AERMEC

air conditioning

High efficiency heat recovery unit
Air flows from 1000 to 30000 m3/h

SELECTION, INSTALLATION, AND MAINTENANCE MANUAL

ERSR

AERMEC
COMPANY QUALITY SYSTEM
ICIM
ISO 9001:2000 - n° 0128/4
CISQ IQNet
AERMEC S.P.A.

CE

GB

IERSRUY 0612. 6180468_02

English

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General standards

The present manual is an integral part of the documentation enclosed with the machine.
It must be conserved for future reference and must accompany the machine throughout its working life.
The manual defines the purpose to which the machine was built and establishes the correct installation and use limits.

- All use, installation and maintenance instructions of the unit are described in this manual as well as the main accident prevention standards.
- Read carefully and fully all information contained in this manual before the installation, starting, use, maintenance and cleaning of the unit. Pay particular attention to the use regulations that are accompanied by "DANGER" or "WARNING", because if not observed, they could cause damage to the machine and/or persons and property.

- For irregularities not contemplated by this manual, please consult the local After Sales Service.

- Aermec S.p.A. decline any responsibility for any damage due to the improper use of the machine, and to a partial or superficial reading of the information contained in this manual.

- Installation and maintenance must be carried out by trained and qualified personnel, having the requirements laid down by law 46/90 and/or DPR 380/2001 for electric/electronic and air conditioning installations, with consequent registration at the local CHAMBER of COMMERCE. Otherwise Aermec S.p.A. decline all responsibility regarding the safety of the product.

THE MANUFACTURER DECLINES ANY RESPONSIBILITY FOR DAMAGE TO PROPERTY, PERSONS OR ANIMALS CAUSED BY THE NON OBSERVANCE OF THE INDICATIONS AND REGULATIONS CONTAINED IN THE PRESENT MANUAL.

Even though a suitable risk analysis was carried out during the design of the ERSR unit, pay ATTENTION to the pictograms on the machine that make the reading of the manual easier catching the readers attention concerning risks that can't be avoided or sufficiently limited with the adoption of protection means and measures.

GENERAL DANGER SIGNS
Carefully observe all indications at the side of the pictogram.
The non observance of the indications could caus hazardous conditions with possible injury to the operator and to the user in general.

VOLTAGE DANGER SIGN
Carefully observe all indications at the side of the pictogram.
The signs indicate components on the unit or, in the present manual, identify areas that could generat risks of an electrical nature.

GENERAL WARNING SIGNS
Carefully observe all indications to the side of the pictogram that limit some actions in order to ensure greater safety for the operator.

MAIN GUARANTEE CONDITIONS

- The guarantee does not includ payment for damages due to incorrect installation by the installer.
- The guarantee does not include payment for damages due to the improper use of the unit by the user.
- The manufacture is not responsible for injuries to the installer or user, caused by incorrect installation or improper use of the unit;
- The equipment must be installed in such a manner so as to allow maintenance and/or repair operations;
- The guarantee does not cover in any case costs due to turntable ladders, scaffolding or othe similar elevating systems that are necessary to carry out operations under guarantee.

The guarantee is not valid if:

- the services and repairs have been carried out by unauthorised personnel or companies;
- the unit has been previously repaired or modified with non original parts;
- the unit has not been suitably maintained;
- the instructions illustrated in the present manual have not been observed;
- unauthorised modifications have been made.

Note:
The manufacturer reserves the right to carry out modifications at any time deemed necessary to improve their product, and are not obliged t apply the said modifications to previously manufactured machines that have already been delivered or are being constructed.
The general conditions are in any case subject to the general sale conditions foreseen on the stipulation of the contract.

SELECTION MANUAL

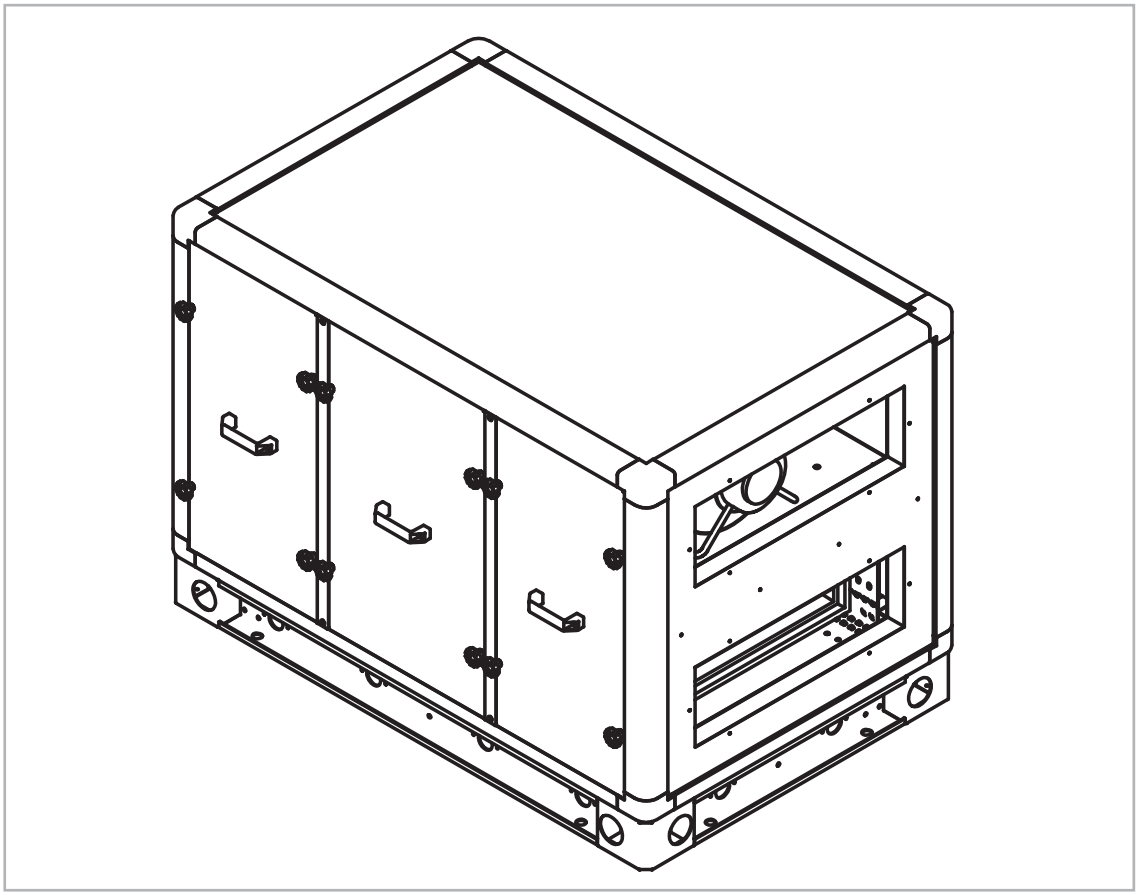
Description of the unit

The ERSR series units have been designed to satisfy the thermohygrometric well-being and the change over and quality of the air. They actually permit a determined amount of air to be extracted from the environment and replace it with fresh air.
The unit uses a high efficiency heat recovery unit that reduces the energy output to a minimum (with the possibility to obtain the hygroscopic treatment of the surface).
The heat, thus obtained from the heat exchanger, allows to minimize the use of the air conditioning unit, giving as end-result an elevate saving in the cost management.
The heat recovery unit has specially designed aluminium plates to permit maximum heat exchange efficiency and to increase the air side flow section so as to minimise the pressure drop.
The fresh air is therefore pre-heated or pre-cooled, according to the season, by the exhausted air.
The inlet air is filtered prior to passing through the recovery unit that is kept clean by means of a similar filter (G4) on the expulsion side as well.
The steady speed variation is obtained thanks to the inverters supplied with the electric fans.
The ERSR series represent the ideal solution to satisfy engineering needs typical of public environments such as bars, restaurants, offices and conference rooms.
The high reliability of the components used and the severe tests that the units are subjected to, guarantee high qualitative standards and easy installation and maintenance of the machine.

Available versions

1) **(T) VERSION**: unit equipped with heat recovery unit.
2) **(H) VERSION**: unit equipped with heat recovery unit with thermohygrometric well-being treatment of the surface.

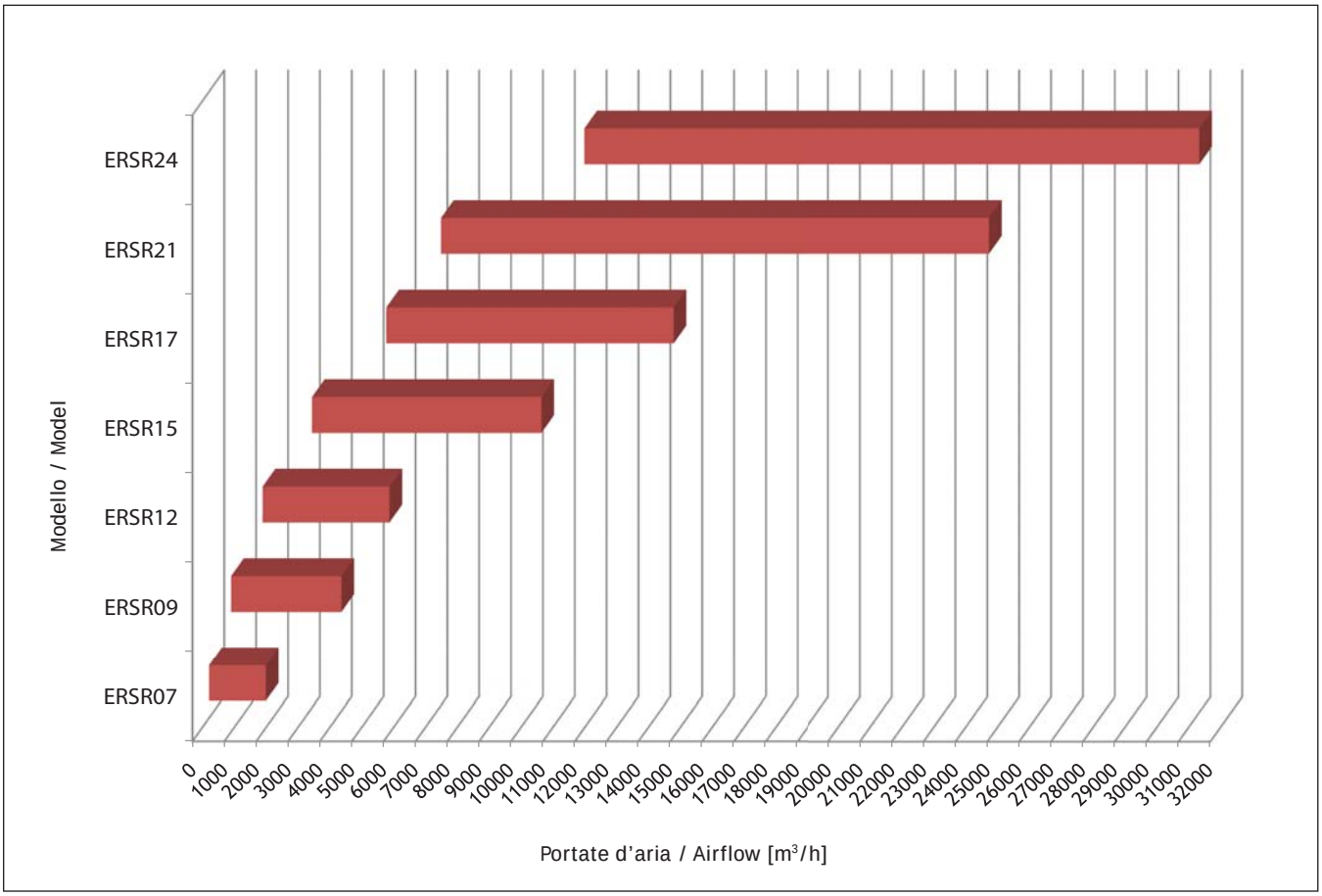
Each of the units can be individually equipped with integration coils:
- W: water coil (for hot or cold water operation): in this case the coil is always positioned downstream of the recovery unit on the supply air flow.



ERSR series high efficiency heat recovery unit.

Air flows range

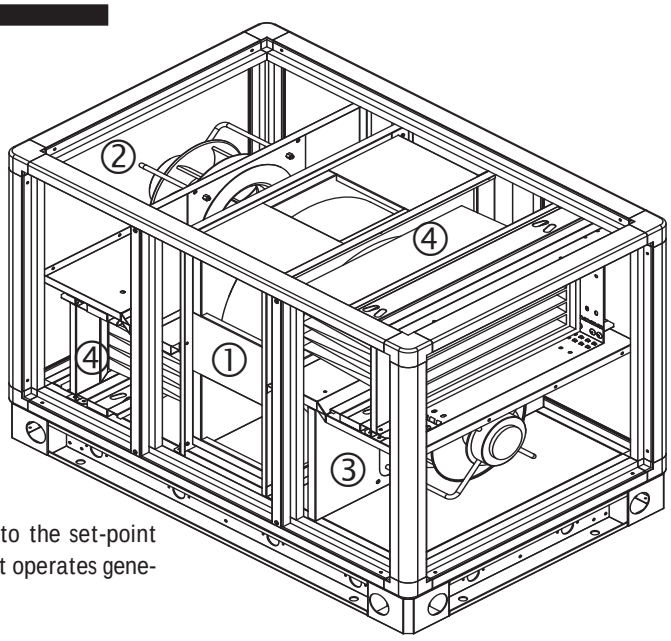
The following image represents the values of max. and min. air flow according to each size.



Description of main components

The entire range of ERSR high efficiency heat recovery units has been conceived in order to guarantee better and more accessible inspection of all parts (heat recovery unit, filters, condensate drain pan, coils and fans).

LEGENDA	
1	Heat recovery unit
2	Suction fan
3	Supply Fan
4	Filter



Frame and panels

Aluminium frame (UNI 6060) and 25 mm galvanised steel sandwich panels for the internal surface and pre-painted for the external surface with injected polyurethane insulation (density 42 kg/m3). Continuous galvanised steel profile base. The disassembly of the internal panels for the inspection of parts has been made as simple as possible. Inspection of the unit can be made from both sides.

High efficiency filters

Soft bags filters on the fresh and exhaust air side (class F7 in accordance with EN 779).

Heat recovery unit

The rotary heat recovery unit air/air is caracterized by a very wide surface which grants elevate performances and low pressure drops.

Suction and supply fans

"Plug fans" with very low noise emission. Electric motors are directly-coupled to the fans (until size 17) with electronic control or high efficiency, controlled by inverters.

Differential pressure switch on the fresh air

It is necessary to check the clogging level of the air filters. Once Raggiunto the set-point of the differential pressure, it operates generating an alarm signal.

Electrical panel

The electrical panel is made of galvanized steel as standard frame, and it is placed near the technical cabiner related to the exhaust fan (2).

Terminal plate for accessories

The unit is supplied with a terminal plate box for the electrical connection of the potential accessories, placed in the technical cabinet of the supply fan only (3).

Regulation

Different types of control are offered according to different needs:

- manual or automatic drive for heating or cooling, with chance of dehumidifying and time slots handling
- fans control with 3 adjustable speeds inverter
- valve control, dampers actuators and electrical heaters
- control on supply pressure of fans
- speed control of the rotary recuperator
- freecooling e freeheating
- air quality control
- re-startup after black-out

For a more detailed decription, please see the "Control" section of the present manual, or refer to the Control Manual supplied with the unit.

Remote panel

It permits to make drive operations to the ERSR unit at a certain distance.

Equipment

Standard Version, (T) with rotary heat recovery unit

In the standard version the ERSR unit is represented as a rotary heat recovery unit air-air.

(H) Version with hygroscopic rotary heat recovery unit

n the "H" configuration, the rotary recuperator is "hygroscopic" with the possiibility to recover the latent heat from exhaust air.

Fans flows

Horizontal fans (H)
All sizes are equipped with horizontal fans.
Vertical fans (V)
For the sizes 07 and 09 only,are included, (H) also the vertical fans, together with the horizontal fans.

Accessories

ACCESSORIES:

Flanges, FRR
It consists of a flange which has to be coupled to the rectangular openings in the unit to allow the use of channels with equal section. This accessory is compatible with all four supply/suction opening vents. The accessory modules RBF, RBC, RBP, RE and MSS are already equipped with double flange FRR.
Accessories supplied as assembled.

Rectangular flexible connection, GAR
To prevent the transmission of vibrations generated by unit movements to air channels, it is possible to insert a flexible connection to be coupled to the rectangular opening vents of the unit.
This accessory is compatible with all four supply/ suction opening vents.
With accessory modules, RBC, RBP, RE and MSS you can remove the flexible connection GAR from the the unit to place it on these modules. Accessories supplied mounted.

Suction damper on the fresh air, HSR
This is a damper which has be connected to the suction section of fresh air. The damper will be placed in the closed position with the machine off to protect it from frost. The damper has a manual drive.

Recirculation damper module, RSR
The accessory is useful when external temperatures have quite rigid values and there is no need for air renewal. The accessory is not included in the first two sizes.

G4 Filters, HG4
In front of the bag filters provided as standard, it is possible to mount panel filters G4 class (EN 779) contained in a 50 mm mesh.

Protection roof, TP
The protection roof is necessary in the case of external installation, and serves to protect the unit from rain and bad weather.

Condensate drain pan,VRC.
Condensate drain pan in stainless steel AISI 304 placed below the rotary heat recovery unit.
It is composed by a drain panel with drop draining. We recommend the application only if the conditions of the unit so require.

ACCESSORIES MODULES:

Module with cold water coil, RBF.
The accessory consists of a cold water coil. The coil is supplied with necessary connections with plastic caps.
The condensate drain pan is in stainless steel AISI 304 with a threaded drain pipe with a diameter of 1 “G according to UNI 338.
The RBF accessory is complete with 3-way valve at three points powered at 230 V. The valve is assembled with the necessary pipes and fittings, will be supplied separate from the unit in a separate package. The assembly will be charged to the customer.

Module with hot water coil, RBC.
The accessory consists of a module with hot water coil. The battery comes with the connections with plastic caps.
The RBC accessory is supplied complete with 3-way valve at three points powered at 230 V. The valve is assembled with the necessary pipes and fittings, and it will be provided separate from the unit in a separate package. The assembly will be charged to the customer.

Module with cold water coil and re-heating water coil, RBP.
This is an external module, equipped with a water-cooled battery with copper tubes and aluminum fins. The manifolds have threaded male connections for water inlet/ outlet. It is present also a re-heating hot water coil with copper pipes and aluminum fins. Also in this case collectors have male threaded inlet and outlet connections. All coils come with the connections with plastic caps.
The condensate drain pan is in stainless steel AISI 304 with a threaded drain pipe with a diameter of 1 “G UNI 338. The RBP accessory is complete with double 3-way valve at three points on 230V.
The valves, assembled with the necessary pipes and fittings will be provided separate from the unit into a separate package. The assembly will be charged to the customer.

Module with heating electric battery, RE
The accessory consists of a module equipped with electric battery with armored finned elements. It is equipped with safety thermostat with manual reset set at 90 ° C and further automatic resetting thermostat, set between 30 ° C and 90 ° C.
The module is complete with power panel which power supply is separate from the unit.
For details on the operation logic, please check the control manual supplied with the unit when it has complete regulation.

Module with silencers, MSS.
The accessory consists of silencers to be placed on the supply/exhaust. They are made of mineral wool panels with the surface in contact with air, protected with polyester film between the two expanded and perforated galvanized steel sheets.

All modules can be equipped with protection roof (see below table).

Further accessories

Several further accessories (for example: modules with direct expansion coil, dampers, anti-vibration dampers etc.) are available on request.

Accessories table

ERSR Size	07	09	12	15	17	21	24
UNIT ACCESSORIES							
FRR Flanges	FRR09	FRR09	FRR12	FRR15	FRR17	FRR21	FRR24
GAR Rectangular antivibration damper	GAR07	GAR09	GAR12	GAR15	GAR17	GAR21	GAR24
HSR Suction damper on fresh air	HSR07	HSR09	HSR12	HSR15	HSR17	HSR21	HSR24
RSR Recirculation damper module	-	-	HSR12	RSR15	RSR17	RSR21	RSR24
HG4 G4 filter	HG407	HG409	HG412	HG415	HG417	HG421	HG424
TDP Protection roof	TDP07	TDP09	TDP12	TDP15	TDP17	TDP21	TDP24
VRC Condensate drain pan	VRC07	VRC09	VRC12	VRC15	VRC17	VRC21	VRC24
ACCESSORIES MODULES							
RBC Hot water coil module	RBC07	RBC09	RBC12	RBC15	RBC17	RBC21	RBC24
RBF Cold water coil module	RBF07	RBF09	RBF12	RBF15	RBF17	RBF21	RBF24
RE Electric battery module	RE0706	RE0909	RE1218	RE1524	RE1730	RE2148	RE2463
RBP Cold + re-heating coil modules	RBP07	RBP09	RBP12	RBP15	RBP17	RBP21	RBP24
MSS Silencers module	MSS07	MSS09	MSS12	MSS15	MSS17	MSS21	MSS24
ACCESORIES MODULES WITH ROOF							
RBCT Hot water coil module	RBC07T	RBC09T	RBC12T	RBC15T	RBC17T	RBC21T	RBC24T
RBFT Cold water coil module	RBF07T	RBF09T	RBF12T	RBF15T	RBF17T	RBF21T	RBF24T
RET Electric battery module	RE0706T	RE0909T	RE1218T	RE1524T	RE1730T	RE2148T	RE2463T
RBPT Cold + re-heating coil modules	RBP07T	RBP09T	RBP12T	RBP15T	RBP17T	RBP21T	RBP24T
MSST Silencers module	MSS07T	MSS09T	MSS12T	MSS15T	MSS17T	MSS21T	MSS24T

Choice and unit configuration

In the table on page 12 are listed all the necessary fields for completing the commercial code consists of 15 fields.
When configuring the unit must be considered that not all configurations are possible.

FIELD 1
Acronym which indicates the product: in this case ERSR =HK.

FIELD 2
In the 2nd filed it is possible to choose between 7 different sizes according to the requested air flows, as indicated in the table.

FIELD 3
You can choose between two different versions: T and H.
The T version is characterized by a rotary recuperator, while the H version offers a hygroscopic rotary recuperator with the peculiarity of the humidity recovery.

FIELD 4
SIt will be given the opportunity to use this field to define the arrangement of horizontal (H) or vertical (V) air flows possible for sizes 7 and 09 only.

FIELD 5
You can choose whether the supply fan (VM), will be placed at the top or bottom of the machine. The exhaust fan (VE), will also be positioned above or below (Figure 3). If the supply fan (VM) is positioned at the top of the unit, the direct coupling with the RBF, RBC, RBP, RE and MSS modules is possible through appropriate brackets (not supplied).

Nominal air flow table [m^3/h]

Size	07	09	12	15	17	21	24
Base version, T or H	1100	2000	3700	6000	7800	12200	16100

FIELD 6
The right (RH) or left (SX) orientation of the unit is determined by the air flow coming from the supply fan. You can choose also the left or right positioning of the connections (condensate discharge, manifolds or coils connections) and of the inspection panels.

FIELD 7
Field 7 is intended to define the presence or absence of the protection roof of the single unit base.

FIELD 8
You can choose whether put or not the condensate drain pan under the rotary recuperator; this according to the operating conditions of the unit.

FIELD 9
In this field is defined the presence or not of the FRR flanges in the 4 indicated positions shown on page 11.

FIELD 10
The presence or absence of the flexible connections (GAR) in the four positions shown on page 11 is regulated by the table on page 12 and can be activated putting the number 1 to confirm the presence or 0 to indicate the absence.

FIELD 11
It will be given the opportunity to define the presence or absence of the HSR damper and its location: either on the room air exhaust or on the fresh air suction, or both.

FIELD 12
The field 12 indicates the possibility of including or excluding the RSR recirculation damper module (not available for sizes 7 and 09).

FIELD 13
This filed indicates the possibility of including or excluding the G4 HG4 filters.

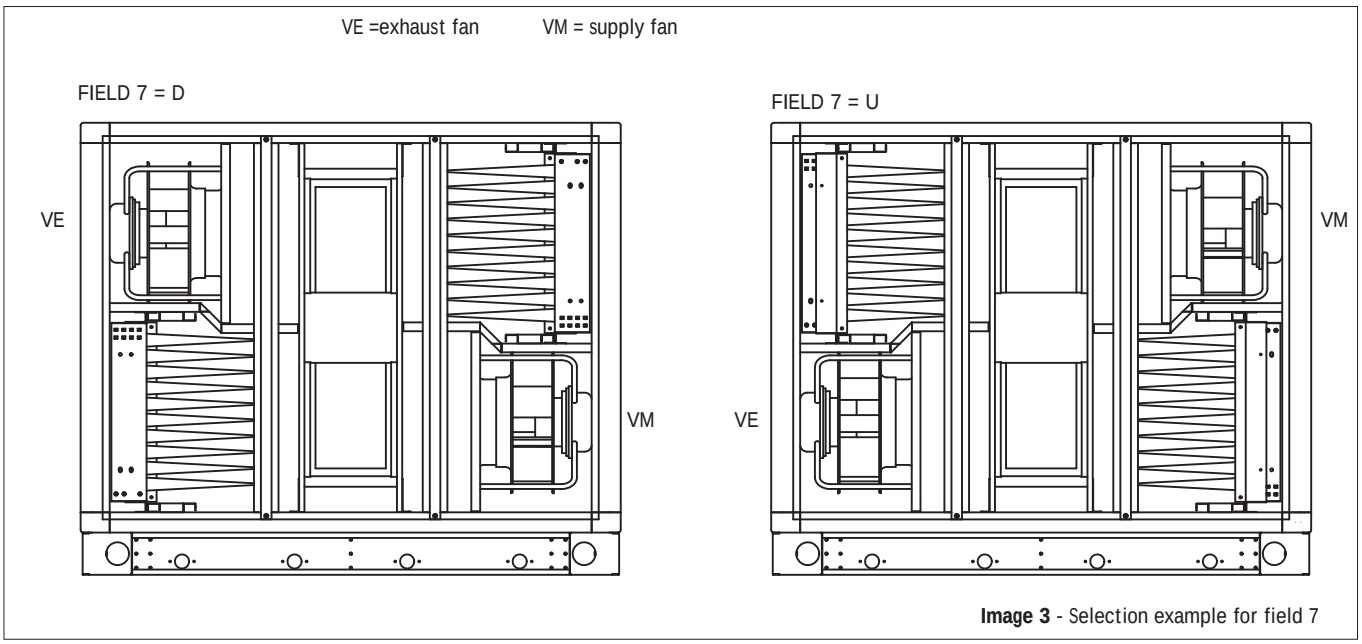


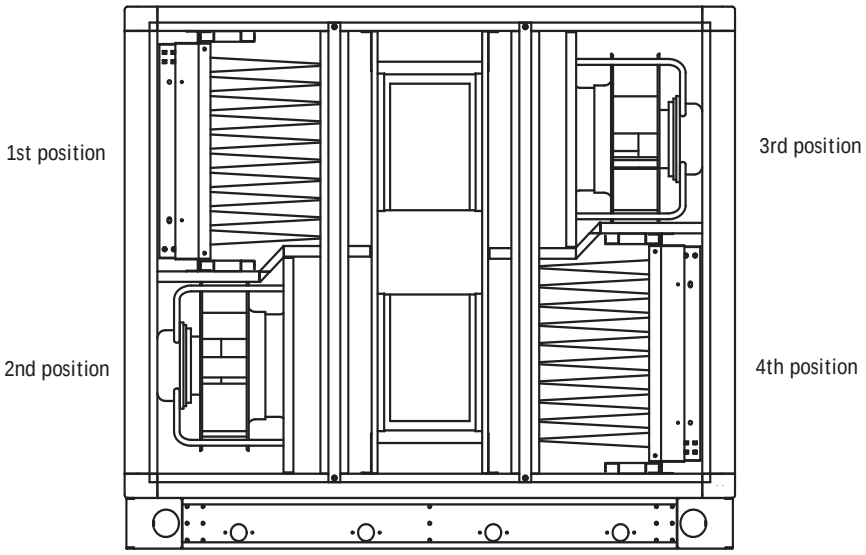
Image 3 - Selection example for field 7

CONFIGURATION EXAMPLE:

Code	HK	07	T	V	D	4	N	N	0	0	0	0	0	0	1	0	1	N	N
Field n°	1	2	3	4	5	6	7	8	9				10				11	12	13

ERSR high efficiency recuperator with following characteristics:

Field n°1 **HK** = ERSR unit
Field n°2 **7** = nominal air flow 1100 m^3/h;
Field n°3 **T** = rotary recuperator;
Field n°4 **V** = air flows with vertical direction;
Field n°5 **D** = below supply fan, above exhaust fan;
Field n°6 **4** = connections side SX (left), inspections side SX (left);
Field n°7 **N** = without protection roof of the base unit;
Field n°8 **N** = without condensate drain pan;
Field n°9 **0-0-0-0** = without flanges in the 4th positions;
Field n°10 **0-0-1-0** = flexible connection in the 3rd position;
Field n°11 **1** = damper placed in the exhaust room air;
Field n°12 **N** = without recirculation damper;
Field n°13 **N** = without panel filter.



Selection of fields 9 and 10: flanges position FRR and flexible connections GAR.

TABLE = Commercial code related to the base unit

FIELD		CODE	DESCRIPTION		NOTE
SERIES					
1		**HK**	ERSR heat recovery unit		
UNIT SIZE					
2		**07**	Nominal air flow on supply/exhaust: 1100 m^3/h		
		09	Nominal air flow on supply/exhaust: 2000 m^3/h		
		12	Nominal air flow on supply/exhaust: 3700 m^3/h		
		15	Nominal air flow on supply/exhaust: 6000 m^3/h		
		17	Nominal air flow on supply/exhaust: 7800 m^3/h		
		21	Nominal air flow on supply/exhaust: 12200 m^3/h		
		24	Nominal air flow on supply/exhaust: 16100 m^3/h		
RECUPERATOR TYPE					
3		**T**	Rotary		
		H	Hygroscopic rotary		
UNIT PROVISION					
4		**V**	Vertical air flows (sizes 07 and 09 only)		
		H	Horizontal air flows.		
FANS POSITION					
5		**U**	Up (supply fan above, exhaust fan below)		
		D	Down (supply fan below, exhaust fan above)		
CONNECTIONS/ INSPECTIONS SIDE ACCORDING TO THE SUPPLY FAN					
6		**1**	Connections side DX (right), inspections side DX		
		2	Connections side DX, inspections side SX (left)		
		3	Connections side SX, inspections side DX		
		4	Connections side SX, inspections side SX		
TDP - PROTECTION ROOF					
7		**N**	No (not present)		
		Y	Yes (present)		
VRC - CONDENSATE DRAIN PAN					
8		**N**	No (not present)		
		Y	Yes (present)		
FRR - FLANGE					
9	Position 1	**0 / 1**	0 = No (not present)	1= Yes (present)	
	Position 2	**0 / 1**	0 = No (not present)	1= Yes (present)	
	Position 3	**0 / 1**	0 = No (not present)	1= Yes (present)	
	Position 4	**0 / 1**	0 = No (not present)	1= Yes (present)	
GAR - RECTANGULAR FLEXIBLE CONNECTION					
10	Position 1	**0 / 1**	0 = No (not present)	1= Yes (present)	
	Position 2	**0 / 1**	0 = No (not present)	1= Yes (present)	
	Position 3	**0 / 1**	0 = No (not present)	1= Yes (present)	
	Position 4	**0 / 1**	0 = No (not present)	1= Yes (present)	
HSR - DAMPER					
11		**N**	No (not present)		
		1	Room air exhaust		
		2	Fresh air suction		
		3	both		
RSR - RECIRCULATION DAMPER MODULE					
12		**N**	No (not present)		
		Y	Yes (present)		Not available for sizes ERSR07 and ERSR09.
HG4 - G4 PLANE FILTERS					
13		**N**	No (not present)		
		Y	Yes (present)		Both on supply and exhaust.

Electrical regulation (standard)

The unit can be equipped with 2 different regulation modes (factory set):
• CPO: 3-speed control (manual or automatic) [V1-V2-V3].
• CPS: automatic pressure control (0-10V) by pressure detector 4-20mA.

NOTE:
One mode excludes the other.

CPO: 3-speed control

This option consists in a regulation with constant flow. Three different flow-rates con be selected, Vmin, Vmed, Vmax (see table 4), which are maintained constant through the frequency variation of the fan's inverter (see the Regulation Manual for further information).
The flow-rate that can be set is that of the supply fan. For that of the exhaust fan, a flow-rate expressed as a percentage of the fresh air is expected.

NOTE:
Once the flow-rate has been selected, the inverter will then maintain and manage the flow within the permitted limits.

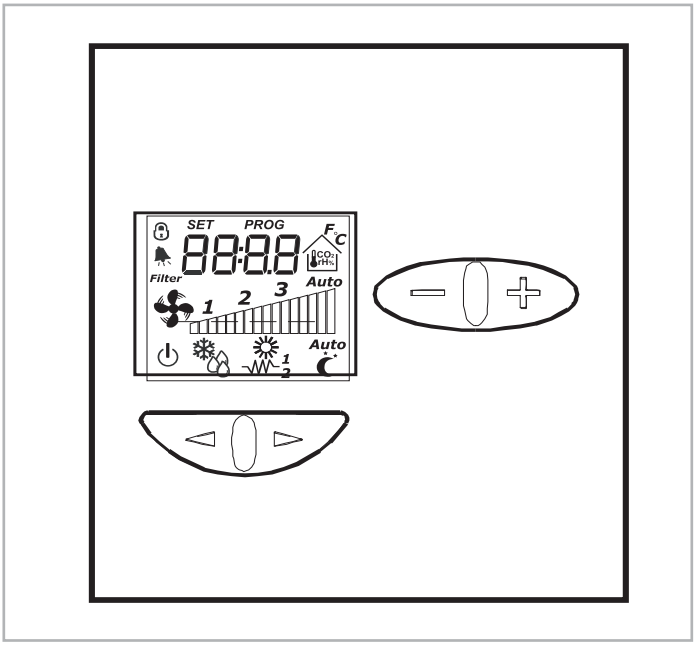


Image = LCD Display

CPS: Pressure control (0-10V) by pressure detector 4-20mA

The supply fan is automatically adjusted to maintain a constant value of the supplied static pressure. The pressure value is taken from a pressure detector positioned in the fresh air or exhaust duct depending on the case.
The regulation controls the supply or exhaust fan depending on where the sensor is positioned.

For example, by selecting the supply fan, the exhaust one will be configured by means of a parameter expressed as a percentage (%) in relation to the other (please see the Regulation Manual for further information).

NOTE:
Once the pressure has been selected, the control will then maintain and manage the pressure within the permitted limits.

Nominal technical data

Model			**07**	**09**	**12**	**15**	**17**	**21**	**24**
Nominal supply/exhaust air flow		[m^3/h]	1100	1950	3700	5950	7800	12200	16100
Max.nominal available static pressure on supply/ exhaust	(1)	[Pa]	420	660	1100	1120	1040	1440	1530
Max. air flow on supply and exhaust		[m^3/h]	2000	4370	5880	10650	14800	24750	31350

Recuperator			High efficiency wheel recuperator						
Number			1	1	1	1	1	1	1
Winter recovered heating capacity	❄	[kW]	10,7	19	36	57,9	75,9	118	156
Winter efficiency	❄	[%]	80	80	80	80	80	80	80
Summer recovered heating capacity	☼	[kW]	2,8	4,9	9,3	14,9	19,5	30,5	40,3
Summer efficiency	☼	[%]	80	80	80	80	80	80	80
Winter efficiency (hygroscopic recuperator)	❄	[%]	73	73	73	73	73	73	73

Fans with 100 Pa and nominal flow									
Fans number on supply/exhaust			1/1	1/1	1/1	1/1	1/1	2/2	2/2
Max. absorbed power for each fan		[kW]	0,4	1,0	3,0	4,3	5,0	5,5	7,5
Max. absorbed power for each fan		[A]	2,3	1,75	4,6	6,6	7,7	8	11
Speed variation			electronic control					Inverter	
Protection class IP			54						
Insulation class			F						

Filters			soft bags						
Classification according to EN779 standard			F7	F7	F7	F7	F7	F7	F7

Sound power level	♫	[dB(A)]	65,6	67	75,3	76,7	78	78	79

Dimensions and weight								
Length	[mm]	1375	1535	2045	2365	2365	3005	3005
Width	[mm]	895	1005	1375	1695	1855	2335	2665
Height	[mm]	965	1285	1445	1765	2085	2405	2725
Weight	[kg]	240	340	570	820	1010	1610	1980
Condensate drain pan discharge diameter (if present)		1”	1”	1”	1”	1”	1”	1”

Power supply	**[V-ph-Hz]**	**400 - 3+N - 50**

(1) With clean filter
❄ External air temperature -5°C; external air R.H. 80%. Internal air temperature 20°C; Internal air H.R. 50%.
☼ External air temperature 35°C; external air R.H. 80% 50%. Internal air temperature 26°C; Internal air H.R. 50%.
♫ Supply fans sound power level not ductable with available static pressure equal to 0 Pa.

Electrical data

ERSR size		07	09	12	15	17	21	24
FRESH AND EXHAUST FANS								
Number		2	2	2	2	2	4	4
Max. absorbed current per fan	[A]	2,3	1,75	4,6	6,6	7,7	8,0	11,0
Max. absorbed power per fan	[kW]	0,4	1	3	4,3	5,0	5,5	7,5
RECUPERATOR ELECTRIC MOTOR								
Max. absorbed current	[A]	0,21	0,21	0,4	0,57	0,57	1,05	1,05
Max. absorbed power	[kW]	0,04	0,04	0,09	0,18	0,18	0,37	0,37
ELECTRIC COILS								
Power supply					400V/3ph/50Hz			
Max. absorbed current	[A]	9,1	13,7	27,4	36,5	45,6	73	95,8
Max. absorbed power	[kW]	6	9	18	24	30	48	63

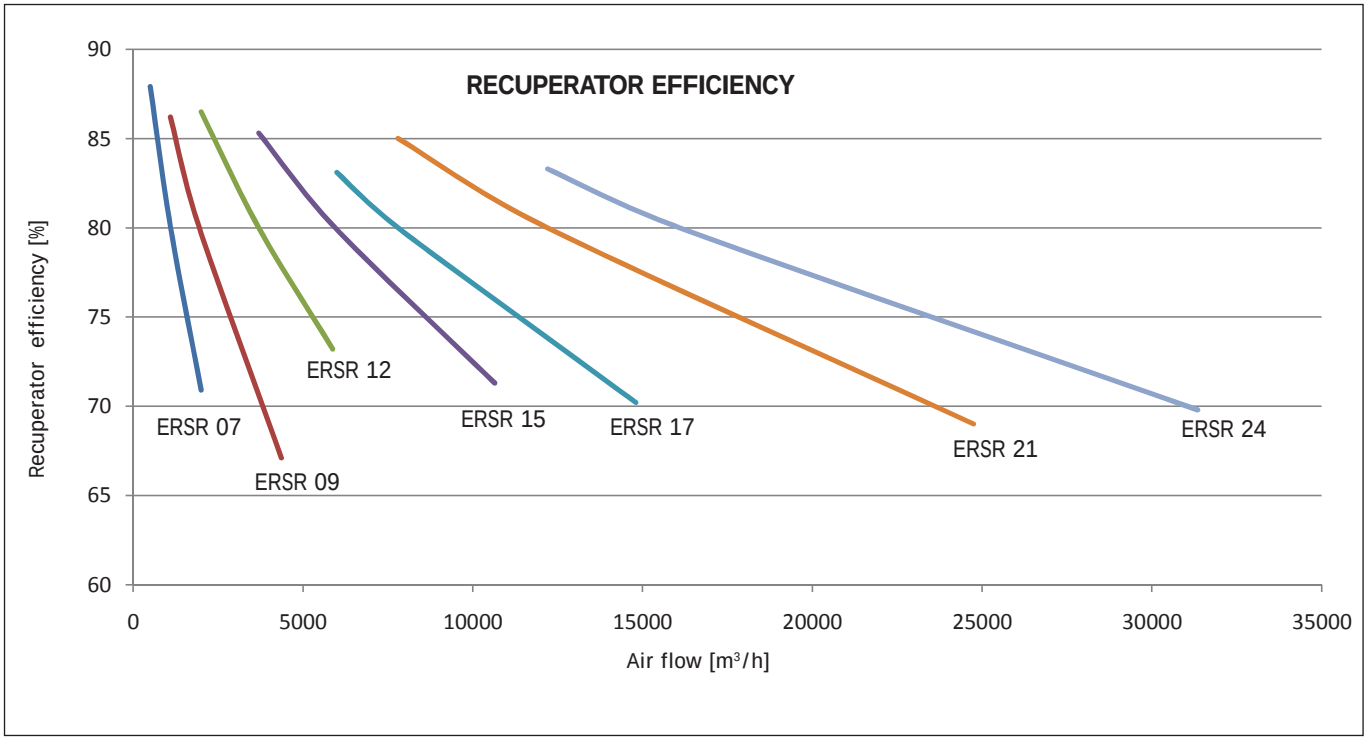
Performances variation

Recuperator made of alluminium: winter operation

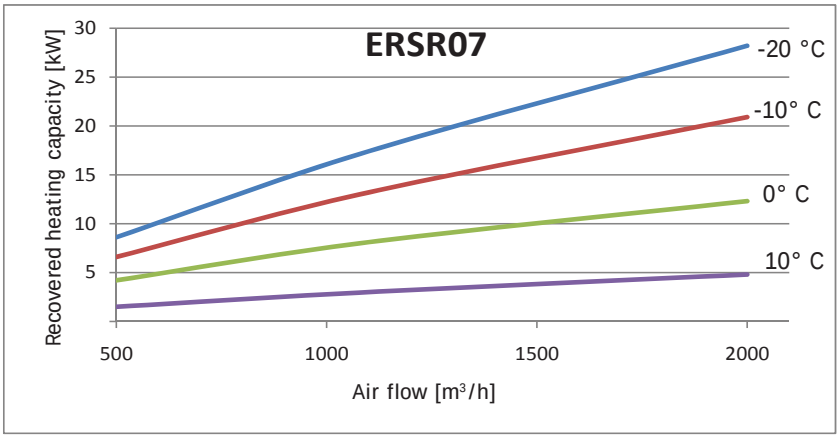
In the following diagrams are reported the efficiencies of the heat recovery during winter conditions related to the ERSR units according to different air flow values.

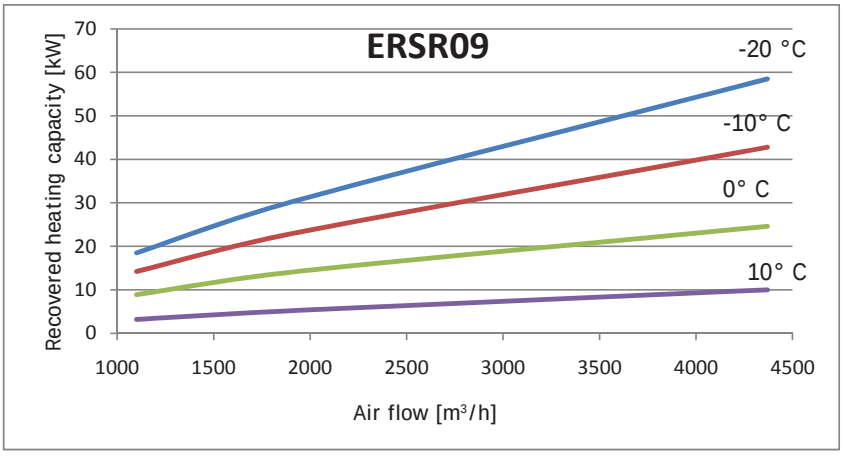
The data are referred to following nominal conditions:
- external air relative humidity 80%;
- internal air temperature 20°C;
- internal air relative humidity 50%.

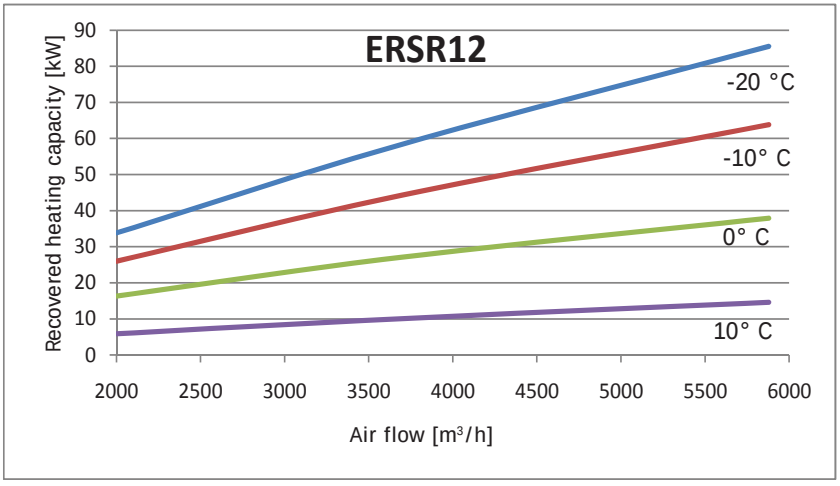
They have been reported also the values of the recovered heating capacity according to different external air temperature values.

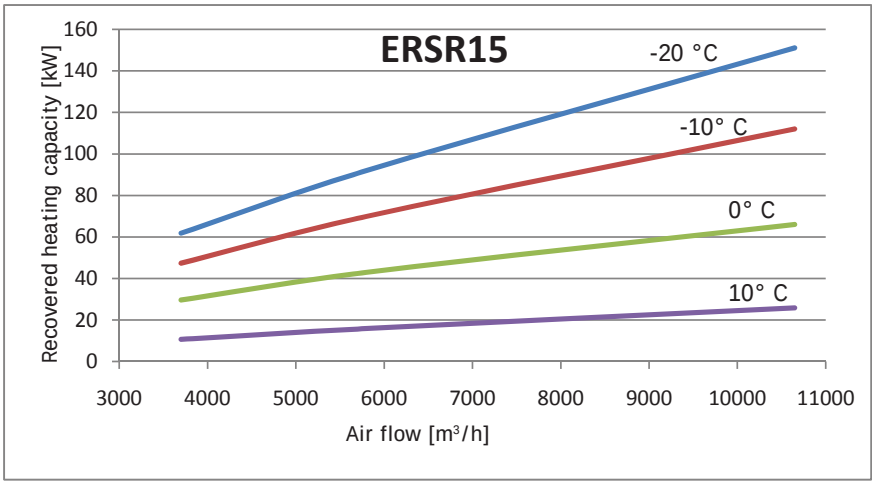


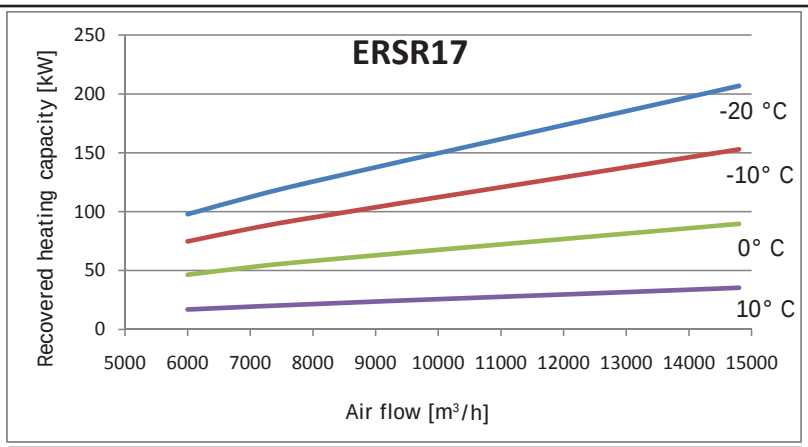
Recovered heating capacity: influence of the exteral air temperature

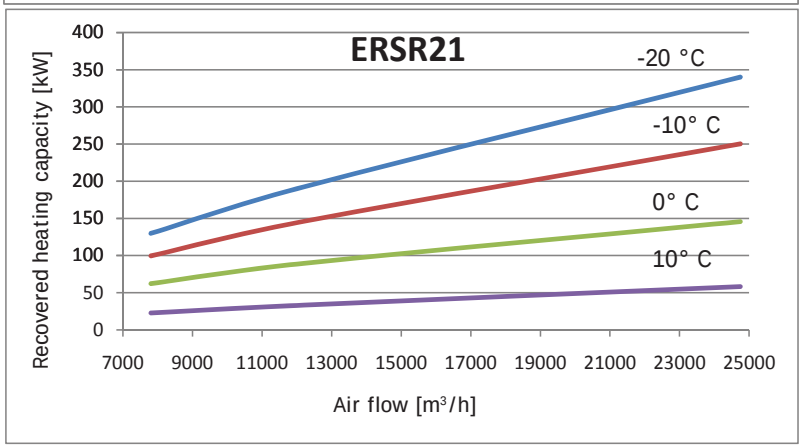


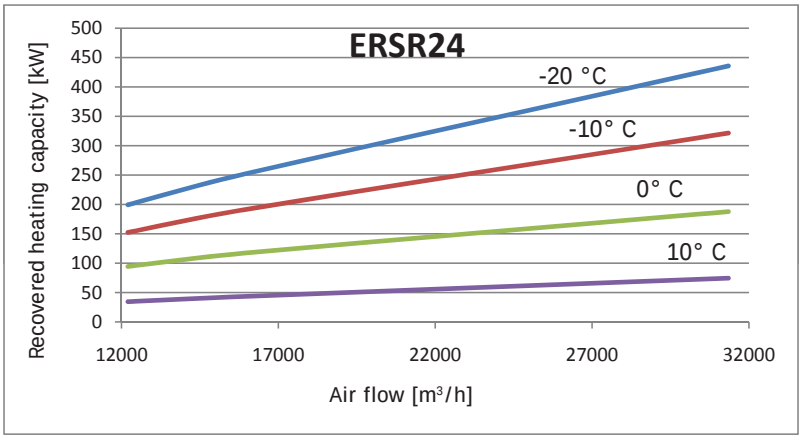












Recuperator made of alluminium: summer operation

TABLE = Correction coefficient of the recovered cooling capacity according to fresh air and exhaust air temperature variation.

T_{rin}, [°C]	K capacity T_{exp} = 20°C	K capacity T_{exp} = 26°C	K capacity T_{exo}= 30°C
28	0,88	0,22	n.a.
32	1,67	0,67	0,22
35	2,94	1,00	0,56
38	4,41	1,62	0,90

Hygroscopic recuperator

With reference to data and graphs related to the hygroscopic recuperator efficiency and recovered heating capacity, please contact the technical department both for sensible power and general power data.

Electric batteries (RE accessory)

ERSR MODEL		07	09	12	15	17	21	24
Stages n.		3	3	3	3	3	3	3
Supply	[V/ph/Hz]				400/3/50			
Length	[mm]	580	740	1045	1350	1510	1990	2310
Height	[mm]	260	420	500	660	820	980	1140
Heating capacity	[kW]	6	9	18	24	30	48	63
Air flow	[m³/h]	1100	1950	3700	5950	7800	12200	16100

Further capacities or stages n. can be requested to Aermec S.p.A. technical department.

Water coils (RBC, RBF e RBP accessories)

The following table shows the geometric characteristics of the water integration batteries and the winter /summer performances according to nominal air conditions. The following charts show the performances variations, in terms of capacity, pressure drops on air/water side, according to the air flow and to the different models.
Under winter conditions data are referred to two different conditions of inlet/outlet water temperature: 70/60° C and 45/40 ° C.
In summer conditions, the inlet/outlet water temperature is 7 / 12° C.
Are finally reported (Table 7) the correction factors of performance in winter conditions for different percentages of ethylene glycols and for different values of fresh air and exhaust temperatures.

RBC Hot water coil

MODEL		07	09	12	15	17	21	24
Rows		2	2	2	2	2	2	2
Length	[mm]	605	765	1045	1350	1510	1965	2285
Height	[mm]	250	400	480	660	780	960	1140
Manifolds	inch	1”	1”	1”	1”	1”1/2	1”1/2	2”
Air pressure drop	Pa	23	19	26,9	23	22,7	21,8	20,3
Water inlet temperature 45°C; outlet 40°C [1]								
Power	[kW]	4,9	9,2	14,9	25,0	32,8	52,7	71,0
Air outlet temperature	[°C]	28,7	28,2	26,7	27,4	27,4	27,4	27,8
Water flow	[m³/h]	0,8	1,5	2,5	4,3	5,7	8,9	12,1
Pressure drop on water side*	[kPa]	12,0	10,0	13,7	18,6	13,7	15,7	24,5
Water inlet temperature 70°C; outlet 60°C [1]								
Power	[kW]	9,53	16,9	27,4	46,7	60,1	95,8	130,4
Air outlet temperature	[°C]	38,1	39,2	36,5	37,7	37,7	38,4	38,9
Water flow	[m³/h]	0,8	1,4	2,3	4,0	5,2	8,4	11,3
Pressure drop on water side*	[kPa]	9,0	8,0	8,0	7,0	10,8	15,7	19,6

1 Coils inlet air temperature equal to 15°C

* Pressure drops on water side do not include pressure drops caused by the 3-way valve (standard)

RBF cold water coil

MODEL		07	09	12	15	17	21	24
Rows		4	4	4	4	4	4	4
Lenght	[mm]	605	765	1045	1350	1510	1965	2285
Height	[mm]	250	400	480	660	780	960	1140
Manifolds	[inch]	1"	1"	1"1/2	1"1/2	1"1/2	2"	2"1/2
Air pressure drop	[Pa]	80	64	72,9	62,3	61,5	59,2	54,9
Water inlet temperature 7°C; oulet temp. 12°C [2]								
Total power	[kW]	10,5	19,5	34,7	59,8	80,0	127,4	171,3
Sensible power	[kW]	4,1	7,6	13,9	23,9	32,0	51,0	68,5
Air outlet temp.	[°C]	17	16,5	16,7	15,9	15,7	15,5	15,3
Air outlet relative humidity	[%]	96	97	93,4	94,1	94,3	94,5	94,7
Water flow	[m³/h]	1,6	2,9	6,0	10,3	13,7	21,9	29,5
Pressure drop on water side*	[kPa]	15,1	8,0	7,0	22,6	33,4	34,3	32,4

2 Coils inlet air temperature equal to 27,8° C; R.H. coil inlet air equal to 75 %.

* Pressure drops on water side do not include drops related to the 3 -way valve (standard)

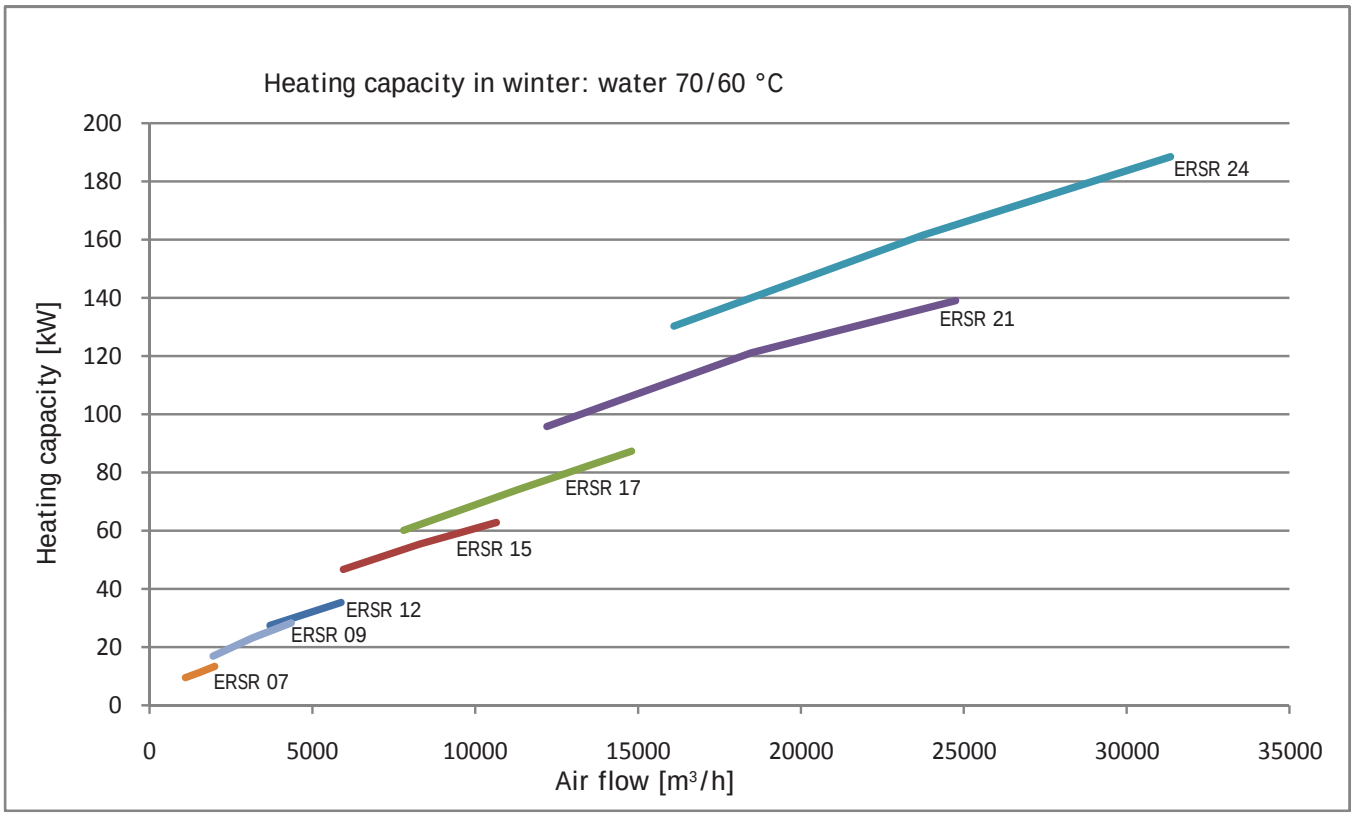
RBP cold water coil + re-heating coil

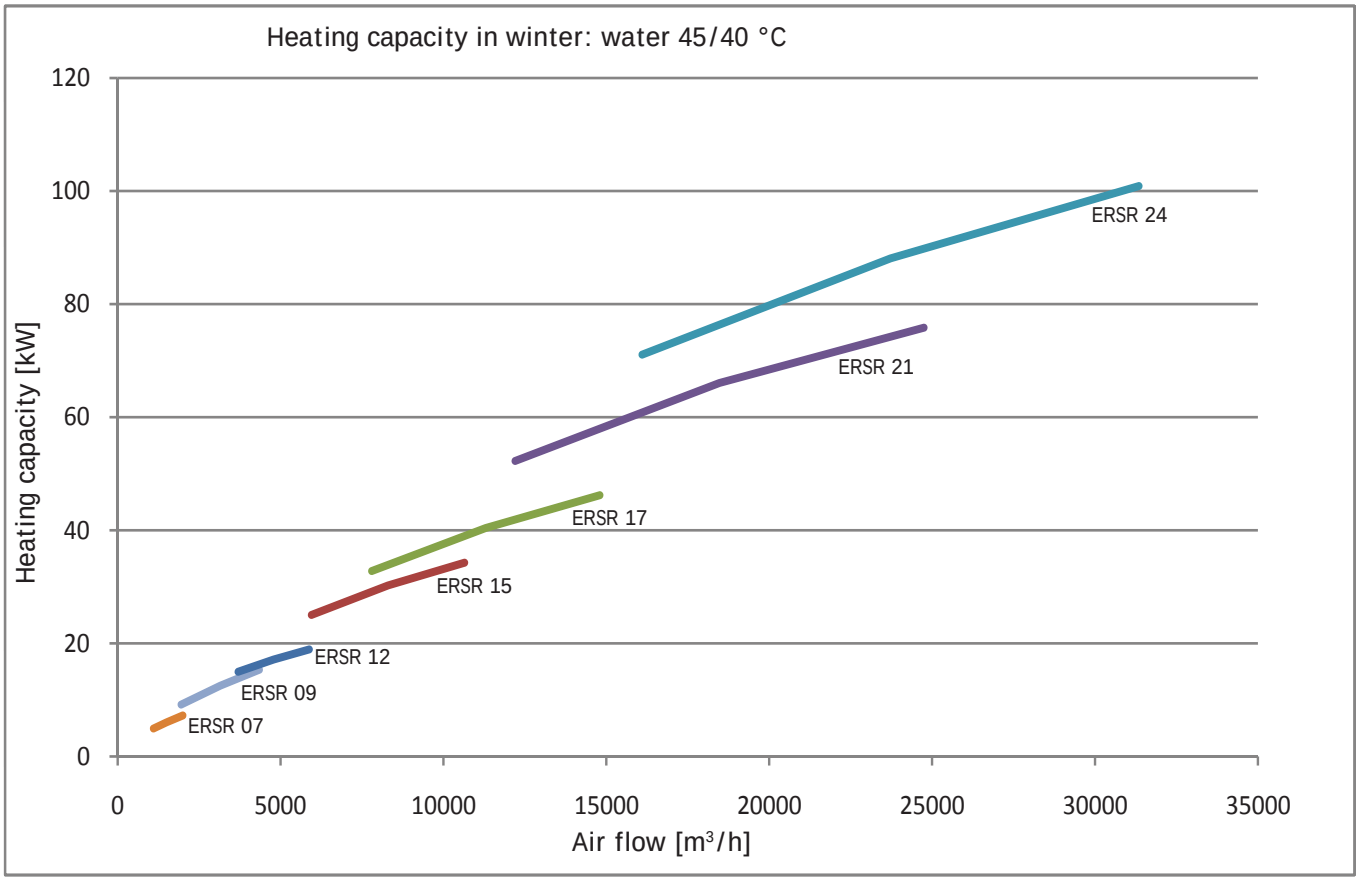
For the data related to this accessory please refer to the technical data reported in the table for the RBF accessory (cold water coil) and to the RBC accessory (hot water coil).

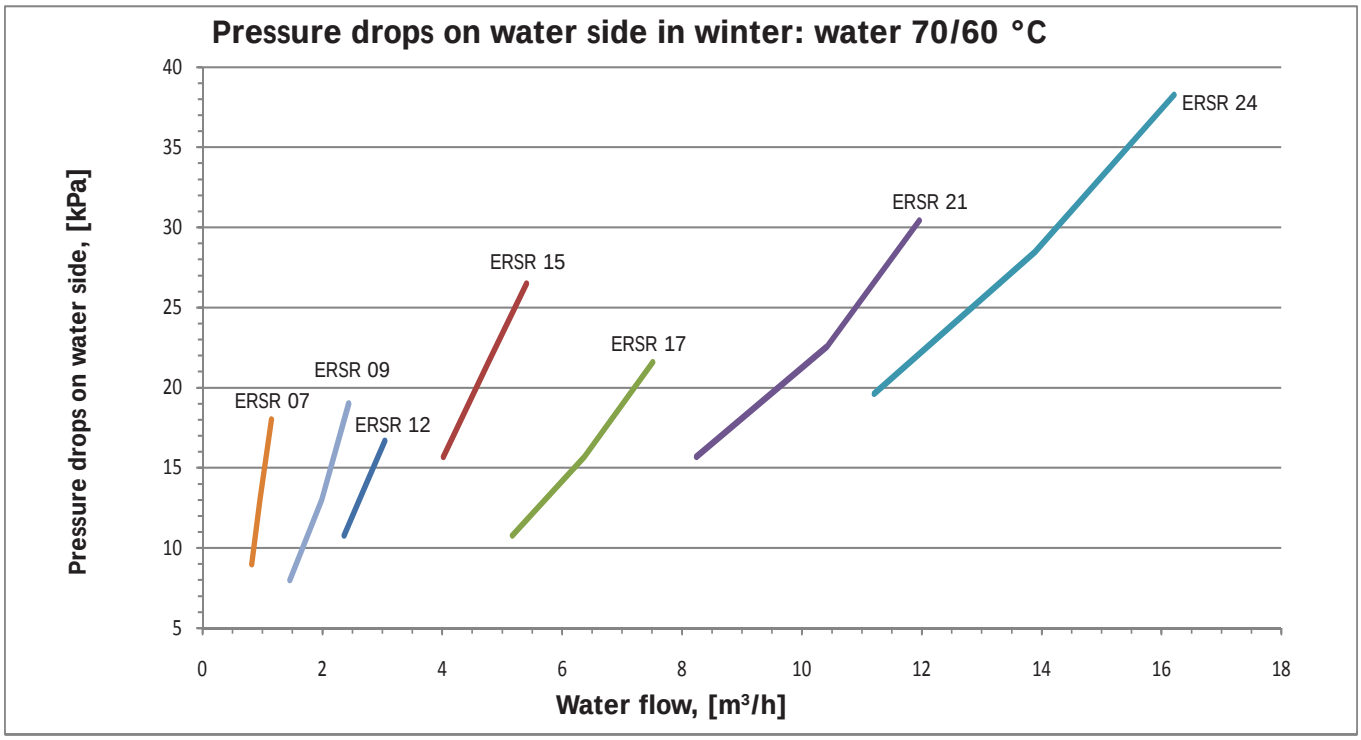
TABLE = Correction factors of the coils capacity according to the glycols percentage, fresh air temperature and exhaust air temperature. Winter case.

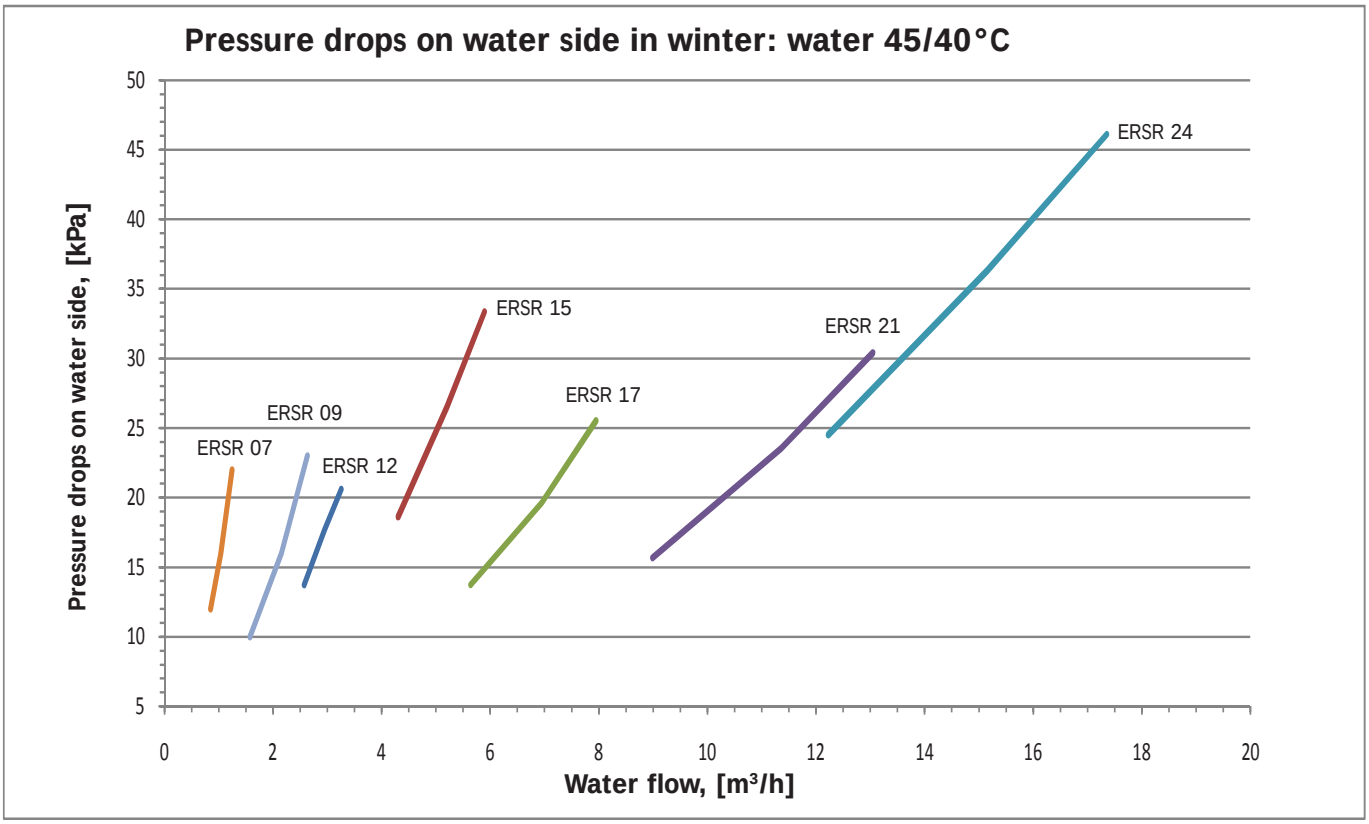
Glycols, [%]	K capacity T_{H2O} = 70/60°C	K capacity T_{H2O} = 45/40°C
0	1	1
15	0,983	0,979
30	0,961	0,947
TFresh air temp., [°C]		
-20	1,016	1,030
-10	1	1
0	0,982	0,967
10	0,949	0,907
Exhaust air temp., [°C]		
20	1,044	1,081
22	1	1
25	0,934	0,878
30	0,821	0,670

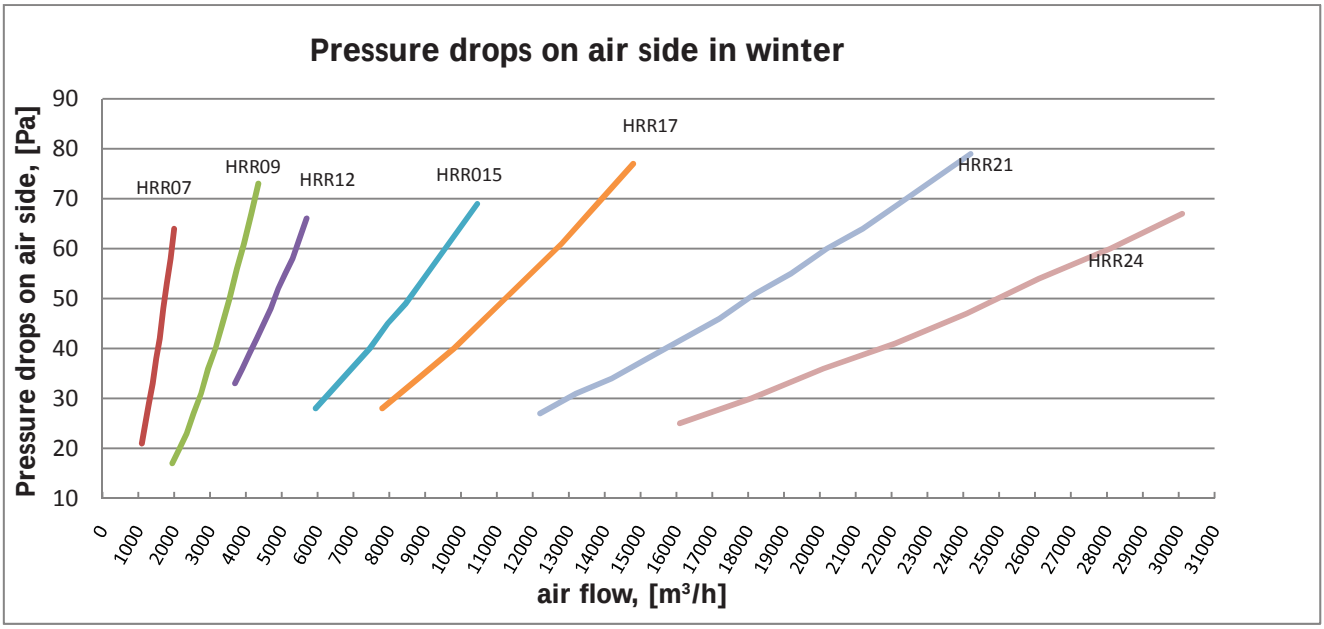
Hot water coil RBC



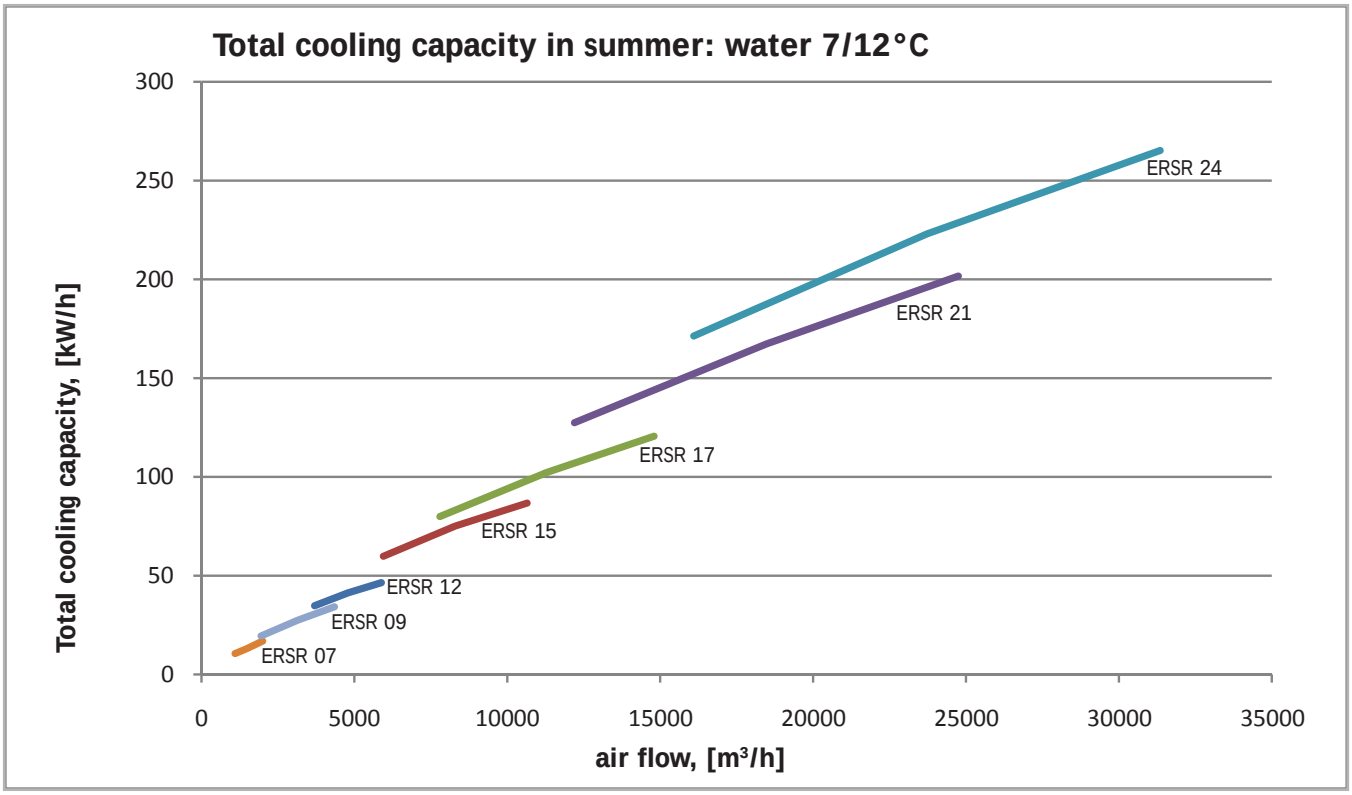


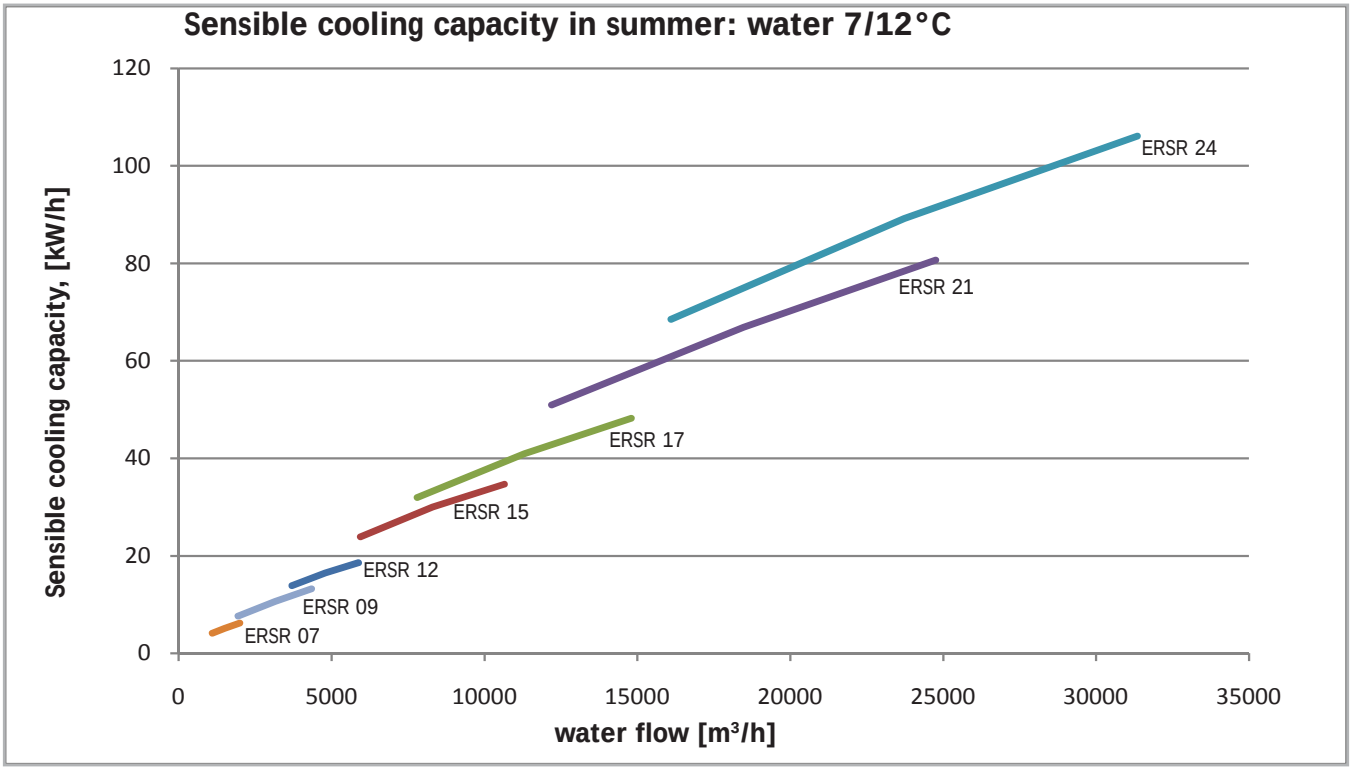

Pressure drops on water side in winter: water 70/60 °C
Pressure drops on water side, [kPa]
Water flow, [m³/h]
ERSR 07
ERSR 09
ERSR 12
ERSR 15
ERSR 17
ERSR 21
ERSR 24

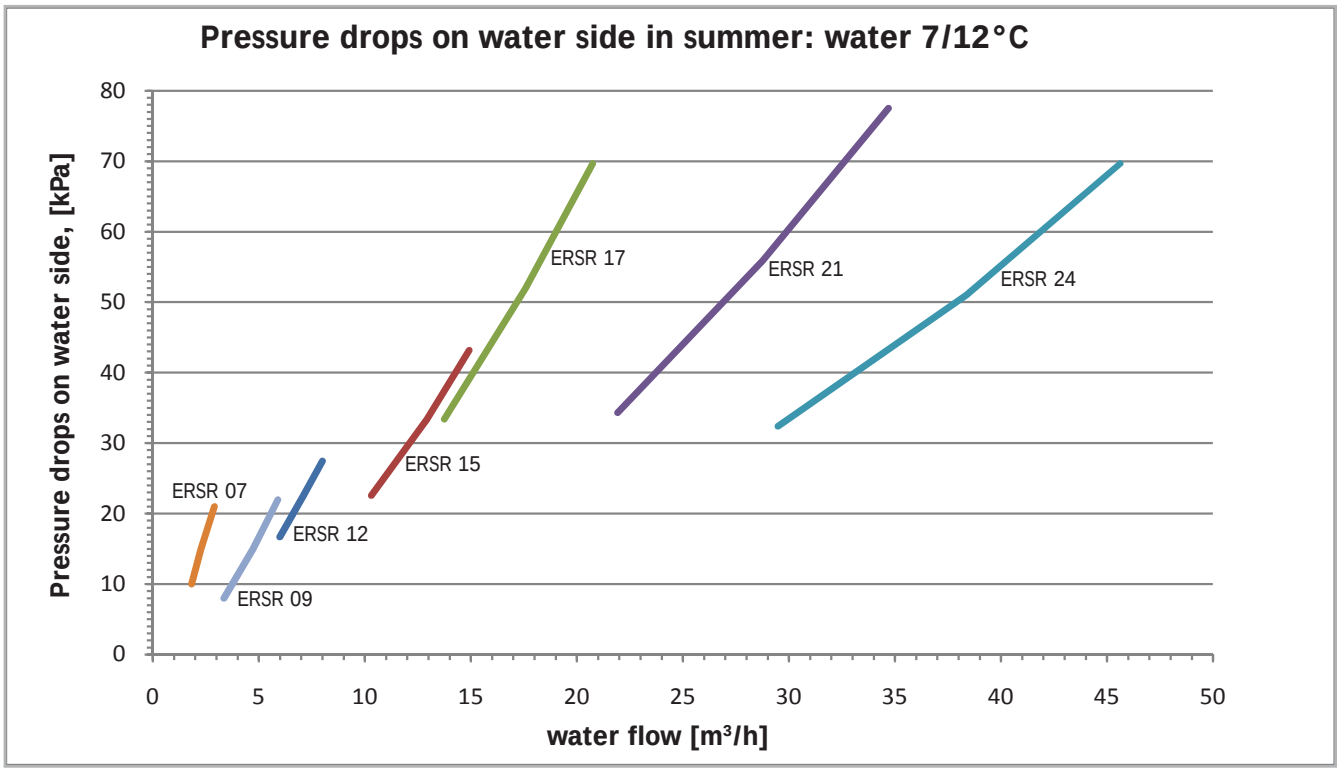

Pressure drops on water side in winter: water 45/40°C
Pressure drops on water side, [kPa]
Water flow, [m³/h]
ERSR 07
ERSR 09
ERSR 12
ERSR 15
ERSR 17
ERSR 21
ERSR 24



Cold water coil RBF




Sensible cooling capacity in summer: water 7/12°C
Sensible cooling capacity, [kW/h]
120
100
80
60
40
20
0
0
5000
10000
15000
20000
25000
30000
35000
water flow [m³/h]
ERSR 24
ERSR 21
ERSR 17
ERSR 15
ERSR 12
ERSR 09
ERSR 07


Pressure drops on water side in summer: water 7/12°C
Pressure drops on water side, [kPa]
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
40
45
50
water flow [m³/h]
ERSR 17
ERSR 21
ERSR 24
ERSR 15
ERSR 07
ERSR 12
ERSR 09

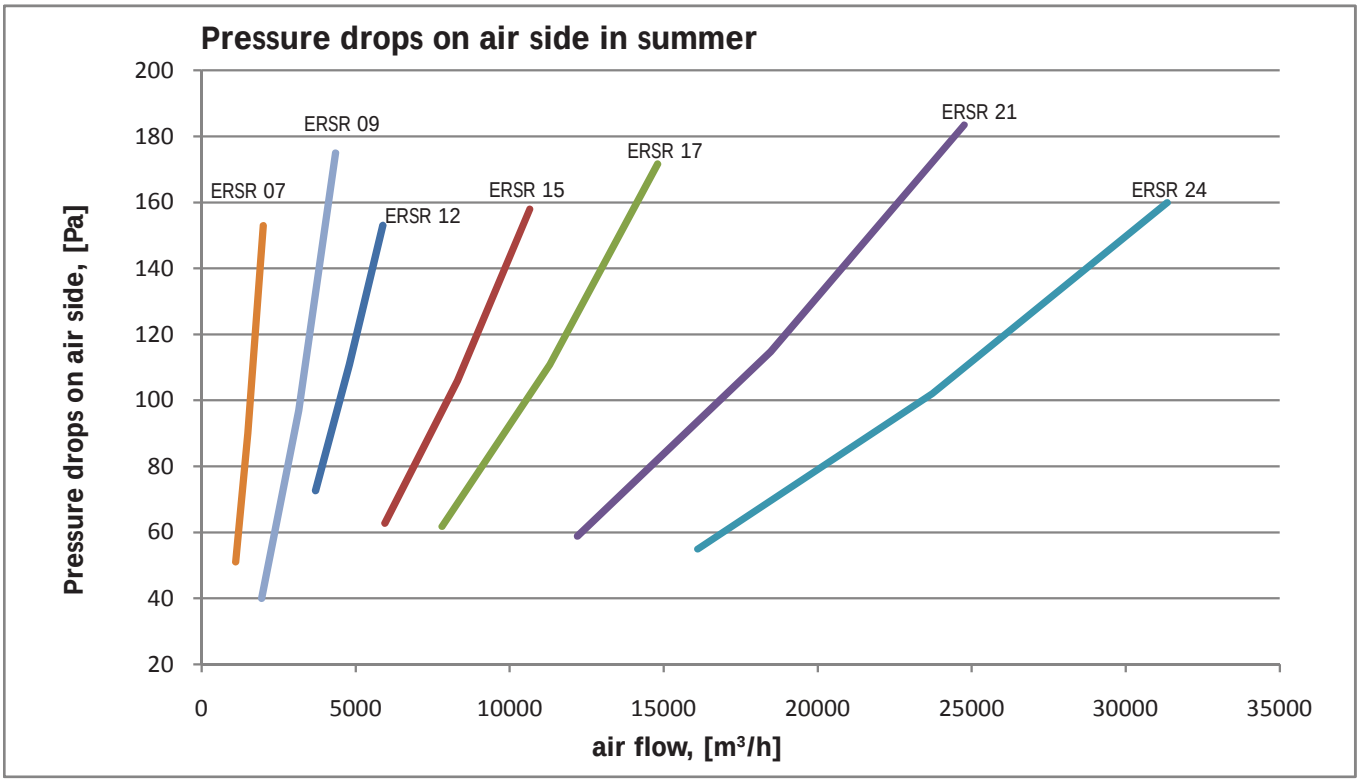


TABLE = Correction factors of the coils capacity according to the glycols percentage.

Glycols, [%]	K total	K resa sensibile
0	1	1
15	0,948	0,954
30	0,879	0,895

3-way valve characteristics

In the following table are reported the primary characteristics and the curve of the pressure drops due to the valve. The 3-way valve is complete with actuator with power supply 230 V ON/OFF.

Valve for the hot coil

MODEL		07		09		12		15		17		21		24	
		T	H	T	H	T	H	T	H	T	H	T	H	T	H
Diameter	inch	1”		1”		1”		1”		1”1/2		1”1/2		2”	
Kvs	[m³/h]	10		10		10		10		25		25		40	

Valve for the cold coil

MODEL		07		09		12		15		17		21		24	
		T	H	T	H	T	H	T	H	T	H	T	H	T	H
Diameter	inch	1”		1”		1”1/2		1”1/2		1”1/2		2”		2”	
Kvs	[m³/h]	10		10		25		25		25		40		40	

Operating limits

MODEL		07	09	12	15	17	21	24
Max. inlet coil water temperature	[°C]	70	70	70	70	70	70	70
Max. water inlet coil water pressure	[bar]	8	8	8	8	8	8	8
Max. glycols percentage of the water coil	[%]	30	30	30	30	30	30	30
Min. room temp. of the inverter	[°C]	-20	-20	-20	-20	-20	-20	-20
Max. room temp. of the inverter	[°C]	70	70	70	70	70	70	70

Sound power level in dB

MODEL	Hz	125	250	500	1000	2000	4000	8000	tot
ERSR 07	**dB(A)**	57,2	55,5	56,8	59,6	62,2	52,6	44,2	65,6
ERSR 09	**dB(A)**	59,1	56,8	59,9	62,4	62,8	51,5	44,7	67,0
ERSR 12	**dB(A)**	65,8	66,6	70,6	70,0	68,8	67,8	55,6	75,3
ERSR 15	**dB(A)**	68,3	68,4	71,0	73,2	70,6	64,6	55,6	76,7
ERSR 17	**dB(A)**	70,2	70,2	73,0	73,5	72,1	67,7	57,3	78,0
ERSR 21	**dB(A)**	72,0	72,0	74,0	74,0	71,0	67,0	58,0	78,0
ERSR 24	**dB(A)**	77,0	77,0	76,0	74,0	70,0	68,0	59,0	79,0

Sound power level of the supply fan, not ducted, with static available pressure equal to 0 Pa.

INSTALLATION, USE AND MAINTENANCE MANUAL

General safety requirements

WARNING!
The ERSR series units are destined to the public and services setors: any other use (in highly corrosive environments, in the presence of potentially explosive surroundings, etc.) is not permitted.

Installation and maintenance

Before installation, make sure that the unit has not been damaged during transportation: the use of a damaged machine may be hazardous. Installation and supplementary maintenance must be carried out by trained personnel in accordance with the existing laws.
The unit must not be used as recovery of equipment or spare parts. Any other use other than that indicated in the present manual may be dangerous and is therefore prohibited.
Before starting any maintenance or cleaning operations, make sure the units is disconnected from the power supply and that it cannot be reconnected without the knowledge of the maintenance engineer.
During maintenance and cleaning, take care of possible burning from heating coils.
Before starting up the unit, make sure that the electrical parts have been connected to the building's earth system.
Before starting the unit, make sure that the fan inlets have been channelized or equipped with protection grilles.
During installation, maintenance and cleaning, personal protective equipment (PPE) must be worn and specific tools used.

Access to the unit

Access to the unit once it has been installed must only be permitted to qualifi ed operators and technicians. The operator is a person who has been authorised by the owner of the machine to carry out operations on the machine (in accordance with that indicated in the present manual). The technician is a person authorised by Aermec or subordinate under their own responsibility by a Aermec distributor, to carry out operations on the machine. The owner of the machine is the legal representative of the company, entity or individual owner of the system in which the Aermec machine is installed.

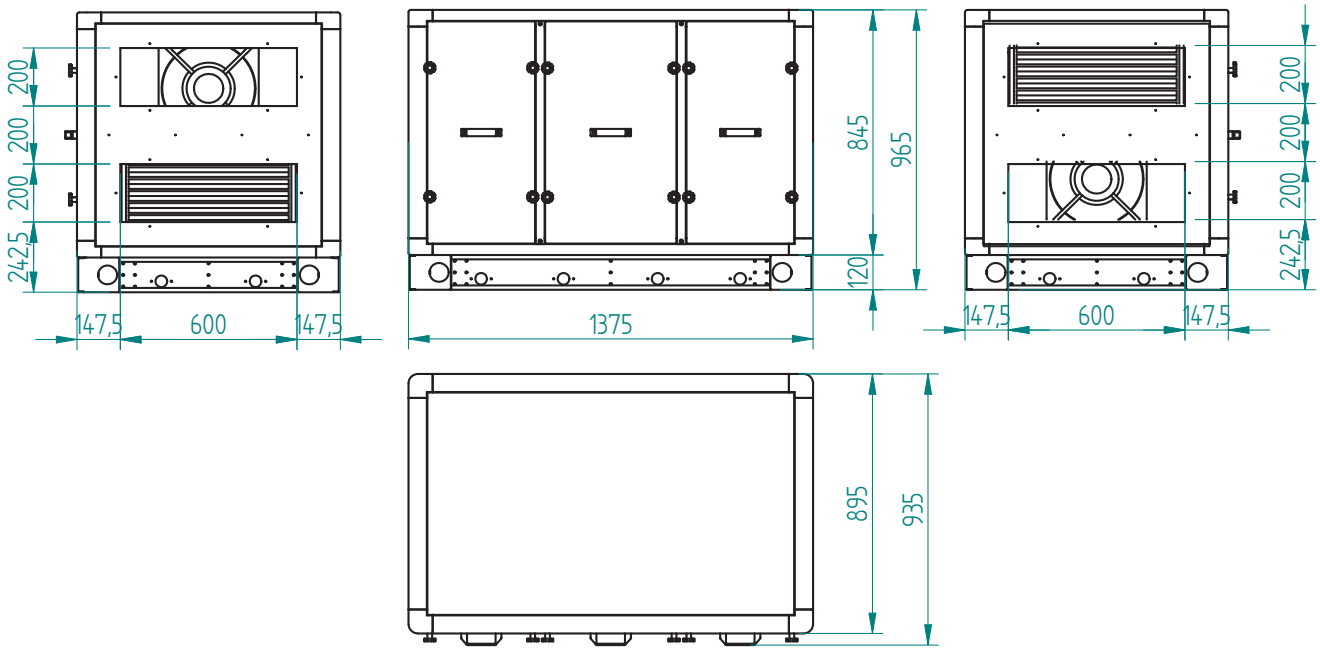
These persons are responsible for the observance of all safety standards indicated in the present manual and the existing. law. In the event that access by unauthorised persons to the machine can not be prevented due to the nature of the location in which it is installed, a cordoned area must be defined around the machine and at least 1.5 meters from the external surface, inside of which only operators and technicians are permitted.

Residual risks

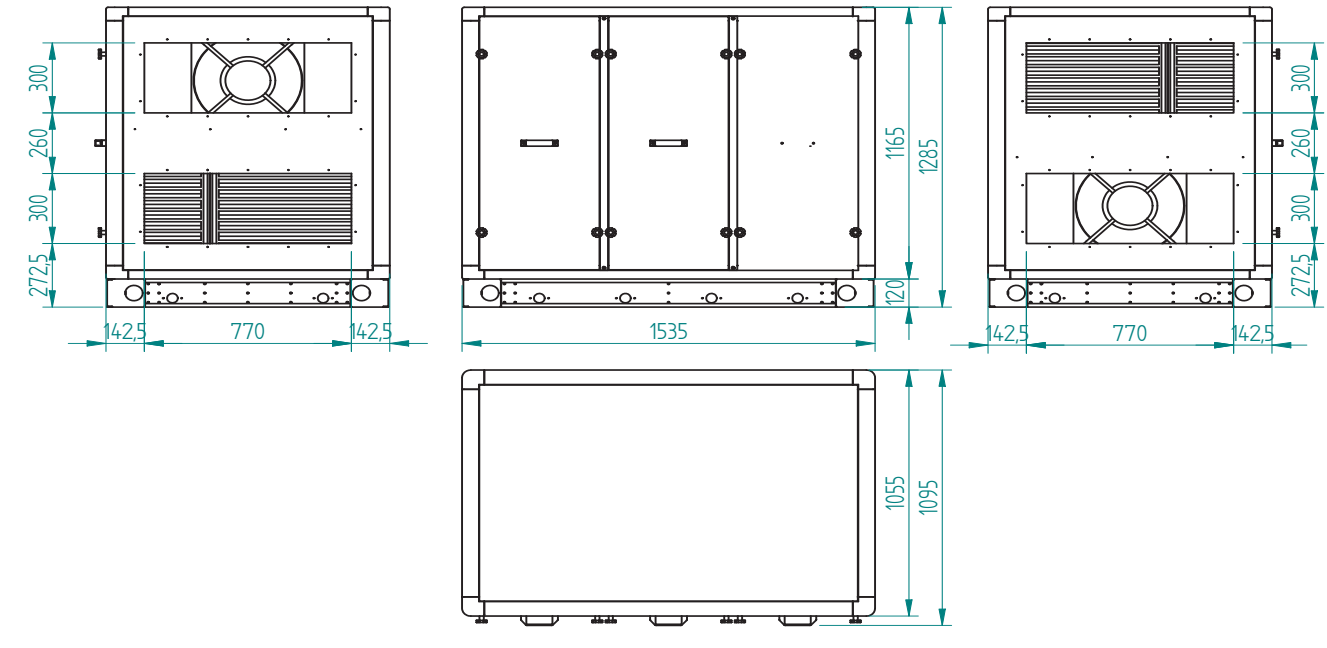
The installation, start-up, shutdown and maintenance of the machine must be carried out in accordance with that stipulated in the technical documentation of the product and in such a manner that no hazardous situations are generated. The machine has been designed so as to reduce to a minimum the risks for the safety of those persons interacting with it. During the design phase, it was not technically possible to completely eliminate the risk causes. Therefore it is imperative to refer to the following instructions.

CONSIDERED PART	RESIDUAL RISK	METHOD	PRECAUTIONS
Inside the unit: rotary heat recovery unit	small cuts, crushing fingers	contact	avoid contact with eyes, use protective gloves
Inside the unit: electric pre-heating battery	burns, injuries	contact	avoid contact
Inside the unit: metal parts and electrical cables	intoxication, electrocution, severe burns	insulation defect of the power supply cables upstream of the unit's electric panel; metal parts under voltage	suitable electrical protection of the power supply line; maximum care when earthing the metal parts
Outside the unit: area around the unit	severe burns	fire due to short circuit or overheating of the power supply line upstream of the unit's electric panel	cable section and power supply line safety system conforming with existing laws.
Accessories: heat exchange battery	small cuts, crushing fingers	contact	avoid contact with eyes, use protective gloves

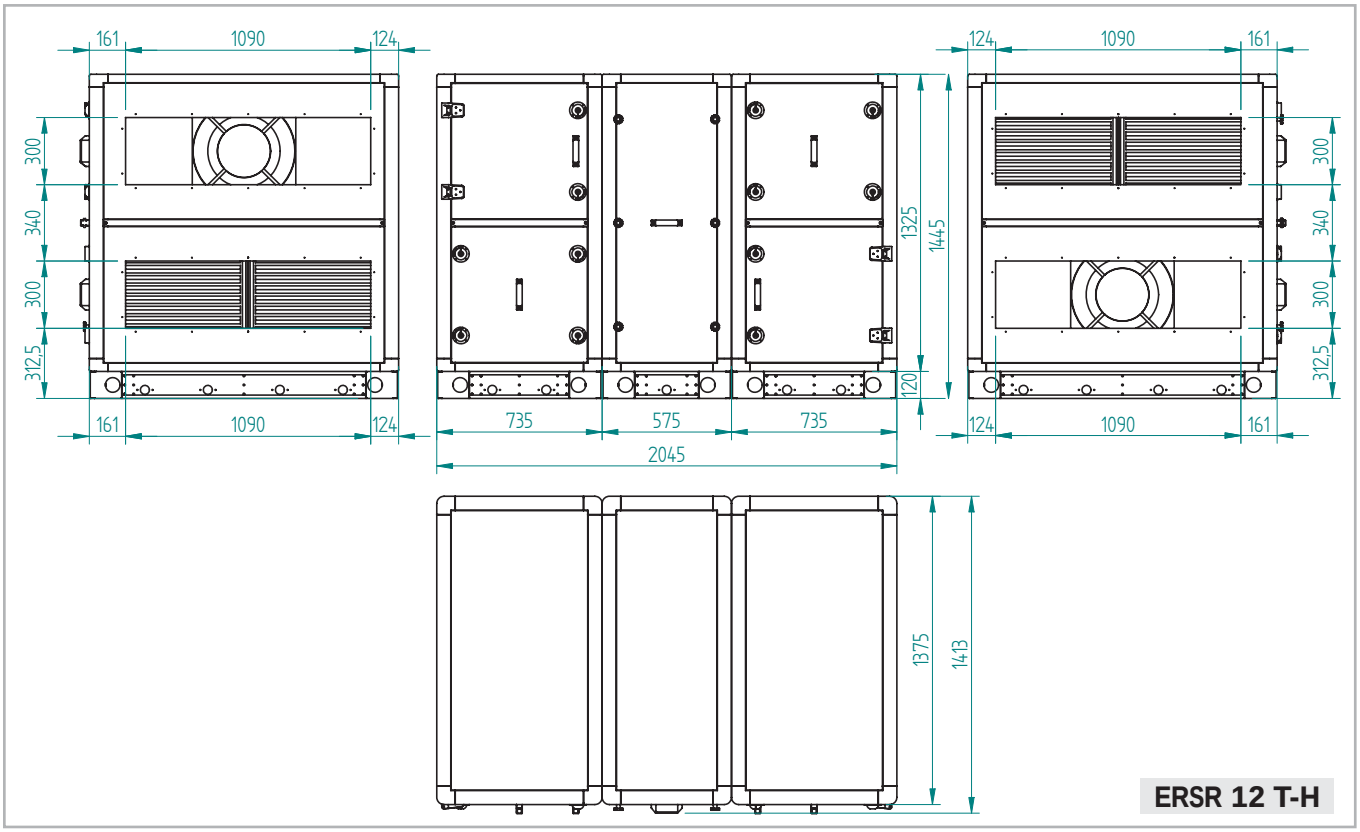
Dimensions



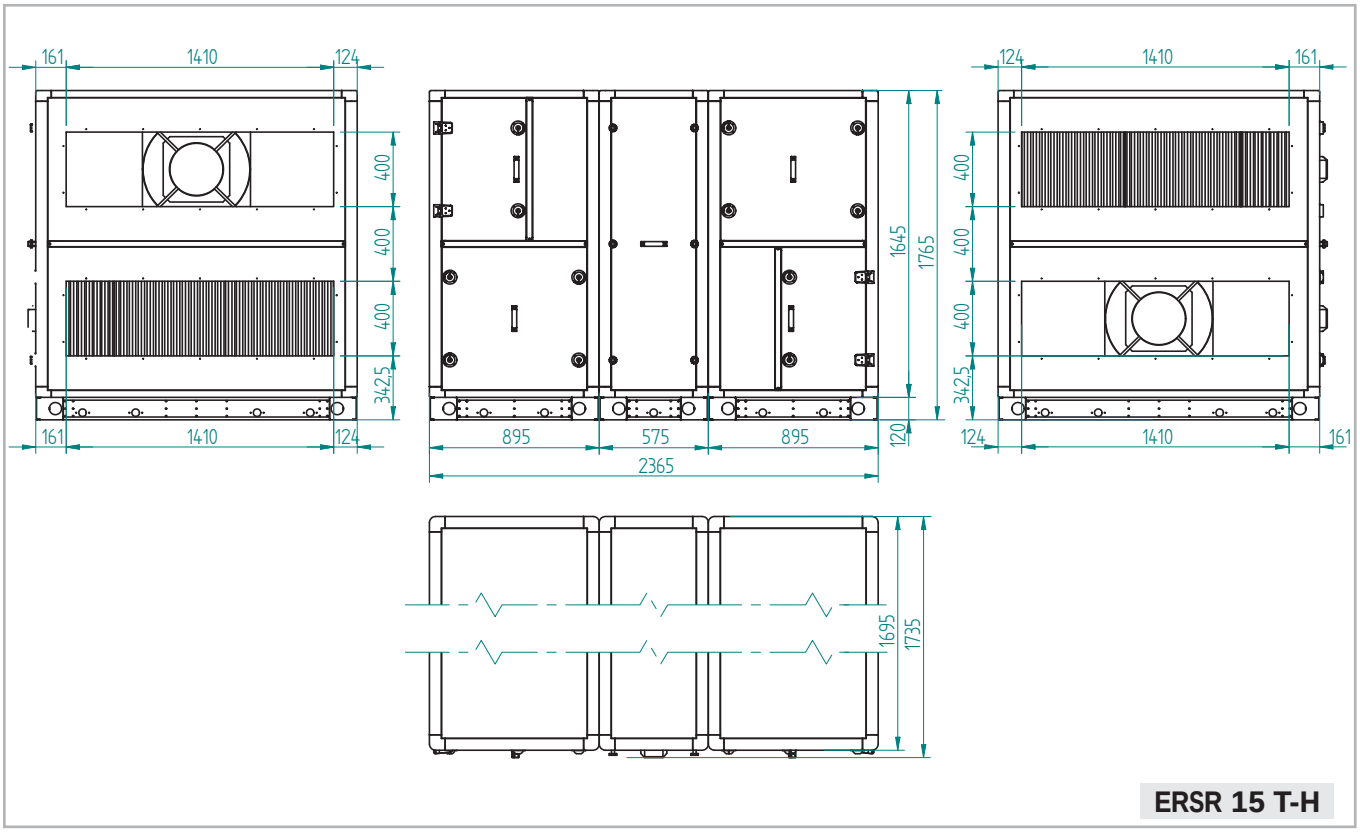
ERSR 07 T-H



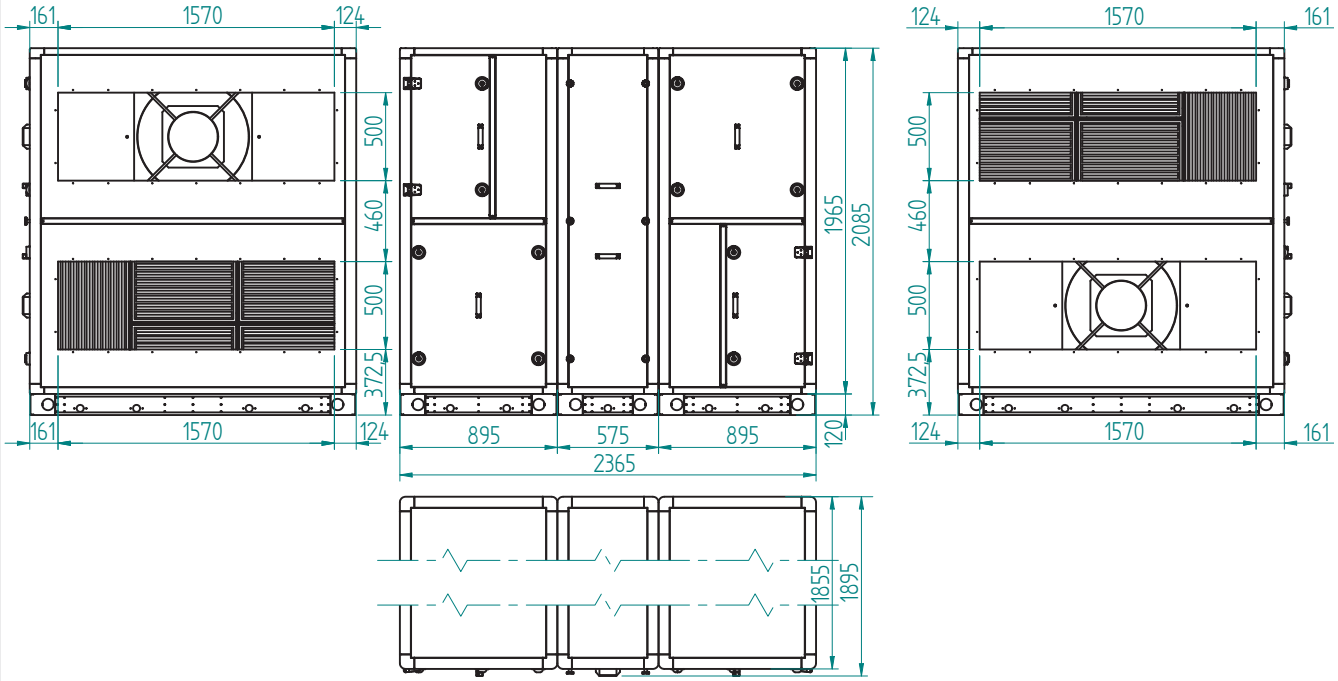
ERSR 09 T-H



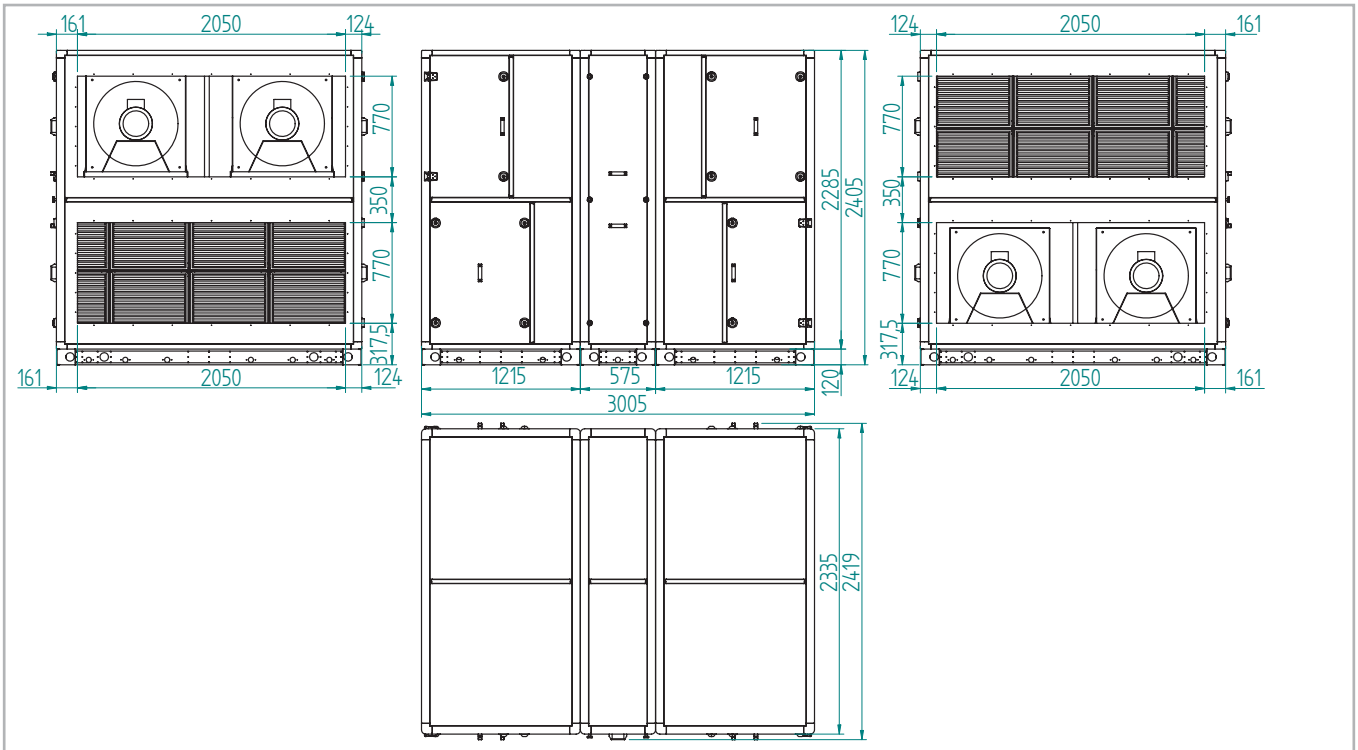
ERSR 12 T-H



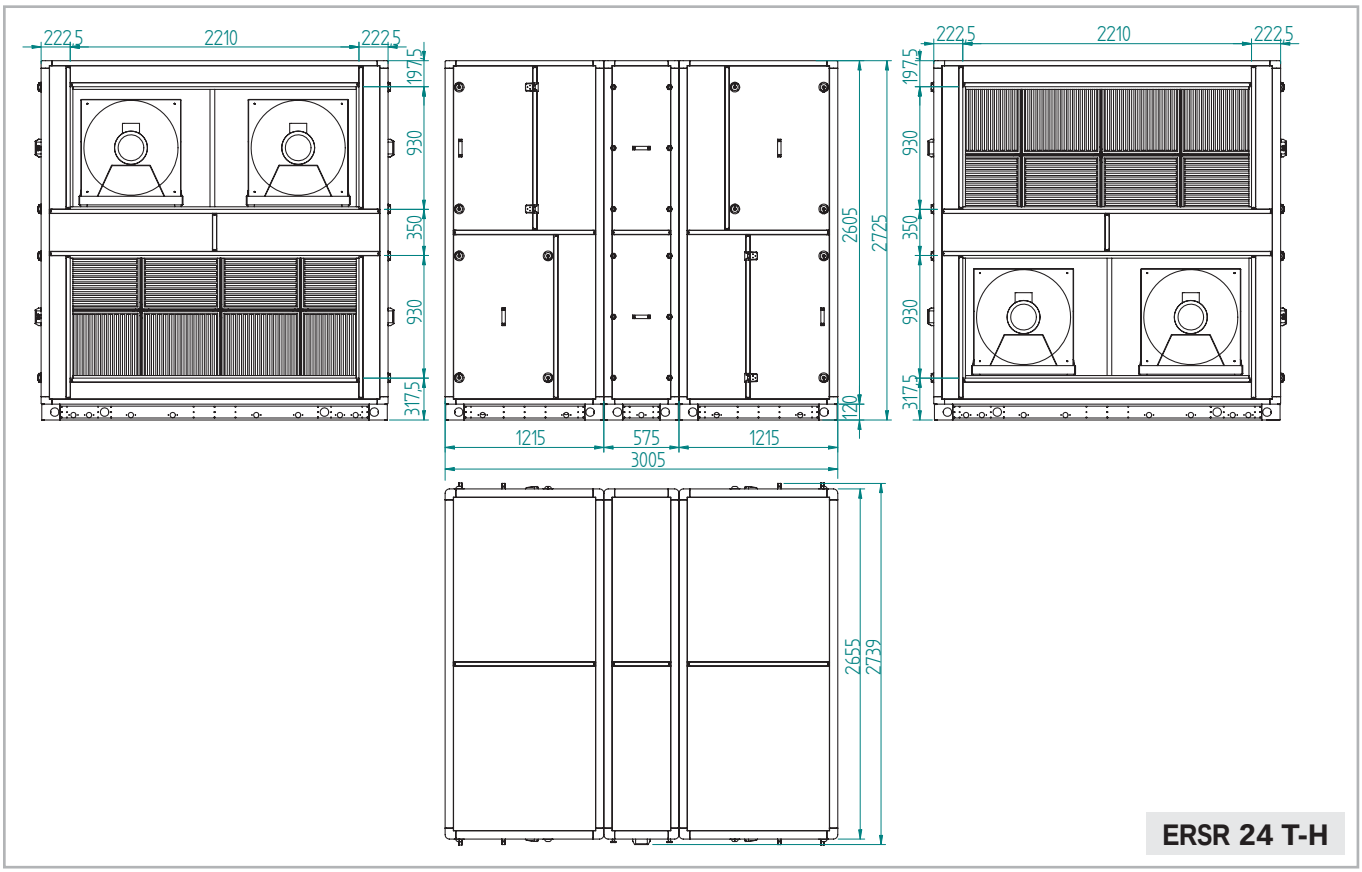
ERSR 15 T-H



ERSR 17 T-H



ERSR 21 T-H

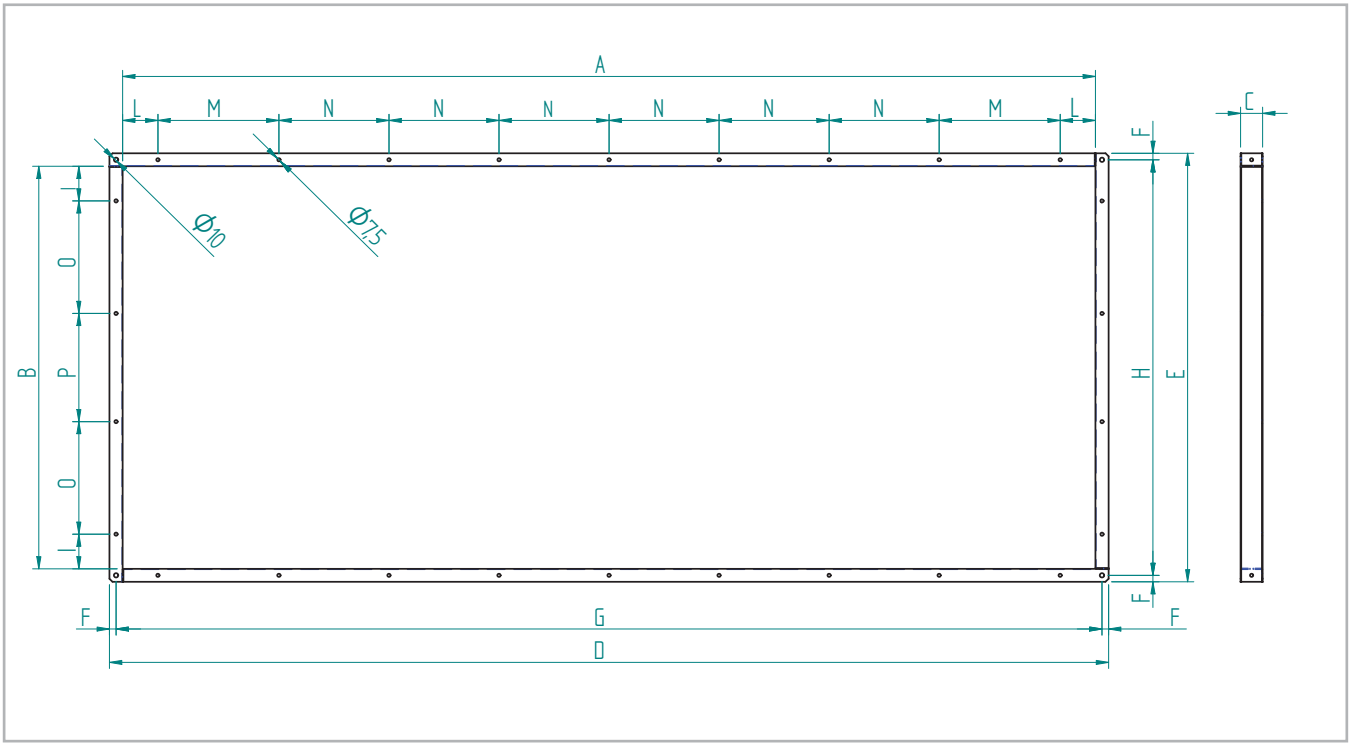


Accessories weight

Accessories weight table (in Kg.)

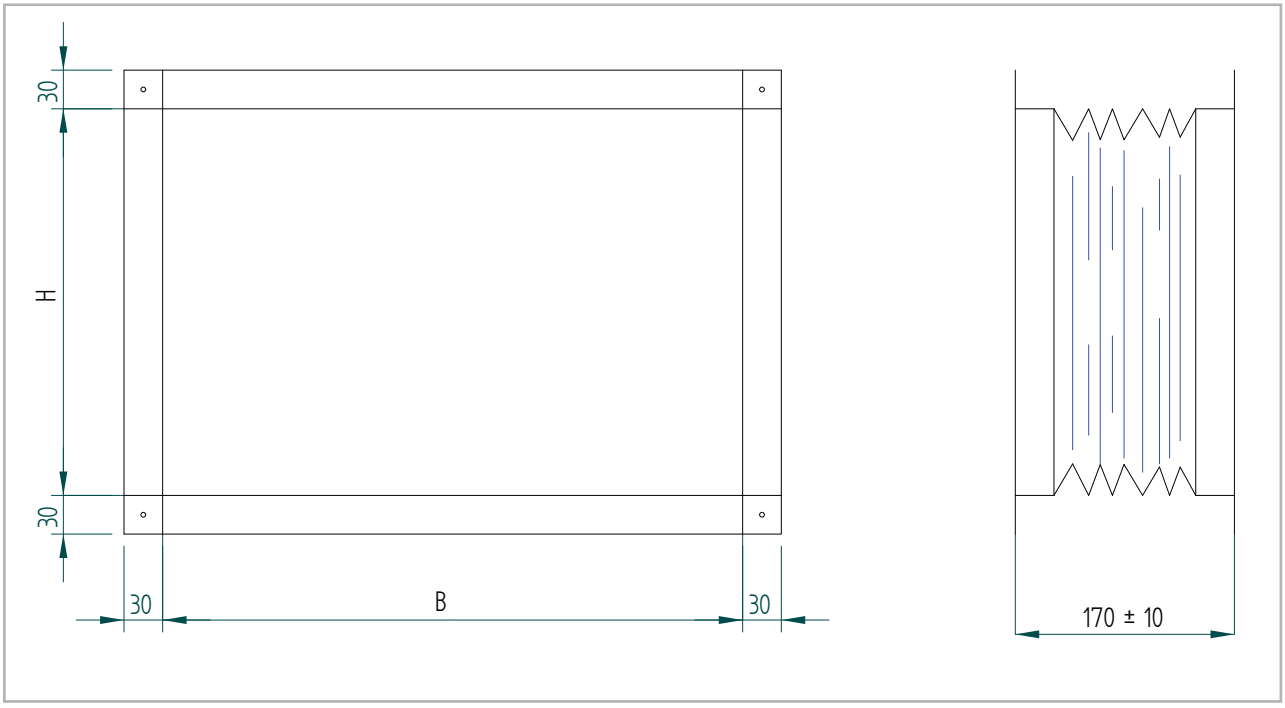
Accessory	ERSR 07	ERSR 09	ERSR 12	ERSR 15	ERSR 17	ERSR 21	ERSR 24
Hot water coil module (RBC)	59	72	88	114	132	166	201
Cold water coil module (RBF)	75	91	117	153	174	227	273
Cold water coil + re-heating coil modules (RBP)	117	142	180	235	271	349	425
Electric battery module (RE)	41	49	60	73	81	99	112
Silencers module (MSS)	81	107	138	179	202	272	325
Exhaust damper module (RSR)	---	---	101	152	176	246	323
Rectangular flanges (FRR)	3	4	5	6	7	9	11
Flexible connections (GAR)	4	5	7	9	10	14	16
Suction damper on the fresh air (HSR)	4	5	6	12	15	18	22
Condensate drain pan (VRC)	1	1	2	2	2	3	3
Protection roof (TDP)	9	12	21	30	33	53	61

Rectangular flange dimensions FRR

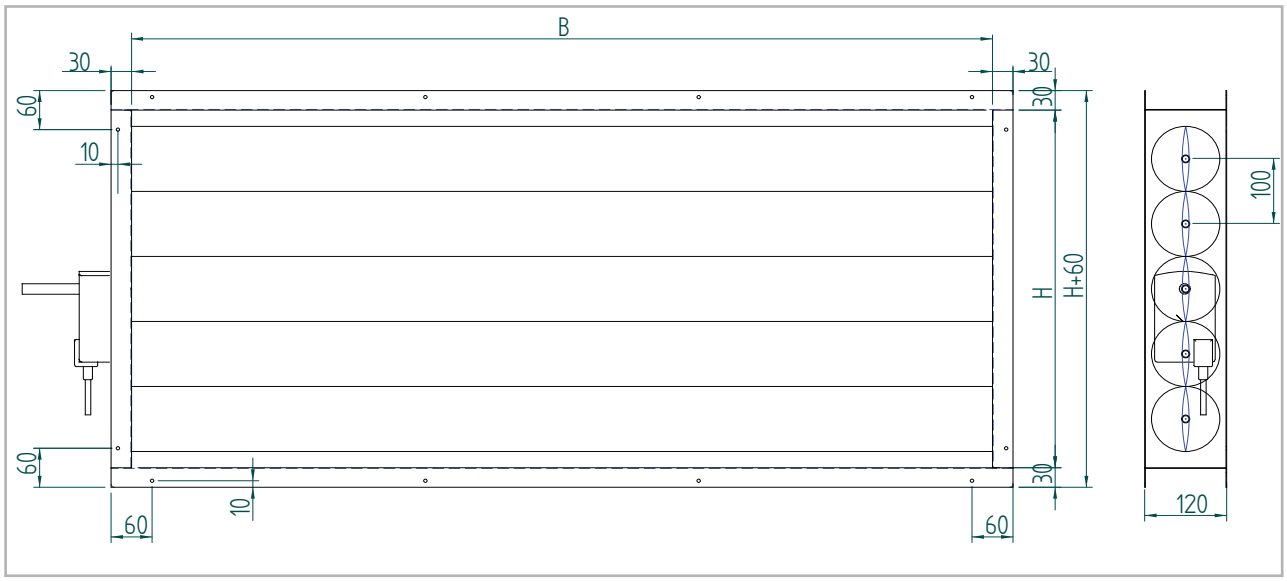


ERSR	A	B	C	D	E	F	G	H	I	L	M	N	O	P
07	600	200	50	660	260	15	630	230	100	100	200	---	---	---
09	770	300	50	830	330	15	800	330	80	80	180	250	140	---
12	1090	300	50	1150	360	15	1120	330	80	80	215	250	140	---
15	1410	450	50	1470	510	15	1440	480	80	80	250	250	290	---
17	1570	500	50	1630	560	15	1600	530	80	80	205	250	340	---
21	2050	770	50	2110	830	15	2080	800	80	80	195	250	180	250
24	2210	930	50	2270	990	15	2240	960	80	80	275	250	260	250

Flexible connection dimensions GAR

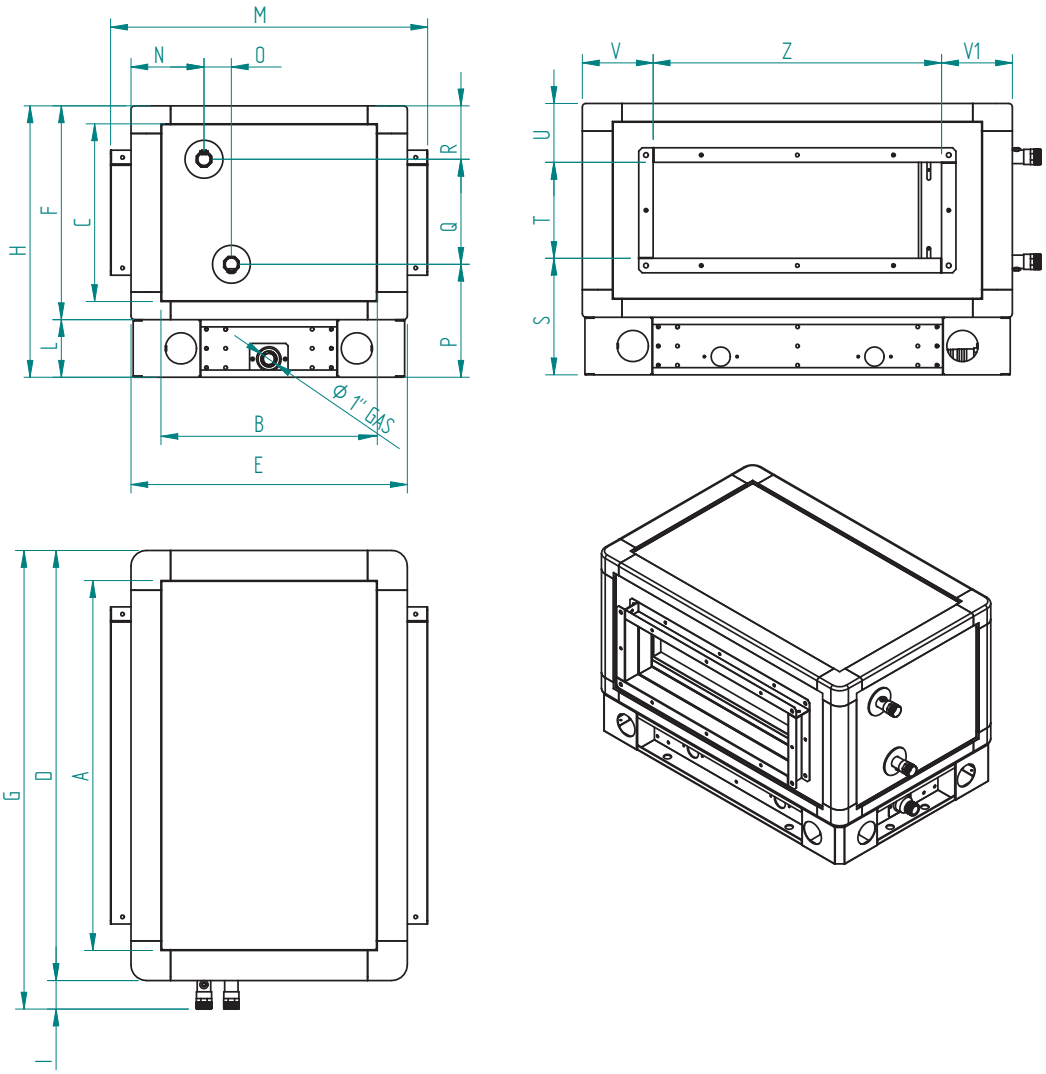


Suction damper on the fresh air dimensions HSR



MODEL		07	09	12	15	17	21	24
B	[mm]	600	770	1090	1410	1570	2050	2210
H	[mm]	200	300	300	450	500	770	930

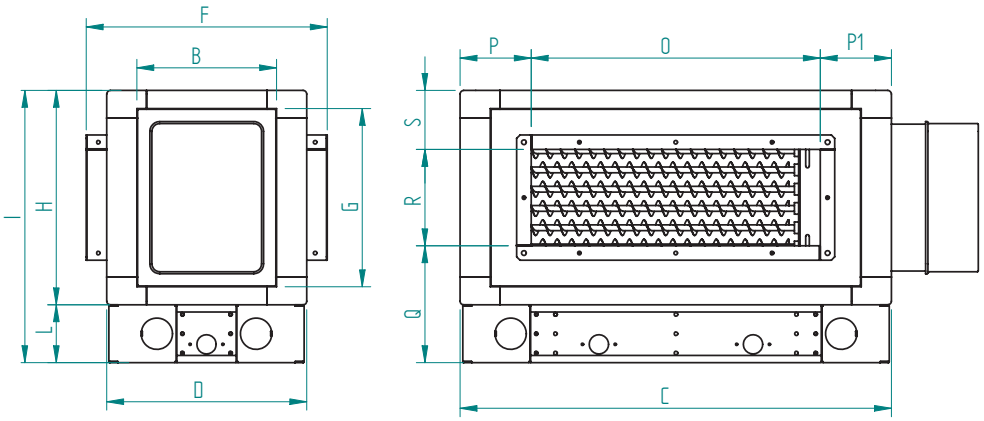
Cold water coil module dimensions RBF

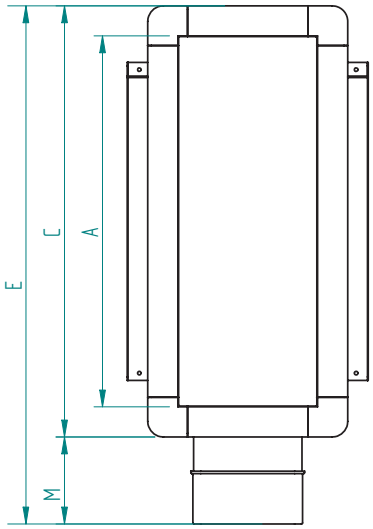


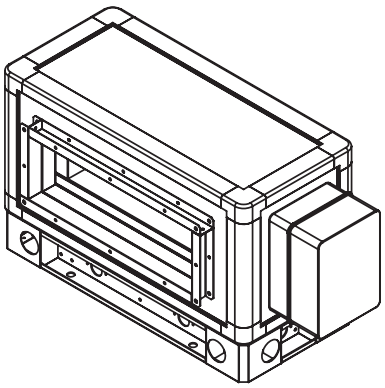
ERSR	A	B	C	D	E	F	G	H	I	L	M
07	770	450	370	895	575	445	954,5	565	59,5	120	660
09	930	450	530	1055	575	605	1114,5	725	59,5	120	660
12	1250	450	610	1375	575	685	1457,5	805	82,5	120	660
15	1570	450	770	1695	575	845	1777,5	965	82,5	120	660
17	1730	450	930	1855	575	1005	1937,5	1127	82,5	120	660
21	2210	450	1090	2335	575	1165	2430,5	1285	95,5	120	660
24	2530	450	1250	2655	575	1325	2765,5	1445	112,5	120	675

ERSR	N	O	P	Q	R	S	T	U	V	V1	Z
07	152	57	235,5	218,5	111,5	242,5	200	122,5	122,5	147,5	600
09	152	57	323,5	368,5	123,5	152,5	300	152,5	152,5	142,5	700
12	150	90	241,5	432	131,5	312,5	300	192,5	124	161	1090
15	150	90	241,5	612	111,5	317,5	450	197,5	124	161	1410
17	150	90	251,5	372	141,5	372,5	500	252,5	124	161	2050
21	150	90	247,5	900	137,5	317,5	770	197,5	124	161	2050
24	165,5	90	258,5	1058	128,5	317,5	930	197,5	222,5	2210	222,5

Electric battery module dimensions RE



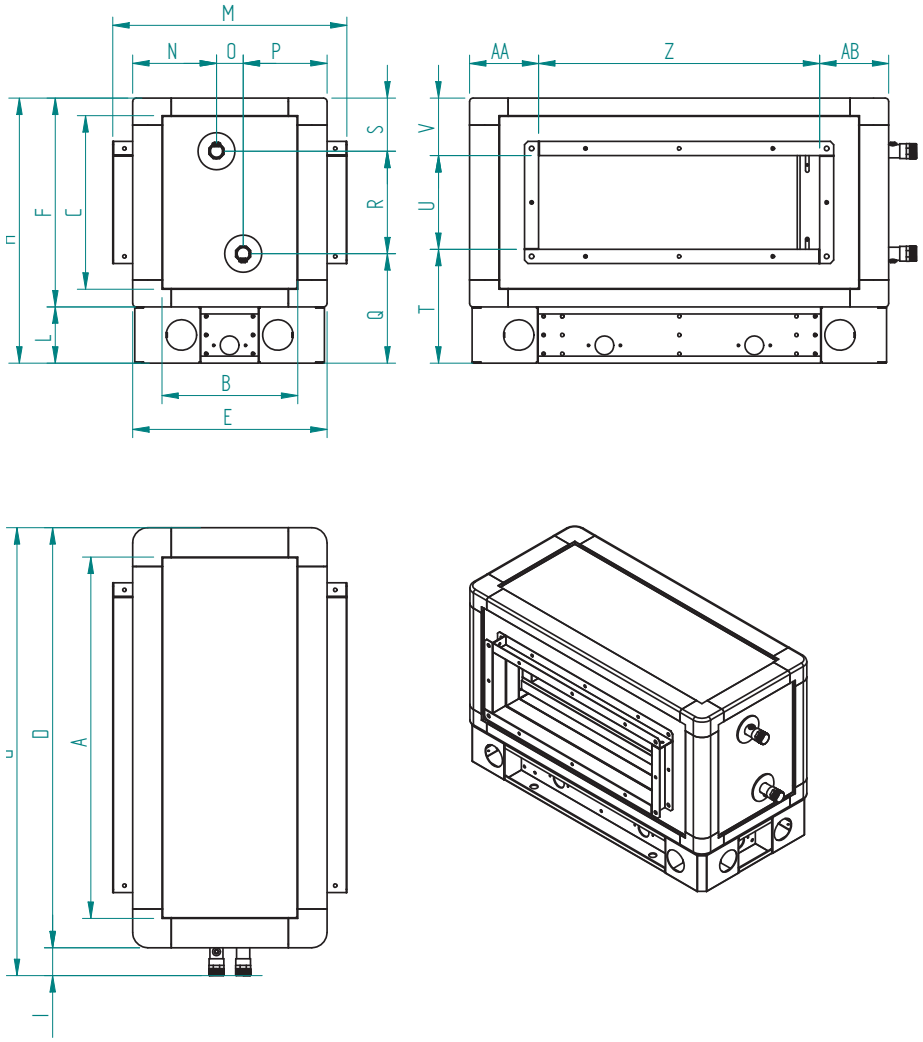




ERSR	A	B	C	D	E	F	G	H	I	L	M
07	770	290	895	415	107,5	500	370	445	565	120	180,5
09	930	290	1055	415	1235,5	500	530	605	725	120	180,5
12	1250	290	1375	415	1555,5	500	610	685	805	120	180,5
15	1570	290	1695	415	1875,5	500	770	845	965	120	180,5
17	1730	290	1855	415	2035,5	500	930	1005	1125	120	180,5
21	2210	290	2335	415	2515,5	500	1090	1165	1285	120	180,5
24	2530	290	2655	415	2835,5	515	1250	1325	1445	120	180,5

ERSR	O	P	P1	Q	R	S
07	600	147,5	147,5	242,5	200	122,5
09	770	142,5	142,5	272,5	300	152,5
12	1090	124	124	312,5	300	192,5
15	1410	124	124	317,5	450	197,5
17	1570	124	161	372,5	500	252,5
21	2050	124	161	317,5	770	197,5
24	2210	222,5	222,5	317,5	930	222,5

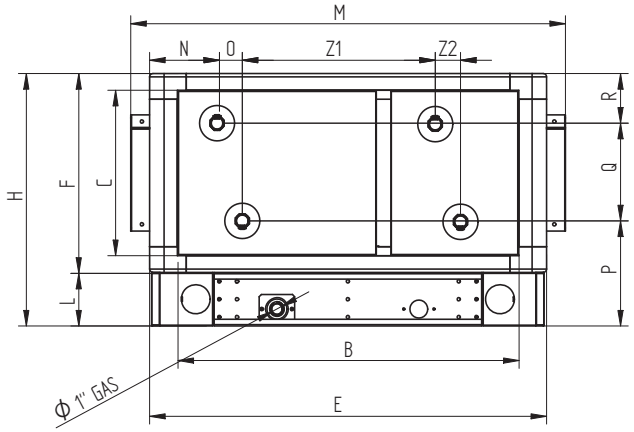
Hot water coil module dimensions RBC

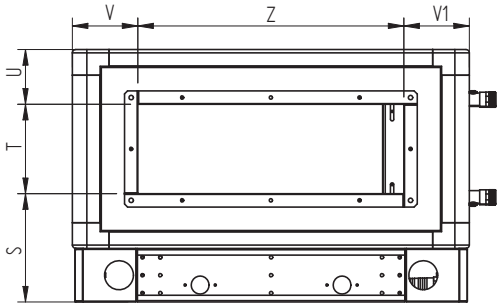


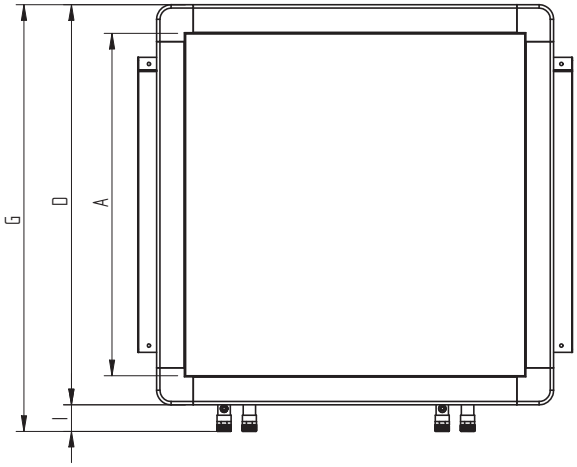
ERSR	A	B	C	D	E	F	G	H	I	L	M	N
07	770	290	370	895	415	445	954,5	565	59,5	120	500	179
09	930	290	530	1055	415	605	1114,5	725	59,5	120	500	179
12	1250	290	610	1375	415	685	1434,5	805	59,5	120	500	177,5
15	1570	290	770	1695	415	845	1754,6	965	59,5	120	500	177,5
17	1730	290	930	1855	415	1005	1937,5	1125	82,5	120	500	177,5
21	2210	290	1090	2335	415	1165	2417,5	1285	82,5	120	500	177,5
24	2530	290	1250	2655	415	1325	2750,5	1445	95,5	120	515	177,5

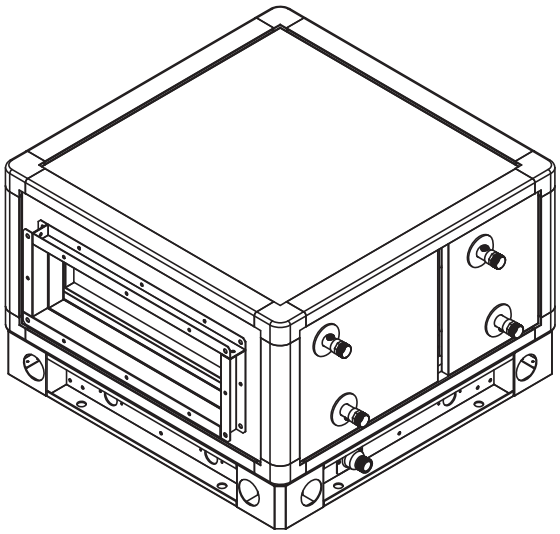
ERSR	O	P	Q	R	S	T	U	V	Z	AA	AB
07	57	179,0	233,5	218,5	113,5	242,5	200	122,5	600	147,5	147,5
09	57	179,0	233,5	368,5	123,5	272,50	300	152,5	770	142,5	142,5
12	60	177,5	234,5	446	124,5	312,5	300	192,5	1090	124	124
15	60	177,5	234,5	626	104,5	317,5	450	197,5	1410	124	124
17	60	177,5	251,5	732	141,5	372,5	500	252,5	1570	124	161
21	60	177,5	241,5	912	131,5	317,5	770	197,5	2050	124	161
24	60	177,5	247,5	1080	117,5	317,5	930	197,5	2210	222,5	222,5

Cold coil + re-heating coil modules dimensions RBP





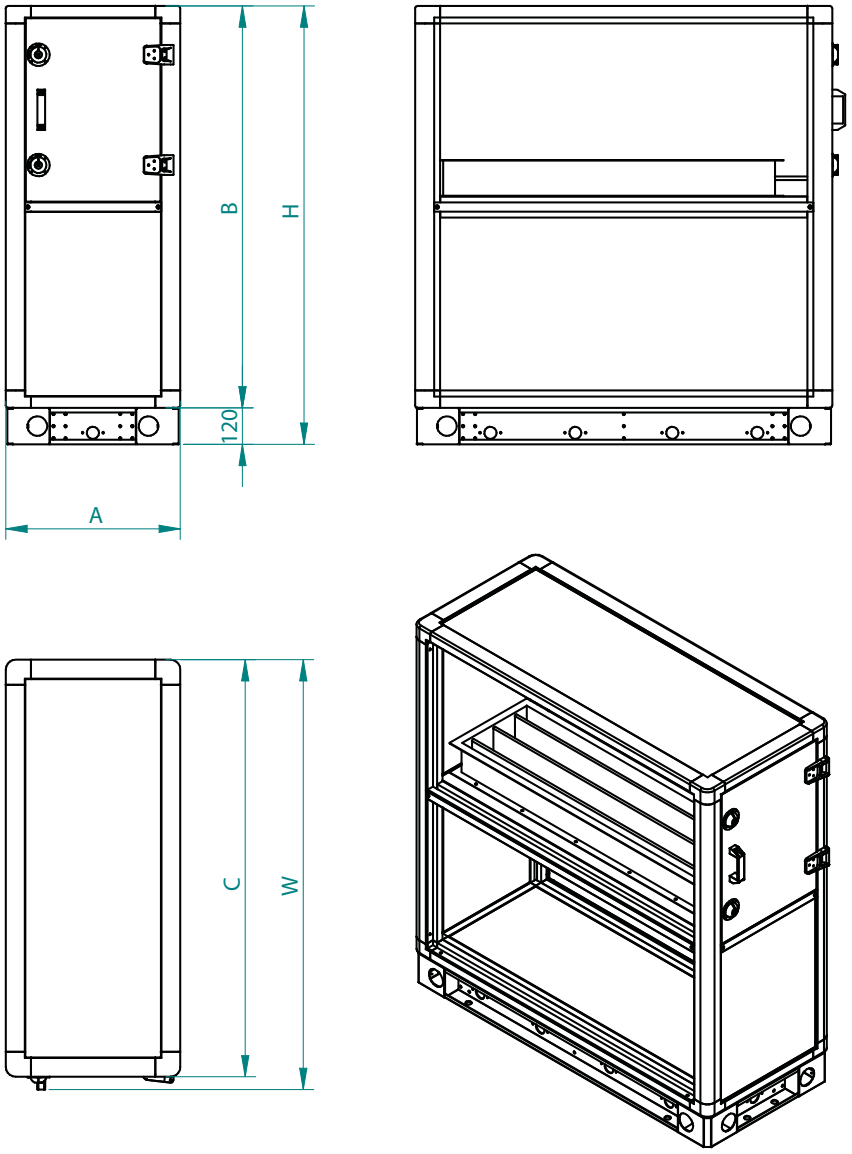




ERSR	A	B	C	D	E	F	G	H	I	L	M	N
07	770	450	370	895	575	445	958,5	565	63,5	120	660	167
09	930	770	530	1055	895	605	1114,5	725	59,5	120	980	152
12	1250	770	610	1375	895	685	1457,5	805	82,5	120	980	150
15	1570	770	770	1695	895	845	1777,5	965	82,5	120	980	150
17	1730	770	930	1855	895	1005	1937,5	1127	82,5	120	980	150
21	2210	770	1090	2335	895	1165	2430,5	1285	95,5	120	980	150
24	2530	770	1250	2655	895	1325	2765,5	1445	112,5	120	995	165,5

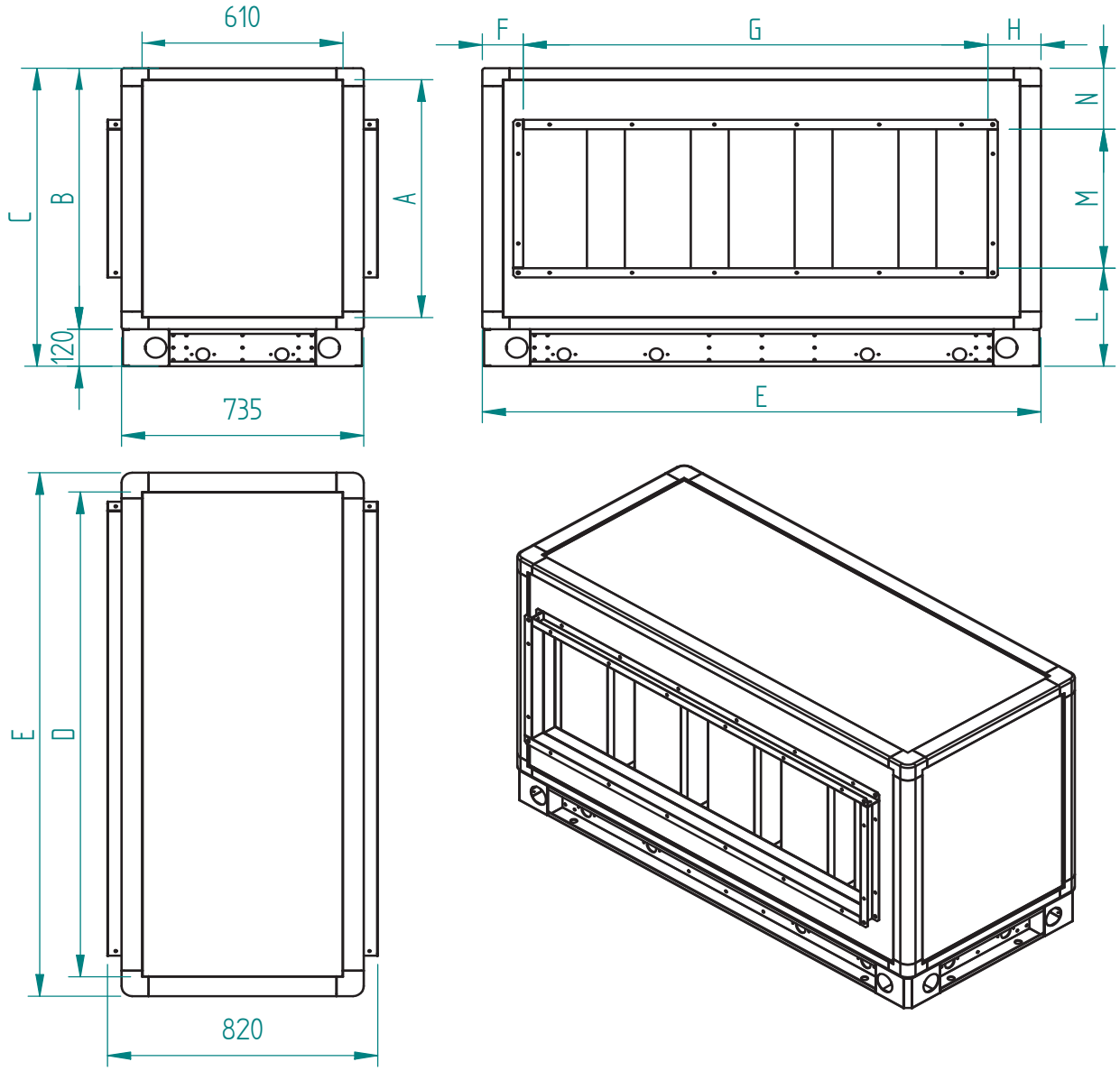
ERSR	O	P	Q	R	S	T	U	V	V1	Z	Z1	Z2
07	57	238,5	211,5	114,5	242,5	200	122,5	147,5	147,5	600	143	57
09	57	323,5	368,5	123,5	152,5	300	152,5	152,5	142,5	700	440	57
12	90	241,5	432	131,5	312,5	300	192,5	124	161	1090	440	60
15	90	241,5	612	111,5	317,5	450	197,5	124	161	1410	440	60
17	90	251,5	372	141,5	372,5	500	252,5	124	161	2050	440	60
21	90	247,5	900	137,5	317,5	770	197,5	124	161	2050	440	60
24	90	258,5	1058	128,5	317,5	930	197,5	222,5	222,5	2210	440	60

Exhaust damper module dimensions RSR



ERSR	07	09	12	15	17	21	24
A	---	---	575	735	735	895	1055
B	---	---	1325	1645	1965	2285	2605
C	---	---	1375	1695	1955	2335	2655
H	---	---	1445	1765	2085	2405	2725
W	---	---	1417	1735	1895	2377	2695

Silencers module dimensions MSS



ERSR	A	B	C	D	E	F	G	H	L	M	N
07	370	445	565	770	895	147,5	600	147,5	242,5	200	122,5
09	530	605	725	930	1055	152,5	770	142,5	272,5	300	152,5
12	610	685	805	1250	1375	124	1090	161	312,5	300	192,5
15	770	845	965	1570	1695	124	1410	161	317,5	450	197,5
17	930	1005	1125	1730	1855	124	1570	161	372,5	500	252,5
21	1090	1165	1285	2210	2335	124	2050	161	317,5	770	197,5
24	1250	1325	1445	2530	2655	222,5	2210	222,5	317,5	930	197,5

Minimum clearances

All operative spaces necessary for the following must be checked before starting installation:

- position of the supply and exhaust air channels;
- passage of electrical power supply cables;
- installation of some parts (three-way valves, condensate discharge trap, etc.) without which the correct functioning of the unit cannot be guaranteed;
- correct maintenance and cleaning operations.

The following diagram illustrates the necessary spaces for the correct installation of the unit.

In particular (see the figure below):

- a space of at least 200 mm must be available in correspondence with the condensate discharge in order to carry out the trap (more detailed instructions can be found on the label attached to the discharge);
- for ordinary maintenance (visual inspection, replacement and cleaning of filters) a space of at least 1000 mm (indicated with L in the diagram) must be available. In the event accessories such as electric pre-heating coils direct expansion or water post heating coils must be fitted or replaced, the available space on the inspection panel side, must be equal to the width of the machine plus 1000 mm:

- Ordinary maintenance:

L = 1000 mm

- Plug in and removal coils:

L = machine width + 1000 mm

- a space of at least 400 mm is required in correspondence with the water coil manifolds to be able to install the three-way valves and related servo controls.
- a space of at least 1000 mm is required for maintenance operations or replacement of the fans in relation to their inlets.

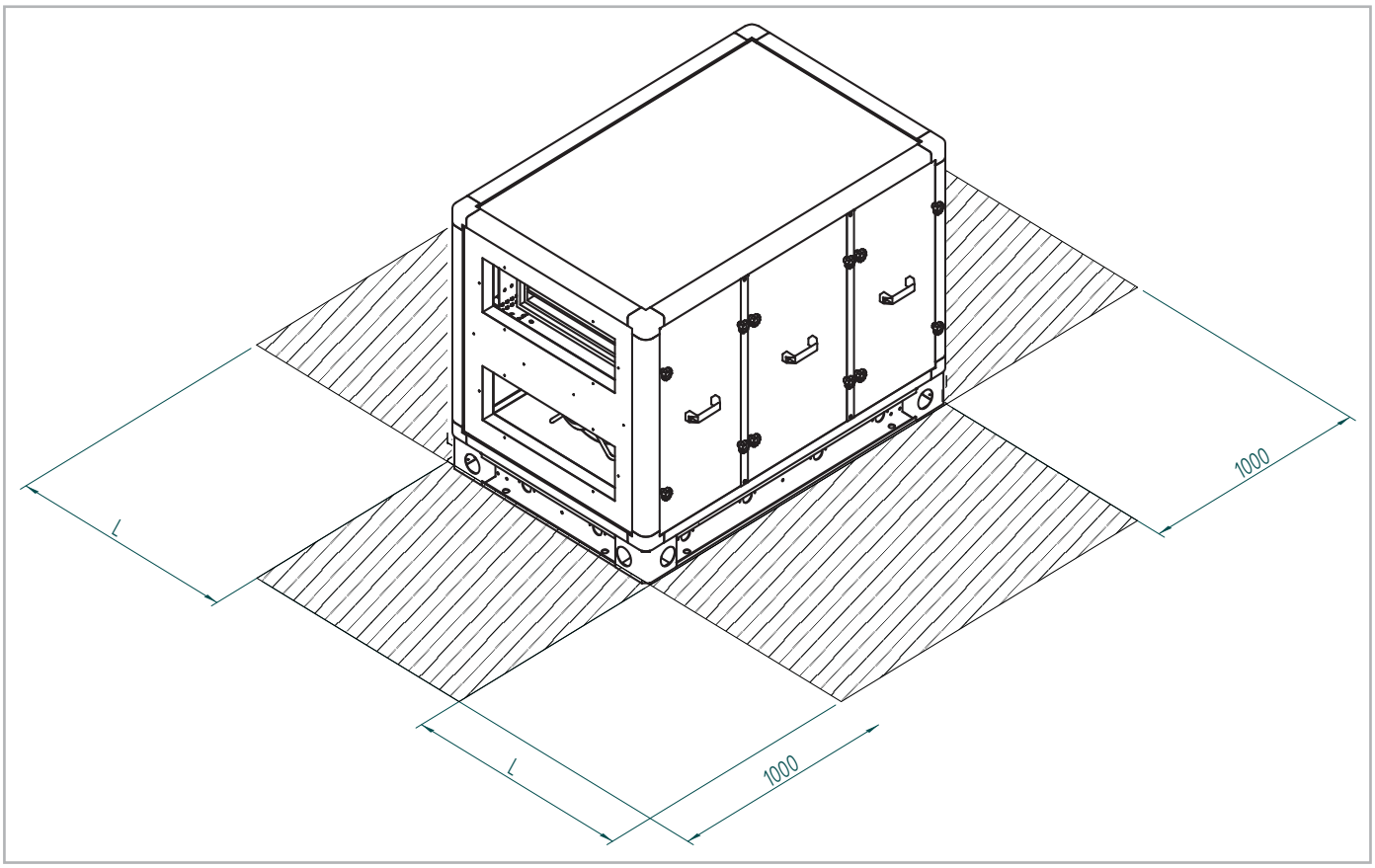


Image = Minimum clearances

Data plates

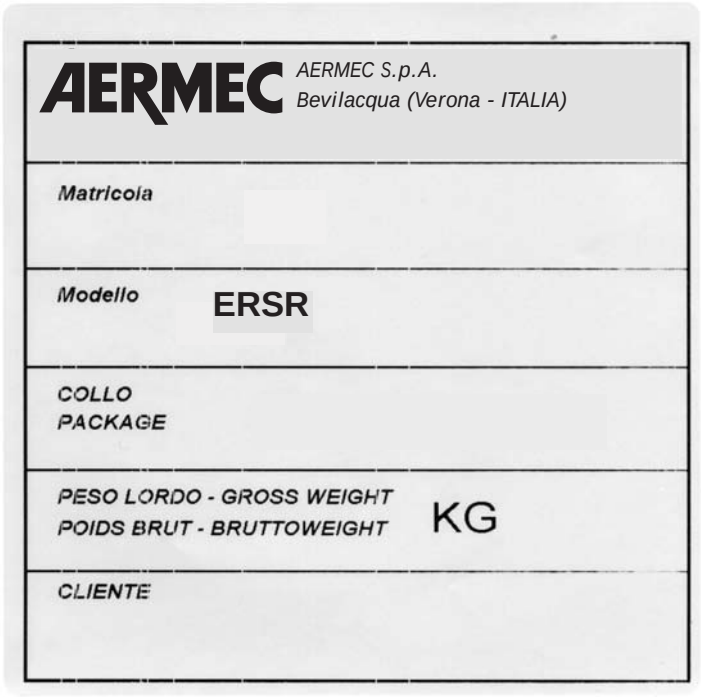
AERMEC S.p.A.
Bevilacqua (Verona - ITALIA)

CE

Matricola

Modello ERSR

Portata Air flow Debit d'air Luftmenge [m³/h]		
Efficienza recuperatore Recovery efficiency Rendement de récupérateur Rekuperator Wirkungsgrad [%]		
Elettroventilatori inglese francese tedesco	[V - ph - Hz] 230 - 1 - 50	[w]
Batteria di pre-riscaldamento inglese francese tedesco [w]	[V - ph - Hz] 400 - 3 - 50	[w]
Batteria di riscaldamento inglese francese tedesco [w]		
Batteria di raffreddamento inglese francese tedesco [w]		



AERMEC S.p.A.
Bevilacqua (Verona - ITALIA)

Matricola

Modello ERSR

COLLO
PACKAGE

PESO LORDO - GROSS WEIGHT
POIDS BRUT - BRUTTOWEIGHT KG

CLIENTE

The ERSR units are equipped with:
• an adhesive plate that indicates the model's main technical data such as nominal air flow rate, efficiency of the heat recovery unit, electrical data and coils performance.
• an adhesive plate indicating, in addition to the model, the gross weight and the customer.
Each ERSR unit is identified by means of a serial number on the plate.
Both labels will be positioned on the inspection side, in correspondence with the control panel if present, or the electrical wiring box. The serial number must be quoted for any future reference and any communication with Aermec S.p.A.

Receipt, warehousing and handling

Packaging

Before installation and use, the packaging of the unit and all parts supplied with it must be completely removed.
The units are supplied packaged with polyethylene film and resting on wooden feet. For transport reasons, some accessories are supplied loose.

WARNING!
The packaging of the unit must be disposed of in accordance with the laws in force.

Transport

In order to transport the unit safely, refer to the weight indication on the rating plate oneach unit.
In any case, transportation must be carried out with the following precautions:
• the unit and possible accessories must not undergo violent knocks so as not to compromise the integrity of the structure and internal parts;
• the unit and possible accessories must be suitably secured to the transportation surface by means of cords or any other means that prevent its movement;
• during transport, the unit and possible accessories must be protected so as to prevent that the protruding parts, such as the coil connectors, condensate discharges, electrical components, etc., are knocked;
• the load must be protected against bad weather during transport.

WARNING!
Make sure the unit cannot move during transport. Any movement that could cause an accident must be avoided by means of suitable restraining means.

Receipt and warehousing

On receipt of the goods, check that they have not undergone damage and that they correspond with that indicated on the accompanying documents. Possible damages or incomplete delivery must be timely indicated on the accompanying document. The unit can be stored in an area protected from weather with temperatures from -20°C to a maximum of +70°C.
On receipt of the unit a first visual control must be made to check:
• all components are present;
• there is no damage to the unit and possible accessories.
• the integrity of the manifolds of possible finned coils and condensate discharges;
• that possible hydraulic connectors are protected with the special plastic caps. Otherweise, make sure they are suitably closed;
• the integrity of the panels;
• the integrity of the electric panel and the electrical and electronic components.

Handling

In order to safely lift and position the unit and possible accessories, refer to the weight indications present on the rating plate or in the present manual.
The lifting of the unit and possible accessories must be carried out using mechanical means and in accordance with the exhisting health and safety standards. The units can be handled both by fork-lift or by crane. The unit should ideally be handle packed.

Lifting with fork lifter

If a forklift is used, make sure it is of suitable capacity and that the forks are of sufficient length. Make sure that the unit is securely balanced.

Lifting with crane

Use a lifting beam or bars, cords of suitable capacity (not chains), 42 mm (1" 1/4) diameter tubes that must be inserted into the holes at the base of the machine (the tubes are not supplied); block the ends of the tubes with pegs or split pins making sure that the cord does not slip off.
Make sure that the unit is securely balanced.

WARNING!
Use suitable personal protective equipment (DPI) during handling operations.

Site storage

Site storage must be made with the following precautions:
• the unit and possible accessories must be stored under cover and protected against accidental knocks;
• the unit must be protected against dust.

WARNING!
The unit must not be used as a support for persons or other objects.

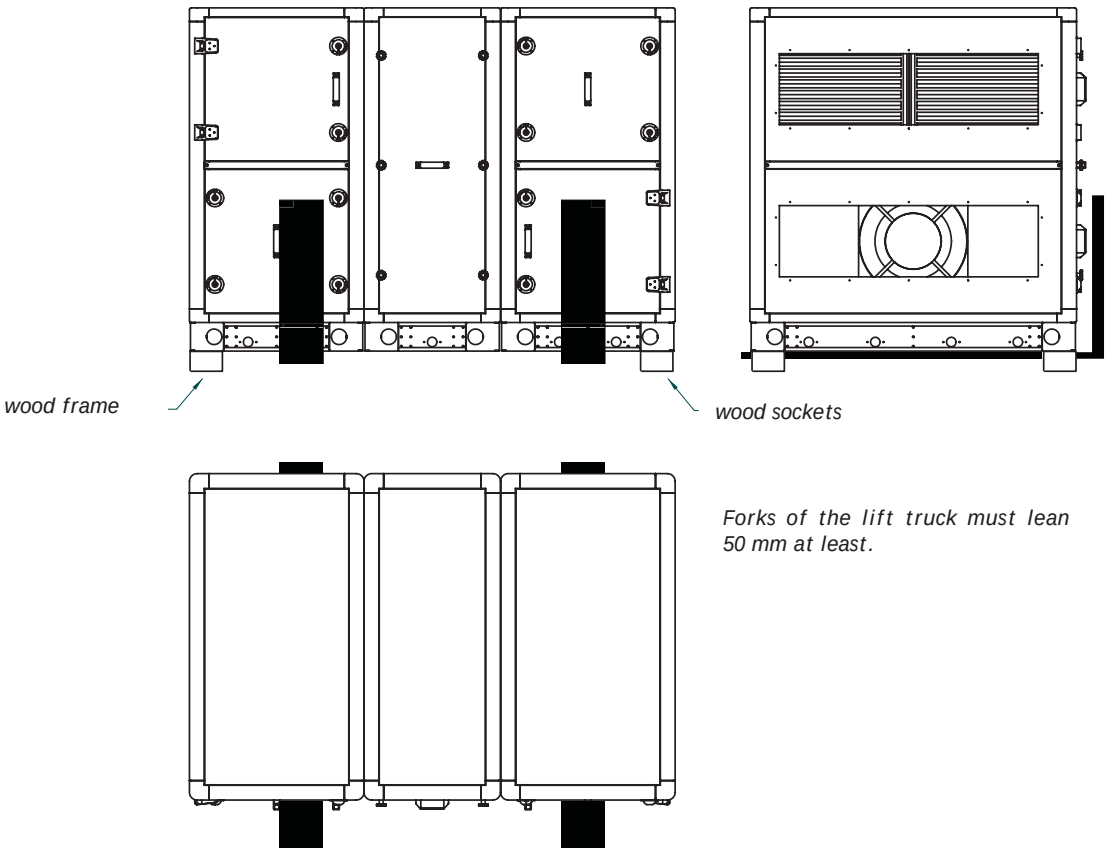


Image = Lifting with lift truck.

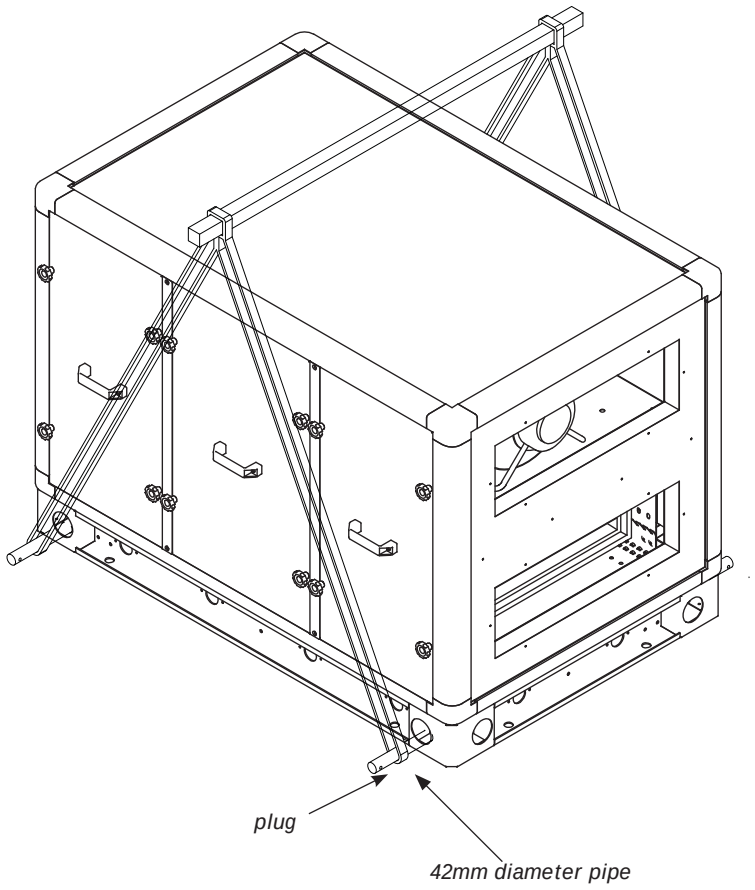


Image = lifting with crane

Installation

WARNING!
Use suitable personal protective equipment (PPE) during installation operation.

WARNING!
Installation and supplementary maintenance must be carried out by trained personnel according with the laws in force.
The unit must be installed in accordance with the clearances indicated in the previous page.
The surface on which the unit rests must be flat and sturdy, suitable to support the weight when operating.

Ducts

WARNING!
It is prohibited to start up the machine if the fan inlets are not ducted or are not protected by protection grilles.

• arrange suitable brackets to support the channelling so as to avoid that their weight overloads the recovery unit;
• connect the supply and exhaust opening vents to the channels through anti-vibration dampers (canvas). The anti-vibration damper joint must be secured to the panel with self-tapping screws making sure that the canvas joints are taught when running;
• arrange an earth cable that acts as a bridge on the anti-vibration joint to guarantee the equipotential connection between the channels and the recovery unit;
• before connecting any bends or branches, etc., set out the supply channel with a straight section with a length of at least 2.5 times the shorter side of the channel A, and avoid that the channelling has an incline greater than 7° to avoid drops of fan's performance.

Ducts:condensate discharge (on request)

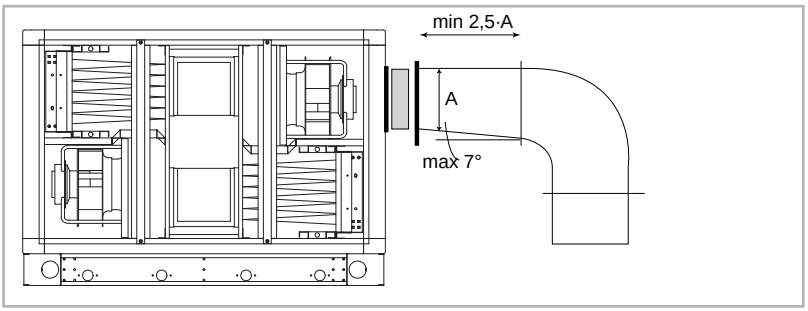
The condensate drain pan has 1" G UNI 338 threaded outlets.
A discharge system must foresee a suitable drain-trap to:
• allow the free discharge of the condensate;
• avoid the undesired inlet air in vacuum systems;
• avoid the infiltration of odours or insects.
The lower part of the trap should have a discharge plug or should in any case allow easy disassembly for cleaning.
The instructions for the dimensioning and execution of the trap are as follows (see figure 21):

H1 = 2P
H2= H1 / 2

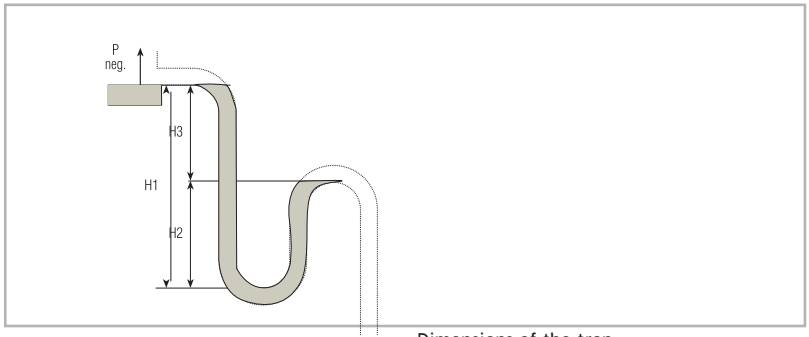
where P is the pressure of the water column expressed in mm (1 mm w.c. = 9.81 Pa).

Water coils connections

All water coil manifolds have threaded male connectors for the water inlet and outlet.
For correct installation follow the simple indications below:
• anti-freeze devices should be present in the event of adverse weather conditions;
• the course of pipes must be such so as not to create obstacles in the case that the coil must be removed and so as not to compromise inspection and maintenance of the unit and possible accessories;
• arrange suitable brackets to support the piping so as to avoid that their weight overloads the recovery unit;
• when screwing together the manifolds and hydraulic circuit, avoid forces that could damage the coil manifolds;
• provide shut-off valves to isolate the coil from the rest of the circuit in the case it must be disconnected from the hydraulic circuit;
• for the connection of water feed pipes, follow the indications on the "WATER INLET" and "WATER OUTLET" plate on the outside panels;
• fit an air relief valve on the highest section of the circuit and a water discharge valve on the lowest section of the circuit;
• once the connections have been made, the external rubber gasket must be positioned flush the panels in order to avoid air leckage.



Diverting side of the duct.



Dimensions of the trap.

WARNING!
To avoid burns during the heating function, the piping must be carefully insulated with suitable material as far as the panels.

Electric connections: earthing

WARNING!
Make sure that the characteristics of the mains power supply are compatible with the electrical characteristics indicated on the part's name plates.

The electrical connections and wiring must be carried out by qualified personnel according with the laws in force.

WARNING!
Each electrical appliance must be connected to the earthing of the system.

Use the connectors with the earth symbol to connect the earthing of the unit and possible accessories to the earthing of the building.

Power supply connection

WARNING!
Make sure that the characteristics of the mains power supply are compatible with the electrical characteristics indicated on the machine's rating plate.
The machine is equipped with a manual supply cut-out device.
The wiring diagrams of the accessory electrical panel are supplied alongside the machine.

Electrical connections: batteries

WARNING!
Make sure that the characteristics of the mains power supply are compatible with the electrical characteristics indicated on the machine's rating plate.
Carry out the following instructions for the connection of the batteries:
• fit upstream a suitable protection with a thermomagnetic differential switch;
• always connect a safety thermostat to guarantee the cut out of the electric heating coilpower supply in the event of excess temperatur;
• the safety thermostat must be in series with the regulating thermostat (not supplied);
• the power supply of the coil must be slaved to the function of the fans;
• always connect the earthing wire of the electric battery to the terminal inside the electric box.

The wiring diagrams are supplied loose the unit.

First start-up

WARNING!
Make sure that all the indications in the present manual have been carried out before carrying out the controls on the first start-up.
Before starting the recovery unit, check:
• with a tester that the voltage on the terminals is 230 V ± 5%: if the voltage is subject to frequent changes, contact our technical department for the choice of suitable protections;
• that the unit is correctly secured to the ground;
• the connection of the unit to the building's earthing;
• the channel connections;
• the connection of the condensate discharge with the trap;
• the insulation of the coil's supply pipes;
• the absence of air in the water and direct expansion coils.

WARNING:
Before starting up, check that all the unit's panels are in place and fixed with suitable screws.
Refer to the regulation manual for the setting of all parameters and for detailed information concerning the machine operations and control board.

Preliminary controls - electric parts

Before carrying out the controls in this paragraph, make sure that the power supply line of the unit is disconnected upstream of the unit. Make sure that the disconnecting device is padlocked or that a suitable notice warning not use is applied to its handle.
All operations must be carried out without voltage as follows:
- move the main switch to the "0" position (OFF);
- remove the panel of the electric panel;
- make sure that the power supply cables are correctly dimensioned;
- make sure that the recovery unit is connected to the earthing;
- make sure that the screws which fix the wires to the electrical components inside the panel are tight so as to guarantee a good contact;
- close the door of the electric panel.

At this point power can be applied to themachine closing the line disconnecting device and moving the main switch of the machine to the "1" position (ON).

Start and stop

Press the "on/off" button on the microprocessor or open the remote on/off contacts.Disconnect the machine on the main switch of the electric panel for long periods.

Start-up

Move the main switch on the electric panel to the "ON" position. Proceed as follows according to the the machine model:

ERSR with electronic regulator:
Refer to the regulation manual supplied with the machine.

Running

If present, the microprocessor control system of the recovery unit will regulate, depending on the foreseen option, the air flow or the pressure according to that previously described and to the regulation manual.

Unit maintenance

WARNING!
Use suitable personal protective equipment (PPE) during maintenance operations

WARNING!

Before accessing to the unit for maintenance or cleaning operations, make sure the unit is disconnected from the power supply, that the supply can not be switched on again without the maintenance engineer's knowledge and that the heat exchange coils are off.

WARNING!
Take particular care when working close to finned coils because they are particularly sharp.

WARNING!
After the maintenance operations, make sure that panels are correctly closed by means of fixing screws.

The ERSR series recovery units have been conceived to require less maintenance and to make each operation easy. Below are some simple instructions for correct maintenance of the unit.
The maintenance program must in any case be carried out by a qualified technician.

Ordinary maintenance

Ordinary maintenance consists in simple operations that should be carried out monthly as follows:
- check the tightness of the fans fixing screws to the panels;
- check that the machine's power supply cable has not undergone any alterations that could compromise its insulation;
- make sure that the screws which fix the wires to the electrical components inside the electric panel are tight so as to guarantee an electrical connection; the same also goes for the earthing connections.

Filters maintenance

The filters cleaning is fundamenta in order to maintain a high qualitative standard of air in the room. The synthetic filters fitted to the ERSR unit can be regenerated using compressed air or washing them in cold water. Proceed as follows to disassemble the filters:

- **r**emove the inspection panel with knobs;
- remove the filters;
- clean the filters;
- reassemble all parts in reverse order.

NOTE:

Contact the head offices for the supplementary maintenance of the recovery unit, condensate drain pan and heat exchanging coils.

Unit disposal

The ERSR series recovery units have been designed to guarantee continual operations. The duration of some main parts depends on the maintenance to which it has undergone.
At the end of their useful life, the ERSR series units must be disposed according to that foreseen by the present laws.

If the unit is to be disposed of, the operation must be carried out by specialised personnel.
The main materials of the ERSR series units are:
• galvanised sheet steel (panels, fans);
• aluminium or aluminium alloy sheet metal (recovery unit, condensate drain pan, coil fins, dampers, electric motor);
• copper (coil pipes, winding of the electric motors);
• polyurethane foam (sandwich panels insulation).

Diagnosis and fault solving

PROBLEM	CAUSE	SOLUTION
1. INSUFFICIENT AIR FLOW RATE	1. Clogged filters	- Clean the filters
	2. Clogged coils	- Clean the coils
3. NOTHING AIRFLOW	1. Power supply off	- Check the voltage
	2. Electric motor burnt	- Replace the electric motor
4. NOISE 'ANOMALOUS	1. Excessive flow rate	- Reduce the flow rate
	2. Fan bearings worn or defective	- Replace bearings
	3. Foreign bodies on the fans' impellers	- Clean the wheel
4. DRIVE WATER	1. Clogged trap	- Clean trap
	2. No trap or not properly made	- Arrange for a trap as indicated in the present manual
5. FAILURE OF DESIRED TEMPERATURES	1. Inlet temperature outside the permitted limits	- Check the water temperature
	2. Air in the water coils	- Bleed the coils
	3. Insufficient water flow rate in the water coils	- Increase the water flow rate
	4. Insufficient coil inlet water temperature	- See 5.1
	5. Dirty surface of the recovery unit pack	- Clean the surface of the pack

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