capacity [kW]*	2.25 kW / 230V	
Post-heater capacity [kW]*	2.25 kW / 230V	

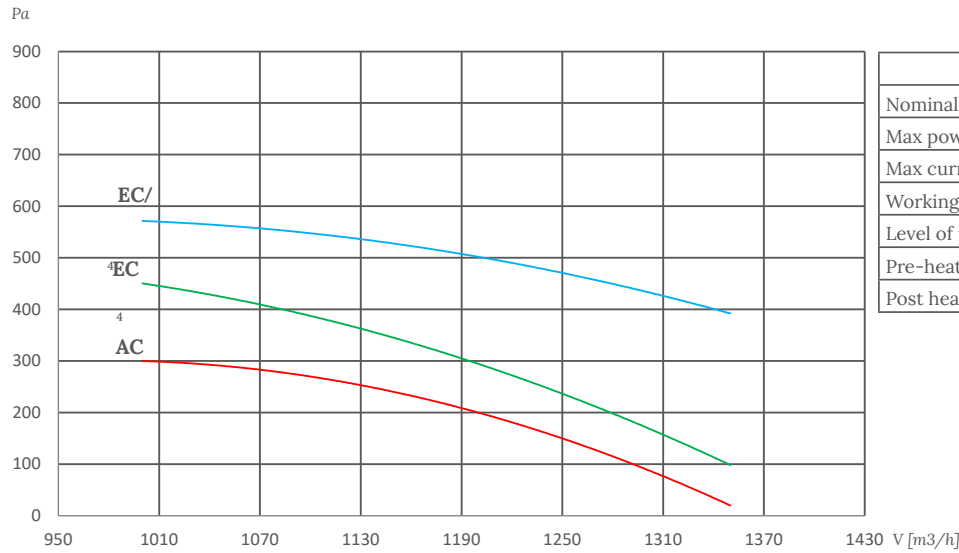
Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
500	81.5	83.5
600	81.0	83.0
700	80.5	82.5
800	80.0	82.0
900	79.6	81.6

Thermal efficiency (EN 13053)
E_{winter}: Ambient -7°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave brands [Hz] at 800 m³/h, 200 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	69	63	65	70	67	66	58	53	72
ETA	69	60	61	60	58	55	50	46	63
Casing	66	55	61	58	50	51	44	34	59

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB TOP 12



	AC	EC	EC+
Nominal Voltage [V]	1~ 230V	1~ 230V	1~ 230V
Max power [W]	2x373W	2x420W	2x780W
Max current [A]	2 x 3.6 A	2 x 1.8 A	2 x 4.0 A
Working temperature[°C]	-20 ÷ 40	-25 ÷ 50	-20 ÷ 55
Level of protection	IP 20	IP 44	IP 54
Pre-heater capacity [kW]*	3.0 kW / 230V		
Post heater capacity [kW]*	3.0 kW / 230V		

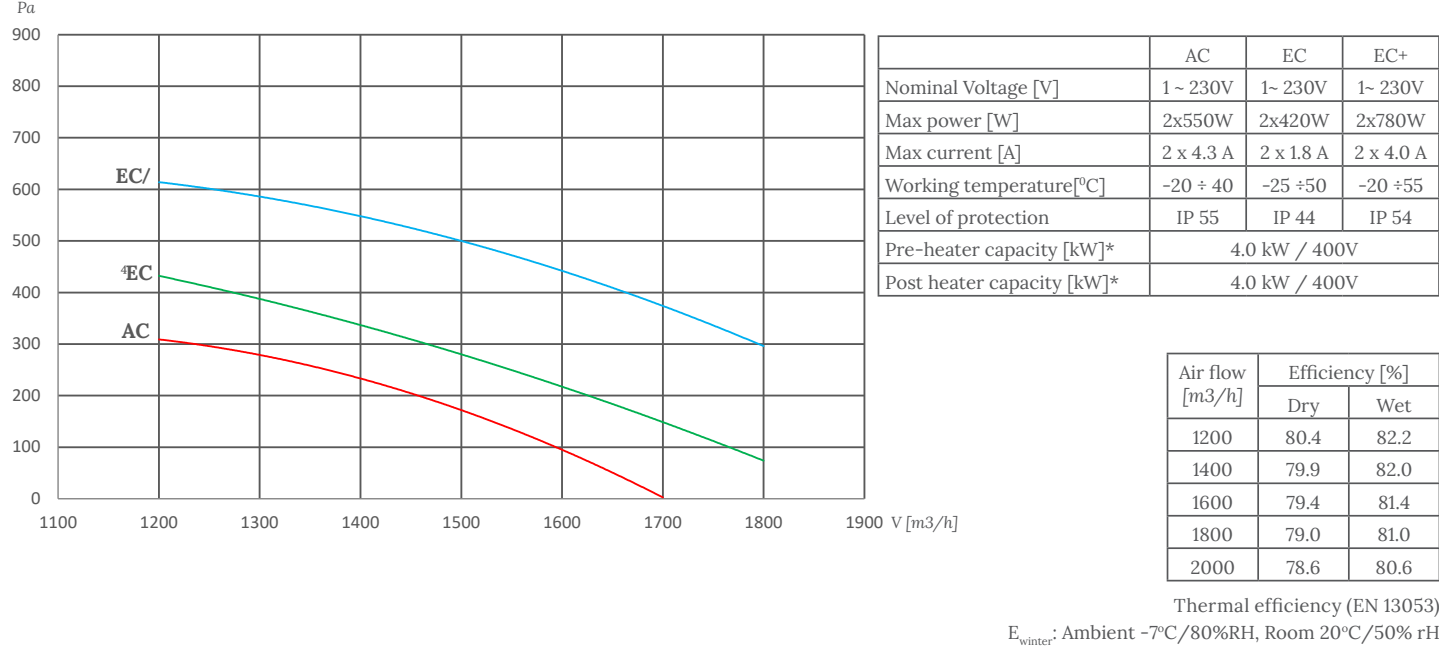
Air flow [m3/h]	Efficiency [%]	
	Dry	Wet
1000	80.3	82.3
1100	80.0	82.2
1200	79.8	81.7
1300	79.6	81.5
1400	79.0	81.0

Thermal efficiency (EN 13053)
E_{winter}: Ambient -7°C/80%RH, Room 20°C/50% rH

Sound power [dB]	Octave brands [Hz] at 1200 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	62	63	77	64	64	59	53	48	71
ETA	57	55	66	56	53	45	41	37	60
Casing	55	59	72	52	47	44	39	29	64

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

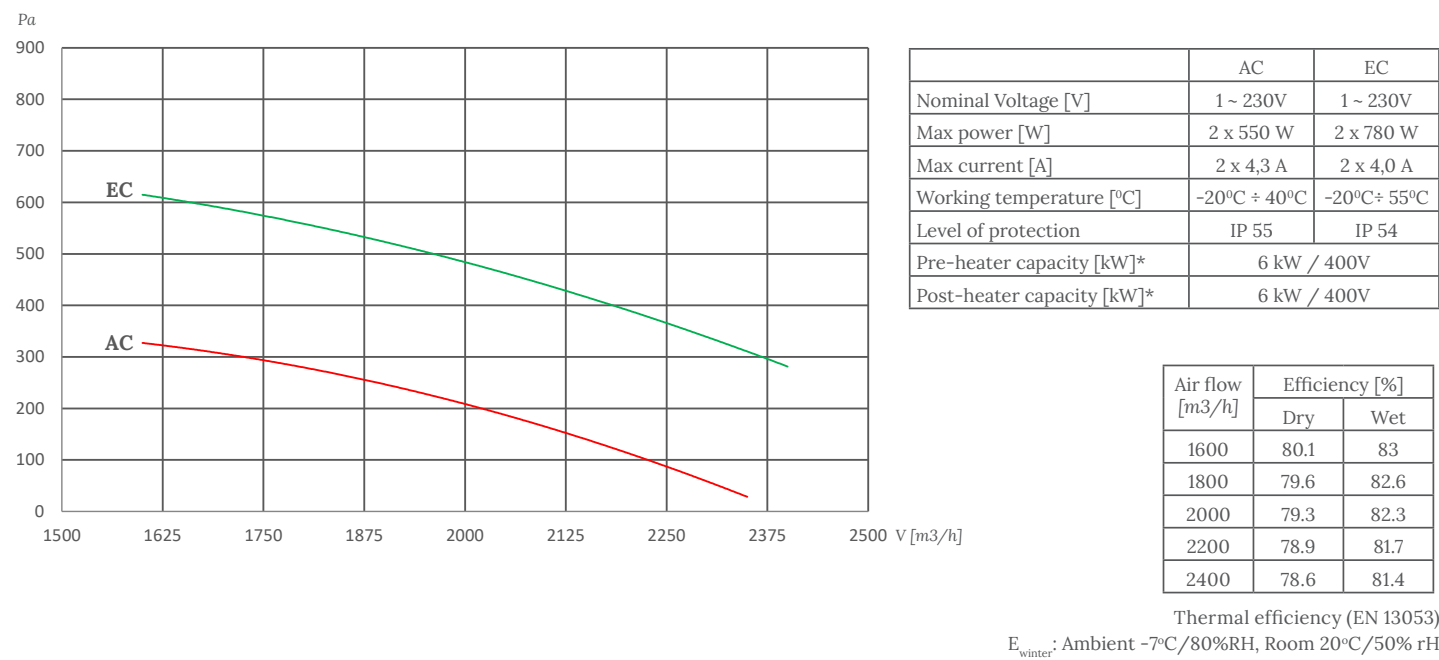
TANGRA EVB TOP 16



Sound power [dB]	Octave brands [Hz] at 1600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	61	56	70	63	65	60	54	50	69
ETA	55	46	60	55	54	46	42	40	58
Casing	58	48	66	51	48	45	40	31	59

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

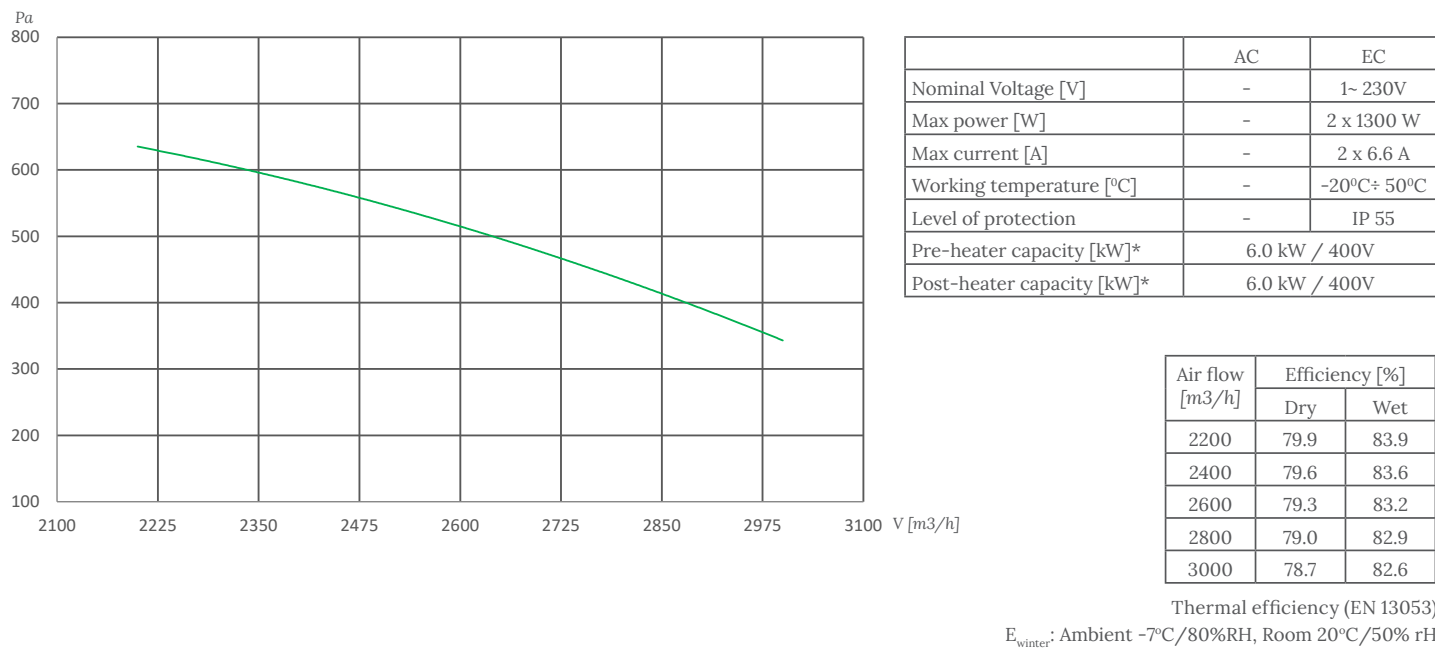
TANGRA EVB TOP 24



Sound power [dB]	Octave brands [Hz] at 2400 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	66	61	71	67	69	64	60	60	72
ETA	57	53	62	59	57	49	48	51	62
Casing	63	53	67	55	52	49	46	41	61

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

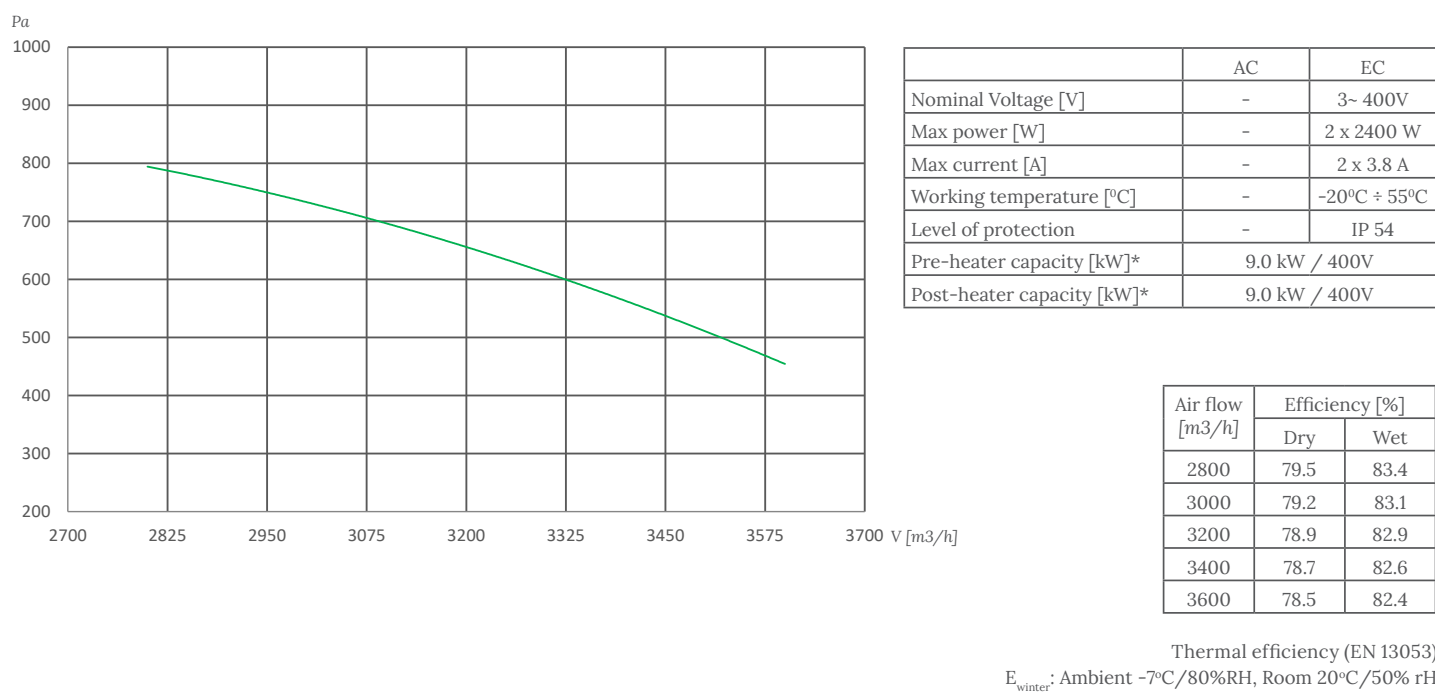
TANGRA EVB TOP 30



Sound power [dB]	Octave brands [Hz] at 3000 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	64	64	72	66	67	65	60	56	72
ETA	57	56	60	56	52	48	44	41	58
Casing	61	56	68	54	50	50	46	37	62

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3

TANGRA EVB TOP 36



Sound power [dB]	Octave brands [Hz] at 3600 m³/h, 250 Pa								
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB (A)
SUP	68	66	73	69	69	66	62	59	74
ETA	62	59	64	60	54	49	46	46	61
Casing	65	58	69	57	52	51	48	40	63

Classification EN 13053	
Heat recovery	H1
Air velocity	V1
SFPv class	3



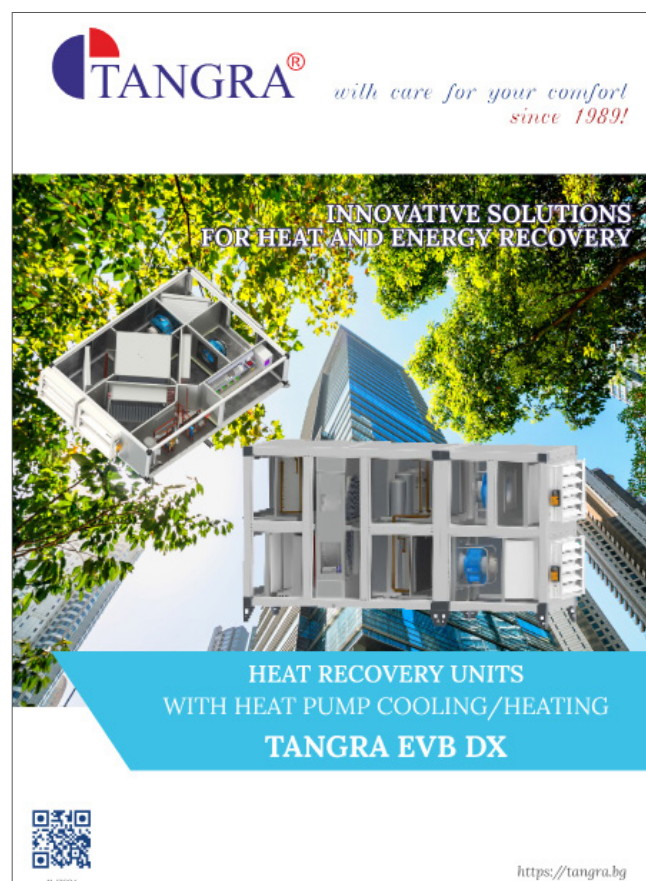
TANGRA AHU Modular MODULAR AIR HANDLING UNITS

- 14 model sizes with wide range of configurations and components
- Air volume: 3500m³/h ÷ 70 000m³/h
- Plate or Rotary Heat Recovery System
- AC or EC plug fans (IE3, IE4, IE5)
- Integrated control system with BMS
- EUROVENT certified



TANGRA EVB School DECENTRALISED HEAT RECOVERY UNITS

- 3 different models suitable for all types of installation (ceiling, vertical and under-window)
- Air volume: 400m³/h ÷ 1000m³/h
- Plate Heat Recovery System
- EC plug fans (IE4 and IE5)
- Option for water/electric heater



TANGRA EVB DX COMPACT THERMODYNAMIC AIR HANDLING UNITS

- 3 versions suitable for different types of projects
- Air volume: 1000m³/h ÷ 6000m³/h
- Plate or Rotary Heat Recovery System
- EC plug fans (IE3, IE4, IE5)
- Integrated control system with BMS
- Integrated DC inverter reversible heat pump module
- Option for swimming pools (dehumidification)



TANGRA ACU COMPACT SUPPLY AIR HANDLING UNITS

- 6 models with options for wide selection of components
- Air volume: 500m³/h ÷ 6600m³/h
- AC or EC plug fans (IE3, IE4, IE5)
- Integrated water or DX heating/cooling coils
- Option for mixing sections
- Integrated control system with BMS



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