

RECHPMX



Heat recovery unit with builtin heat pump system from 2.000 to 14.000 m³/h



The wholly self-controlled RECHPMX units are designed and developed for civil, commercial or industrial buildings in which the air renewal and its thermal treatment are possible by one compact and efficient solution; in fact, the use of two sequential heat recovery systems (static + dynamic) makes the unit particularly efficient, according to the energy saving and pollution reduction laws and, contemporarily, making the plants easier both for realization and management.

RECHPMX series, T, TB and P version (and T-H, TB-H and P-H version with thermal break frame), consists of five sizes, to cover 2000÷14000 m³/h airflow range, 0,5÷29,3 kW leftover (nominal) cooling power range and 3,2÷40,5 kW leftover (nominal) heating power range. According to the selected version, RECHPMX unit can satisfy:

- the renewal of room air and the neutralization of summer and winter heat loads connected with it (T version)
- as above, but with built-in free-cooling system also (TB version)
- the neutralization of the room heat loads also, by using room recycled air partially (P version)

Accessories

- AEH: Pre or post electric heater
- FTR: F7 class rigid bag filter
- PSTD: Air filter pressure switch
- MDL: Liquid manometer
- SKR: Adjusting damper
- SSE: On/off damper actuator
- CU-A: Fresh air side external hood
- CU-E: Exhaust air side external hood
- GA-A: Fresh air side flexible joint
- GA-E: Exhaust air side flexible joint
- TPR: Roof cover

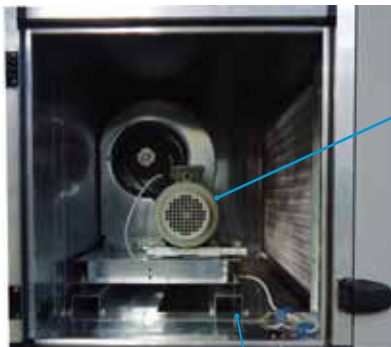
RECHPMX Heat recovery unit with builtin heat pump system



The side technical space, allows a very easy access for inspections and maintenance



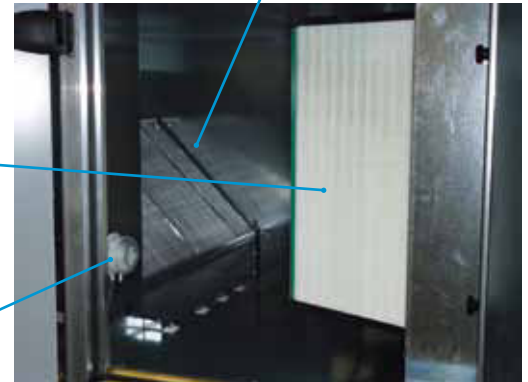
Large doors with handles and hinges for check or replacement of all the components



The fan section, mounted on rubber supports anti-vibration

The evaporator and condenser coils with cu tubes and aluminum fins

Static recovery by the high efficiency aluminum cross flow exchanger



The F7 rigid bag filter

The air filter pressure switch

Mechanical features

Unit frame made in extruded aluminum profiles and sandwich panels (thick 42 mm) RAL 9002 pre-painted. Class 0 mineral wool insulation. Synthetic filter cell, G4 efficiency class, removable by side; as option fibreglass rigid bag filters, F7 efficiency class. Fan sections composed of belt driven double inlet forward curved blade fans and class F IP55 three phase motors; rubber isolators below fan motor group; safety micro-switches on inspection doors. High efficiency cross low heat recovery - EUROVENT certified - air to air type, made in aluminum. Second section of heat transfer by heat pump refrigeration system (R407C) essentially composed of:

- scroll hermetic compressor(s)
- evaporator/condenser coils Cu tube,
- Al fins
- bi-flux thermostatic valves
- cycle inversion valves
- low/high pressure switches
- high pressure manometers
- liquid separators and receivers

Built-in electrical board complete with microprocessor for temperature control and remotable consolle for setting and for visualizing sensor and set-point temperature values, both for master module and slave module(s) (max 4 modules); prearrangement for remote supervision system by RS485 connection and MODBUS protocol.

Controls

It consists of an on board electrical panel totally wired and a remote control panel that allows temperature regulation in environments equipped with heat recovery unit with built-in heat pump system; it is an easy plug and play electronic control. The device automatically controls the fan (1 step fan speed control) as well as the possible electric heater in order to adjust the room temperature in the most suitable way. Temperature acquisition is performed with the return air sensor, the fresh air sensor and exhaust air sensor (for defrosting in heat mode). The electronic control is suitable to manage electric pre and/or post heater, free-cooling/free-heating by-pass damper based on fresh air sensor, automatic heating/cooling changeover, manage of external dampers, heat exchanger defrost based on exhaust air sensor (it reverses the refrigerant cycle), clogged filter alarm by pressure switch, remote ON-OFF via digital input, sensors diagnostic, electric heater post ventilation and thermal protection alarm, high and low pressure alarm, compressors and fans thermal protection, integrated scheduling clock with four programs for each day of the week and RS485 serial interface with MODBUS protocol. The display clearly shows the current working mode and ambient room temperature and desired set point is easily changeable with arrows keys; moreover there are two different level of parameters to setup and adjust every functions of the unit. A single remote control panel can connect up to four units, allowing an easy and quick setup and check from a single site.

Accessories

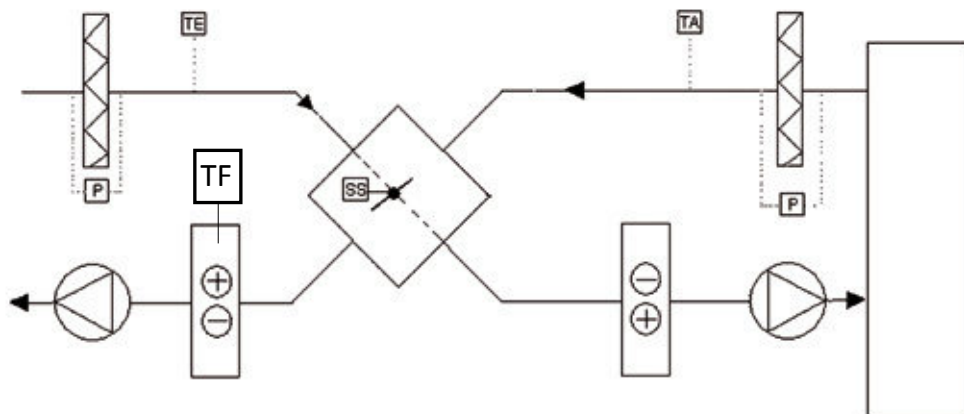
AEH: pre or post heating electric heater

SSE: on/off spring actuator for damper

PSTD: air filter pressure switch



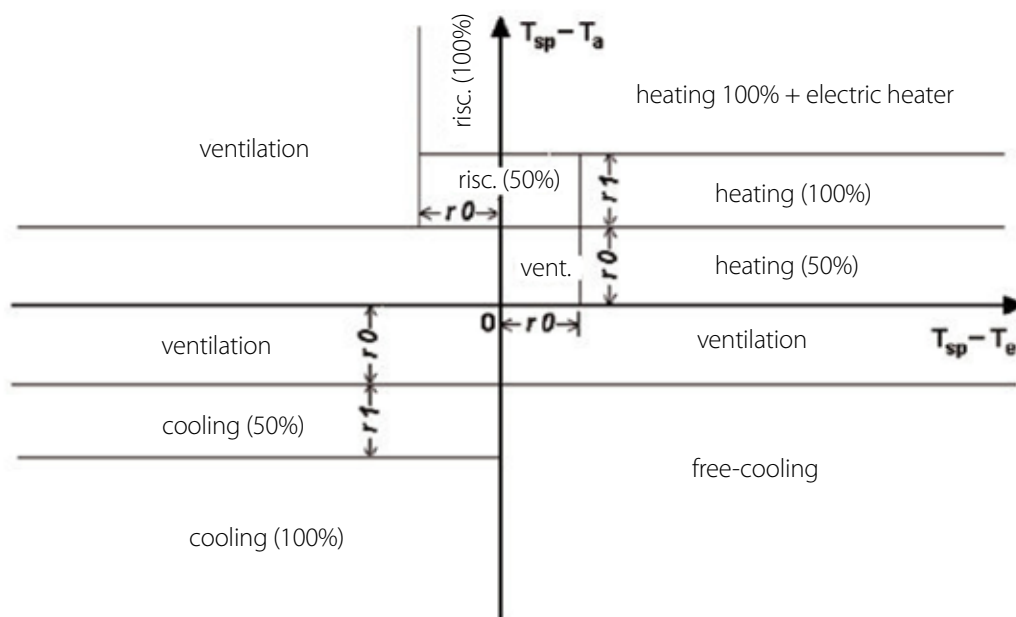
The schematic diagram shows position and function of the components of the unit.



- **TA** = return air sensor
- **TE** = fresh air sensor
- **TF** = exhaust air sensor
- **Tsp** = set point temperature

RECHPMX Heat recovery unit with builtin heat pump system

According to $T_{sp}-T_e$ and $T_{sp}-T_a$ values, the electronic control determines by it-self the working mode of the system, deciding cooling, heating (with or without electric heater) or defrosting mode.



Heat recovery unit with built-in heat pump system cannot work with air low different from nominal air low in order to assure a good operation of the refrigerant system.

RECHPMX			24	48	70	100	140
Airflow	Nom	m ³ /h	2400	4800	7000	10000	14000
	Min	m ³ /h	2000	4000	6000	8000	10000
External Static Pressure	Nom	Pa	350	350	350	350	350
Sound pressure level at 1 m	Nom	dB(A)	47	49	50	51	53
Full load total current		A	13,4	26,1	40,8	56,0	80,4
Electrical power supply		V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Cooling mode							
Efficiency T-TB ⁽¹⁾	Nom	%	44,3	42,8	47,5	50,5	45,8
Recovered cooling capacity T-TB ⁽¹⁾	Nom	kW	2,10	4,10	6,20	9,00	11,9
Compressor cooling capacity ⁽¹⁾	Nom	kW	11,0	22,0	33,0	44,0	58,0
Total cooling capacity T-TB ⁽¹⁾	Nom	kW	13,1	26,1	39,2	53,0	69,9
Available cooling capacity T-TB ⁽¹⁾	Nom	kW	0,50	1,10	1,90	1,30	1,00
EER T-TB ⁽¹⁾	Nom		3,47	3,45	3,49	3,52	3,53
Supply temperature T-TB ⁽¹⁾	Nom	°C	25,6	25,6	25,5	25,8	25,9
Efficiency P ⁽¹⁾	Nom	%	53,9	48,1	45,1	43,7	43,9
Recovered cooling capacity P ⁽¹⁾	Nom	kW	0,90	2,10	3,20	4,30	5,80
Compressor cooling capacity ⁽¹⁾	Nom	kW	11,0	22,0	33,0	44,0	58,0
Total cooling capacity P ⁽¹⁾	Nom	kW	11,9	24,1	36,2	48,3	63,8
Available cooling capacity P ⁽¹⁾	Nom	kW	5,57	11,5	17,5	22,4	29,3

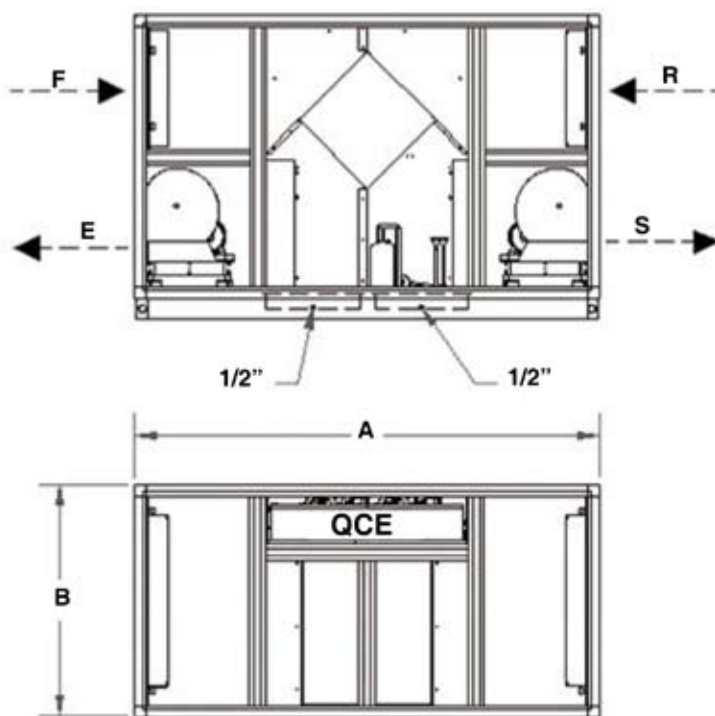
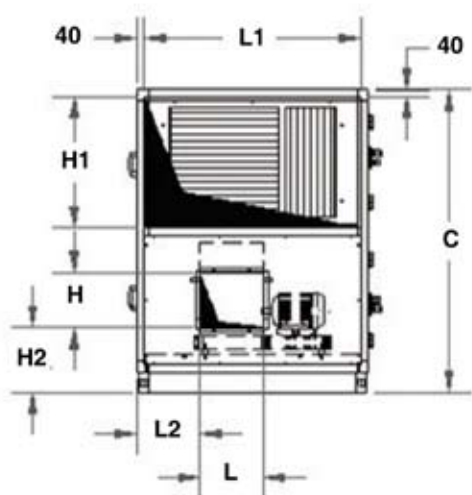
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RECHPMX			24	48	70	100	140
EER P ⁽¹⁾	Nom		3,47	3,45	3,49	3,52	3,53
Supply temperature P ⁽¹⁾	Nom	°C	21,6	21,4	21,2	21,7	22,0
Heating mode							
Efficiency T-TB ⁽²⁾	Nom	%	51,0	49,2	54,8	56,4	51,4
Recovered heating capacity T-TB ⁽²⁾	Nom	kW	9,90	19,5	29,2	40,5	53,1
Compressor heating capacity ⁽²⁾	Nom	kW	12,0	24,0	36,0	48,0	64,0
Total heating capacity T-TB ⁽²⁾	Nom	kW	21,9	43,5	65,2	88,5	117,0
Available heating capacity T-TB ⁽²⁾	Nom	kW	3,20	6,10	10,0	12,0	15,1
COP T-TB ⁽²⁾	Nom		5,61	5,58	5,62	5,72	5,72
Supply temperature T-TB ⁽²⁾	Nom	°C	23,9	23,7	24,2	23,5	23,2
Efficiency P ⁽²⁾	Nom	%	62,5	55,4	52,0	50,3	50,6
Recovered heating capacity P ⁽²⁾	Nom	kW	4,50	9,90	15,1	20,4	27,5
Compressor heating capacity ⁽²⁾	Nom	kW	12,0	24,0	36,0	48,0	64,0
Total heating capacity P ⁽²⁾	Nom	kW	16,5	33,9	51,1	68,4	91,5
Available heating capacity P ⁽²⁾	Nom	kW	7,15	15,2	23,5	30,2	40,5
COP P ⁽²⁾	Nom		4,23	4,35	4,41	4,41	4,47
Supply temperature P ⁽²⁾	Nom	°C	28,8	29,3	29,9	28,9	28,5
Fans							
Full load total current		A	5,20	9,68	16,20	22,60	31,20
Full load total power input		kW	2,20	4,40	8,00	11,00	15,00
Poles		N°	4	4	4	4	4
Motor protection rating			IP 55	IP 55	IP 55	IP 55	IP 55
Motor insulation class			F	F	F	F	F
Electrical power supply		V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors							
Refrigerant gas			R407C	R407C	R407C	R407C	R407C
Type			Scroll	Scroll	Scroll	Scroll	Scroll
Number			1	2	2	2	2
Full load total current		A	8,20	16,40	24,60	33,40	49,20
Full load total power input		kW	4,84	9,68	14,80	20,20	29,80
Electrical power supply		V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Electric pre or post-heating accessory AEH							
Stages			1	1	1	1	1
Heating capacity		kW	6,00	12,00	18,00	24,00	32,00
ΔT air side	Nom	°C	7,4	7,4	7,6	7,1	6,7
Pressure drop	Nom	Pa	35	35	35	35	35
Electrical power supply		V/Ph/HZ	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
High efficiency filters							
FTR Pressure drop	Nom	Pa	160	104	112	132	156

(1) Outdoor air 32°C 50% RH, ambient air 26°C 50% RH

(2) Outdoor air -5°C 80% RH, ambient air 20°C 50% RH

Dimensions and weight



A	= supply
B	= fresh air
C	= room air
L	= exhaust
H	= electrical board

		24	48	70	100	140
A	mm	2400	2400	2740	3110	3410
B	mm	870	1200	1500	1900	2000
C	mm	1560	1560	1660	1805	2135
L	mm	238	340	403	475	560
H	mm	268	300	351	408	482
L1	mm	790	1120	1420	1820	1920
H1	mm	670	670	720	793	958
L2	mm	196	322	436	535	542
H2	mm	341	325	324	299	304
Weight	Kg	670	860	1330	1820	2150

For more details ask technical documentation to info@aerfor.com

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