

## TECHNICAL SHEET



Vertical unit for fresh air ventilation with high efficiency heat recovery (~ 90%) and for summer dehumidification with setting of the outdoor air flow rate and possible operation with total or partial recirculation. The flow rate for the fresh air ventilation, from 100 to 400 m<sup>3</sup>/h, can be selected via the user panel, and it is controlled and kept constant automatically by the unit. The machine, designed for a vertical floor installation, is built in a single block that performs the air ventilation functionality with heat recovery as well as the thermodynamic handling of the inflow air: this means summer dehumidification and control of winter and summer temperatures. In general, the operations of the unit, which can be set and managed through the on-board or remote user panel, are: fresh air ventilation, air recirculation, free-cooling, free-heating, dehumidification, and integration of summer and winter sensible capacity. The unit is equipped with 5 motorized dampers, already installed and wired, which guarantee the automatic regulation of air flow rate, while the heat extractor, placed on the exhaust airflow, also reduces energy consumption in both dehumidification and summer integration. The temperature control of the air introduced into the room during the winter season or during fresh air ventilation takes place on the hydronic coil by means of a motorized valve with a modulating actuator, already mounted inside the UC 500-MVHE unit.

**Compressor:** hermetic type

**Phase clamp fuse:** 250V - 8A

**Heat exchanger:** high efficiency cross-flow exchanger (approximately 90%)

**Plate exchanger:** Braze-welded plate exchanger built with AISI 316 stainless steel, used for condensation in the chiller circuit, when integration is requested

**Control unit:** control unit used to manage temperatures, pressures, to manage electric devices and functions, in accordance with settable parameters

**Fans:** double suction centrifugal fan directly coupled to its motor

**Filters:** with synthetic fiber filter material, 65% iso coarse class

**Pre-treatment coil:** copper tubes and aluminum fins with "hydrophilic" treatment

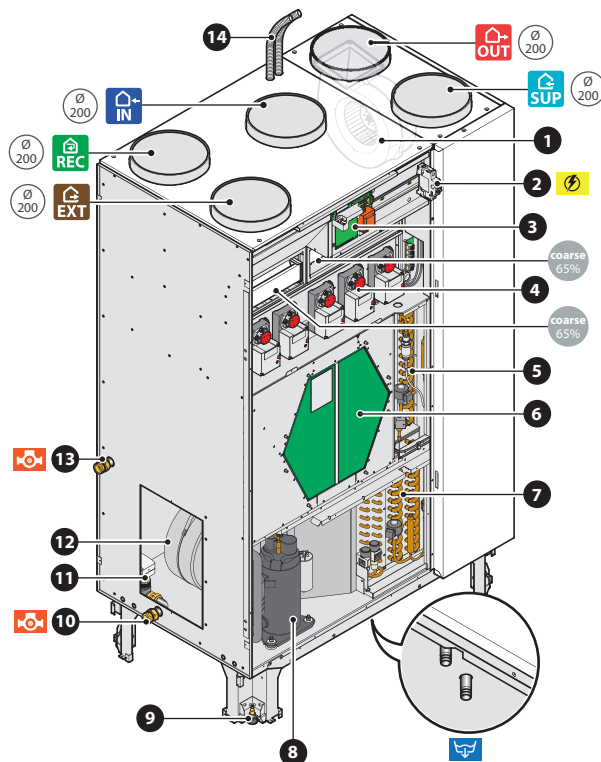
**Evaporator coil:** copper tubes and aluminum fins with "hydrophilic" treatment

**Condensing coil:** copper tubes and aluminum fins

**Coolant gas:** R 410a

Description	Dimensions	Weight	Code
UC 500 - MVHE	900x1500x570 mm	140 kg	7041451

## COMPONENTS



Ref.	Description
1	Discharge fan
2	Power supply switch
3	Control Unit
4	Dumper servomotors
5	Auxiliary condenser
6	Heat exchanger
7	Finned pack
8	Compressor
9	Adjustable feet
10	Water inlet
11	2-way valve for water circuit
12	Inflow fan
13	Water outlet
14	Corrugated tubes for wiring connection

Wiring Box

Ø 20 mm Condensation Drain

1/2" F Hydraulic connection

### AIR FLOWS

Fresh air inlet

Supply air

Exhaust air

Stale air extraction

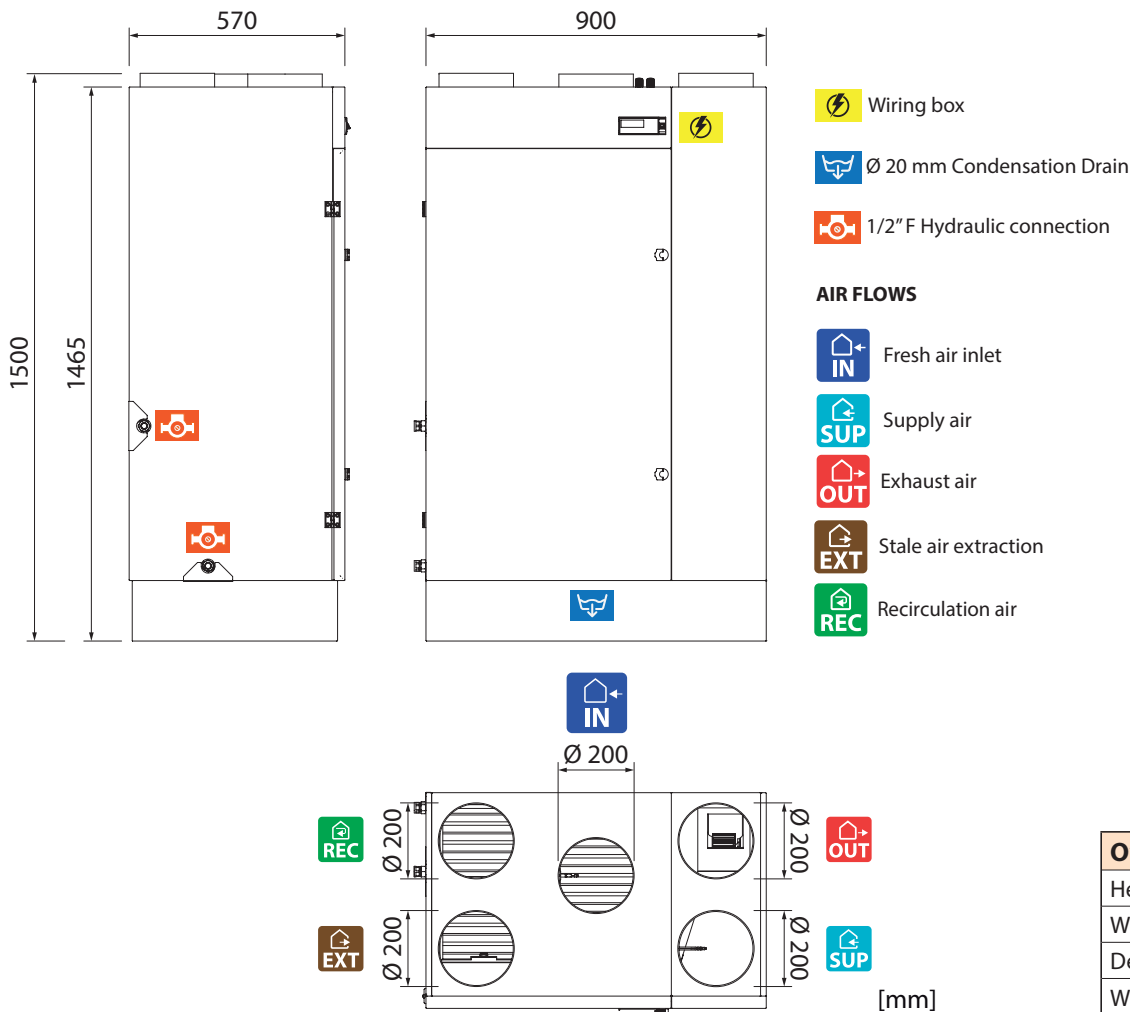
Recircul. air

### AIR FILTERS: Classes, Minimum Efficiency, Type Of Particulate

e(PM10) min ≤50 % Hairs

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## DIMENSIONS AND TECHNICAL DATA



Overall unit dimension	
Height	1500 mm
Width	900 mm
Depth	570 mm
Weight	140 kg


### Technical characteristics

#### Technical specifications

Condensation with room air (26 °C - 65% - 500 m <sup>3</sup> /h)	l/day	61,9
Condensation with external air (35 °C - 50% - 400 m <sup>3</sup> /h)	l/day	95,1
Rated electrical power	W	800
Total maximum power consumption of the fan	W	175
Power consumption on stand-by mode	W	5
Nominal air flow rate	m <sup>3</sup> /h	500
Nominal renewal air flow rate	m <sup>3</sup> /h	400
Fan performance	Pa	200
Unit water flow rate	l/h	500
Condensation water supply		F 3/4"
Pre-treatment water head loss	DaPa	2930
Refrigerant (R 410a)	kg	0,770



### MANDATORY COMPLEMENTS

The installation of no. 2 Condensate drain choosing, according to the needs, among those proposed.


Condensate drain		Code
	<b>SF-M 20</b> Condensate drain kit consisting of a siphon with silicone membrane, hose and fitting, to be used in combination with RDZ air handling units.	<b>3600400</b>

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## ACCESSORIES

Control panels		Code
	<b>REMOTE CONTROL - TYPE 1</b> - DIN rail control panel (6 modules) for displaying operations and setting unit parameters. The signals for dehumidification, summer/winter integration, boost, and free-cooling must be connected to the panel. Fresh air ventilation can be activated manually or by time scheduling.	<b>7041460</b>
	<b>KNX-UTA INTERFACE</b> Interface for integrating the ventilation unit into a home automation system with KNX protocol. It is possible to display operating statuses, alarms and change the unit's settings.	<b>7041480</b>

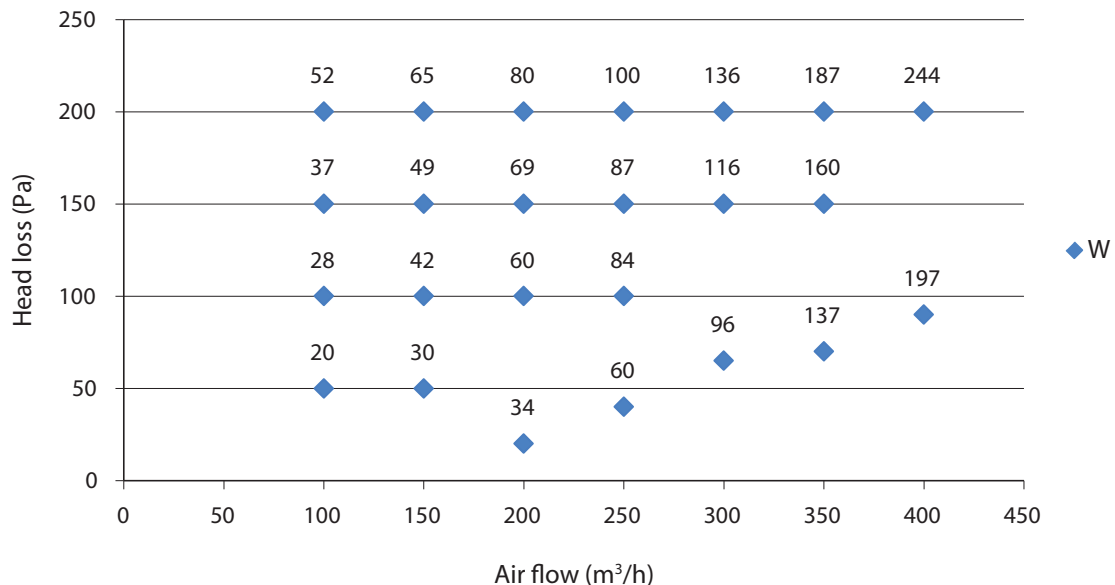
## SPARE PARTS

Air filter kit		Code
	<b>FILTER KIT FOR UC 500-MVHE</b> Kit for complete replacement of unit filters containing: • 1 ISO Coarse 60% filter - Size 160x360x100 mm • 2 ISO Coarse 60% filter - Size 180x360x50 m	<b>7044170</b>
	<b>FILTER KIT FOR UC 500-MVHE</b> Kit for complete replacement of unit filters containing: • 1 ISO Coarse 65% filter - Size 160x360x100 mm • 2 ISO Coarse 65% filter - Size 180x360x50	<b>7044171</b>

## CONSUMPTION DETECTED IN RENEWAL MODE

Air Flow Set	m <sup>3</sup> /h	100				150				200			
Head Loss	Pa	50	100	150	200	50	100	150	200	20	100	150	200
Electric Consumption	W	20	28	37	52	30	42	49	65	34	60	69	80

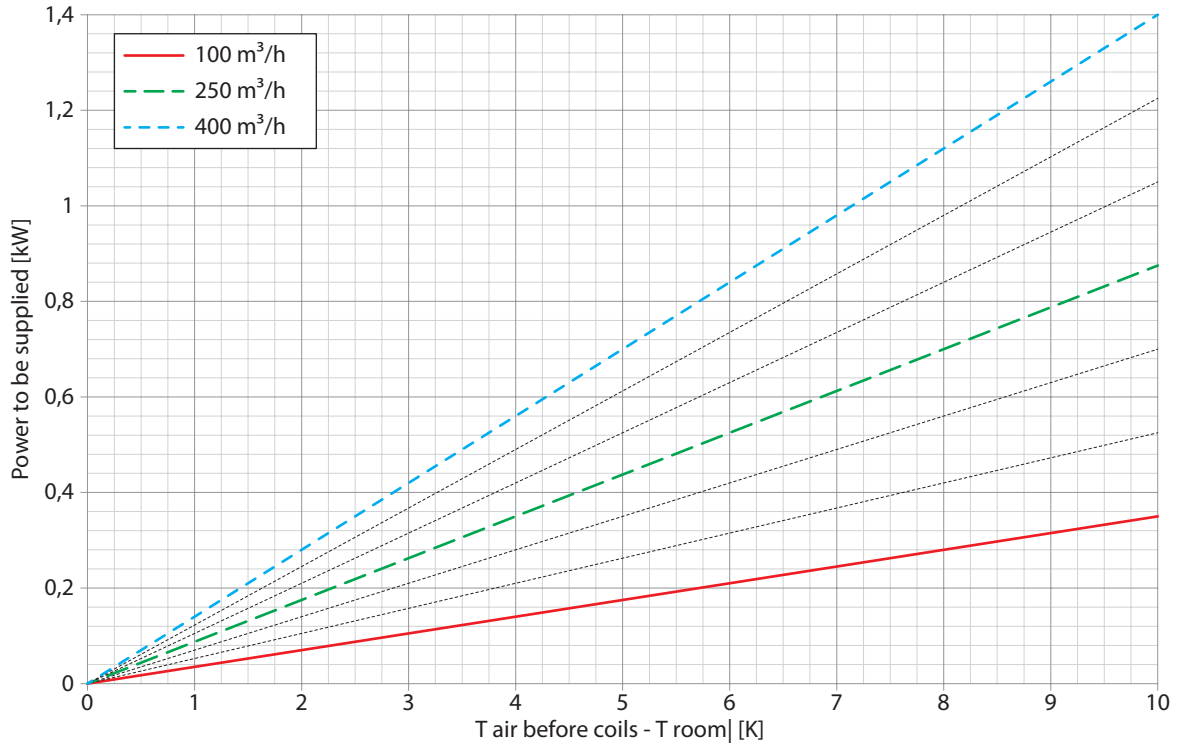
Air Flow Set	m <sup>3</sup> /h	250				300			350			400	
Head Loss	Pa	40	100	150	200	65	150	200	70	150	200	90	200
Electric Consumption	W	60	84	87	100	96	116	136	137	160	187	197	244



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## OPERATION IN VENTILATION MODE ONLY

If the unit is requested to run the renewal or boost function, it is necessary to provide the machine using a certain amount of power from the hydronic circuit to make the neutral air exit the unit. The required amount of power is reported in the graph below.



## SUMMER PERFORMANCE

Yield during dehumidification, depending on room temperature, relative humidity, considering a unit supplied with water at 15 °C.

Performance in recirculation mode								
Inlet air		Outlet air		Latent cooling power		Sens. cooling power		Cooling power to be supplied to the unit
°C	% R.H.	°C	% R.H.	W	l/g	Max	Set 19 °C	
300 m³/h								
26	55	26	34,9	1097	37,9	1155	735	1180
	65		36,3	1576	54,4			1560
400 m³/h								
26	55	26	39,4	1122	38,8	1540	980	1450
	65		41,6	1697	58,6			1870
500 m³/h								
26	55	26	42,7	1127	38,9	1925	1225	1670
	65		45,5	1791	61,9			2120

Performance in renewal mode								
Inlet air		Outlet air		Latent cooling power		Sens. cooling power		Cooling power to be supplied to the unit
°C	% R.H.	°C	% R.H.	W	l/g	Max	Set 19 °C	
300 m³/h								
33	50	26	38,0	2040	70,5	1155	735	2010
35	50	26	39,6	2448	84,5	1155	735	2340
400 m³/h								
33	50	26	44,1	2281	78,8	1540	980	2400
35	50	26	46,4	2754	95,1	1540	980	2780





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Performance in recirculation mode + renewal mode												
Renewal air			Recirculation air			Neutral outlet air		Latent cooling power		Sens. cooling power		Cooling power to be supplied to the unit
										Max	Set 19 °C	
° C	% R.H.	m <sup>3</sup> /h	° C	% R.H.	m <sup>3</sup> /h	° C	% R.H.	W	l/g	W	W	W
<b>300 m<sup>3</sup>/h</b>												
33	50	<b>100</b>	26	55	<b>200</b>	26	35,7	1358	46,9	1155	735	1410
				65			36,7	1684	58,2			1660
35	50			55			36,1	1516	52,3			1520
				65			37,2	1827	63,1			1780
33	50	<b>200</b>		55	<b>100</b>		36,7	1679	58,0			1690
				65			40,0	1845	63,7			1820
35	50			55			37,7	1966	67,9			1910
				65			38,3	2117	73,1			2030
<b>400 m<sup>3</sup>/h</b>												
33	50	<b>100</b>	26	55	<b>300</b>	26	40,3	1358	46,9	1540	980	1620
				65			42,0	1806	62,4			1950
35	50			55			40,8	1504	51,9			1720
				65			42,5	1926	66,5			2040
33	50	<b>200</b>		55	<b>200</b>		41,5	1660	57,3			1870
				65			42,6	1948	67,3			2080
35	50			55			42,4	1914	66,1			2060
				65			43,6	2209	76,3			2260
33	50	<b>300</b>	55	<b>100</b>	42,7	1943	67,1	2120				
			65		43,2	2077	71,7	2220				
35	50		55		44,2	2305	79,6	2400				
			65		44,8	2459	84,9	2500				
<b>500 m<sup>3</sup>/h</b>												
33	50	<b>100</b>	26	55	<b>400</b>	26	43,6	1326	45,8	1925	1225	1810
				65			45,8	1850	63,9			2170
35	50			55			44,1	1438	49,6			1890
				65			46,3	1969	68,0			2250
33	50	<b>200</b>		55	<b>300</b>		44,8	1586	54,8			2010
				65			46,5	2003	69,2			2280
35	50			55			45,7	1810	62,5			2180
				65			47,5	2206	76,2			2450
33	50	<b>300</b>	55	<b>200</b>	45,9	1848	63,8	2230				
			65		47,1	2111	72,9	2410				
35	50		55		47,5	2188	75,6	2480				
			65		48,4	2473	85,4	2650				
33	50	<b>400</b>	55	<b>100</b>	47,1	2106	72,7	2460				
			65		47,8	2244	77,5	2540				
35	50		55		49,3	2550	88,0	2780				
			65		49,9	2705	93,4	2870				

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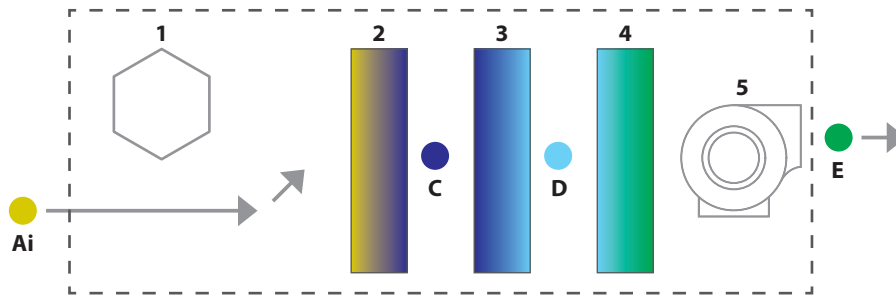
## EXAMPLE OF RECIRCULATION PERFORMANCE

Yield during dehumidification in recirculation mode, with a flow rate of 500 m<sup>3</sup>/h, with a unit supplied with water at a temperature of 15 °C, with room delivery air at 26° and a R.H. of 65% and later delivered back into the room at 26° and R.H. of 45.5%.

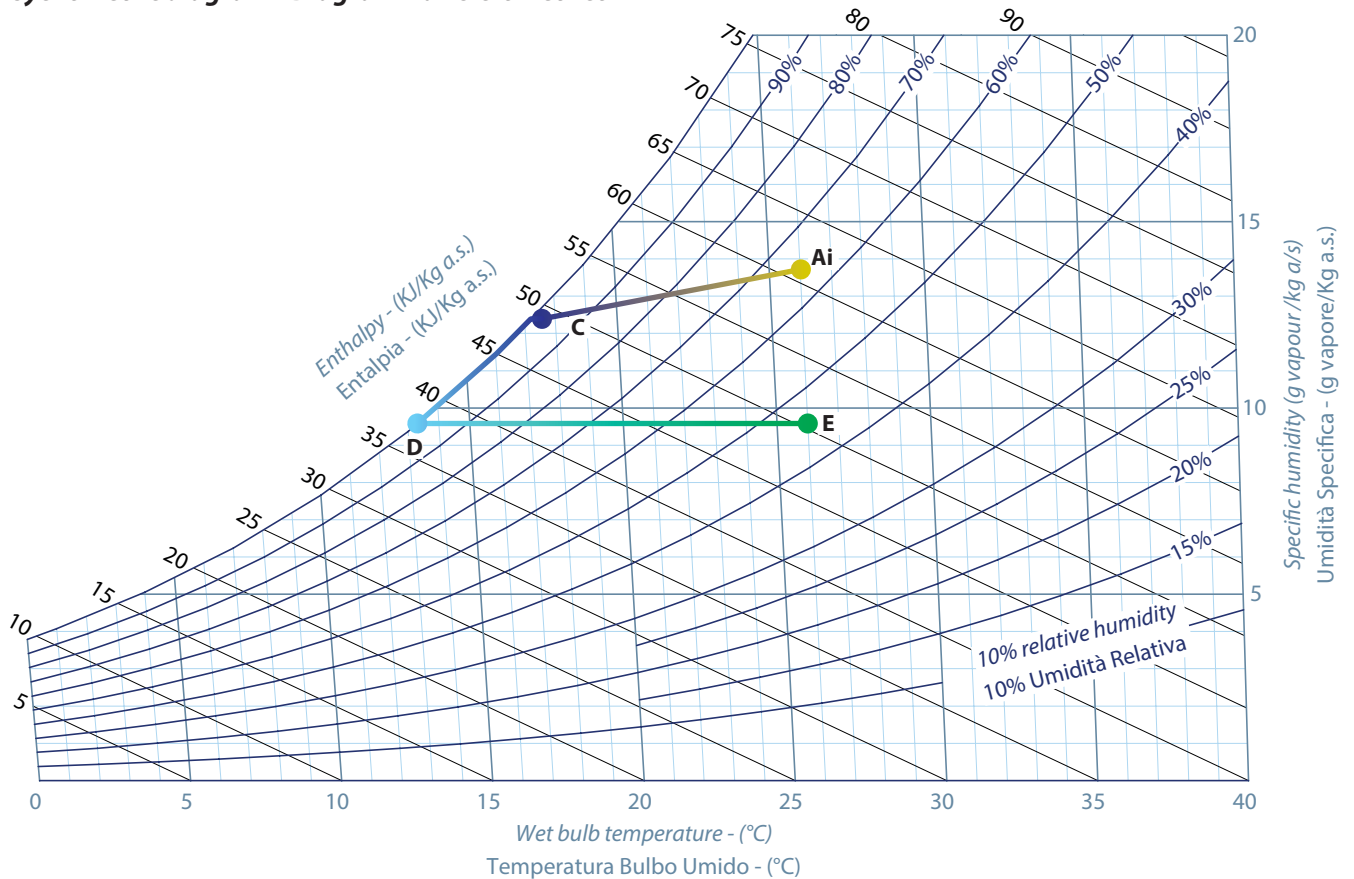
Air key		
<b>Ai</b>		Room air intake
<b>C</b>		Pre-treatment post-coil
<b>D</b>		Evaporator post-coil
<b>E</b>		Room air delivery

Parts key		
<b>1</b>		Recovery unit
<b>2</b>		Pre-treatment coil
<b>3</b>		Evaporator coil
<b>4</b>		Condenser coil
<b>5</b>		Delivery fan

### Air flow diagram - Schema Flusso Aria






### Psychometric diagram - Diagramma Psicrometrico








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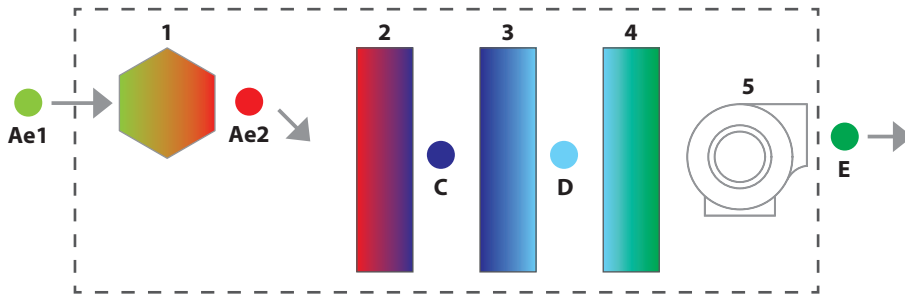
## EXAMPLE OF RENEWAL PERFORMANCE

Yield during dehumidification in renewal mode, with a flow rate of 300 m<sup>3</sup>/h, with a unit supplied with water at a temperature of 15 °C, with outdoor air delivery at 35° and a R.H. of 50% and later delivered back into the room at 26° and R.H. of 39.6%.

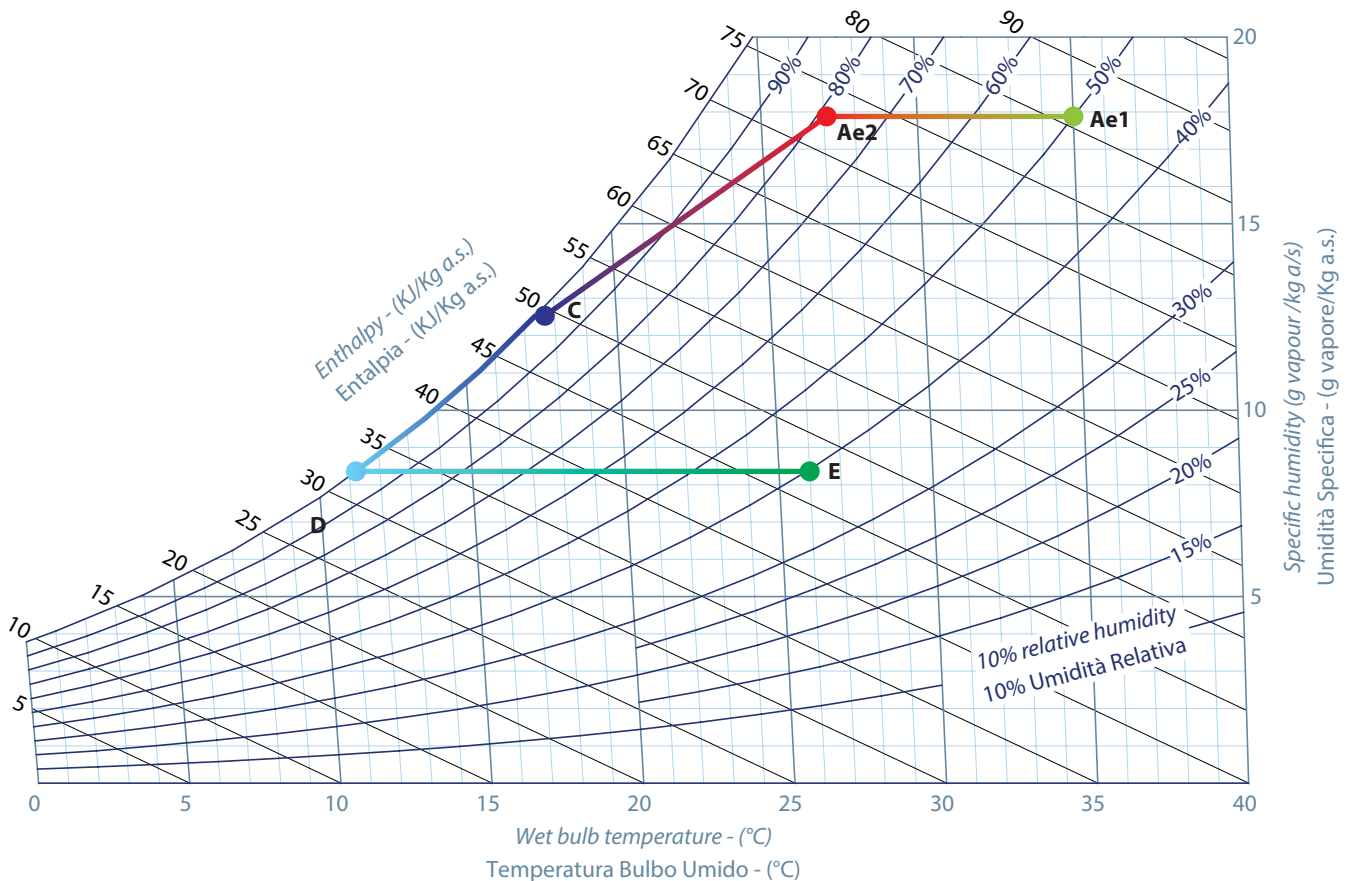
Air key		
<b>Ae1</b>		Outdoor Air Intake
<b>Ae2</b>		Post Recovery Unit Outdoor Air
<b>C</b>		Pre-Treatment Post-Coil
<b>D</b>		Evaporator Post-Coil
<b>E</b>		Room Air Delivery

Parts key		
<b>1</b>		Recovery unit
<b>2</b>		Pre-treatment coil
<b>3</b>		Evaporator coil
<b>4</b>		Condenser coil
<b>5</b>		Delivery fan

### Air flow diagram - Schema Flusso Aria



### Psychometric diagram - Diagramma Psicrometrico



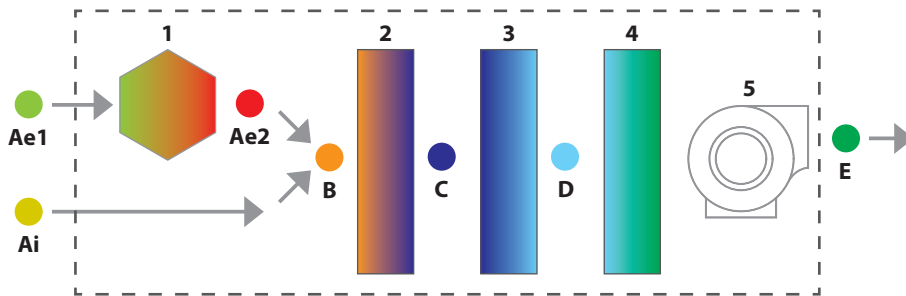
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## EXAMPLE OF RECIRCULATION + RENEWAL PERFORMANCE

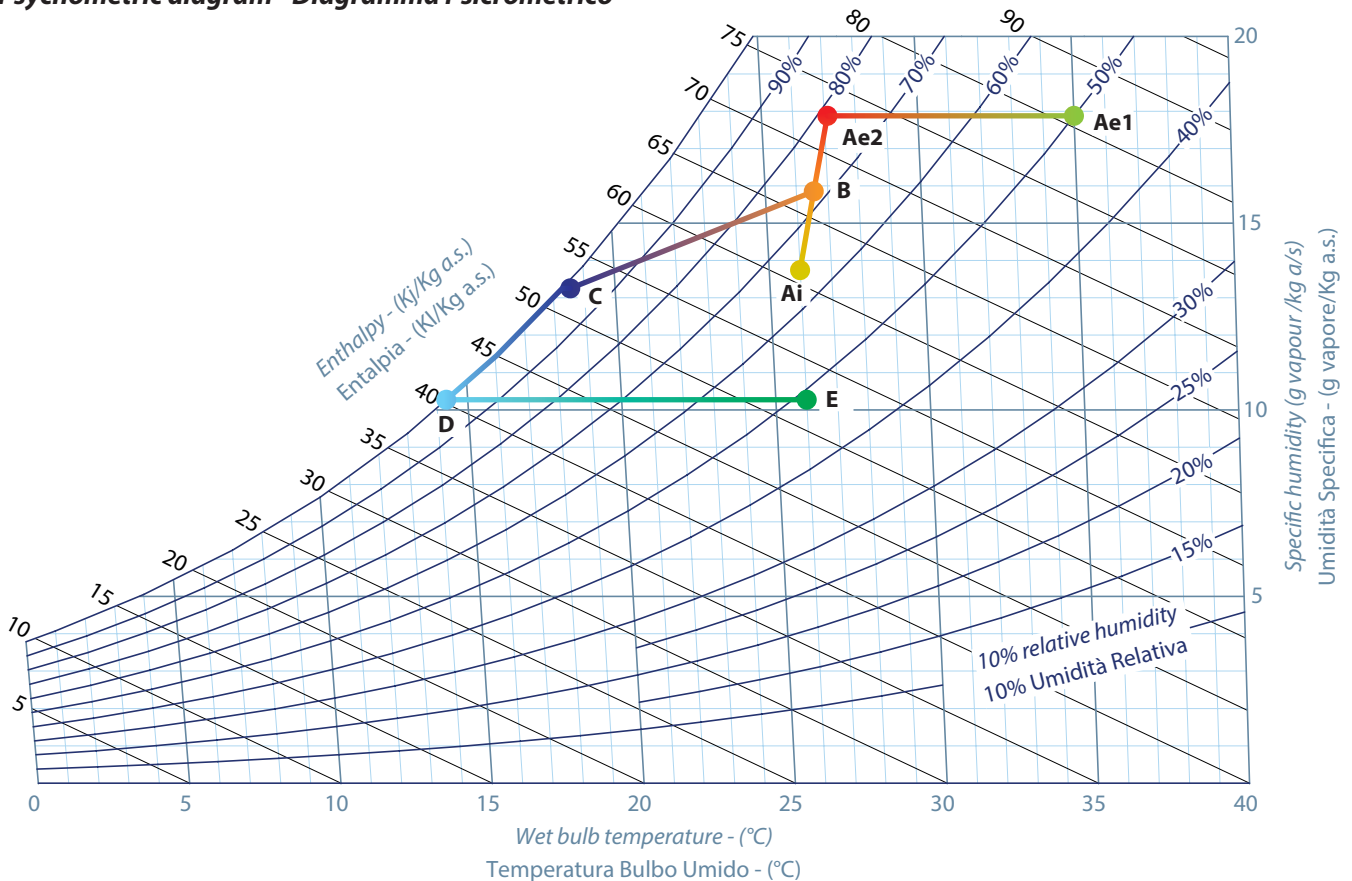
Yield during dehumidification in recirculation + renewal mode with a total flow rate of 500 m<sup>3</sup>/h, when the unit is supplied with water at a temperature of 15 °C. Recirculation 200 m<sup>3</sup>/h Room air at 26° and R.H. of 65 + Renewal 300 m<sup>3</sup>/h outdoor air at 35° and R.H. 50%, with later mixing and re-delivery into the room at 26° and R.H. of 48.4%

Air key				Parts key				
<b>Ae1</b>		Outdoor Air Intake	C		Pre-treatment Post-Coil	<b>1</b>		Recovery unit
<b>Ae2</b>		Post Recovery Unit Outdoor Air	D		Evaporator Post-Coil	<b>2</b>		Pre-treatment coil
<b>Ai</b>		Room air intake	E		Room Air Delivery	<b>3</b>		Evaporator coil
<b>B</b>		Ae2-Ai Mixed Air				<b>4</b>		Condenser coil
						<b>5</b>		Delivery fan

**Air flow diagram - Schema Flusso Aria**



**Psychometric diagram - Diagramma Psicrometrico**





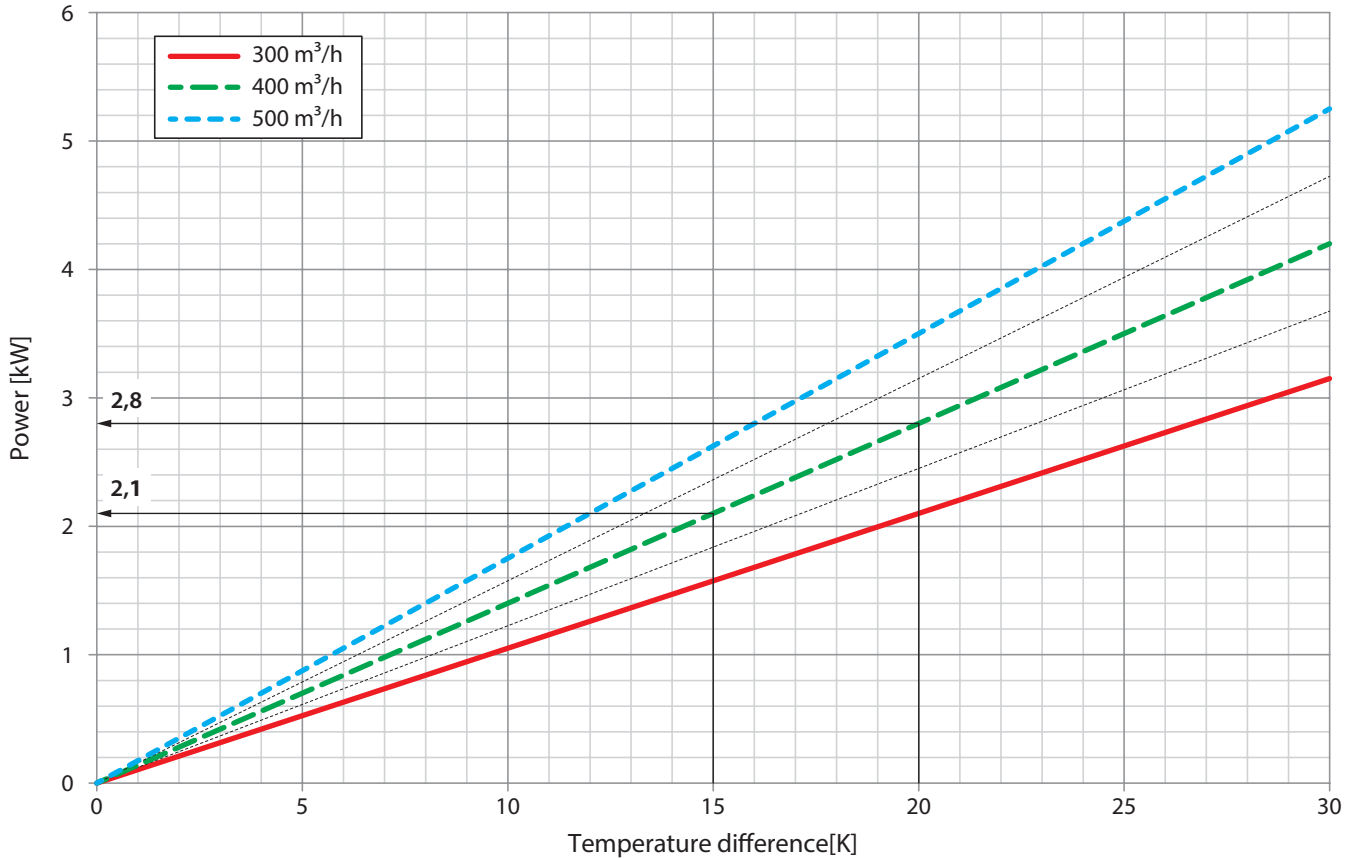
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## OPERATION IN WINTER INTEGRATION MODE

If the winter integration function is enabled, the unit will start the delivery fan (if renewal is enabled then the output fan will also start). The unit will automatically adjust the flow rate through a 2-way motorized valve with 0-10 V servomotor installed upstream, to obtain a temperature value that is equal to the integration setpoint, as set on the control unit panel.

From the graph below it is possible to find the powers that need to be delivered and supplied by the unit.

### Controlled-power integration diagram



#### Example

Air flow rate: 400 m<sup>3</sup>/h  
Setpoint Temperature 35 °C  
Room temperature: 20 °C  
Air temperature at coil input 15 °C

Temperature delta with room 15 K

**Power delivered into the room: 2.1 kW**

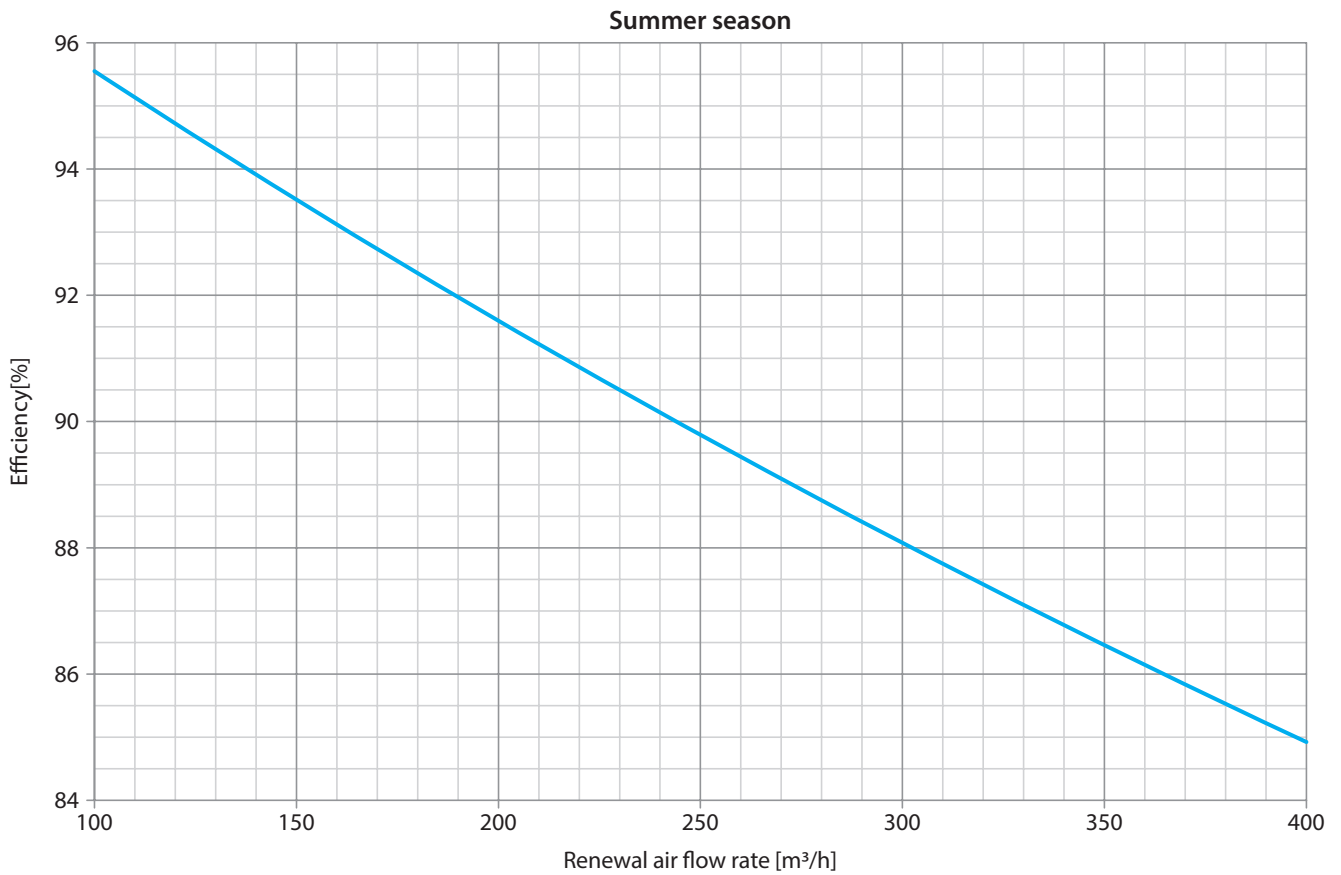
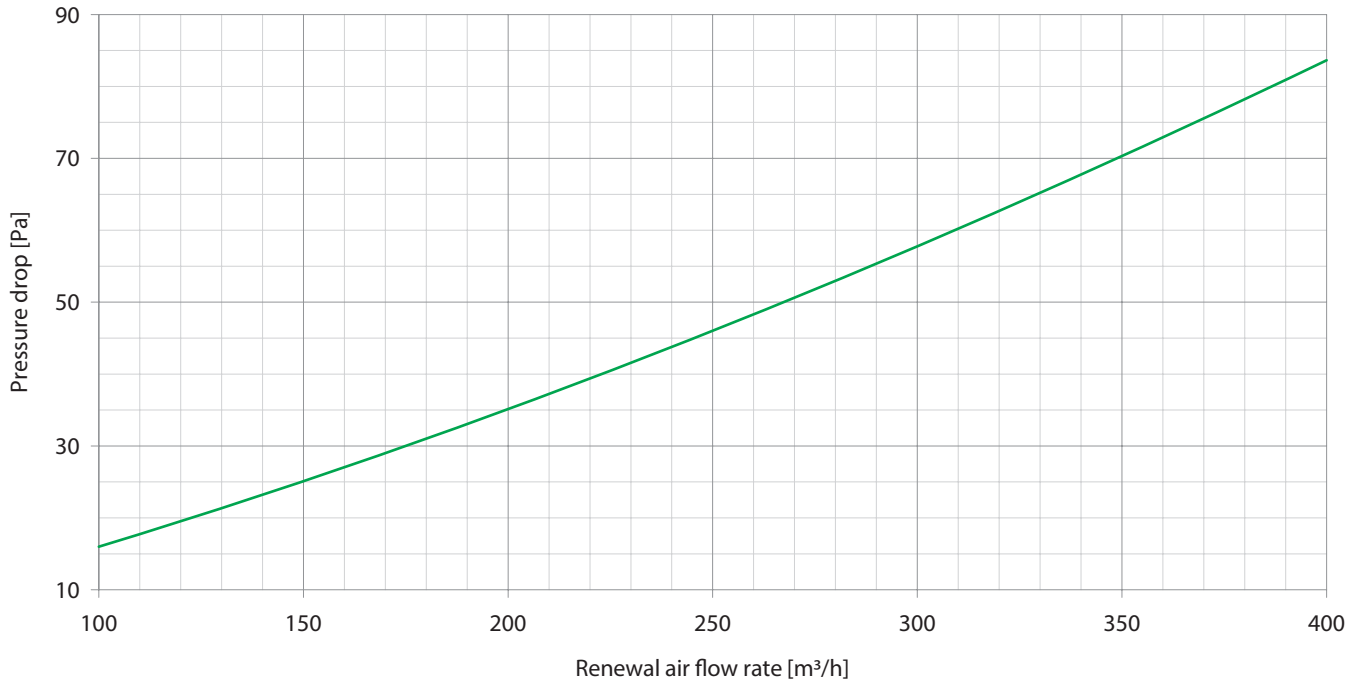
Temperature delta with Air before coils: 20 K

**Power to be supplied to the unit: 2.8 kW**

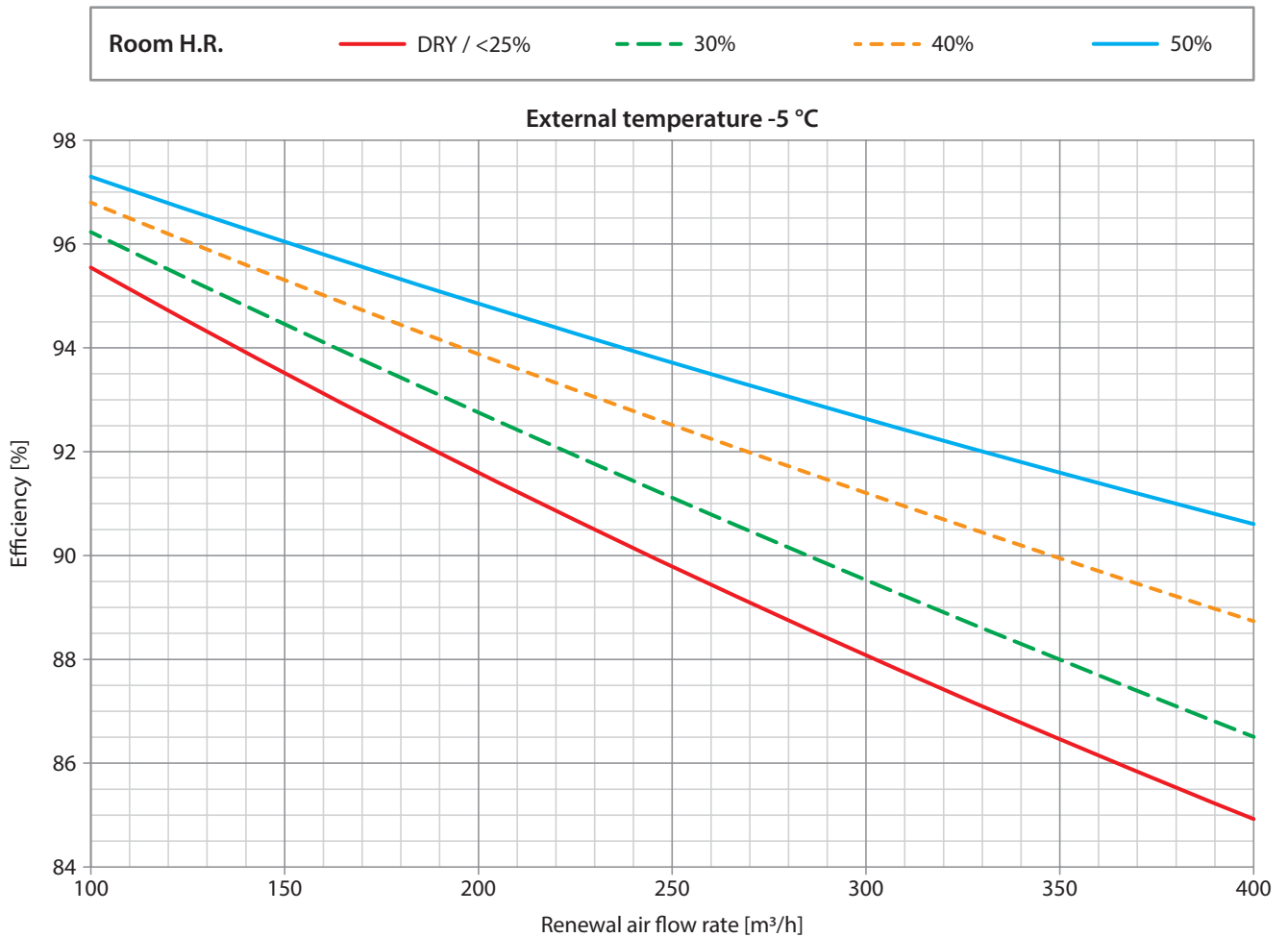
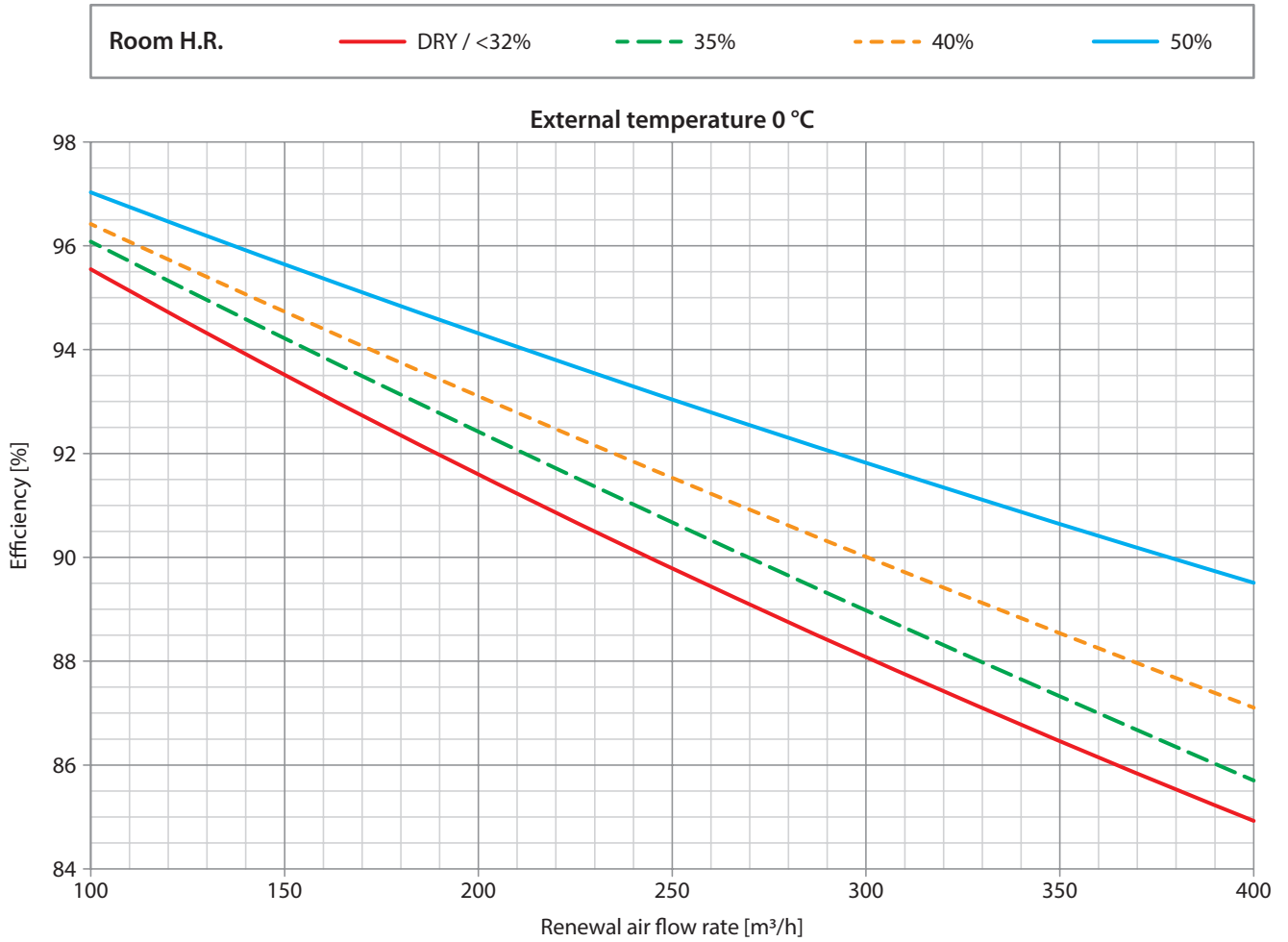
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## RECOVERY UNIT PERFORMANCE

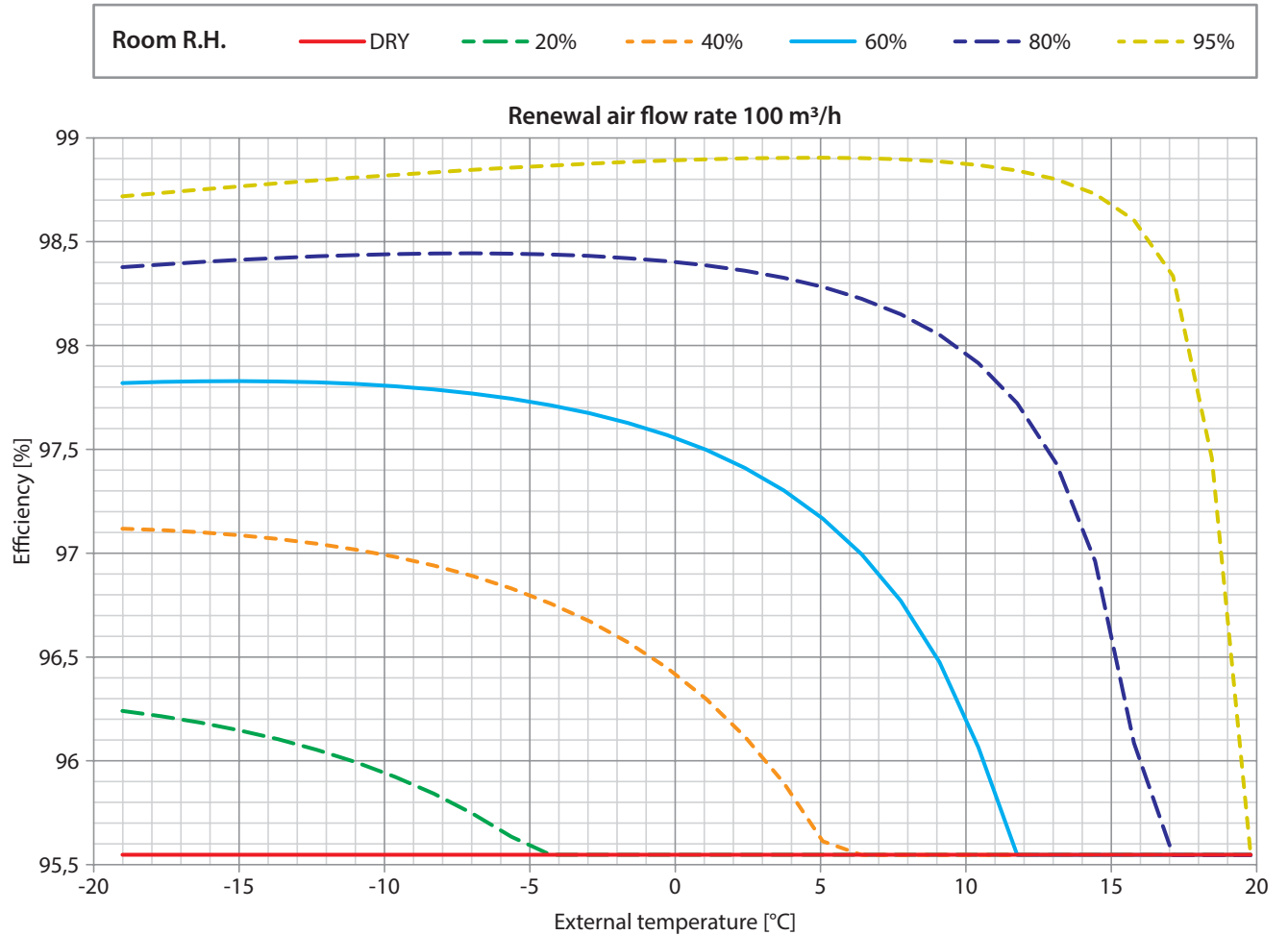
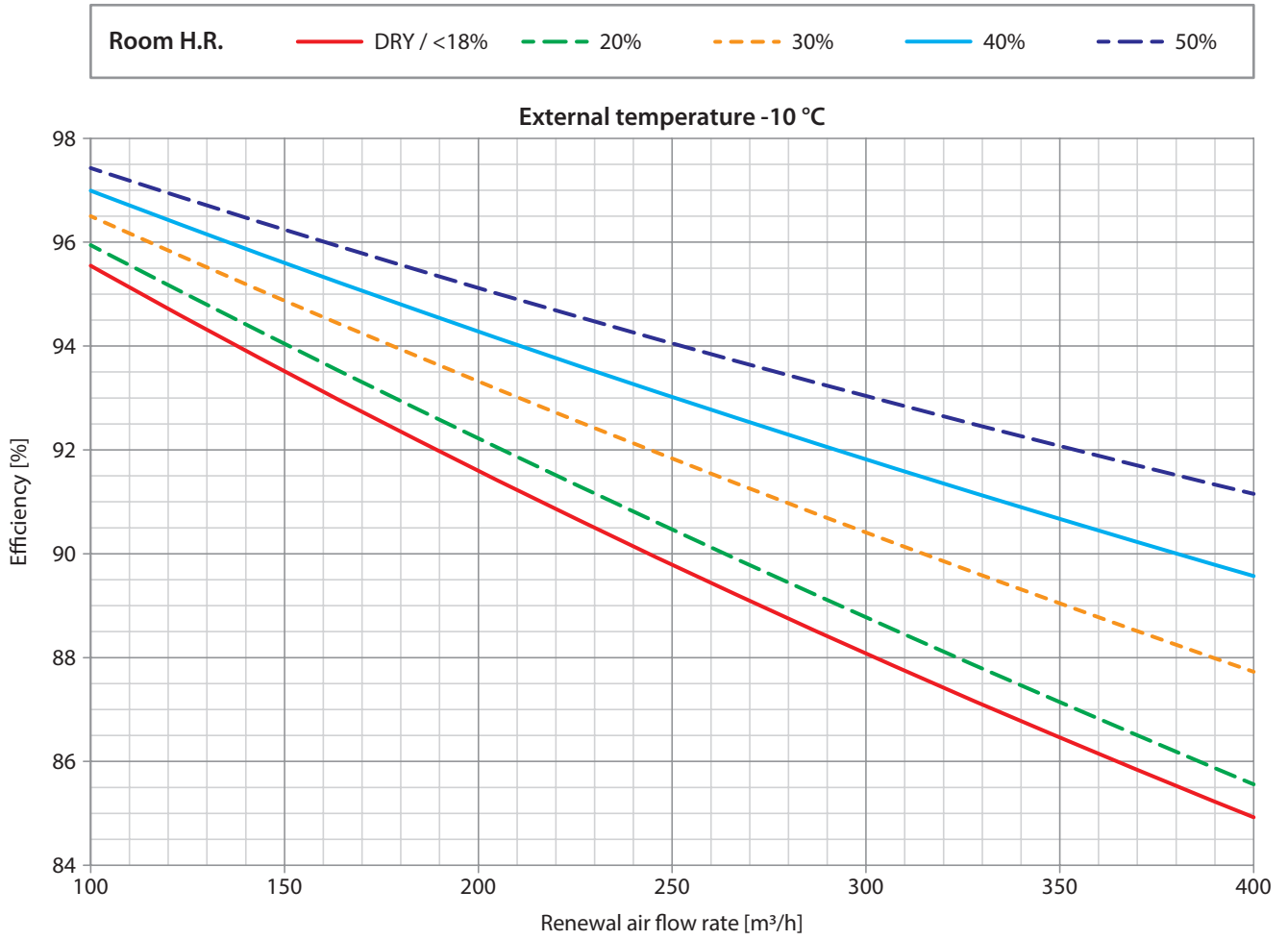
The heat recovery unit is of high efficiency type (~90%). The performance, however, must not be considered fixed. It can vary according to various factors: air flow rate, outdoor temperature and relative humidity (the last two factors only apply to winter mode). Several graphs are provided below, which group together various possible solutions, and can be used to find a more exact efficiency value.



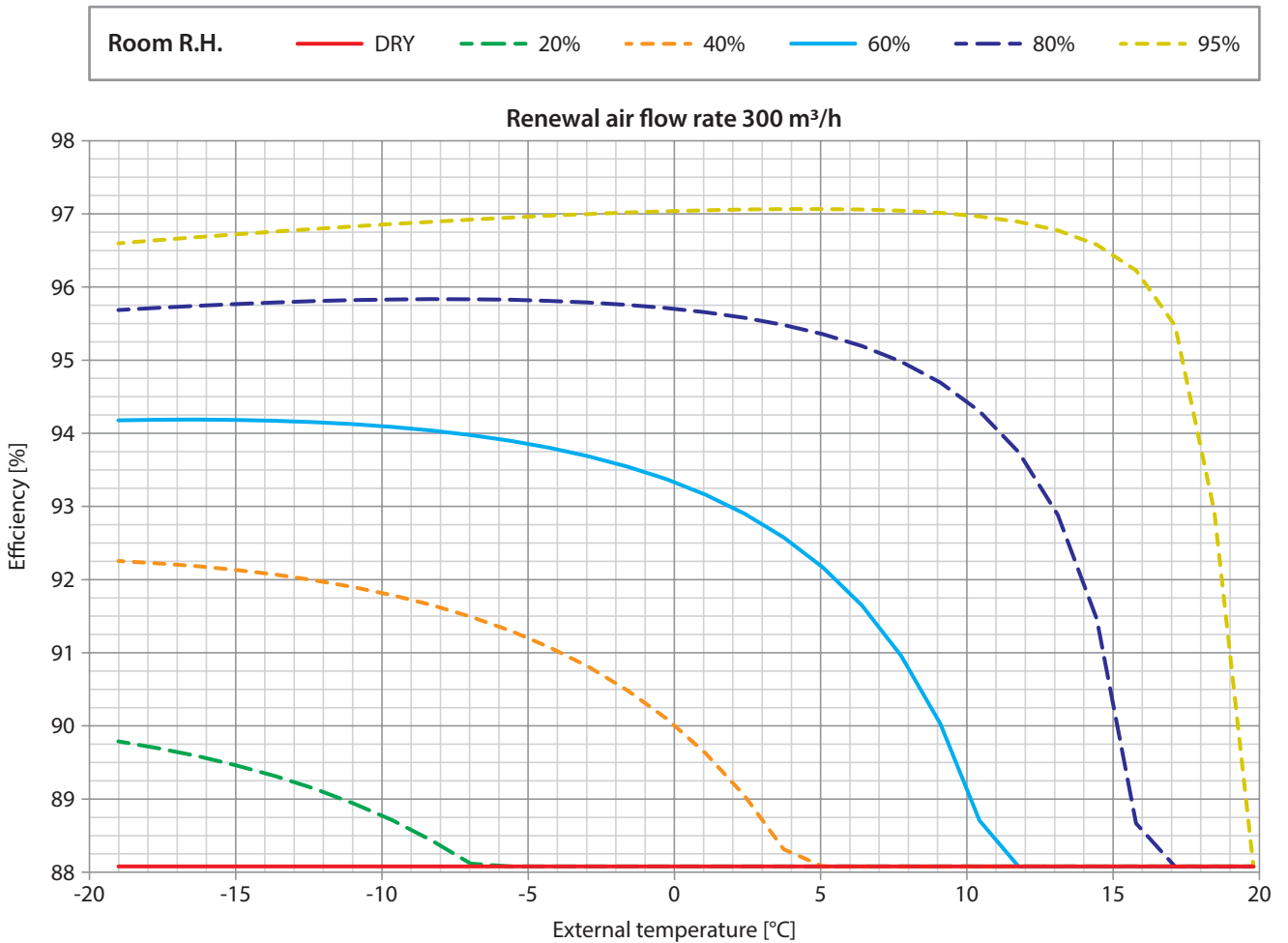
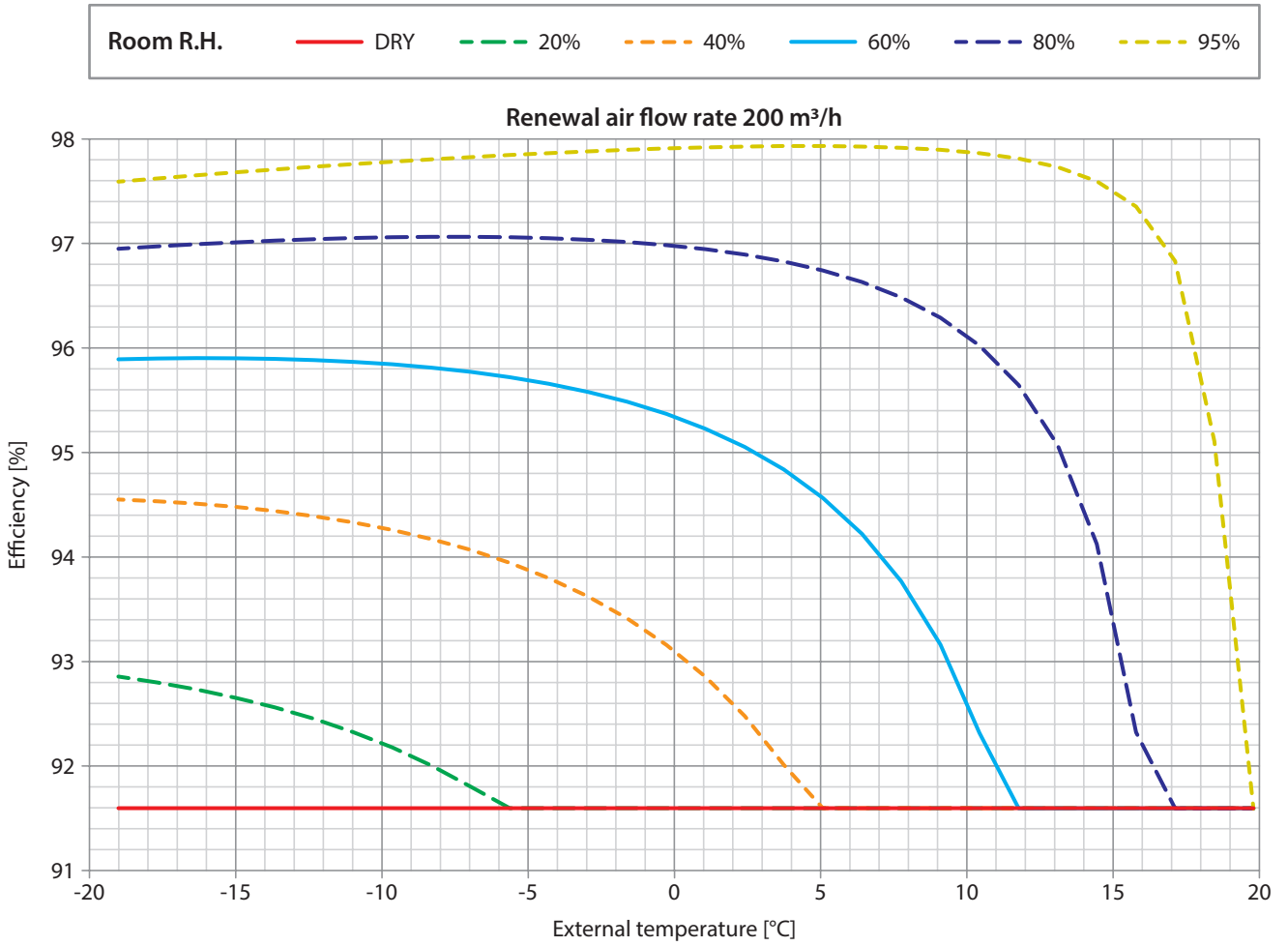
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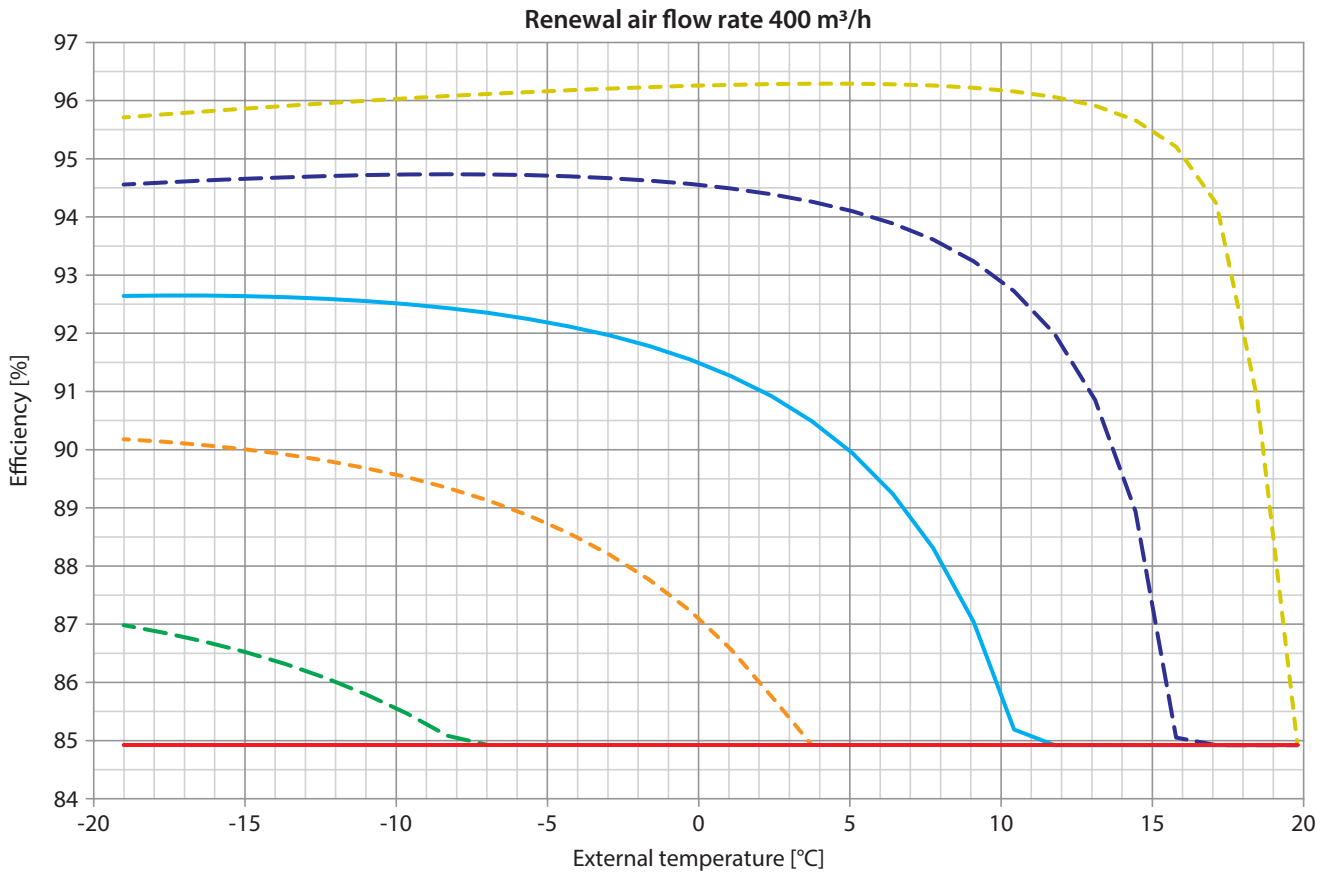
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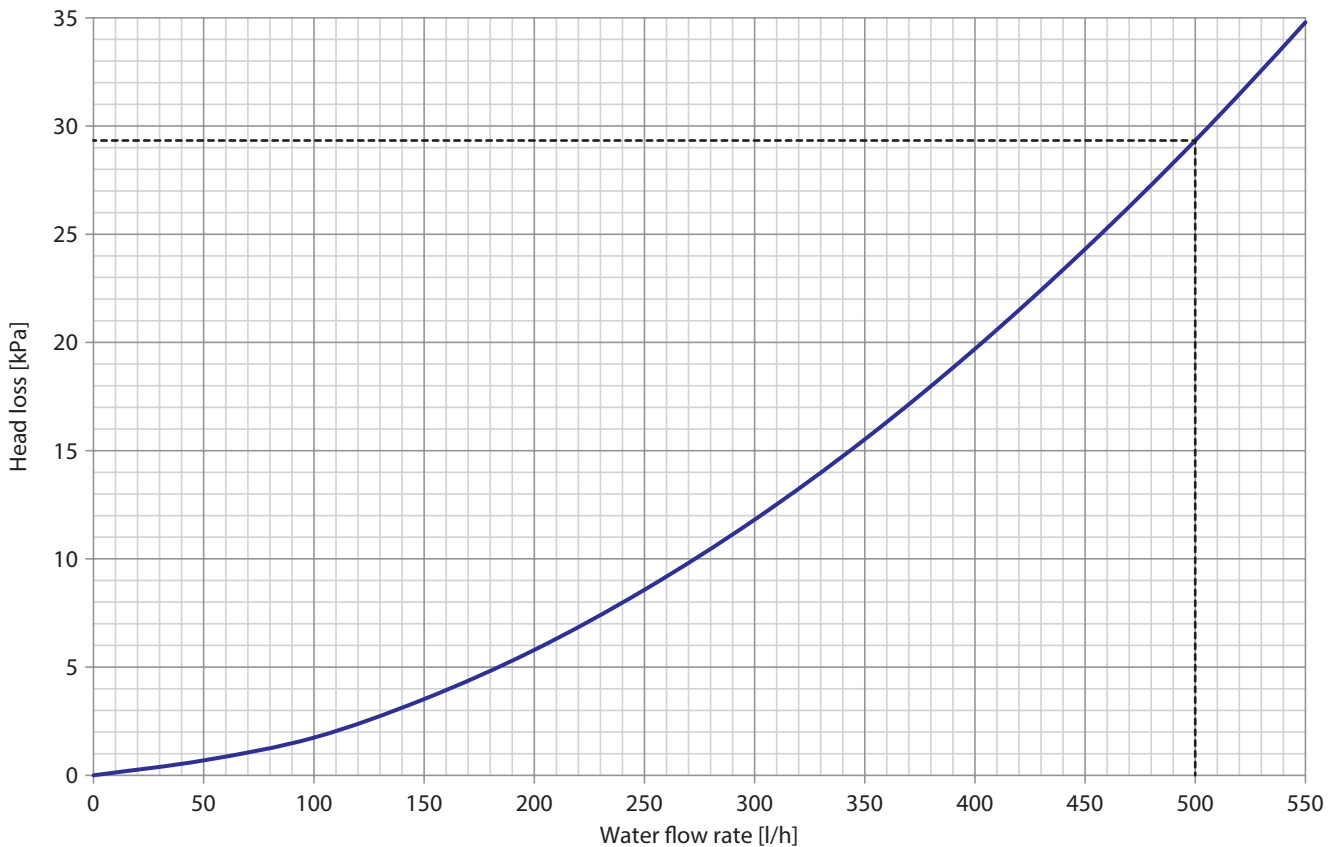
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## PRESSURE LOSS OF THE HYDRAULIC CIRCUIT



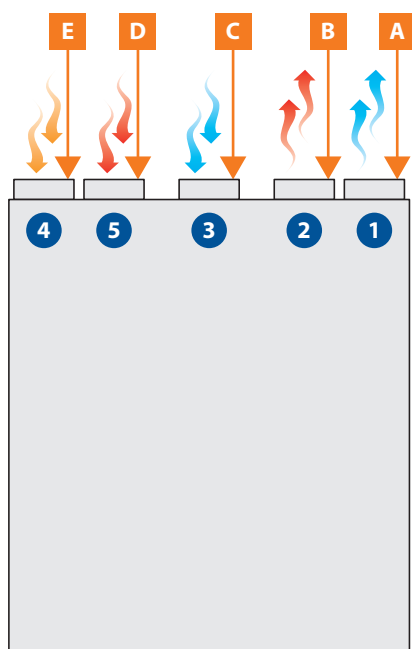
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## ACOUSTIC CHARACTERISTICS

If the unit is installed in a false ceiling, its operation is almost noiseless. On the contrary, the sound of the fan can be transmitted through the distribution ducts into the room. Check the relevant chats in the chapter "TYPE OF MEASUREMENTS".

 It is recommended to install a silencer close to the supply terminal and in the rigid ducts used to connect it.

### Acoustic values from laboratory measurements



#### KEY TO SYMBOLS

- 1) Air supplied into the room
- 2) Exhaust outlet
- 3) Fresh air inlet
- 4) Extraction from bedrooms and living rooms
- 5) Extraction from bathrooms and kitchen

- A) Measuring point close to the flange
- B) Measuring point close to the flange
- C) Measuring point close to the flange
- D) Measuring point close to the flange
- E) Measuring point close to the flange

TYPES OF MEASUREMENT									
FRESH AIR VENTILATION MODE									
Supply Fan	Exhaust Fan	Flowrate setting	Supplyt Fan revolutions	Exhaust Fan revolutions	A	B	C	D	E
		(m <sup>3</sup> /h)	(min <sup>-1</sup> )	(min <sup>-1</sup> )	(dB <sub>A</sub> )				
ON	ON	100	725	689	44	59	43	44	-
ON	ON	150	951	891	51	68	49	50	-
ON	ON	200	1185	1103	53	69	55	57	-
ON	ON	250	1455	1351	61	81	60	62	-
ON	ON	300	1688	1574	62	82	64	66	-
ON	ON	350	1890	1769	68	84	67	68	-
ON	ON	400	2167	1975	72	84	71	72	-
AIR RECIRCULATION MODE									
Supply Fan	Exhaust Fan	Flowrate setting	Supplyt Fan revolutions	Exhaust Fan revolutions	A	B	C	D	E
		(m <sup>3</sup> /h)	(min <sup>-1</sup> )	(min <sup>-1</sup> )	(dB <sub>A</sub> )				
ON	OFF	300	1460	-	64	-	-	-	67
ON	OFF	400	1866	-	71	-	-	-	72
ON	OFF	500	2329	-	77	-	-	-	78

#### NOTES:

- In the above-mentioned chart the revolutions of the fan have been intentionally included because the appliance contains fans with constant volume and the sole air flow rate value is not enough to understand their noise level.
- The appliance has been situated in a closed reverberating room without shielding the noise of the casing and without using any ductwork (from open outlet)
- The maximum number of revolutions for the fan is about 3200 per minute.
- The fan may have a large number of revolutions even with low flow rate. This depends on the sizing of the air ductwork and partially on the integrity of filters and ducts.

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## POSITIONING TO THE FLOOR

