

ERV / ERV-V

Packaged Type Energy Recovery Unit



Index

ERV / ERV-V

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The technical specifications and the performance data declared with this logo have been developed by the tests performed in Eneko Energy Laboratory which is established with the development Project support of Tübitak by regarding relevant standards.

• Casing & Insulation

The unit's casing is made up of double skinned high corrosion resistive 200 gr/m² galvanize coated steel. **50 mm thickness and 70kg/m³ density of Rockwool** insulation between the walls is used for thermal and sound insulation. The case of unit is painted by electrostatic powdered paint. The unit is constructed in sections to ease transportation, mounting and commissioning.

Casing performance as per EN 1886

Casing air leakage: L1 (M)

Thermal bridges: TB2

Thermal transmission: T2

Mechanical strength: D1

Filter leakage: F9

• Exhaust and Supply Air Fans

The fans in packaged type energy recovery units are equipped with innovative Electronically Commutated **EC motor** technology. EC motors have higher efficiency and simple speed control. Fan blades have high aerodynamic efficient backward curved design. EC motors reduce the energy consumption and increase the energy efficiency of the unit. With EC Fans, maintenance costs are reduced as the fans are directly connected to the motors; the belt and pulley problems are eliminated.

• Control System Plug&Play

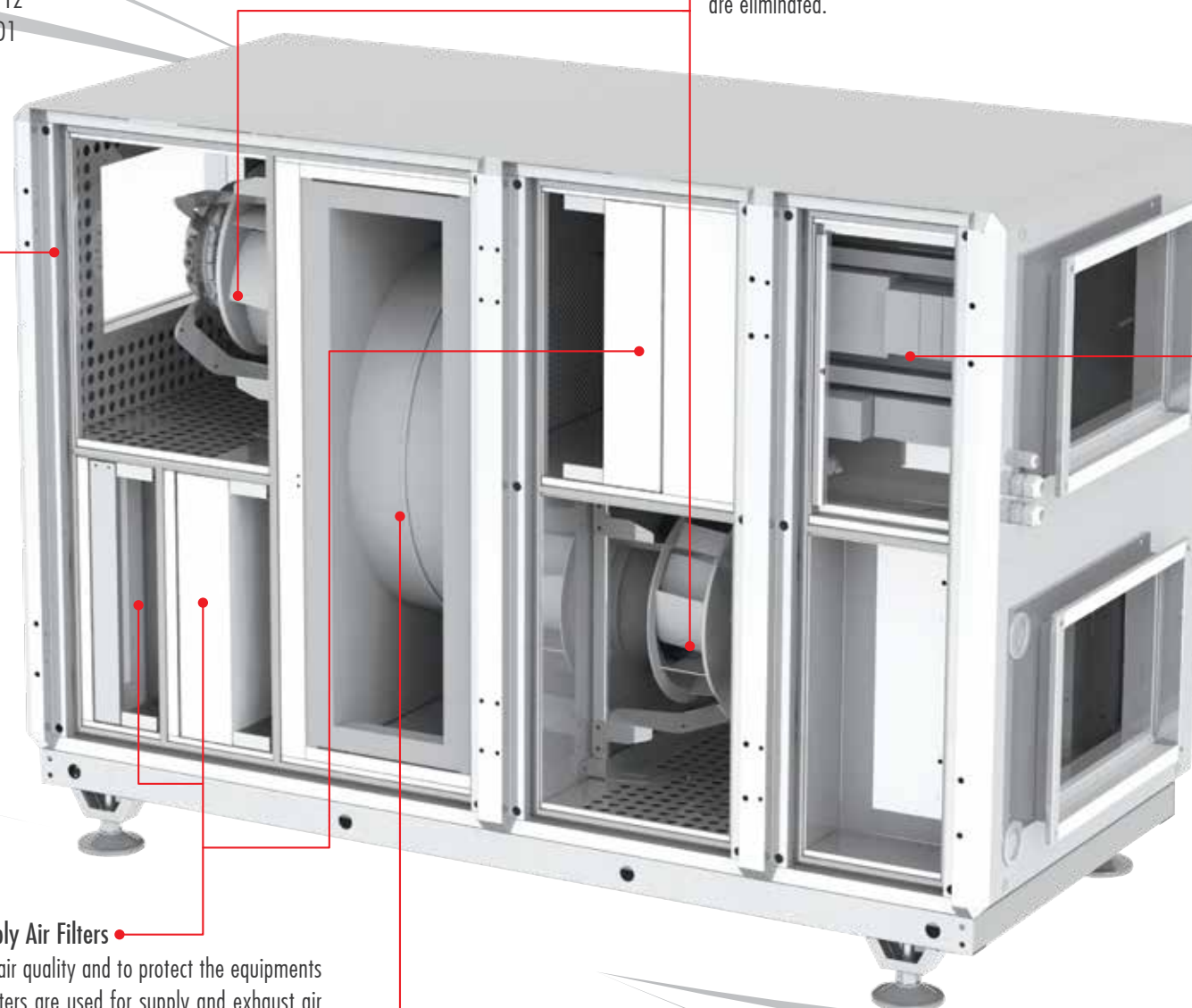
ENECON PLUS and CORRIGO control units are developed for controlling of heat recovery units' equipments, meeting the demands coming from the customers and is user-friendly designed. ENECON PLUS and CORRIGO are capable of commanding the equipments in standard unit and optional accessories. ENECON PLUS and CORRIGO Control units can be performed the basic functions without any control panel, with Standard Panel can be also used more functional. Besides, the control unit can control the all functions via ModBus and switch on/off via BMS as optional and CORRIGO control unit can control the all functions via Bacnet. Alternatives different from ENECON PLUS and CORRIGO controllers are listed in "Control System" part.

• Exhaust and Supply Air Filters

To increase indoor air quality and to protect the equipments used in unit, air filters are used for supply and exhaust air streams according to ISO 16890 standard. A choice of pre-filters (ISO COARSE >80% - ISO COARSE >90% - ISO ePM 10 >50%) and final filters (ISO ePM 1 >50-65% - ISO ePM 1 >80%) are available optionally. Optional filters reduce the available static pressure of the unit.

• Rotary Heat Recovery

ERV energy recovery ventilation units have high efficient rotary heat recovery exchangers. The exchanger transfers sensible heat and moisture between supply and exhaust air. Thus, it is also possible to transfer latent heat. With the optimization of heat exchanger, temperature and humidity efficiency is increased, pressure drop is decreased. Optionally, condensation rotor can be used for sensible heat transfer and sorption rotor can be used for humidity transfer.



• Casing & Insulation

The unit's casing is made up of double skinned high corrosion resistive 200 gr/m² galvanize coated steel. **50 mm thickness and 70kg/m³ density of Rockwool** insulation between the walls is used for thermal and sound insulation. The case of unit is painted by electrostatic powdered paint. The unit is constructed in sections to ease transportation, mounting and commissioning.

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Exhaust and Supply Air Filters

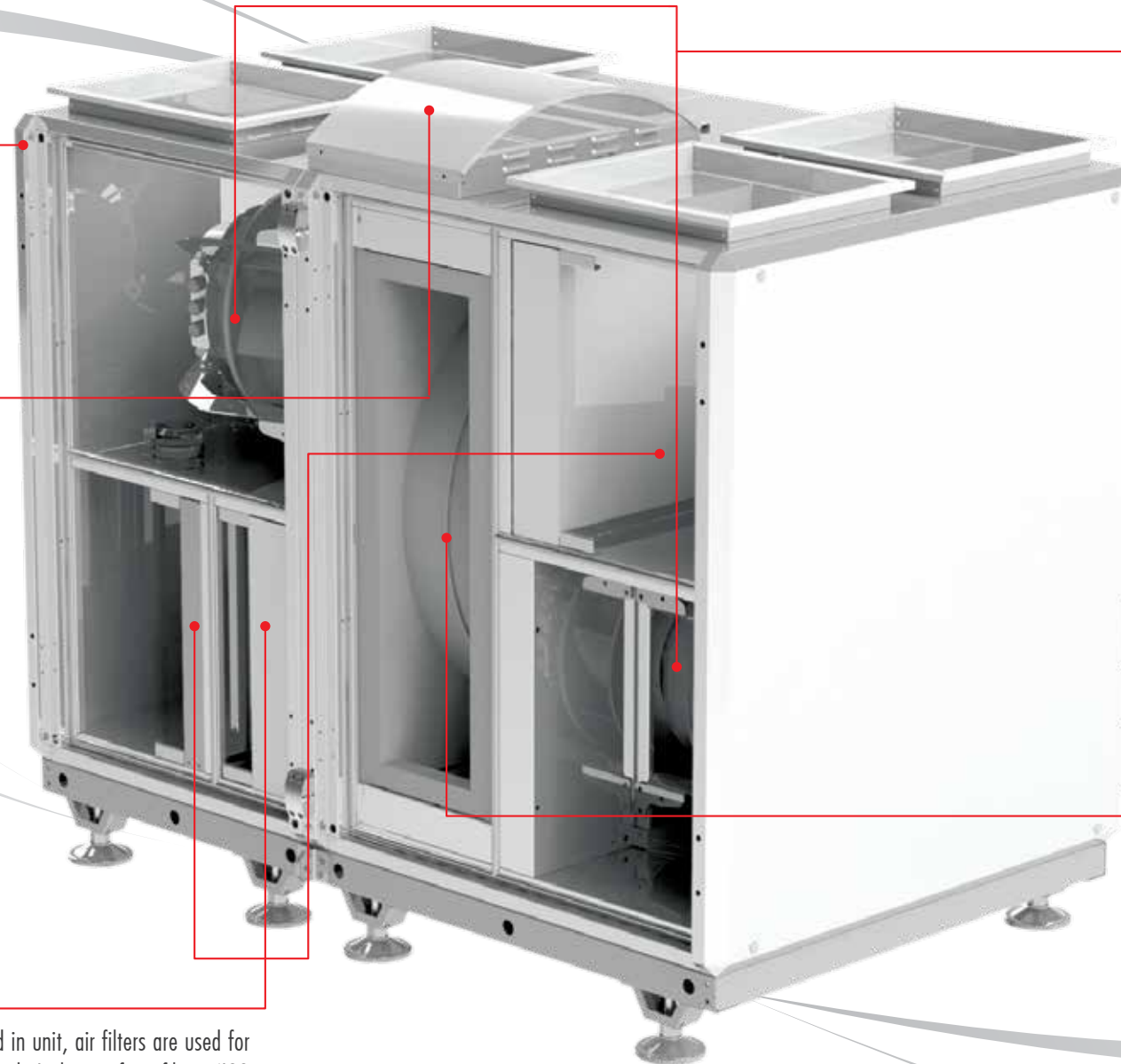
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The fans in packaged type energy recovery units are equipped with innovative Electronically Commutated **EC motor** technology. EC motors have higher efficiency and simple speed control. Fan blades have high aerodynamic efficient backward curved design. EC motors reduce the energy consumption and increase the energy efficiency of the unit. With EC Fans, maintenance costs are reduced as the fans are directly connected to the motors; the belt and pulley problems are eliminated.

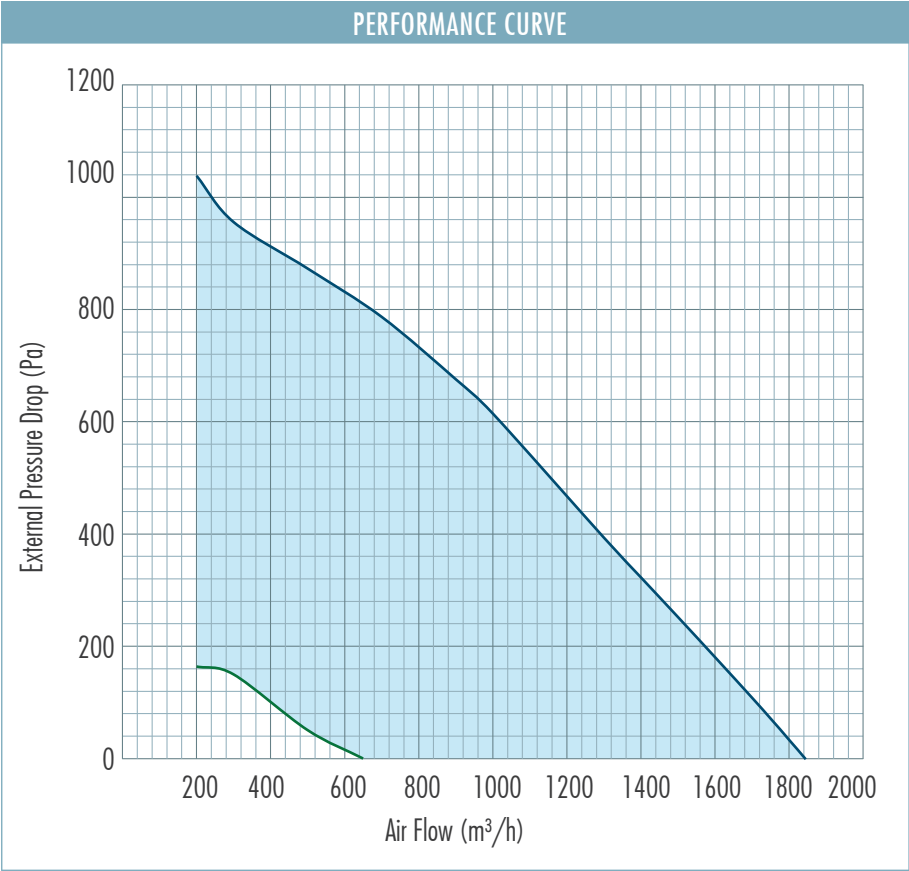
• Rotary Heat Recovery

ERV-V energy recovery ventilation units have high efficient rotary heat recovery exchangers. The exchanger transfers sensible heat and moisture between supply and exhaust air. Thus, it is also possible to transfer latent heat. With the optimization of heat exchanger, temperature and humidity efficiency is increased, pressure drop is decreased. Optionally, condensation rotor can be used for sensible heat transfer and sorption rotor can be used for humidity transfer.

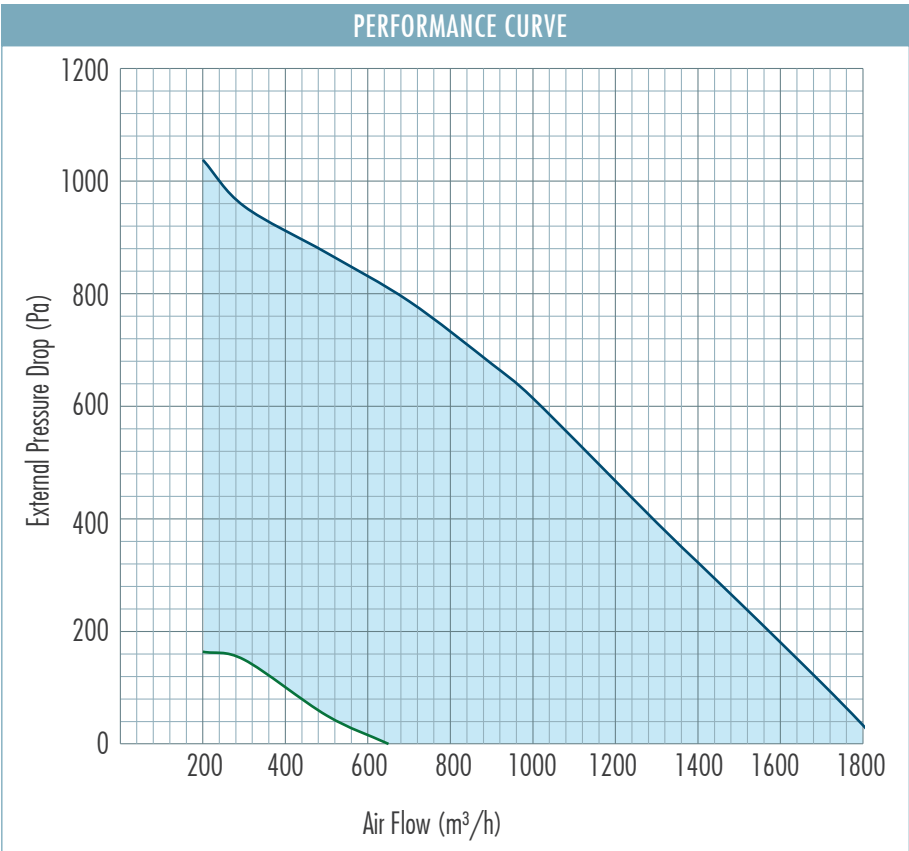




ERV 100



ERV 200

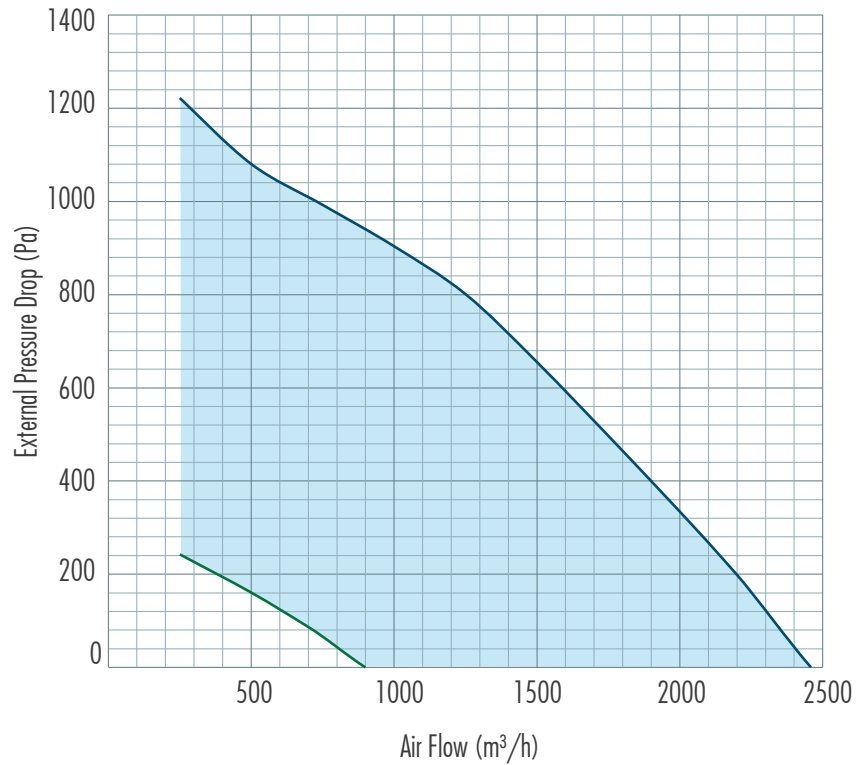


Note: Efficiency values are calculated according to EN 308 standard.



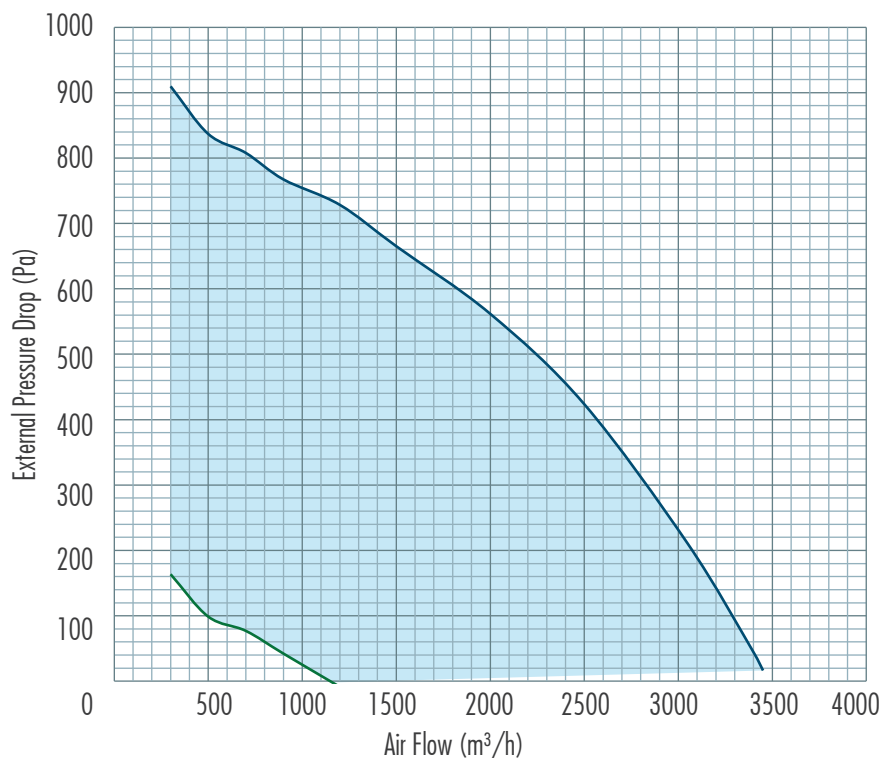
ERV 300

PERFORMANCE CURVE



ERV 400

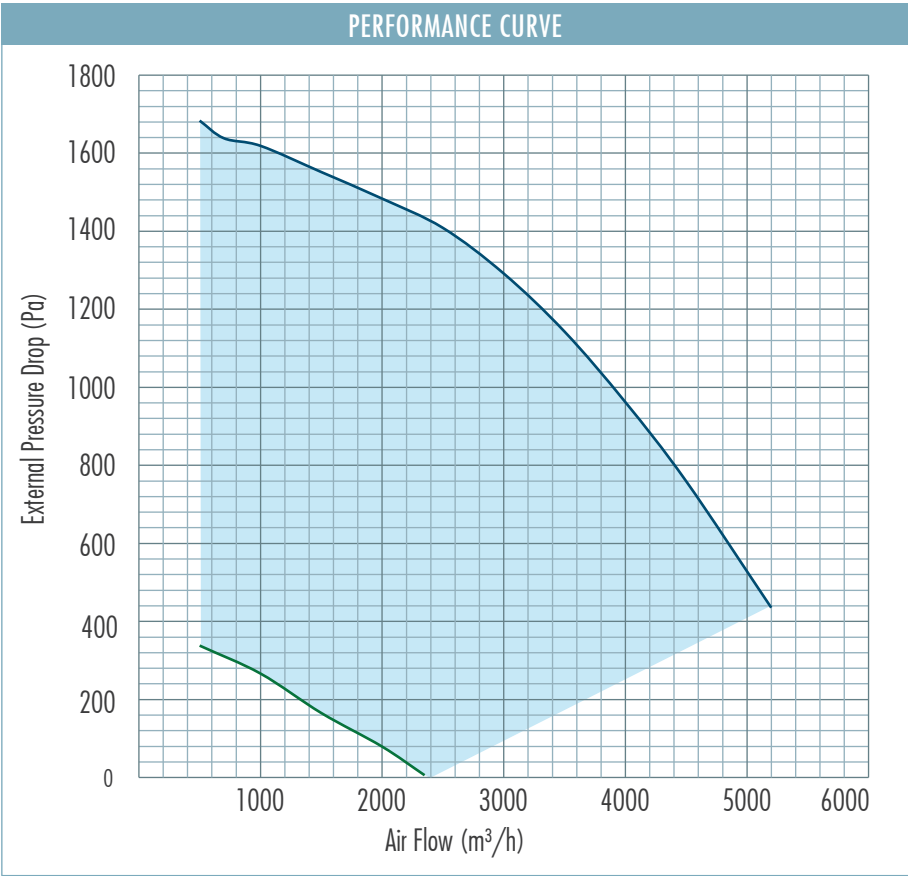
PERFORMANCE CURVE



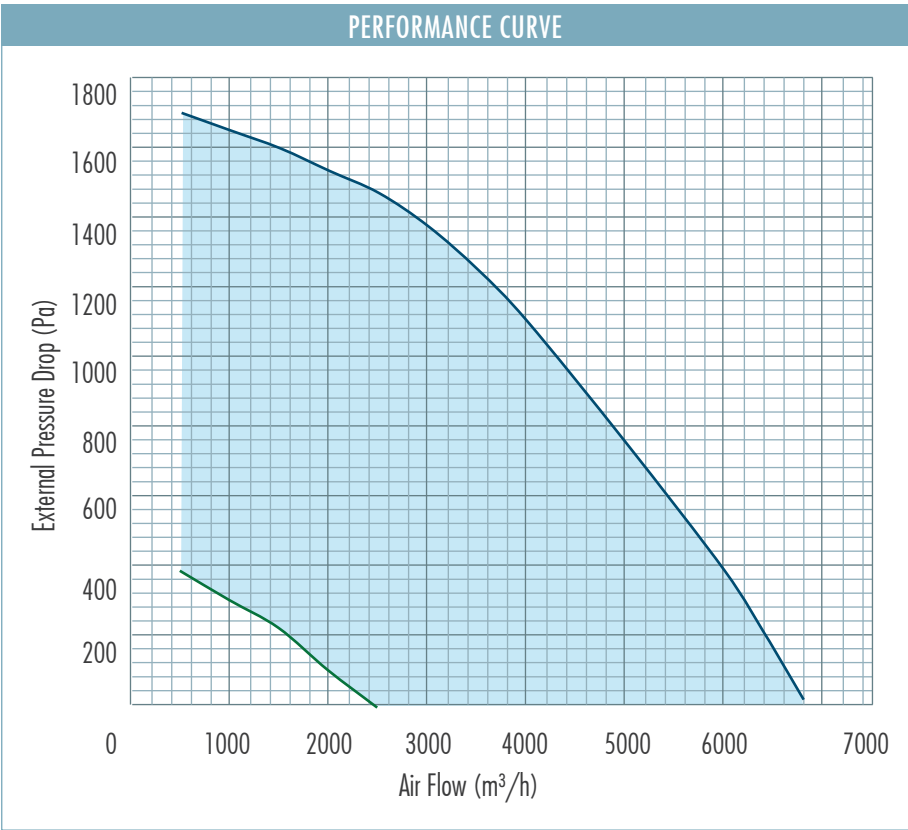
Note: Efficiency values are calculated according to EN 308 standard.



ERV 500



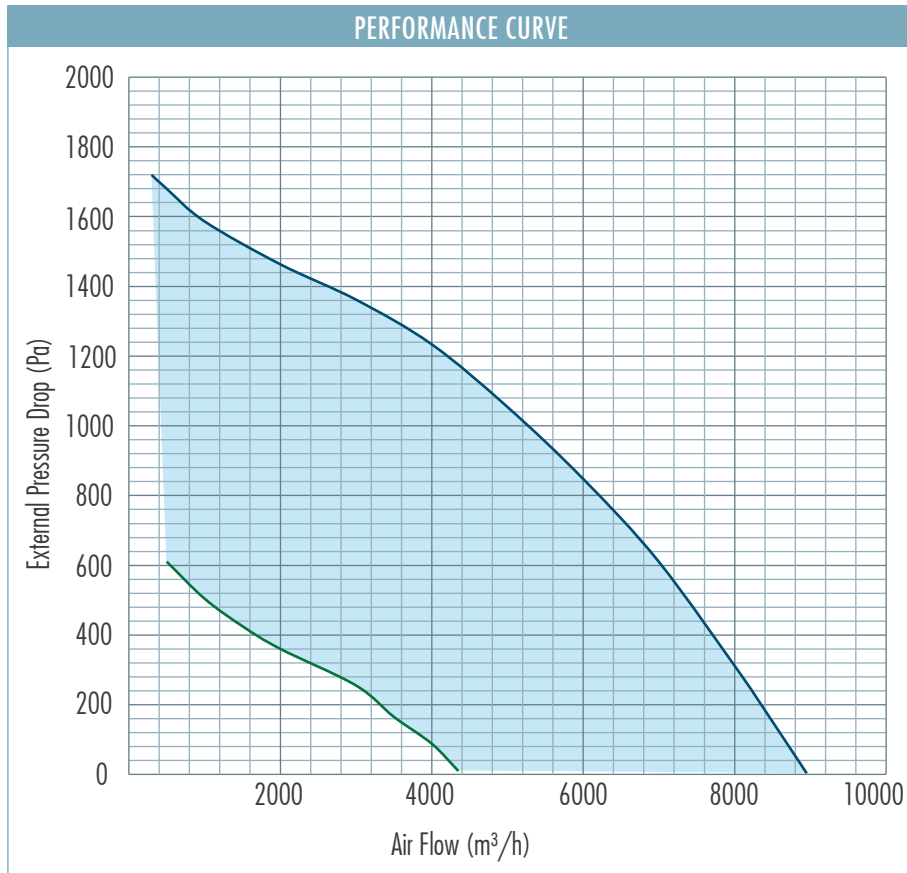
ERV 700



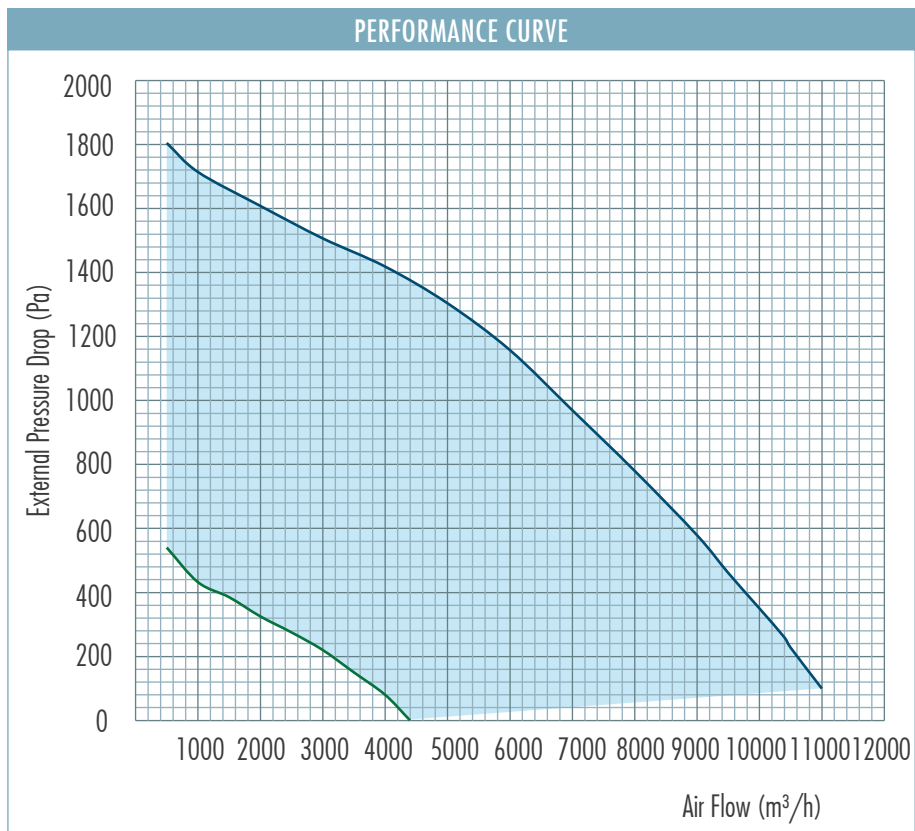
Note: Efficiency values are calculated according to EN 308 standard.



ERV 900



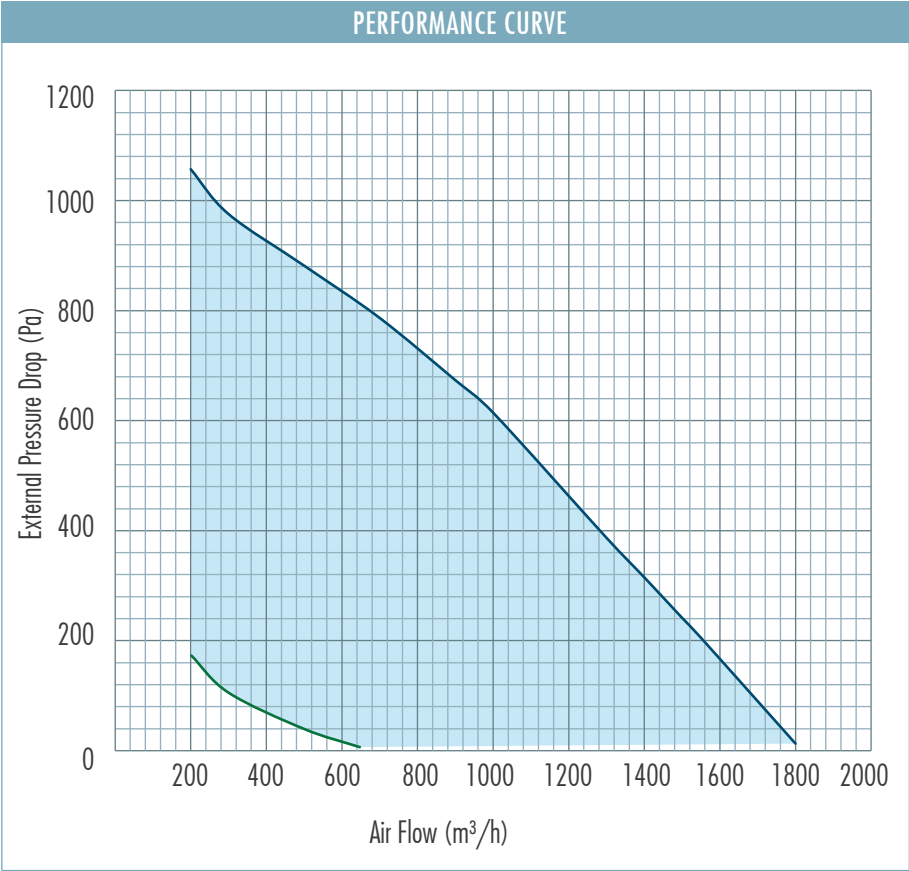
ERV 1100



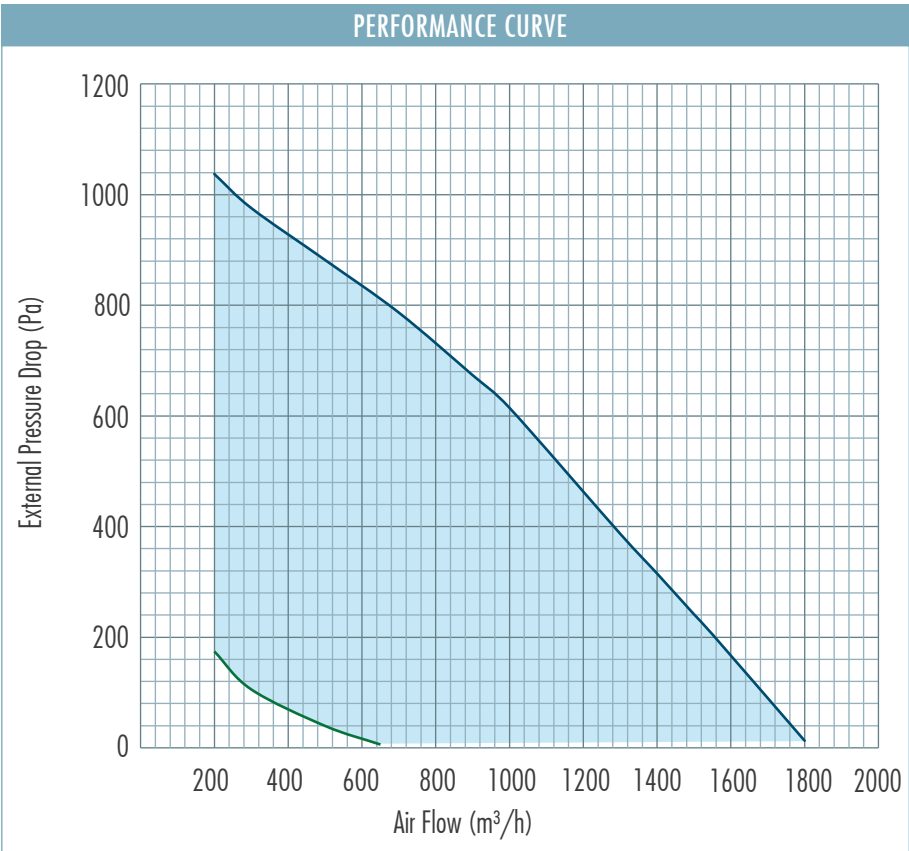
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ERV-V 100



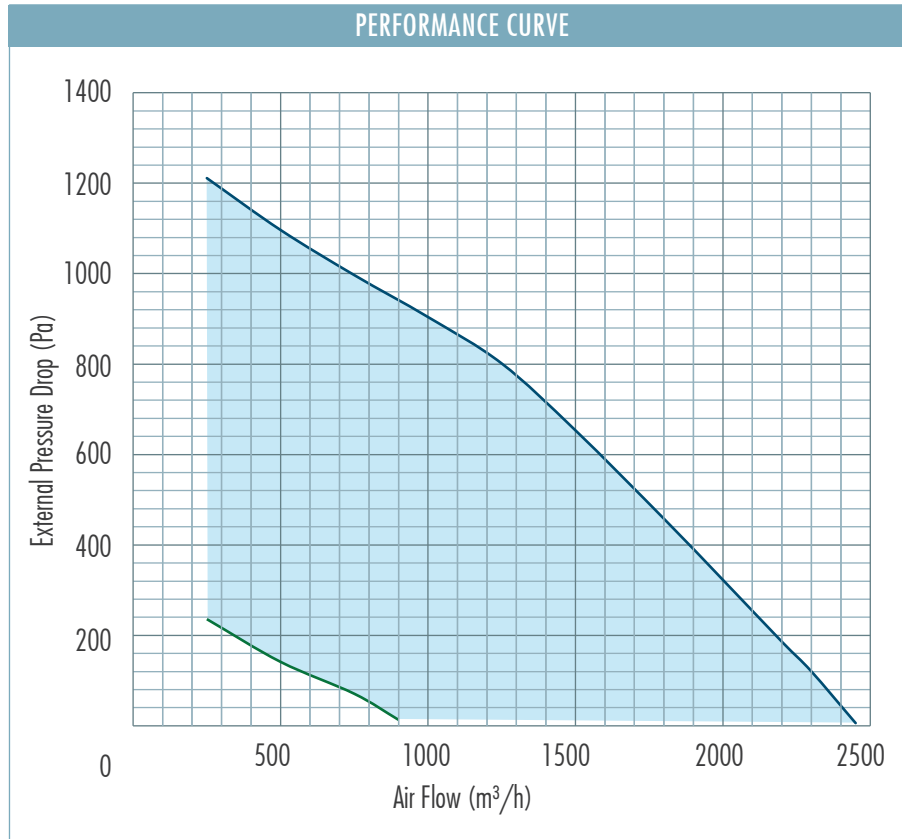
ERV-V 200



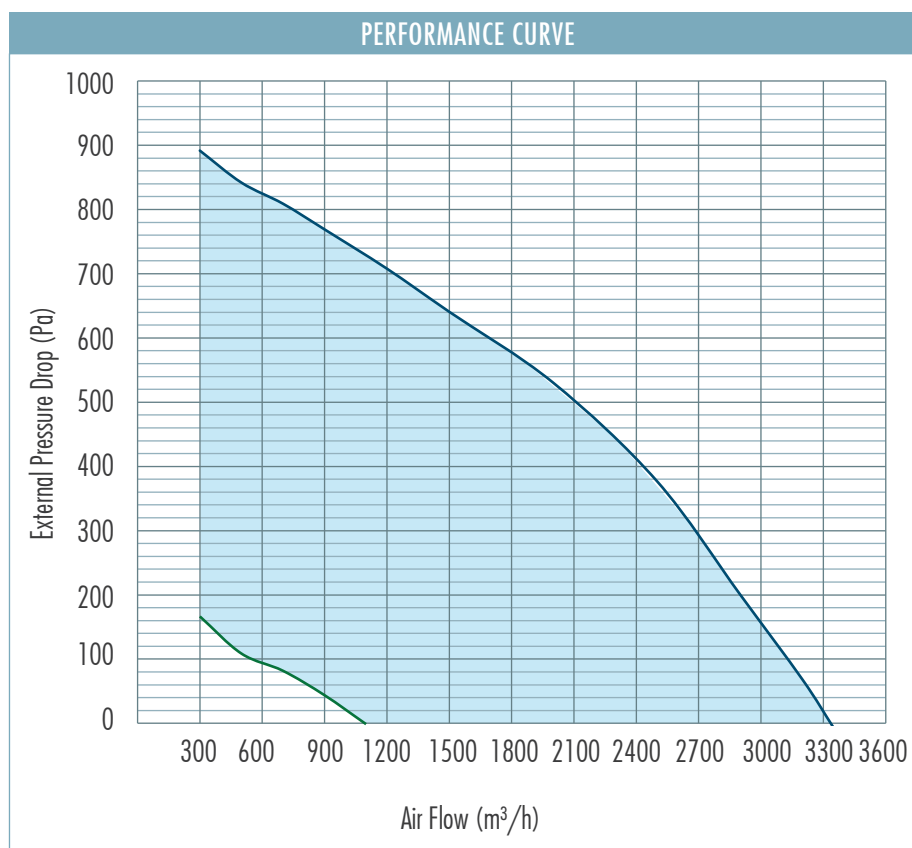
Note: Efficiency values are calculated according to EN 308 standard.



ERV-V 300



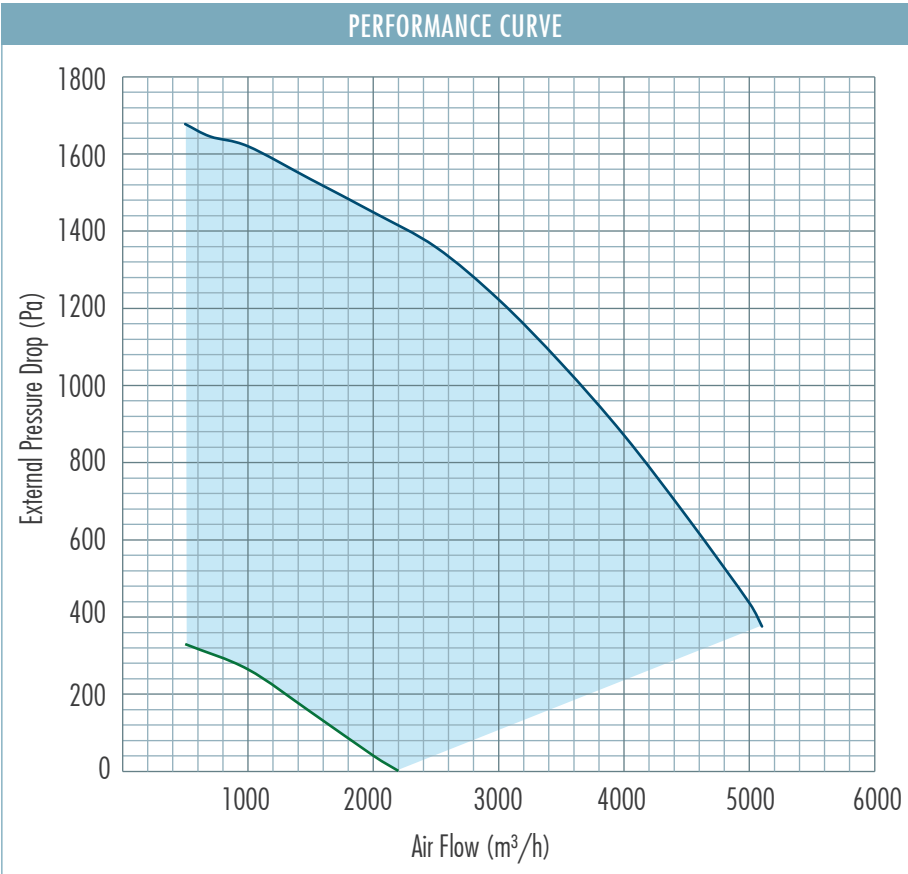
ERV-V 400



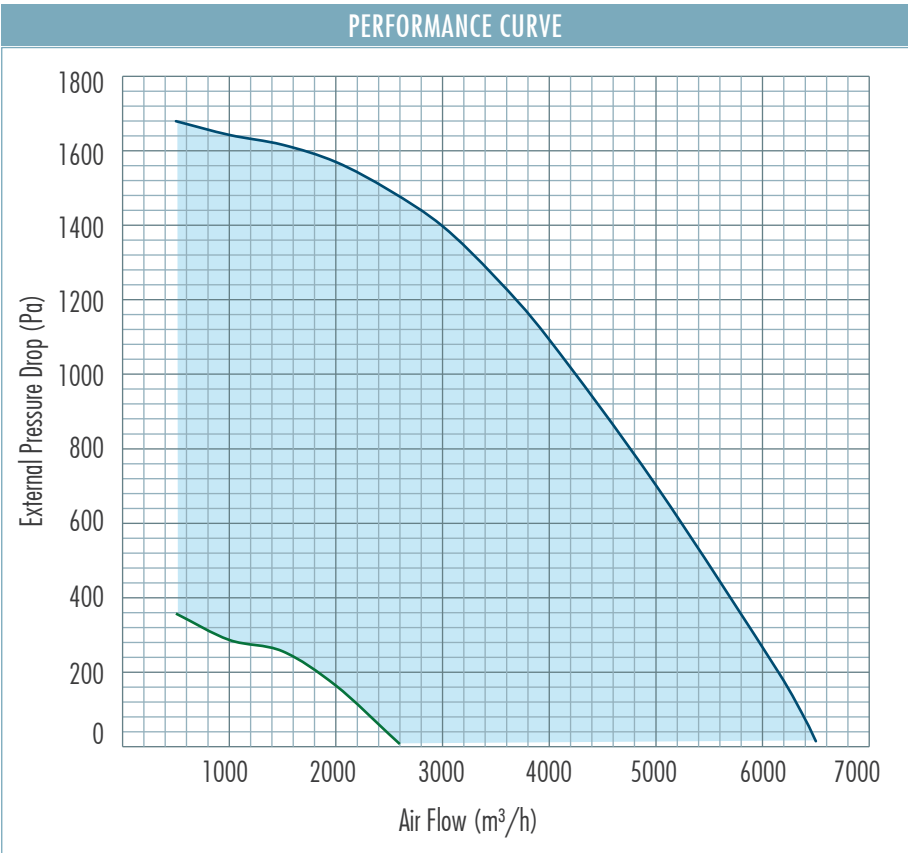
Note: Efficiency values are calculated according to EN 308 standard.



ERV-V 500



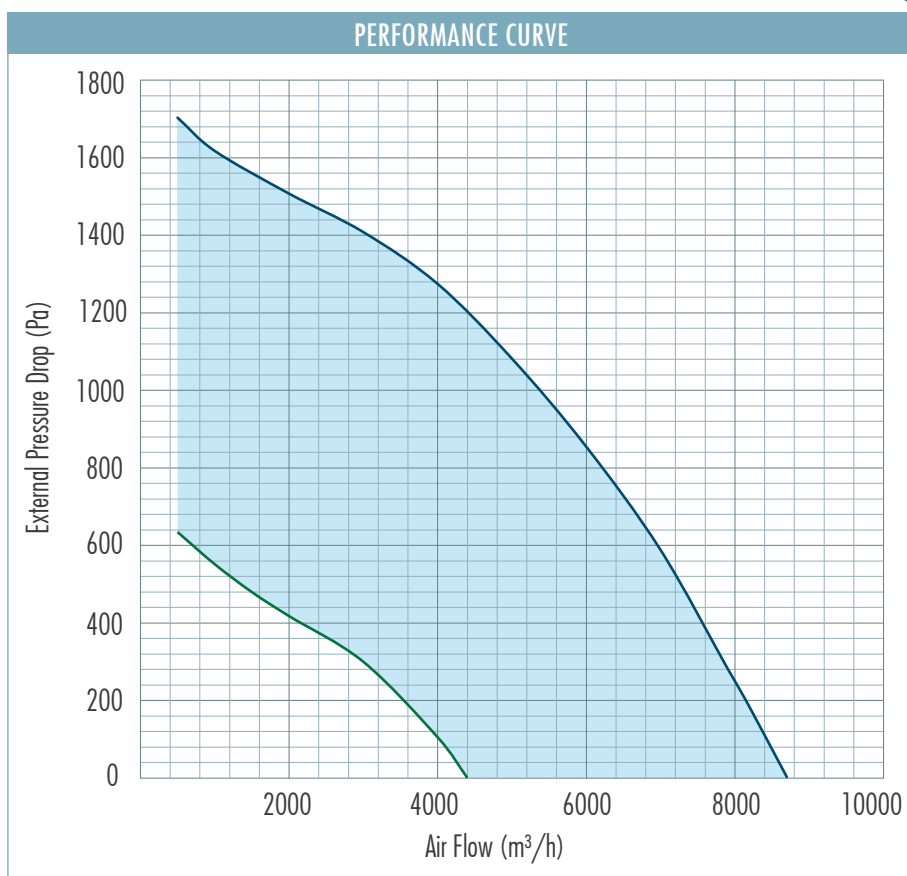
ERV-V 700



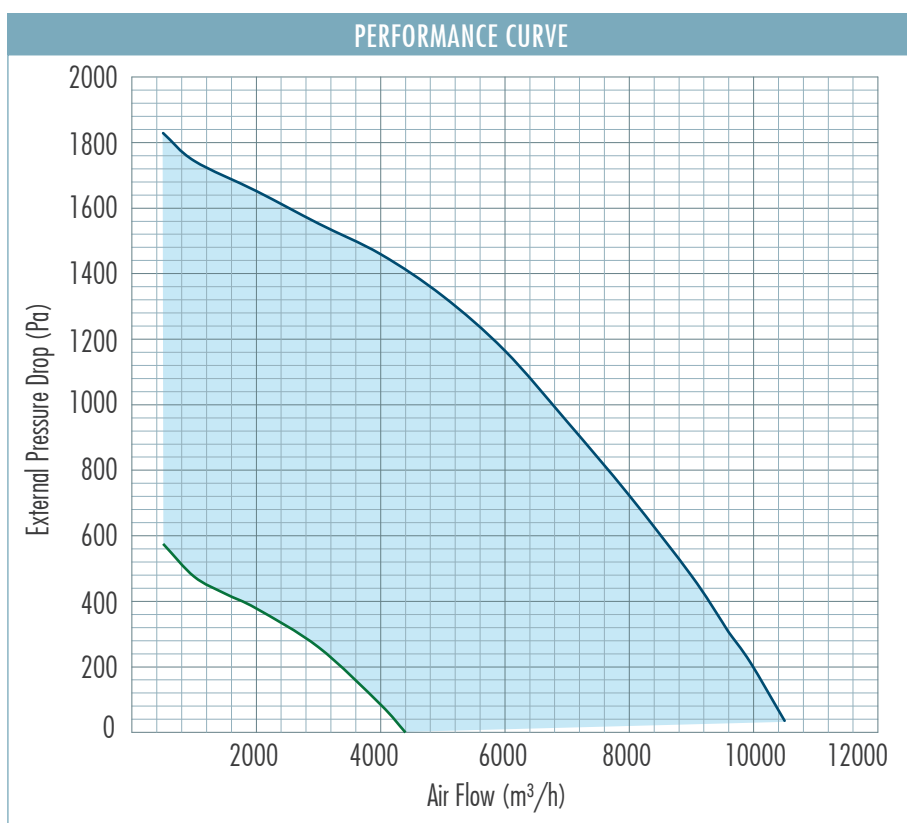
Note: Efficiency values are calculated according to EN 308 standard.



ERV-V 900



ERV-V 1100



Note: Efficiency values are calculated according to EN 308 standard.

Technical Specifications

		ERV 100	ERV 200	ERV 300	ERV 400	ERV 500	ERV 700	ERV 900	ERV 1100
Manufacturer		ENEKO							
ERP		ERP 2018							
Declared typology		NRVU/BVU							
Type of drive installed or intended to be installed		Variable speed							
Type of HRS		Rotor							
Thermal efficiency of heat recovery ¹	%	75,9	75,9	75	75,7	76,3	77,6,8	77,7	76,8
Nominal flow rate (Max ERP flow rate)	m ³ /h	1150	1150	1800	2800	3300	4500	6250	6650
Maximum flow rate (200 Pa External Pressure Drop)	m ³ /h	1550	1550	2200	3050	5200	6400	8300	10500
Effective electric power input	W	820	820	1190	2040	2440	3270	4250	4300
SFP _{int} ¹	W(m ³ /s)	1126	1126	1083	1043	1058	1026	980	934
SFP _{int} _limit ¹	W(m ³ /s)	1138	1138	1085	1063	1061	1026	1048	937
Face velocity at nominal flow rate	m/s	1,39	1,39	1,65	2,04	1,94	2,32	2,14	2,28
Nominal external pressure drop ($\Delta P_{s,ext}$) ¹	Pa	200	200	200	200	200	200	200	200
Internal pressure drop of ventilation components($\Delta P_{s,int}$) (ODA/EHA)	Pa	317/297	317/297	337/317	340/320	309/289	316/296	301/281	319/299
Internal pressure drop of non-ventilation components($\Delta P_{s,add}$) (ODA/EHA)	Pa	There is no "non-ventilation" components							
Static efficiency of fans used in accordance with Regulation (EU) No. 327/2001 (Supply Fan/Exhaust Fan)	%	54.5/54.6	54.5/54.6	60.2/60.4	63.1/63.3	56.6/56.4	59.7/59.4	59.7/59.4	66.2/66
Maximum external leakage	%	<=3							
Maximum internal leakage	%	NA							
Energy classification of filters (Energy performance) (Supply Air Side/Exhaust Air Side)	Kwh	440/369	440/369	653/551	1043/892	1340/1150	1860/1616	2537/2170	2565/2123
Description of visual filter warning for NRVUs intended for use with filters ²		Differential pressure measurement							
Sound power level (L _{WA})		53,7	53,7	51,3	57,7	54,1	56,9	58.1	55,6
Internet adress		www.eneko.com.tr							

¹ Measured at balanced flow, EN308. Performance values will be change different working condition.

² Including test pointing out the importance of regular filter changes for performance and energy efficiency of the unit.

Note: ePM1 ≥ 50% (F7) class filter at supply side, ePM10 ≥ 50% (M5) class filter at exhaust side are used accordin to ISO 16890.

Technical Specifications

		ERV-V 100	ERV-V 200	ERV-V 300	ERV-V 400	ERV-V 500	ERV-V 700	ERV-V 900	ERV-V 1100
Manufacturer		ENEKO							
ERP		ERP 2018							
Declared typology		NRVU/BVU							
Type of drive installed or intended to be installed		Variable speed							
Type of HRS		Rotor							
Thermal efficiency of heat recovery ¹	%	76,5	76,5	75,4	75,7	76,3	76,8	77,7	76,8
Nominal flow rate (Max ERP flow rate)	m ³ /h	1150	1150	1800	2800	3300	4500	6250	6650
Maximum flow rate (200 Pa External Pressure Drop)	m ³ /h	1550	1550	2150	2900	5100	6150	8150	9950
Effective electric power input	W	820	820	1200	2230	2690	3340	4250	4300
SFP _{int} ¹	W(m ³ /s)	1127	1127	1084	1048	1048	1026	978	934
SFP _{int} _limit ¹	W(m ³ /s)	1139	1139	1085	1061	1061	1026	979	937
Face velocity at nominal flow rate	m/s	1,39	1,39	1,65	2,04	1,94	2,32	2,14	2,28
Nominal external pressure drop ($\Delta P_{s,ext}$) ¹	Pa	200	200	200	200	200	200	200	200
Internal pressure drop of ventilation components($\Delta P_{s,int}$) (ODA/EHA)	Pa	317/297	317/297	337/317	340/320	309/289	316/296	301/281	319/299
Internal pressure drop of non-ventilation components($\Delta P_{s,add}$) (ODA/EHA)	Pa	There is no "non-ventilation" components							
Static efficiency of fans used in accordance with Regulation (EU) No. 327/2001 (Supply Fan/Exhaust Fan)	%	54.5/54.5	54.5/54.5	60.2/60.3	62.5/62.7	57.1/57	59.7/59.4	59.7/59.4	66.2/66
Maximum external leakage	%	<=3							
Maximum internal leakage	%	NA							
Energy classification of filters (Energy performance) (Supply Air Side/Exhaust Air Side)	Kwh	440/369	440/369	653/552	1053/901	1329/1139	1859/1616	2512/2170	2461/2123
Description of visual filter warning for NRVUs intended for use with filters ²		Differential pressure measurement							
Sound power level (L _{WA})		53,8	53,8	51,4	58,7	54,9	57	58,1	55,7
Internet adress		www.eneko.com.tr							

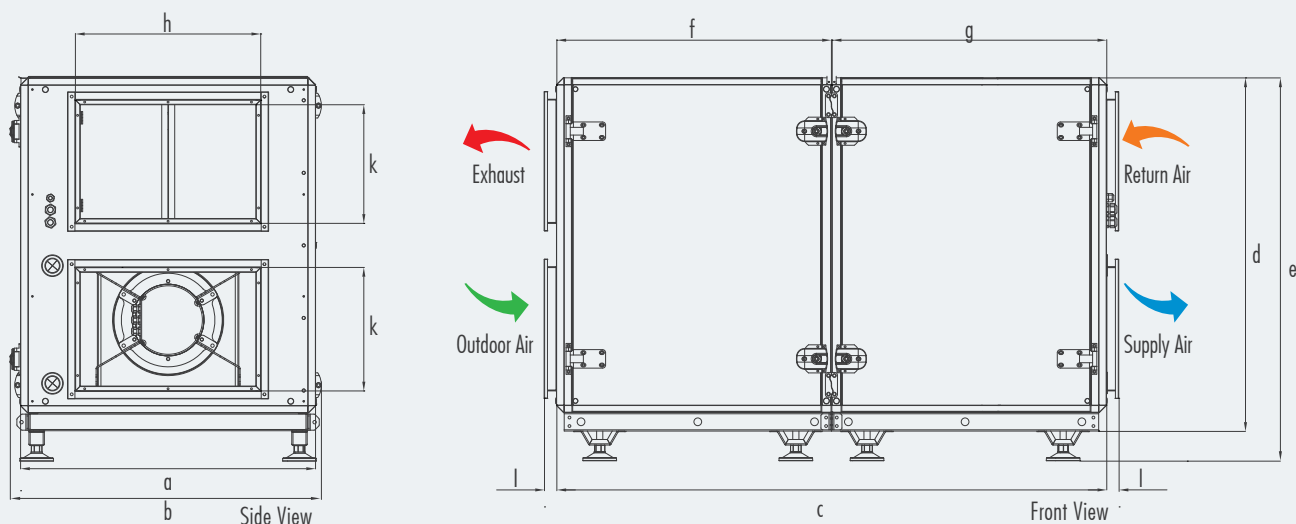
¹ Measured at balanced flow, EN308. Performance values will be change different working condition.

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Note: ePM1 ≥ 50% (F7) class filter at supply side, ePM10 ≥ 50% (M5) class filter at exhaust side are used accordin to ISO 16890.

Unit Dimensions

ERV Unit Dimensions

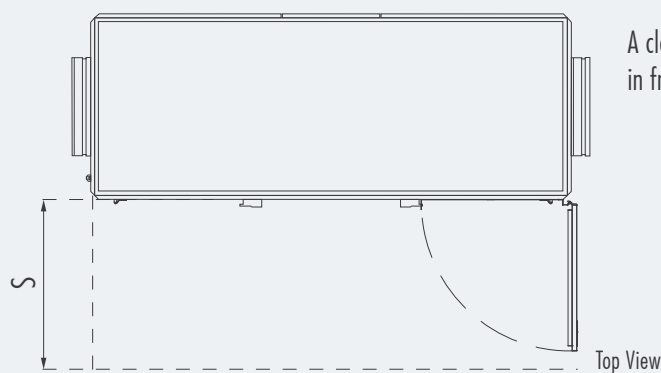


The devices can be produced with right and left options depending on the service direction.

	ERV 100	ERV 200	ERV 300	ERV 400	ERV 500	ERV 700	ERV 900	ERV 1100
a	705	705	805	955	1055	1185	1405	1405
b	740	740	840	1010	1110	1240	1460	1460
c	1630	1630	1700	1780	1780	1780	2070	2070
d	1010	1010	1110	1145	1245	1245	1405	1405
e	1110	1110	1210	1245	1345	1345	1560	1560
f	-	-	-	890	890	890	1070	1070
g	-	-	-	890	890	890	1000	1000
h x k	350x300	350x300	450x300	600x400	700x400	800x400	1000x500	1000x500
l	40	40	40	40	40	40	40	40
weight(kg)	250	250	290	360	400	440	525	540

*All measurement values are mm.

ERV Unit Service Space

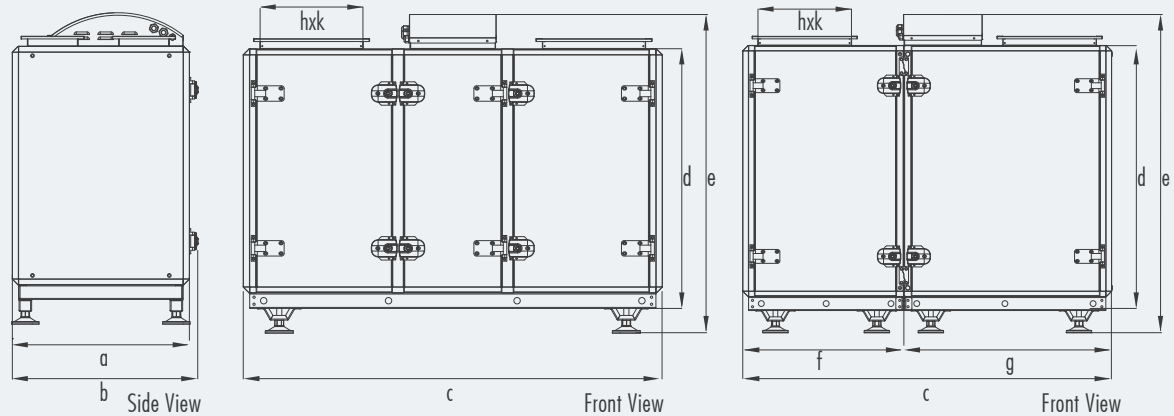


A clear space must be provided in front of the unit for service.

	ERV 100	ERV 200	ERV 300	ERV 400	ERV 500	ERV 700	ERV 900	ERV 1100
S	700	700	800	950	1050	1200	1300	1300

*All measurement values are mm.

ERV-V Unit Dimensions

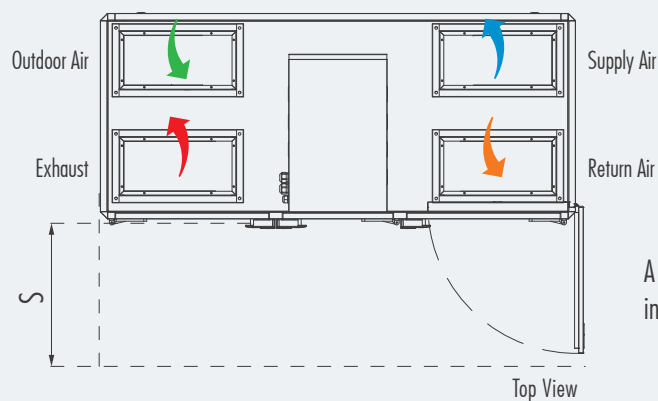


The devices can be produced with right and left options depending on the service direction.

	ERV-V 100	ERV-V 200	ERV-V 300	ERV-V 400	ERV-V 500	ERV-V 700	ERV-V 900	ERV-V 1100
a	705	705	805	955	1055	1185	1405	1405
b	740	740	840	1010	1110	1240	1460	1460
c	1630	1630	1630	1580	1580	1580	1930	1930
d	1010	1010	1110	1145	1245	1245	1405	1405
e	1245	1245	1345	1380	1480	1480	1680	1680
f	-	-	-	690	690	690	860	860
g	-	-	-	890	890	890	1070	1070
h x k	400x200	400x200	400x250	400x350	400x400	400x450	550x500	550x500
weight(kg)	250	250	280	340	370	410	485	500

*All measurement values are mm.

ERV-V Unit Service Space



A clear space must be provided in front of the unit for service.

	ERV-V 100	ERV-V 200	ERV-V 300	ERV-V 400	ERV-V 500	ERV-V 700	ERV-V 900	ERV-V 1100
S	700	700	800	950	1050	1200	1300	1300








*All measurement values are mm.

Control System

Automation Options		Control Cards	
Standard	Optional	Alternative 1 Enecon Plus	Alternative 2 Corrigo
Outdoor Temperature		✓	✓
Extract Temperature		✓	✓
Supply Temperature		✓	✓
Supply Fan Control		✓	✓
Exhaust Fan Control		✓	✓
Fan Alarm		✓	✓
Dirty Filter Control (time)		✓	✓
Fire Alarm		✓	✓
External Low Speed		✗	✓
External Normal Speed		✗	✓
External High Speed		✗	✗
Dirty Filter Control (DPS)		✓	✓
Rotor On-Off Control		✓	✓
Rotor Proportional Control		✗	✓
General Alarm		✓	✗
	External High Speed	✓	✗
	Freeze Protection	✗	✓ (connected to exhaust)
	Exhaust Temperature	✗	✓
	Constant Flow	✗	☹
	Constant Pressure	✗	
	Humidity Control	☹	
	CO2 Control	☹	
	Heating Coil Water(On-Off)	✓	✓
	Cooling Coil Water(On-Off)	✓	✓
	DX Coil (On-Off)	✓	✓
	Heating Coil Water(Proportional)	✓	✓
	Cooling Coil Water(Proportional)	✓	✓
	DX Coil(Proportional)	✓	✓
	Electrical Pre Heater	✓ (max3 Step)	✓ (1 Step)
	Electrical Post Heater(On-Off)	✓ (max3 Step)	✓
	Electrical Post Heater(Proportional)	✗	✗
	Damper (On-Off)	✓	✓
	Damper(Proportional)	✗	✗
	Exchanger Freezing Pressure Control	✗	✗
	Modbus RTU	✓	✓
	MODBUS IP	✗	✓
	BACnet MSTP	✗	✓
	BACnet IP	✗	✓
	Web Browser (TCP/IP)	✗	✓

☹ Only one of them the defined functions is selectable for this control card.

⚠ The optional features in the table vary according to the product.

Control Panel			Control Cards	
Panel Type	Panel Descriptions		Alternative 1	Alternative 2
			Enecon Plus	Corrigo
	Enecon Plus STD Panel	Wall-mounted type Max:30 m communication ability, Colour option: Black	✓	
	Enecon Plus Touch Button Panel	Wall-mounted type Max:30 m communication ability, Colour option: Black	✓	
	Enecon Plus Wifi Panel	Wall-mounted type Max:30 m communication ability, Colour option: White	✓	
	Enecon Plus 7 " Touch Panel	Wall-mounted type Max:30 m communication ability	✓	
	Corrigo STD Panel E3-DSP	Wall-mounted type hand panel, IP 30 protection class, Max:100 m communication ability		✓
	Corrigo STD Panel 4.3 " Panel	Wall-mounted type hand panel, IP 30 protection class, Max:100 m communication ability		✓
	Corrigo STD Panel 7 " Touch Panel	Wall-mounted type hand panel, IP 30 protection class, Max:100 m communication ability		✓

■ Selection of Electrical Cable Cross-Section

Unit Model ERV / ERV-V	Unit Voltage (V)	Unit Power Input (kW)	Current (A)	Fuse (A)	Cable Cross-Section(mm ²) for 50M and PF=0.8
100	400	1,14	4,6	3x10	2,5
200	400	1,14	4,6	3x10	2,5
300	400	1,64	6,6	3x10	2,5
400	400	2,34	3,4	3x10	2,5
500	400	5,94	8,8	3x16	2,5
700	400	5,94	8,8	3x16	2,5
900	400	6,95	11,16	3x16	2,5
1100	400	10,88	14,4	3x20	2,5

■ Cable Cross-Section Formulas

$$1$$

$$I_{\text{current}} = \frac{P}{\sqrt{3} \cdot U \cdot \cos Q}$$

$$I_{\text{cable}} > I_{\text{current}}$$

$$2$$

$$\%e = \frac{100 \cdot P \cdot L}{k \cdot S \cdot U^2}, \quad S = \frac{100 \cdot P \cdot L}{k \cdot \%e \cdot U^2}$$

$$\%e = \%3$$

$$3$$

$$I_{\text{cable}} > I_{\text{fuse}} \geq I_{\text{current}}$$

$$\text{Cable Cross-Section } S = \text{Max } (S1, S2, S3, 1.5 \text{ mm}^2)$$

P : Power

I : Current

U : Voltage

S : Conductor cross section

k : Conductor coefficient

L : Conductor length

%e : The voltage drop

■ Example of Cable Cross-Section Calculation

$$P : 10,8 \text{ kW} \quad L : 50 \text{ m}$$

$$U : 400 \text{ V} \quad \%e : \%3$$

$$PF: \cos Q : 0,8 \quad k : 56 \text{ m} / \Omega$$

$$1$$

$$I_{\text{current}} = \frac{10800 \text{ W}}{\sqrt{3} \cdot 400 \cdot 0,8} = 19,5 \text{ A}$$

The cable will be used, is selected from the cable cross-section table so that the equivalent ampere value in the table should be higher than calculated "I_{current}" value.

$$S1 = 1,5 \text{ mm}^2$$

$$2$$

$$\%e = \%3$$

$$S = \frac{100 \cdot 10800 \cdot 50}{56 \cdot 3 \cdot 400^2}$$

$$S2 \geq 2 \text{ mm}^2$$

$$S2 = 2 \text{ mm}^2$$

$$3$$

$$I_{\text{cable}} > I_{\text{fuse}} \geq I_{\text{current}}$$

$$I_{\text{cable}} > 25 \text{ A} \geq 19,5 \text{ A}$$

"I_{fuse}" which will be higher than "I_{current}", is selected.

The cable will be used, is selected from the cable cross-section table so that the equivalent ampere value in the table should be higher than selected "I_{fuse}" value.

$$I_{\text{cable}} = 32 \text{ A}$$

$$S3 = 2,5 \text{ mm}^2$$

$$\text{Cable cross-section } S = \text{Max } (S1, S2, S3, 1,5 \text{ mm}^2)$$

$$S = \text{Max } (1,5, 2, 2,5, 1,5)$$

$$S = 2,5 \text{ mm}^2$$

■ Duct Type Electric Heaters



Electric heaters are optionally supplied in cold climates for supply air and in extreme climates for both supply and outdoor air sides against freezing. Electric heaters are manufactured according to rectangular duct systems. Standard types are produced of stainless steel heating elements and galvanized metal casing. Stainless steel casing is also available. Electric heaters are equipped with two circuit cutting thermostats. Factory setting for the automatically operating one is 70 °C and for the manual operating 110 °C.

Electric heaters capacity can be controlled up to 2 or 3 steps with ENECON control according to the set temperature from the room control panel and room (or supply air) temperature. Eneko electric heaters are connected in Delta connection in standard models. The electrical heaters, designed as maximum 2 steps, step automatically according to temperature that is set on room control panel with control panel.

Heating Capacity Calculation

$$Q = 0,33 \times V \times (T_2 - T_1)$$

Q : Heating Capacity (W)

V : Air Flow through electric heater (m³/h)

T₁ : Air temperature before the heater (°C)

T₂ : Air temperature after the heater (°C)

Unit Model

Electrical Heater Capacity					
Unit Model		Pre-Heater		After-Heater	
		Capacity (pre-heater) (kW) (Outdoor air between 0°C and -5°C)*	Capacity (pre-heater) (kW) (Outdoor air between -5°C and -15°C)*	Capacity (after-heater) (kW) (Heating the supply air to 25°C)**	Capacity (after-heater) (kW) (Heating the supply air to 25°C)**
ERV / ERV-V	100	3	5	3	5
	200	3	6	3	
	300	7	12	7	12
	400	10	17	10	
	500	14	25	14	25
	700	18	33	18	
	900	24	44	24	44
	1100	31	55	31	

* All pre-heaters are duct type.

** After heater is located inside the unit for ERV units. ERV-V units have after-heater as duct type.

■ Duct Type Heating Coil/Cooling Coil



Duct type heating/cooling coils are assembled in modules as suitable to mount inside duct and have standard capacity. Coils consist of copper tubes and aluminum fins. Inlets and outlets of modules are suitable for duct connections as in heat recovery ventilation units. Additionally, cooling coils have drain pan and extra insulation to prevent condensation of modules. Both heating and cooling coils can be controlled separately as on/off or proportionately via automation system. Heating coil is mounted inside in ERV units and outside as duct type in ERV-V units. All values are calculated according to EN 308 standard.

		90°C/70°C Water			80°C/60°C Water		
Unit Model ERV / ERV-V	Air flow (m³/h)	Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)	Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)
100	800	8,87	5,7	4,1	8,83	4,74	2,9
		17,36	10,38	23,4	17,1	8,75	17,2
200	1000	12,82	6,45	5,1	12,74	5,36	3,7
		24,69	11,9	30,3	24,42	10,03	22,2
300	1900	24,18	12,93	24,6	24,02	10,82	17,8
		43,95	22,58	33,1	43,48	19,07	24,3
400	2900	43,18	21,82	25,1	42,88	18,34	18,3
		73,55	35,17	25,7	72,72	29,64	18,9
500	4000	35,27	31,18	11,2	35,01	26,13	8,1
		60,17	49,94	12,3	59,46	41,94	8,9
700	5500	45,37	40,65	20	45,06	34,14	14,6
		77,23	65,65	22,3	76,37	55,24	16,3
900	7500	36,79	59,03	25,8	36,53	49,69	19
		62,84	95,53	47,4	62,11	80,76	35,2
1100	9000	52,52	65,03	31	51,19	54,72	22,7
		87,68	106,44	58,1	86,74	89,94	43

		70°C/50°C Water			60°C/40°C Water		
Unit Model ERV / ERV-V	Air flow (m³/h)	Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)	Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)
100	800	8,72	3,77	1,9	8,65	2,77	1,2
		16,85	7,12	11,9	14,51	5,08	7
200	1000	12,66	4,26	2,4	15,22	3,6	1,9
		24,15	8,15	15,3	23,88	6,26	10,3
300	1900	23,87	8,7	12	23,71	6,55	7,8
		43	15,54	16,8	42,52	11,96	11,1
400	2900	42,58	14,85	12,5	42,28	11,31	8
		71,89	24,06	13	71,05	18,42	8,5
500	4000	34,75	21,03	5,5	34,99	15,84	3,4
		58,74	33,87	6,1	58,02	25,66	3,8
700	5500	44,75	27,58	9,9	44,44	20,94	6,2
		75,5	44,77	11,1	74,63	34,15	7,1
900	7500	36,27	40,3	13,1	36	30,81	8,5
		61,37	65,93	30	60,64	50,95	19,7
1100	9000	50,85	44,36	15,7	50,51	33,9	10,1
		85,79	73,37	30	84,84	56,64	24

Note: Calculated values are derived from different coils which can be fitted into same coilbox for each model in order to reach desired conditions.

■ Duct Type Cooling Coil

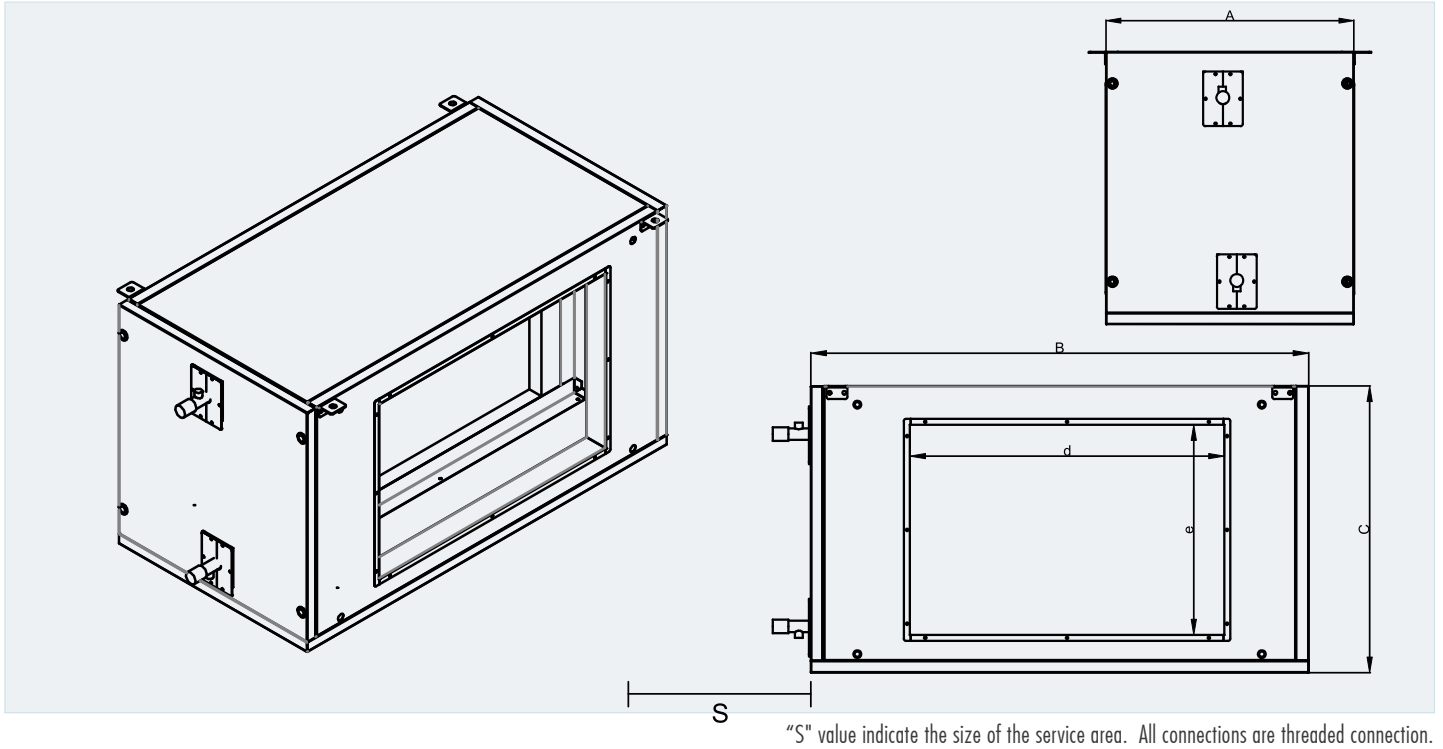
Unit Model ERV / ERV-V	Air flow (m ³ /h)	7°C/12°C Water			6°C/10°C Water		
		Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)	Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)
100	800	9,32	1,46	5,2	10,29	1,89	12,1
		35,73	3,62	1,8	39,05	4,87	4,7
200	1000	13,2	1,65	6,5	14,6	2,12	15
		50,5	4,32	2,5	54,5	5,7	6,3
300	1900	19,38	2,39	3,6	22,05	3,18	9,2
		81,4	8,39	7	86,94	10,66	16,6
400	2900	30,13	3,66	8,7	33,74	4,73	21
		121,96	12,76	16,8	128,91	15,85	30,7
500	4000	26,71	6,19	30,5	28,8	7,68	51,4
		101,56	19,06	18,7	106,39	23,42	40,8
700	5500	30,95	6,56	4,9	33,29	7,74	6,6
		131,68	25,93	36,3	137,43	31,51	71,6
900	7500	26,23	10,3	9,6	29,12	13,2	22,8
		101,89	31,95	6,3	108,79	40,42	14,7
1100	9000	36,75	11,29	11,4	40,83	14,41	20,4
		141,31	35,78	7,7	151,45	45,23	18,1

■ Duct Type DX Coil

Unit Model ERV / ERV-V	Air flow (m ³ /h)	R32, 4°C/45°C Water			R410A, 4°C/45°C Water		
		Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)	Air side pressure drop (Pa)	Capacity (kW)	Fluid side pressure drop (kPa)
100	800	18,58	2,82	5,4	18,24	2,67	8,5
		38,09	4,6	3,8	37,78	4,39	6
200	1000	26,23	3,19	6,9	25,7	3,02	9,3
		53,4	5,28	5	52,85	5,04	8
300	1900	40,81	5,12	3,9	39,84	4,83	6
		72,14	8,59	11,5	71,84	8,41	19,7
400	2900	89,78	9,96	6,8	87,89	9,38	10,6
		98,17	13,71	16,6	97,71	13,36	28,5
500	4000	55,18	10,8	5,2	53,78	10,09	5,9
		91,1	19,96	22,7	90,58	19,32	38,6
700	5500	71,09	14,12	7	69,19	13,16	10,6
		129,47	24,75	10	129,04	24,37	17,2
900	7500	59,56	22,25	9,9	59,11	21,75	16,8
		106,88	37,2	12,3	106,56	36,67	21,3
1100	9000	83,49	24,85	12,5	82,93	24,29	21,3
		149,87	42,3	16,2	149,14	41,3	27,6

Note: Calculated values are derived from different coils which can be fitted into same coilbox for each model in order to reach desired conditions.

■ Duct Type Coil Dimensions



"S" value indicate the size of the service area. All connections are threaded connection.

Unit Model	Duct Type Water Coil Box Model	a	b	c	d	e	s	Weight(kg)
ERV/ERV-V 100	Heating Coil-Capacity 1	500	705	488,5	350	300	705	43,4
	Heating Coil-Capacity 2	500	705	488,5	350	300	705	44,1
	Change-Over Coil-Capacity 1	500	705	488,5	350	300	705	49,9
	Change-Over Coil-Capacity 2	500	705	488,5	350	300	705	54,3
	Dx Coil-Capacity 1	500	705	488,5	350	300	705	50
	Dx Coil-Capacity 2	500	705	488,5	350	300	705	53
	Electrical Heater-Capacity 1	500	705	488,5	350	300	705	45,6
	Electrical Heater-Capacity 2	500	705	488,5	350	300	705	46,8
ERV/ERV-V 200	Heating Coil-Capacity 1	500	705	488,5	350	300	705	43,4
	Heating Coil-Capacity 2	500	705	488,5	350	300	705	44,1
	Change-Over Coil-Capacity 1	500	705	488,5	350	300	705	49,9
	Change-Over Coil-Capacity 2	500	705	488,5	350	300	705	54,3
	Dx Coil-Capacity 1	500	705	488,5	350	300	705	50
	Dx Coil-Capacity 2	500	705	488,5	350	300	705	53
	Electrical Heater-Capacity 1	500	705	488,5	350	300	705	45,6
	Electrical Heater-Capacity 2	500	705	488,5	350	300	705	46,8
ERV/ERV-V 300	Heating Coil-Capacity 1	500	805	552	450	300	805	51,1
	Heating Coil-Capacity 2	500	805	552	450	300	805	53,7
	Change-Over Coil-Capacity 1	500	805	552	450	300	805	59,9
	Change-Over Coil-Capacity 2	500	805	552	450	300	805	65,7
	Dx Coil-Capacity 1	500	805	552	450	300	805	60,6
	Dx Coil-Capacity 2	500	805	552	450	300	805	63,4
	Electrical Heater-Capacity 1	500	805	552	450	300	805	54,4
	Electrical Heater-Capacity 2	500	805	552	450	300	805	56,5
ERV/ERV-V 400	Heating Coil-Capacity 1	500	955	552	600	400	955	54,9
	Heating Coil-Capacity 2	500	955	552	600	400	955	57,9
	Change-Over Coil-Capacity 1	500	955	552	600	400	955	64,4
	Change-Over Coil-Capacity 2	500	955	552	600	400	955	71,2

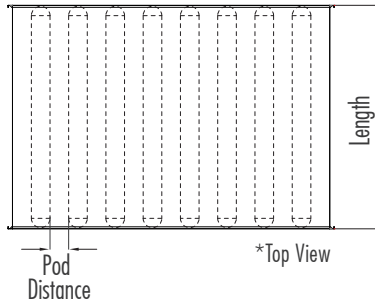
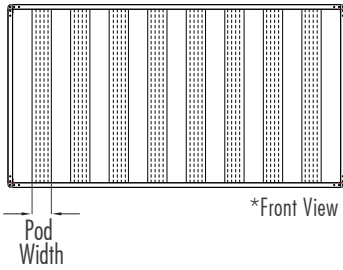
* All measurement values are mm.

■ Duct Type Coil Dimensions

Unit Model	Duct Type Water Coil Box Model	a	b	c	d	e	s	Weight(kg)
ERV/ERV-V 400	Dx Coil-Capacity 1	500	955	552	600	400	955	68,6
	Dx Coil-Capacity 2	500	955	552	600	400	955	67,6
	Electrical Heater-Capacity 1	500	955	552	600	400	955	58,7
	Electrical Heater-Capacity 2	500	955	552	600	400	955	61,3
ERV/ERV-V 500	Heating Coil-Capacity 1	500	1055	679	700	400	1055	70,3
	Heating Coil-Capacity 2	500	1055	679	700	400	1055	75,3
	Change-Over Coil-Capacity 1	500	1055	679	700	400	1055	83,6
	Change-Over Coil-Capacity 2	500	1055	679	700	400	1055	94,3
	Dx Coil-Capacity 1	500	1055	679	700	400	1055	86,6
	Dx Coil-Capacity 2	500	1055	679	700	400	1055	88,4
	Electrical Heater-Capacity 1	500	1055	679	700	400	1055	75,5
	Electrical Heater-Capacity 2	500	1055	679	700	400	1055	79,0
ERV/ERV-V 700	Heating Coil-Capacity 1	500	1185	679	800	400	1185	76,8
	Heating Coil-Capacity 2	500	1185	679	800	400	1185	82,3
	Change-Over Coil-Capacity 1	500	1185	679	800	400	1185	94,1
	Change-Over Coil-Capacity 2	500	1185	679	800	400	1185	104,4
	Dx Coil-Capacity 1	500	1185	679	800	400	1185	97,2
	Dx Coil-Capacity 2	500	1185	679	800	400	1185	104,3
	Electrical Heater-Capacity 1	500	1185	679	800	400	1185	82,8
	Electrical Heater-Capacity 2	500	1185	679	800	400	1185	86,7
ERV/ERV-V 900	Heating Coil-Capacity 1	500	1405	806	1000	500	1405	95,9
	Heating Coil-Capacity 2	500	1405	806	1000	500	1405	102,1
	Change-Over Coil-Capacity 1	500	1405	806	1000	500	1405	119,3
	Change-Over Coil-Capacity 2	500	1405	806	1000	500	1405	139,5
	Dx Coil-Capacity 1	500	1405	806	1000	500	1405	125,1
	Dx Coil-Capacity 2	500	1405	806	1000	500	1405	136,4
	Electrical Heater-Capacity 1	500	1405	806	1000	500	1405	103,4
	Electrical Heater-Capacity 2	500	1405	806	1000	500	1405	108,9
ERV/ERV-V 1100	Heating Coil-Capacity 1	500	1405	806	1000	500	1405	95,9
	Heating Coil-Capacity 2	500	1405	806	1000	500	1405	102,1
	Change-Over Coil-Capacity 1	500	1405	806	1000	500	1405	119,3
	Change-Over Coil-Capacity 2	500	1405	806	1000	500	1405	139,5
	Dx Coil-Capacity 1	500	1405	806	1000	500	1405	125,1
	Dx Coil-Capacity 2	500	1405	806	1000	500	1405	136,4
	Electrical Heater-Capacity 1	500	1405	806	1000	500	1405	103,4
	Electrical Heater-Capacity 2	500	1405	806	1000	500	1405	108,9

* All measurement values are mm.

■ Duct Type Sound Attenuator



Characteristics (Pod width 100 mm)

Length (mm)	Hz								Pressure drop coefficient,β
	63	125	250	500	1k	2k	4k	8k	
600	2	5	10	14	20	15	9	7	1,6
1000	3	8	18	27	37	29	19	14	1,9
1500	5	12	26	40	50	44	27	18	2,4

*Pod distance 100 mm

Pressure drop of the sound attenuator is calculated with β, Pressure drop coefficient
 $\Delta P = \beta \times V^2$.

V face velocity (m/s), is calculated by dividing Air Flow (m³/s) to the area of the connected duct spigot. (m²)

$$\text{Face Velocity, } V(\text{m/s}) = \frac{\text{Air Flow (m}^3/\text{s)}}{\text{Spigot Area (m}^2\text{)}}$$

■ Duct Type Sound Attenuator



Unit Model	Casing Dimensions			Type
	a	b	l	
ERV 100-200	350	300	600	SL-350x300x600x100x75
	350	300	1000	SL-350x300x1000x100x75
	350	300	1500	SL-350x300x1500x100x75
ERV 300	450	300	600	SL-450x300x600x100x100
	450	300	1000	SL-450x300x1000x100x100
	450	300	1500	SL-450x300x1500x100x100
ERV 400	600	400	600	SL-600x400x600x100x100
	600	400	1000	SL-600x400x1000x100x100
	600	400	1500	SL-600x400x1500x100x100
ERV 500	700	400	600	SL-700x400x600x100x75
	700	400	1000	SL-700x400x1000x100x75
	700	400	1500	SL-700x400x1500x100x75
ERV 700	800	400	600	SL-800x400x600x100x100
	800	400	1000	SL-800x400x1000x100x100
	800	400	1500	SL-800x400x1500x100x100
ERV 900-1100	1000	500	600	SL-1000x500x600x100x100
	1000	500	1000	SL-1000x500x1000x100x100
	1000	500	1500	SL-1000x500x1500x100x100
ERV-V 100-200	400	200	600	SL-400x200x600x100x100
	400	200	1000	SL-400x200x1000x100x100
	400	200	1500	SL-400x200x1500x100x100
ERV-V 300	400	250	600	SL-400x250x600x100x100
	400	250	1000	SL-400x250x1000x100x100
	400	250	1500	SL-400x250x1500x100x100
ERV-V 400	400	350	600	SL-400x350x600x100x100
	400	350	1000	SL-400x350x1000x100x100
	400	350	1500	SL-400x350x1500x100x100
ERV-V 500	400	400	600	SL-400x400x600x100x100
	400	400	1000	SL-400x400x1000x100x100
	400	400	1500	SL-400x400x1500x100x100
ERV-V 700	400	450	600	SL-400x450x600x100x100
	400	450	1000	SL-400x450x1000x100x100
	400	450	1500	SL-400x450x1500x100x100
ERV-V 900-1100	550	500	600	SL-550x500x600x100x82
	550	500	1000	SL-550x500x1000x100x82
	550	500	1500	SL-550x500x1500x100x82



GENERAL

The sale of all Products of ENEKO shall exclusively be made on the basis of these General Terms and Conditions of Sales. Any other conditions and General Conditions of Purchase of the Buyer are not accepted.



OFFERS

Our offers are non-binding and without obligation. Contracts for delivery and all other agreements (including subsidiary agreements) as well as declarations of our representatives shall only become legally binding for us after written confirmation. We do not render planning service.

Proposals made and information provided by our representatives shall be non-binding. Illustrations, drawings, dimensions and weights or other performance data shall only be binding if this is expressly agreed in writing.



TERMS OF ORDER

Purchase orders shall be sent to ENEKO in written form and shall be non-binding unless they are accepted by written confirmation (order confirmation) from ENEKO. Each order shall include properly identified Products ordered and relevant shipping dates.



PRICE OF THE GOODS

Prices are net Ex Works according to current Incoterms unless stated otherwise and do not include any kind of taxes. Prices are valid at the date of delivery will be applied. We reserve the right to adjust prices for confirmed orders as well to reflect any increase in our costs for any reason beyond our control like force majeure, shortage of primary material or labor strikes, official orders, transportation or similar problems. In this case, a new price agreement shall be required for higher rates. If such an agreement is not made, we shall be entitled to withdraw from the contract by written notice within 15 days.



TERMS OF PAYMENT

Payments shall be carried out according to the contractual terms as defined and set forth in the order confirmation. If the payment conditions have not been agreed upon conclusion of the contract, the payment terms and payment dates specified in our invoices shall be binding. Deadlines for discounts and periods allowed for payment shall begin to run upon receipt of the invoice. Payments by draft, bills of Exchange or anyway extended payments shall mean neither credit novation, nor prejudice to the Retention of Title agreement, nor to territorial competence. If buyer fails to make payment by due date, we are entitled to charge the buyer with a relevant interest on the unpaid amount.



TERMS OF DELIVERY

Delivery time information is only approximate. We shall only be in default if the performance is due and a written demand for payment was issued.

Delivery day is the day of dispatch Ex Works. We shall also not be liable with regard to bindingly agreed periods and dates in the event of delays in delivery and of performance due to force majeure and events which considerably complicate or make delivery impossible not only temporarily-strike lockout, breakdown, delay in supply with important raw and auxiliary materials even if the delay occurs at our supplier, in particular. These delays entitle us to postpone delivery for the period of the impediment plus a reasonable start-up period or to withdraw from the contract as a whole or in part. If delivery time is extended or we are released from our delivery commitment, the buyer may not derive a claim for damages from it. However, we may only rely on the circumstances mentioned if we notify the buyer immediately. We shall be entitled to make part deliveries. Any part delivery shall be considered as independent transaction. In case of default, our liability is limited to contract-typical foreseeable damage.



SHIPMENT

Shipment is made for the buyer's account. Mode of shipment and shipping route, transport and packaging and other securities respectively shall be at our choice. We shall be entitled, however, not obliged to insure deliveries in the name and for account of the buyer. Risk passes to the buyer when shipment is handed over to the person performing the transport or left our Works for shipment. If shipment is delayed upon buyer's request, risk passes to the buyer with the ready for shipment note. If ordered goods are rejected after the ready for shipment note, we shall be entitled to request payment and store the goods at buyer's expense. Discharge of the goods is made at buyer's expense.



RETENTION OF TITLE

In any event ENEKO shall retain full ownership of all materials supplied whilst the payment conditions of the entire amount have not been complied with, said materials may be removed from the customer at our request. Should the customer be declared bankrupt or insolvent and has not made paid the entire amount of payments. ENEKO shall be entitled to recover the goods. ENEKO may interrupt the supply without incurring any liability whatsoever if he had notice of or became aware of a decrease in the creditworthiness of the purchaser or if any of the existing negotiable instruments or debts were not properly complied with, shall result as being unpaid and protested.



WARRANTY

ENEKO Products are under warranty (defect in material or workmanship) for 2 years from the date of sale reflected on the invoice. Under this warranty, ENEKO is under the obligation to replace the part requested under warranty.

The followings are excluded from ENEKO warranty:

- Normal wear and tear
- Defective assembly or handling
- Third party compensation

Parts the subject of a claim shall be sent to our warehouse as carriage paid with relevant report completely filled in, wherein the parts shall be subjected to analysis.



LIABILITY

ENEKO, for any losses/damages, shall only be responsible within the limits of the law. Owing to basic obligations undertaken by simple negligence, if the contract is violated, ENEKO's liability shall be limited to compensate for losses which are emerged specific and predictable. ENEKO shall not carry any responsibility in case of a single negligence in breach of non-essential contractual obligations.



PROPERTY RIGHTS

The purchaser in no event and under no circumstances whatsoever shall publish or use the trademark, trade name or logo of ENEKO without a prior written permission.



GOVERNING LAW AND JURISDICTION

This agreement shall be governed with all aspects of the Turkish Law. The courts of Izmir/Turkey shall have an exclusive jurisdiction to adjudicate any dispute arising under or in connection with this agreement.



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