

## TECHNICAL SHEET



Air handling unit for room air exchange with high efficiency heat recovery (~90%) and for summer dehumidification. The housing is made of galvanised sheet metal. Fresh air intake flow-rate and supply air flow-rate are handled separately (partial recirculation of air is possible). The fresh air flow-rate can be set from 100 to 240 m<sup>3</sup>/h, while the supply air flow rate can be set from 200 to 360 m<sup>3</sup>/h). Possible operations include fresh air ventilation, air recirculation, freecooling, boost, dehumidification as well as integration of summer and winter sensible capacity. UC 360 V1 is designed for horizontal ceiling installation, and it equipped with a

complete cooling circuit (with refrigerant R290), pre-treatment coil, and plate heat exchanger with 1/2" modulating valves to be supplied with cooled water (15 °C), EC high efficiency modulating fans, motorized dampers for managing air flow rates in the different functions, and by-pass for freecooling. It is mandatory to use 2 condensate drain kits. The heat discharge takes place in the stale air exhaust ducting, thus reducing energy consumption both in dehumidification and integration modes. The unit can be managed with User Display, with an external device (via digital input), with RDZ Wi electronic control unit, KNX.

- Dehumidification capacity (recirculation) 40,2 l/24h (26 °C RH 65%)
- Nominal water flow rate (at 15 °C) 360 l/h
- Additional sensible cooling capacity: 1400 W
- Air connections Ø 160 mm (excluding stale air extract ducting Ø 125 mm)
- Dimensions wxhxd 949x276x1282 mm

Description	Weight	Code
UC 360 V1	79 kg	7041359

### COMPONENTS

#### AIR FLOWS

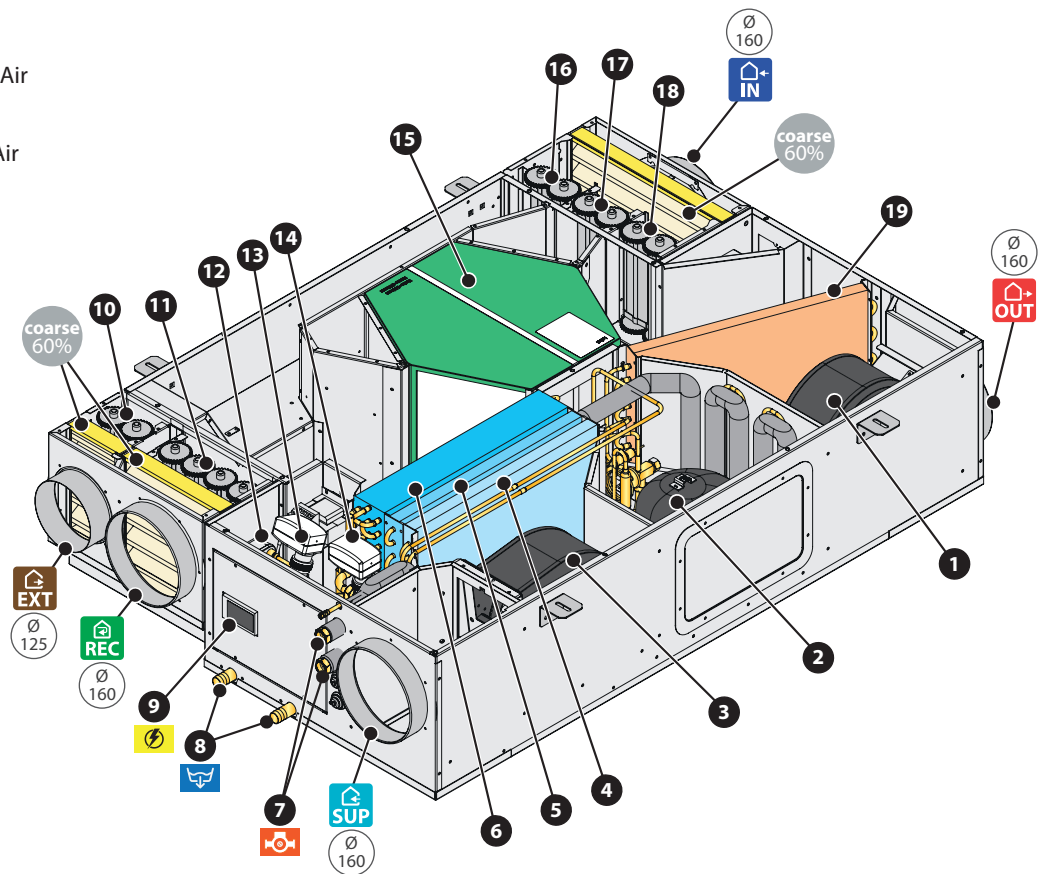
- Fresh Air Inlet
- Exhaust Air
- Stale Air Extraction
- Supply Air
- Recirculation Air

#### AIR FILTERS

Classes, Minimum Efficiency, Type Of Particulate

- e(PM10) min ≤50 % Hairs

- Wiring Box
- Ø 20 mm Condensation Drain
- 1/2" F Hydraulic connection

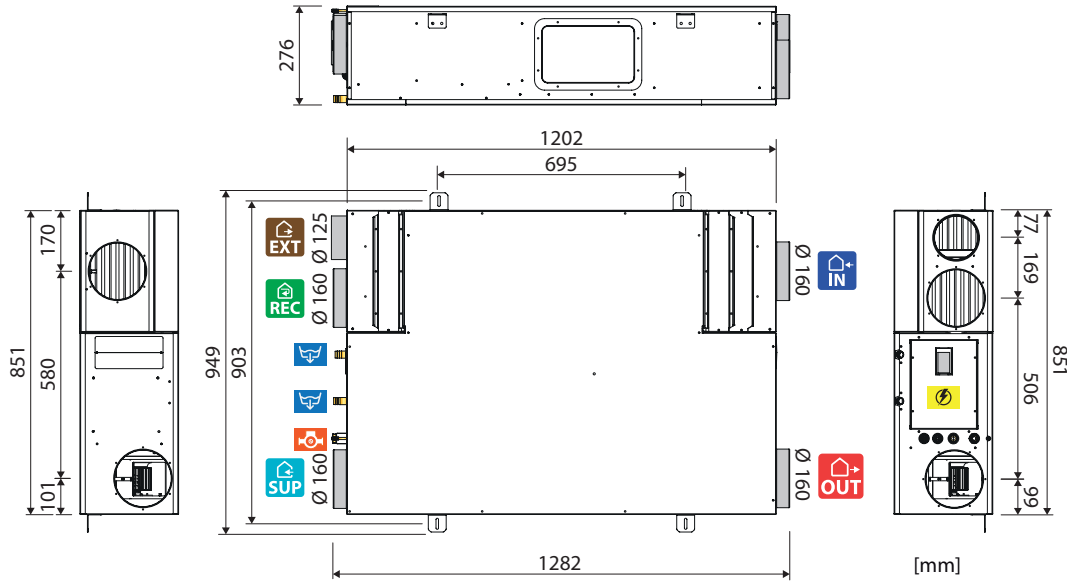


Ref.	Description	Ref.	Description
1	Discharge fan	11	S1 - Extract Room Air damper for Recirculation
2	Compressor	12	Heat exchanger condensed with water
3	Inflow Fan	13	Integration Modulating Valve
4	Finned pack Condensing coil	14	Pre-Treatment Modulating Valve
5	Finned pack Evaporating coil	15	Heat Exchanger
6	Finned pack Pre-Treatment coil	16	S3 - Free Cooling Bypass damper
7	1/2" F Hydraulic connection	17	S4 - Outdoor Air Renewal damper
8	Ø 20 mm Condensation drain	18	S5 - Heatsink Bypass damper
9	Wiring box and Controller on board	19	Heatsink Exhaust Side
10	S2 - Extract Stale Air damper		

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## TECHNICAL DATA AND PERFORMANCE

### Air flows



Overall unit dimensions	
Height	276 mm
Width	949 mm
Depth	1282 mm
Weight	85 kg

### Technical characteristics

#### Technical specifications

Condensation (26 °C - 65% - 360 m <sup>3</sup> /h) without external air	40,2	l/day
Condensation (26 °C - 65% - 360 m <sup>3</sup> /h) with external air (35 °C - 50% - 240 m <sup>3</sup> /h)	56,5	l/day
Voltage-Phases-Frequency	230 + N50/60 Hz	
Rated electrical power	700	W
Total maximum power consumption of the fans (2x149 W)	298	W
Maximum absorbed current	5,7	A
Power consumption on stand-by mode	5	W
Nominal air flow rate	360	m <sup>3</sup> /h
Nominal renewal air flow rate	240	m <sup>3</sup> /h
Inflow fan performance (360 m <sup>3</sup> /h recirculation)	200	Pa
Inflow fan performance (240 m <sup>3</sup> /h ventilation)	250	Pa
Discharge fan performance (240 m <sup>3</sup> /h ventilation - 360 m <sup>3</sup> /h by-pass)	160	Pa
Unit water flow rate	360	l/h
Condensation water supply	½" F	
Pre-cooling water head loss	2010	DaPa
Refrigerant R 290 - GWP: 3	110	gr
Carbon dioxide equivalent	0,00033	t



### MANDATORY COMPLMENTS

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>
	<b>SF-P</b> Condensate drain kit with casing, designed for wall installation. It can be used in combination with RDZ air handling units, and it is suitable for Ø 20-32 mm piping. The external shell can be adjusted considering the thickness of the wall. Washable internal cartridge.	<b>7045502</b>

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## ACCESSORIES

Control panels		Code
	<b>USER DISPLAY</b> Room control panel to display functions and alarms and to change the parameters of the air handling unit. Users can set 24 hour programmable scheduling and running modes, and they can adjust the ventilation rate. Wall installation in 3-module box. Bus connection and direct power supply from the air handling unit.	<b>7041470</b>
	<b>USER DISPLAY TH</b> It also integrates an ambient temperature and humidity sensor.	<b>7041475</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 360 V1</b> Kit for complete replacement of unit filters containing: <ul style="list-style-type: none"> <li>• 1 ISO Coarse 65% filter - dimensions 213x205x30 mm</li> <li>• 1 ISO Coarse 65% filter - dimensions 113x200x30 mm</li> <li>• 1 ISO Coarse 65% filter - dimensions 333x200x30 mm</li> </ul>	<b>7044155</b>

## OPERATING LIMITS

**Summer operation:** the maximum permissible water temperature in summer operation is 18 °C. Above 25 °C, the compressor is excluded, leaving only the fan running.

**Winter operation:** permissible water temperature in winter operation <55 °C. At higher temperatures, the appliance may be damaged.

## FLOW RATE DIAGRAM

### Air flows



Fresh Air Inlet



Exhaust Air



Stale Air Extraction

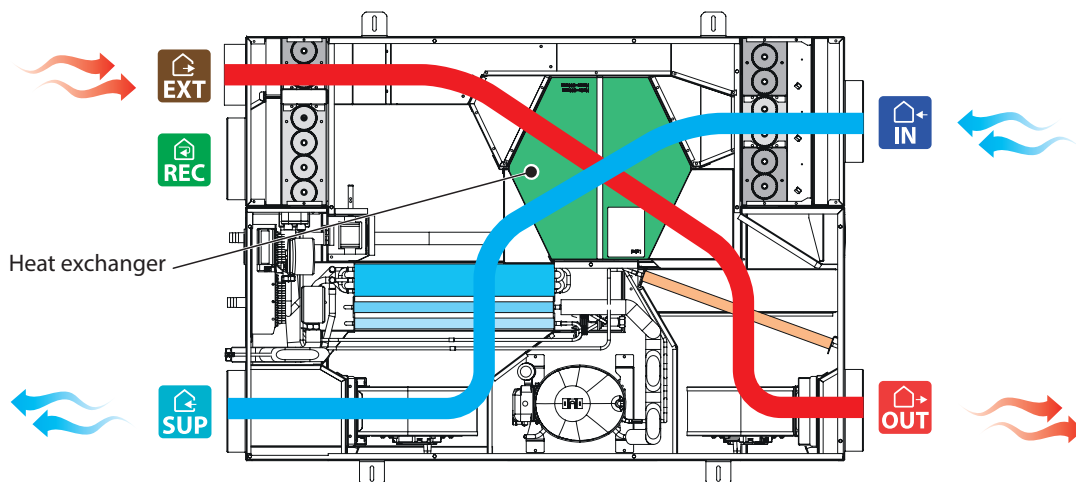


Supply Air



Recirculation Air

### MVHR

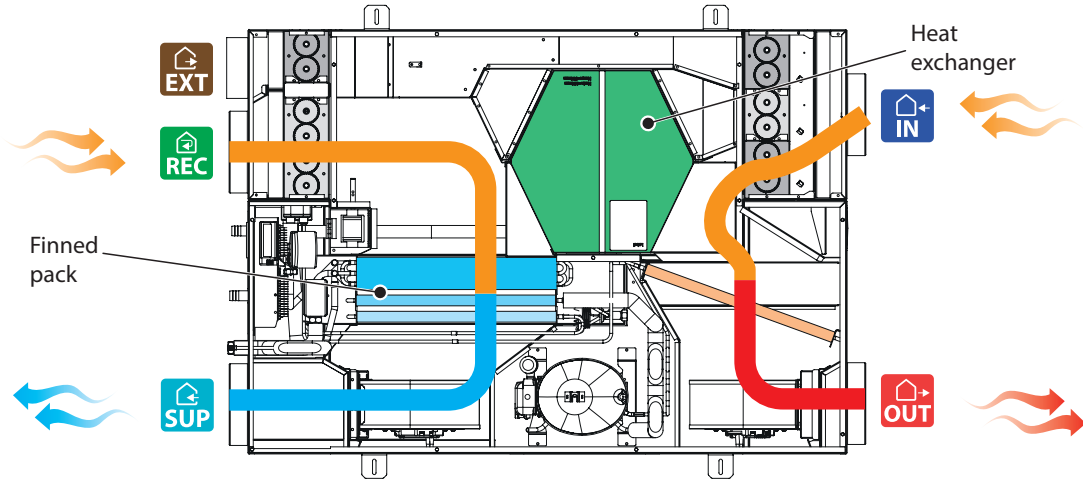


Feature	Value
Ventilation	Settable flow rate
Booster	% setting to be added to the ventilation value

Feature	Range [ m <sup>3</sup> /h ]	
	Min	Max
Ventilation	100	240
Booster	Ventilation set	240

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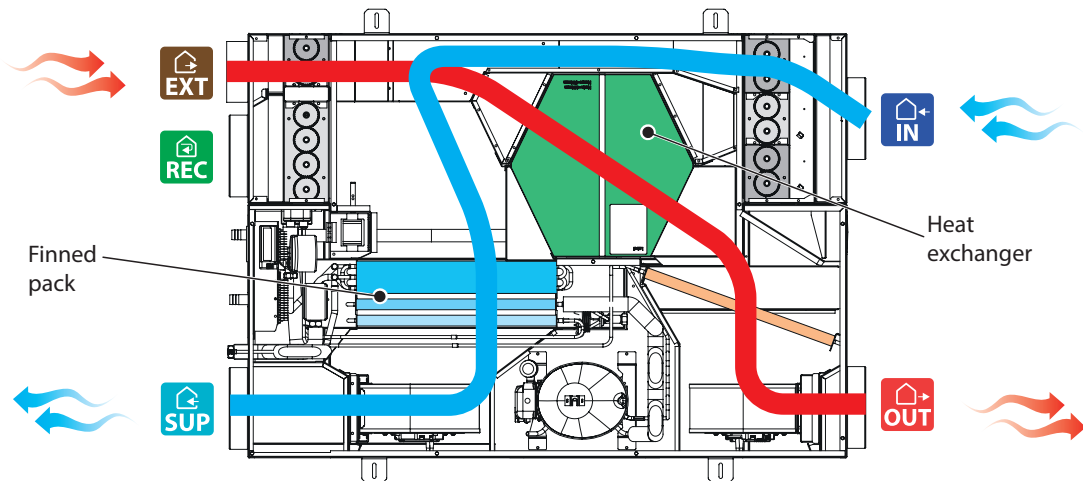
## Air handling (Room Supply)



Feature	Value
One setting	% setting to the range (0% = 200 m <sup>3</sup> /h, 100% = 360 m <sup>3</sup> /h)

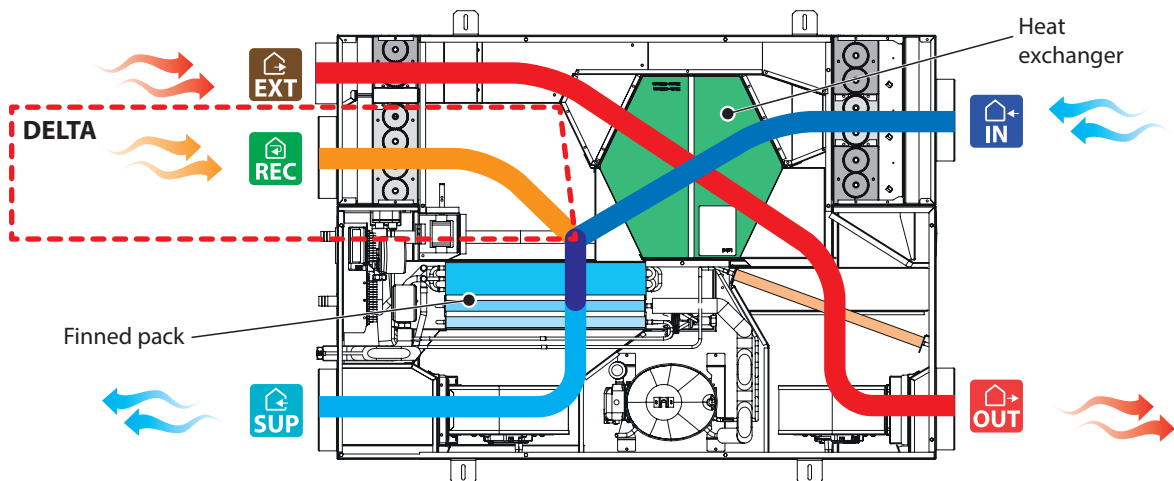
Feature	Range [ m <sup>3</sup> /h ]	
	Min	Max
Dehumidification Integration	200	360

## Free-cooling



Feature	Value
Free-Cooling	% setting to the range (0% = 100 m <sup>3</sup> /h, 100% = 240 m <sup>3</sup> /h)

## Air handling + fresh air ventilation

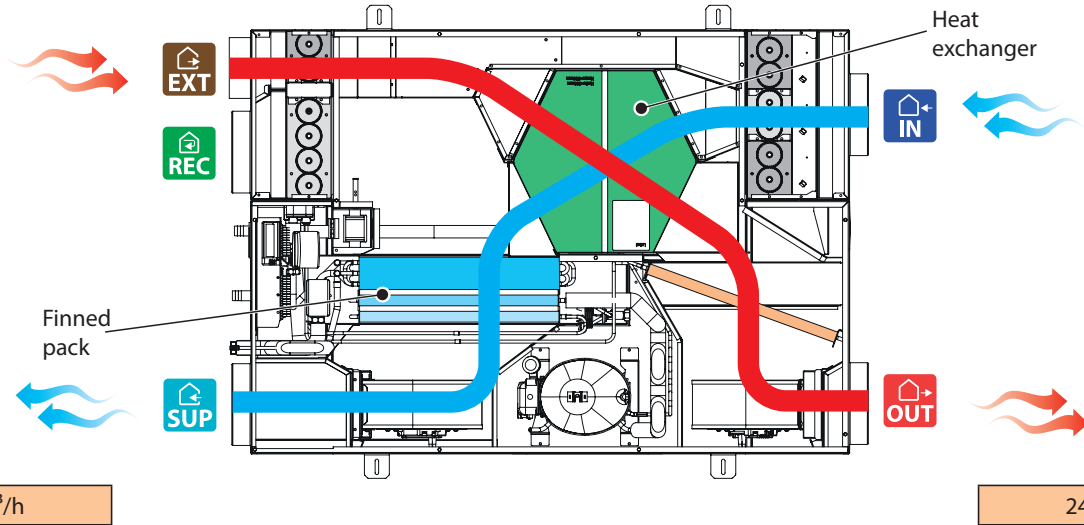


Fresh air flow rate

Air handling flow rate

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## Air handling + boost

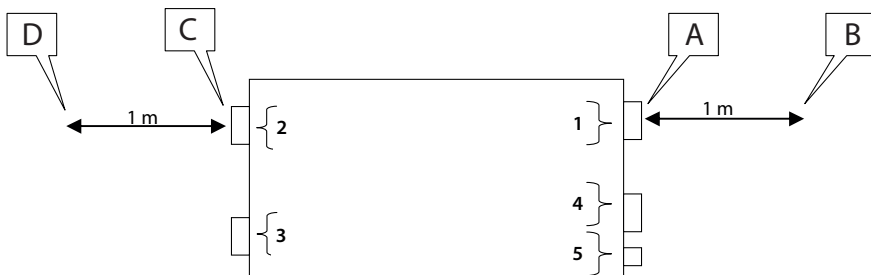


## ACOUSTIC CHARACTERISTICS

The detected acoustic value can be further improved thanks to the noise reduction offered by the presence of the plasterboard ceiling where the machine is installed.



**It is highly recommended to install a silencer near the unit, especially near the supply line.**



### LEGEND:

- 1) Immission to the environment
- 2) Expulsion of stale air
- 3) Fresh air intake
- 4) Clean room intake
- 5) Toilet/kitchen intake
- A) Measuring point near flange
- B) Measurement point at 1m distance flow direction
- C) Measurement point in the vicinity of flange
- D) Measurement point at 1m distance flow direction

Sound pressure detected							
Inlet Fan	Exhaust Fan	Air Flow Rate SET [m <sup>3</sup> /h]	Fan Speed [min <sup>-1</sup> ]	A [db(A)]	B [db(A)]	C [db(A)]	D [db(A)]
ON	OFF	100	1000	47	40	-	-
ON	OFF	200	1227	55	45	-	-
ON	OFF	240	1460	60	49	-	-
ON	OFF	360	2035	68	58	-	-
ON	OFF	360	2860	70	61	-	-
ON	ON	240	2040	-	-	78	64
ON	ON	360 (*)	2540	-	-	80	68
ON	ON	360 (*)	2864	-	-	83	72
ON	ON (**)	240	2064	-	-	61	51
ON	ON (**)	360 (*)	2860	-	-	66	57
Background noise 34 db(A)							

(\*) Exhaust fan with renewal flow rate (max 240 m<sup>3</sup>/h) + external recirculation (120 m<sup>3</sup>/h).

(\*\*) Insertion of a 1 m circular silencer in the exhaust duct (high-density glass wool soundproofing material, thickness 50 mm).

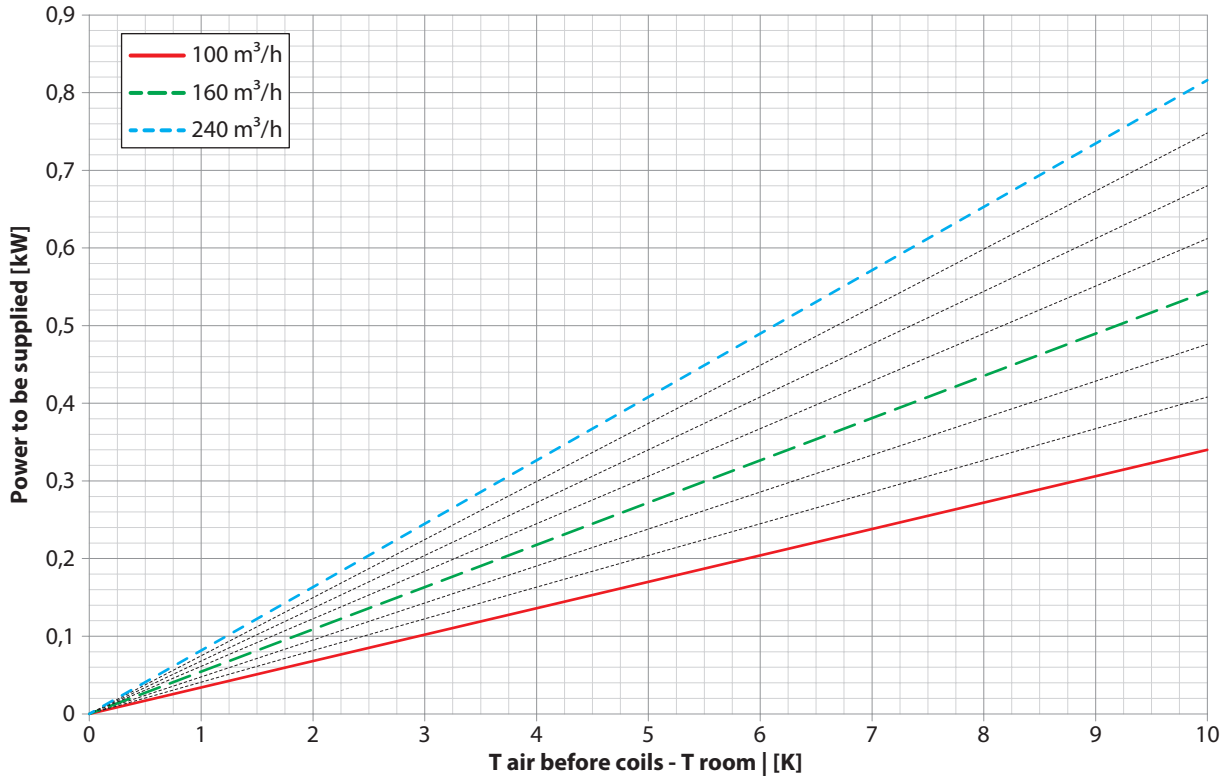
### Notes:

- In the table above, fan revolutions were intentionally included because, since these are constant airflow fans, the airflow rate figure is insufficient to understand the noise level.
- The unit is placed in an enclosed reverberant environment without any shielding of radiant body noise, nor air channels (free mouth) except for tests marked with (\*\*).
- The maximum fan speed is around 2800 rpm.
- It is possible to have a high RPM even at low flow rates; this depends strongly on the sizing of the air channels and to a small extent on the state of cleanliness of the filters and ducts.

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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 EPRFORMANCE

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	
<b>200 m³/h</b>								
26	55	26	34,8	732	25,3	987	476	740
	65		36,5	1042	36,0	937		970
<b>280 m³/h</b>								
26	55	26	40,2	753	26,0	1234	667	930
	65		42,9	1134	39,2	1141		1180
<b>360 m³/h</b>								
26	55	26	44,0	724	25,0	1463	857	1080
	65		47,4	1163	40,2	1324		1330

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	
<b>200 m³/h</b>								
33	50	26	38,5	1339	46,3	884	476	1240
35	50		40,4	1596	55,1	835		1440
<b>240 m³/h</b>								
33	50	26	42,5	1434	49,5	969	619	1390
35	50		44,8	1727	59,6	903		1610

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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
°C	% R.H.	m³/h	°C	% R.H.	m³/h	°C	% R.H.	W	l/g	Max	Set 19°C	
<b>200 m³/h</b>												
33	50	100	26	55	100	26	36,4	1009	34,9	941	476	960
				65			37,3	1169	40,4	916		1070
35	50			55			37,2	1144	39,5	920		1060
				65			38,2	1306	45,1	892		1170
33	50	160		55	40		37,6	1192	41,2	909		1110
				65			37,9	1260	43,5	900		1160
35	50			55			38,9	1411	48,7	873		1270
				65			39,3	1458	50,3	863		1310






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
°C	% R.H.	m³/h	°C	% R.H.	m³/h	°C	% R.H.	W	l/g	Max	Set 19°C	
<b>280 m³/h</b>												
33	50	100	26	55	180	26	42,0	991	34,2	1173	667	1100
				65			43,7	1228	42,4	1116		1260
35	50			55			42,8	1097	37,9	1146		1180
				65			44,5	1353	46,7	1088		1350
33	50	160		55	120		43,2	1155	39,9	1132		1230
				65			44,3	1303	45,0	1094		1340
35	50			55			44,5	1347	46,5	1088		1370
				65			45,7	1486	51,3	1050		1480
33	50	200		55	80		44,0	1259	43,5	1106		1330
				65			44,8	1373	47,4	1080		1400
35	50			55			45,4	1437	49,6	1058		1470
				65			46,6	1594	55,0	1023		1570
33	50	240		55	40		44,9	1353	46,7	1075		1420
				65			45,2	1418	49,0	1066		1460
35	50			55			47,0	1625	56,1	1008		1620
				65			47,5	1684	58,1	993		1660
<b>360 m³/h</b>												
33	50	100	26	55	260	26	45,7	920	31,8	1392	857	1200
				65			48,1	1245	43,0	1298		1400
35	50			55			46,4	1014	35,0	1365		1280
				65			48,8	1349	46,6	1267		1480
33	50	160		55	200		46,8	1068	36,9	1347		1320
				65			48,7	1302	45,0	1274		1470
35	50			55			48,2	1226	42,3	1294		1430
				65			50,1	1476	51,0	1220		1580
33	50	200		55	160		47,6	1161	40,1	1315		1400
				65			49,1	1369	47,3	1258		1520
35	50			55			49,4	1376	47,5	1247		1540
				65			50,9	1562	53,9	1189		1660
33	50	240		55	120		48,5	1261	43,6	1282		1480
				65			49,5	1403	48,4	1240		1570
35	50			55			50,5	1492	51,5	1205		1660
				65			51,7	1637	56,5	1158		1740

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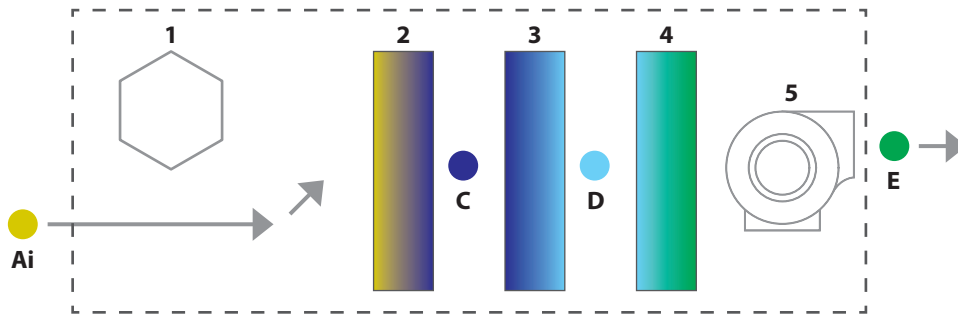
## EXAMPLE OF RECIRCULATION PERFORMANCE

Yield during dehumidification in recirculation mode, with a flow rate of 360 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 47,4%.

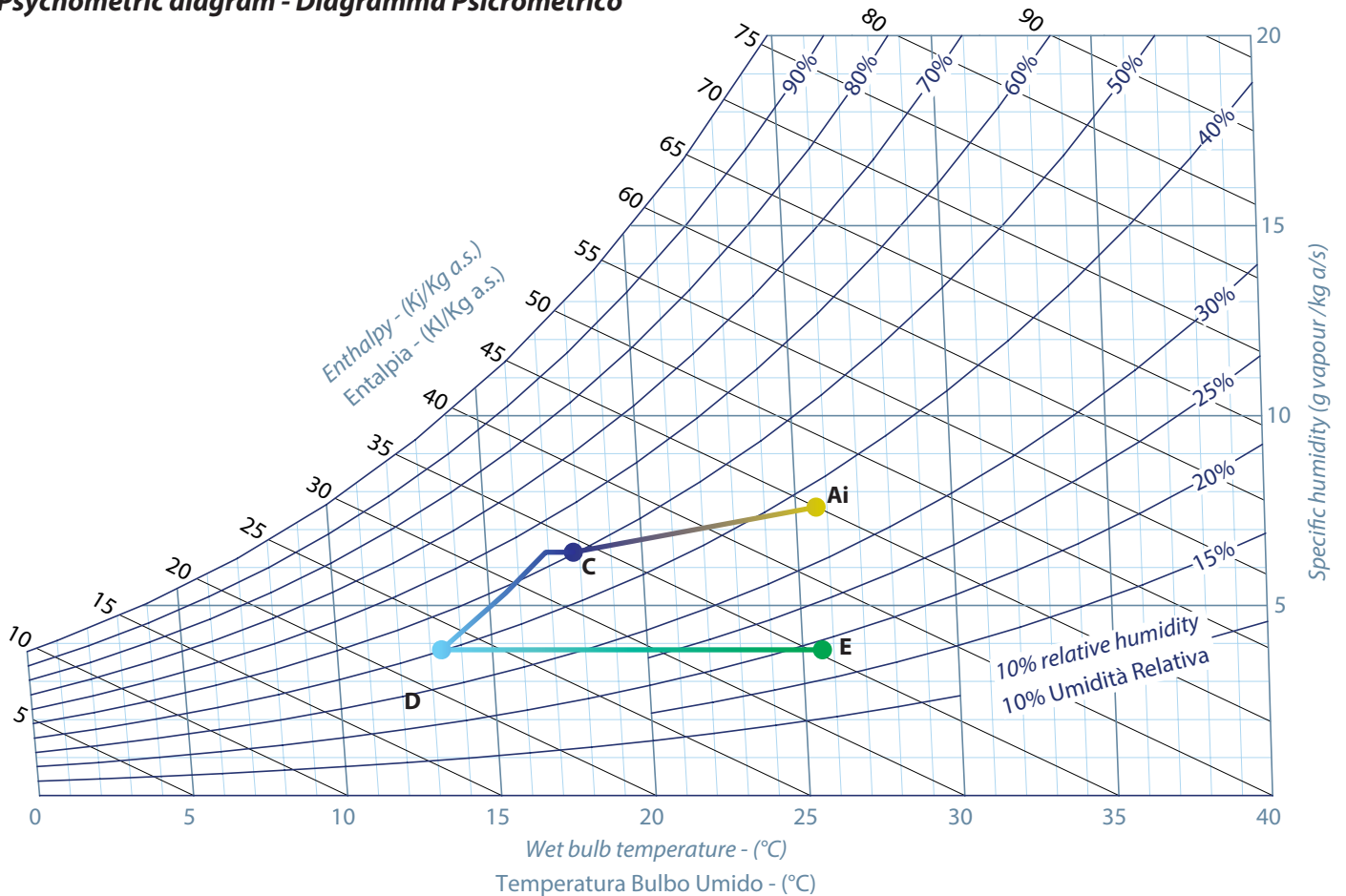
Air key		
<b>Ai</b>		Room air intake
<b>C</b>		Pre-treatment post-coil
<b>D</b>		Evaporator post-coil
<b>E</b>		Room air delivery

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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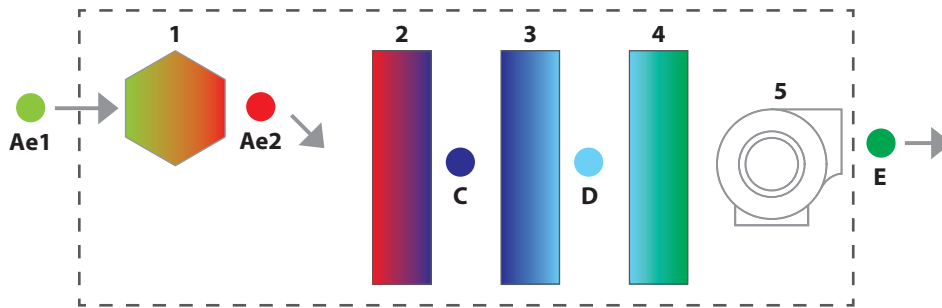
## EXAMPLE OF RENEWAL PERFORMANCE

Yield during dehumidification in renewal mode, with a flow rate of 240 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 44,8%.

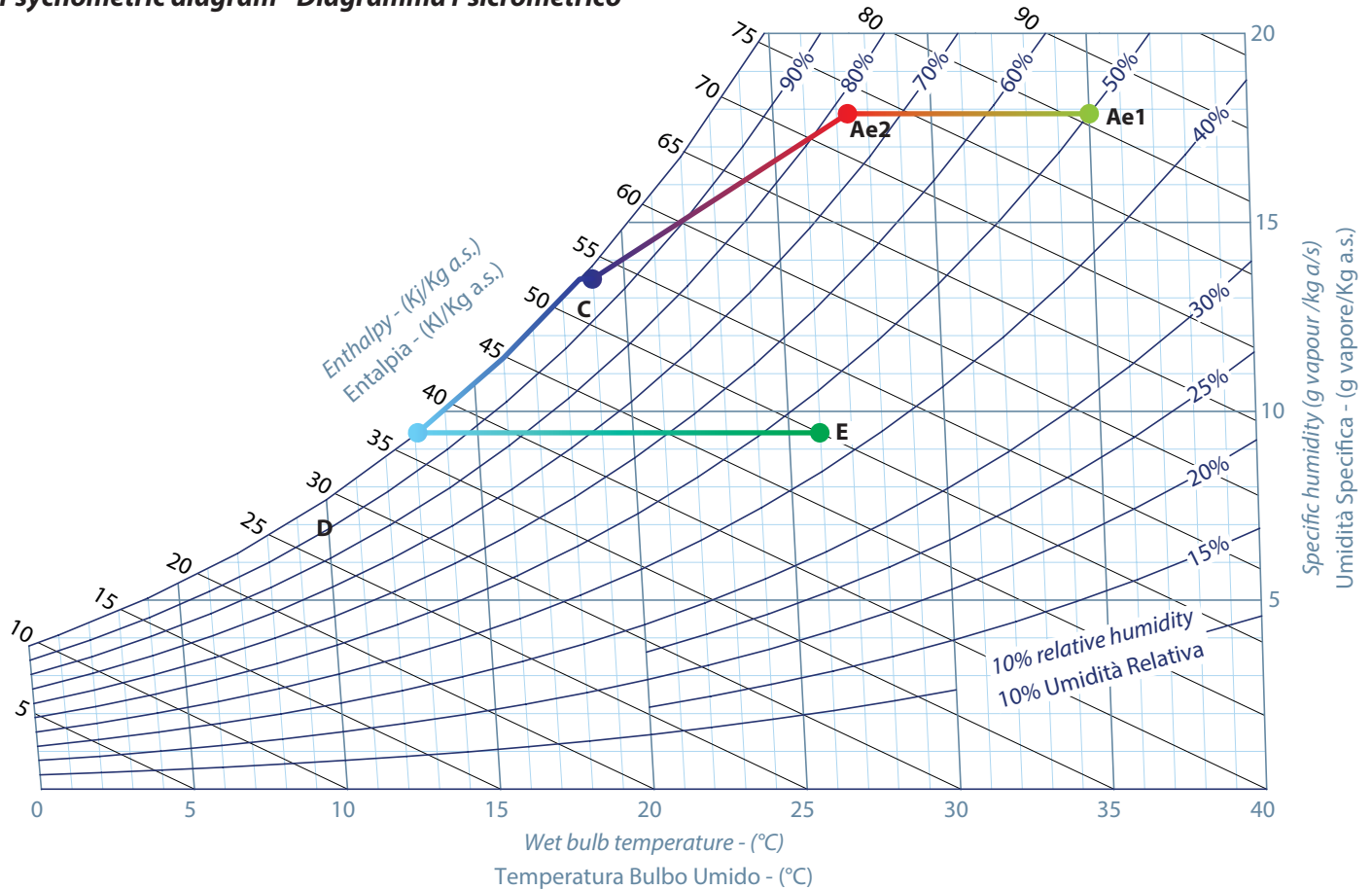
Air key		
<b>Ae1</b>		Outdoor Air Intake
<b>Ae2</b>		Post Recovery Unit Outdoor Ai
<b>C</b>		Pre-Treatment Post-Coil
<b>D</b>		Evaporator Post-Coil
<b>E</b>		Room Air Delivery

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



### Psychrometric diagram - Diagramma Psicrometrico



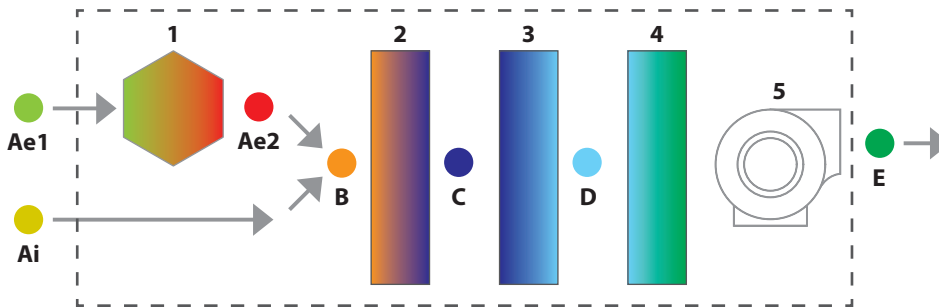
# TECHNICAL SHEET

## EXAMPLE OF RECIRCULATION + RENEWAL PERFORMANCE

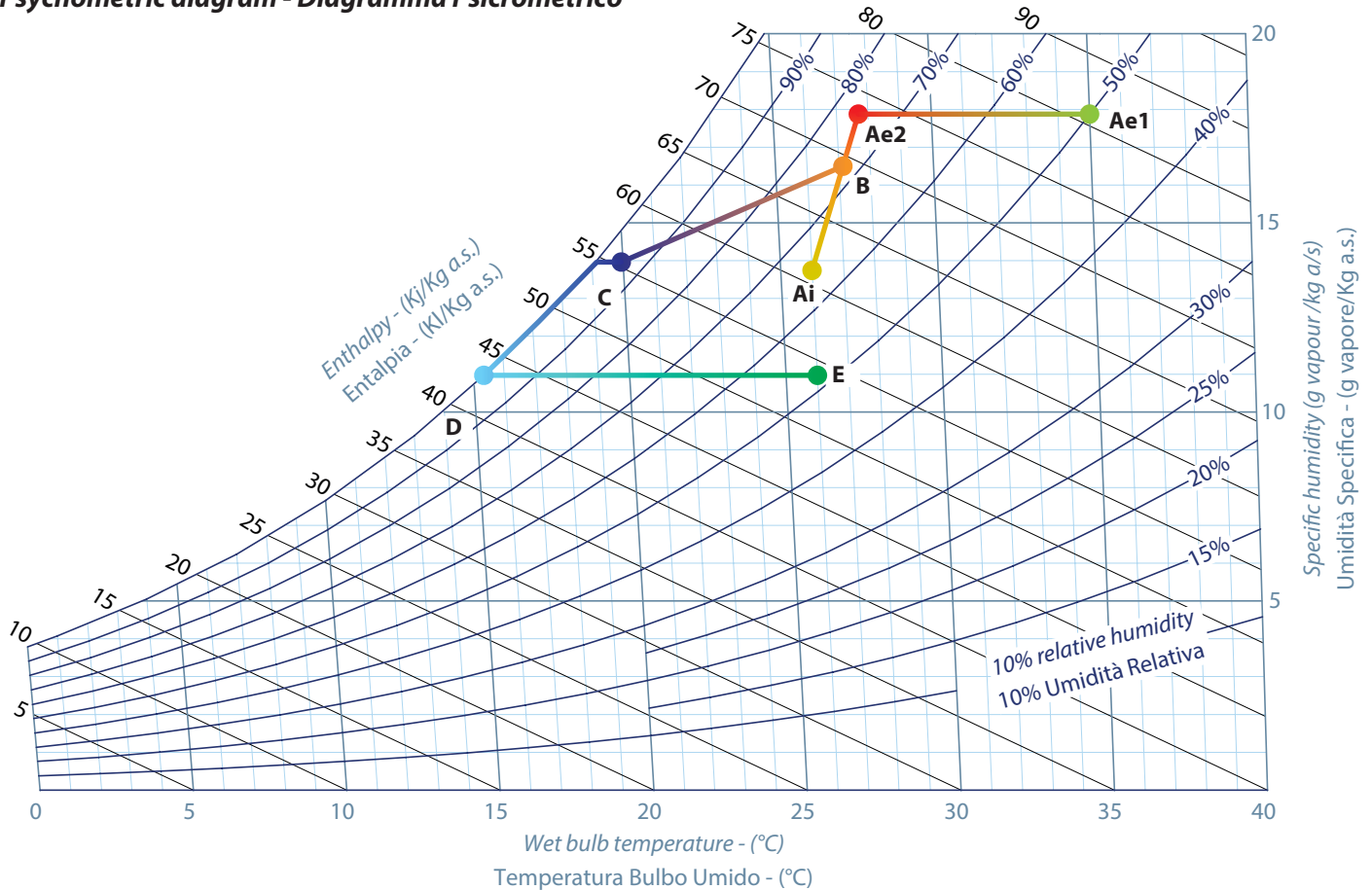
Yield during dehumidification in recirculation + renewal mode with a total flow rate of 360 m<sup>3</sup>/h, when the unit is supplied with water at a temperature of 15 °C. Recirculation 120 m<sup>3</sup>/h Room air at 26° and R.H. of 65 + Renewal 240 m<sup>3</sup>/h outdoor air at 35° and R.H. 50%, with later mixing and re-delivery into the room at 26° and R.H. of 51.7%

Air key			Parts key			
<b>Ae1</b>		Outdoor Air Intake	<b>C</b>		Pre-Treatment Post-Coil	
<b>Ae2</b>		Post Recovery Unit Outdoor Air	<b>D</b>		Evaporator Post-Coil	
<b>Ai</b>		Room air intake	<b>E</b>		Room Air Delivery	
<b>B</b>		Ae2-Ai Mixed Air				
				<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



### Psychrometric diagram - Diagramma Psicrometrico



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## OPERATION IN WINTER INTEGRATION MODE

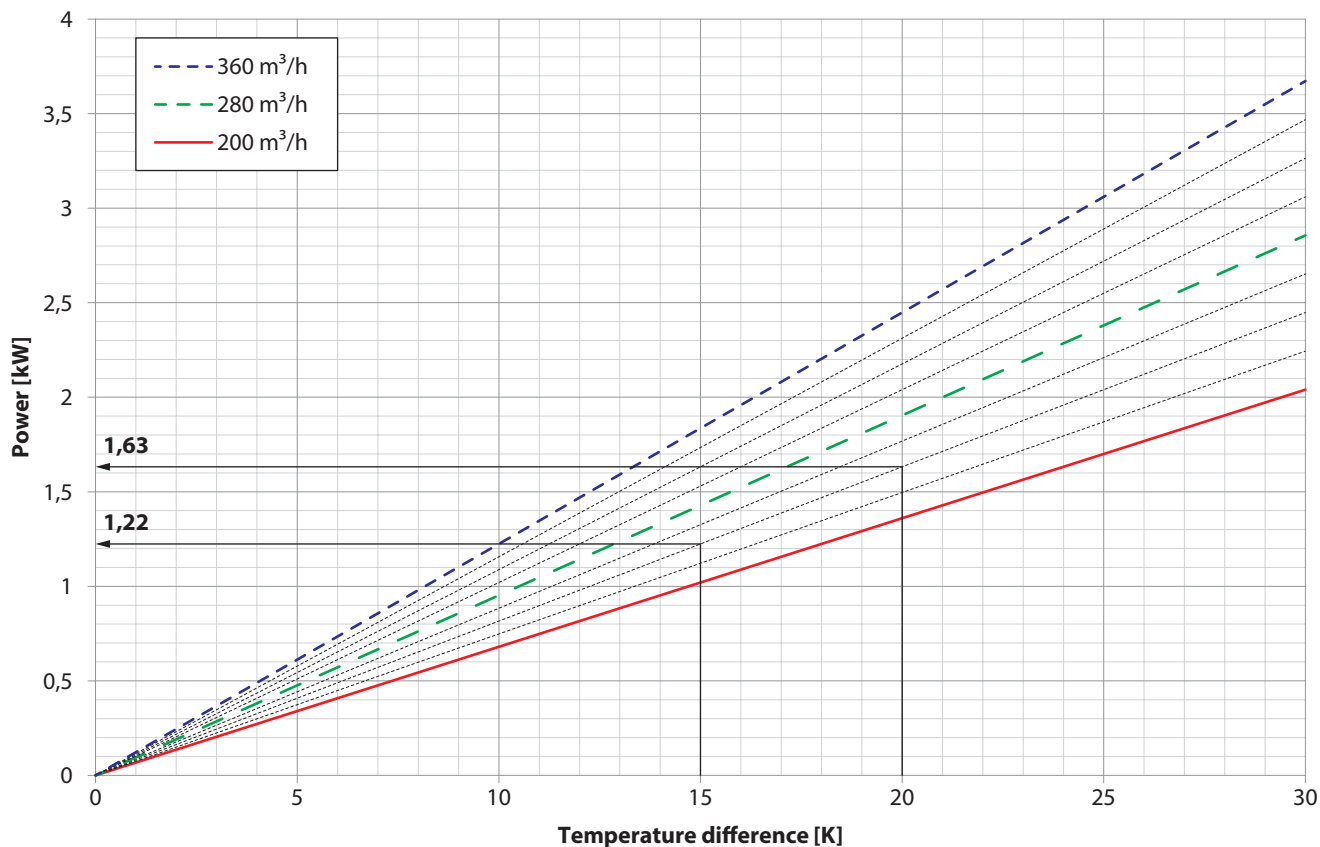
If the winter integration function is enabled, the unit will start the delivery fan (if renewal is enabled then the output fan will also start). Integration can be managed in two ways:

- **Controlled-power integration (from set-point)** The unit will automatically adjust the flow rate through a 2-way motorized valve (with an optional 0-10 V servomotor) installed upstream, to obtain a temperature value that is equal to the integration set-point, as set on the control unit panel.

- **Total power integration** The unit will be hydraulically supplied at the pre-set nominal flow rate and will deliver the maximum available power into the room.

From the graphs below it is possible to find the powers that need to be delivered and supplied by the unit in both configurations.

## CONTROLLED-POWER INTEGRATION GRAPH



### Example

Air flow rate: 240 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

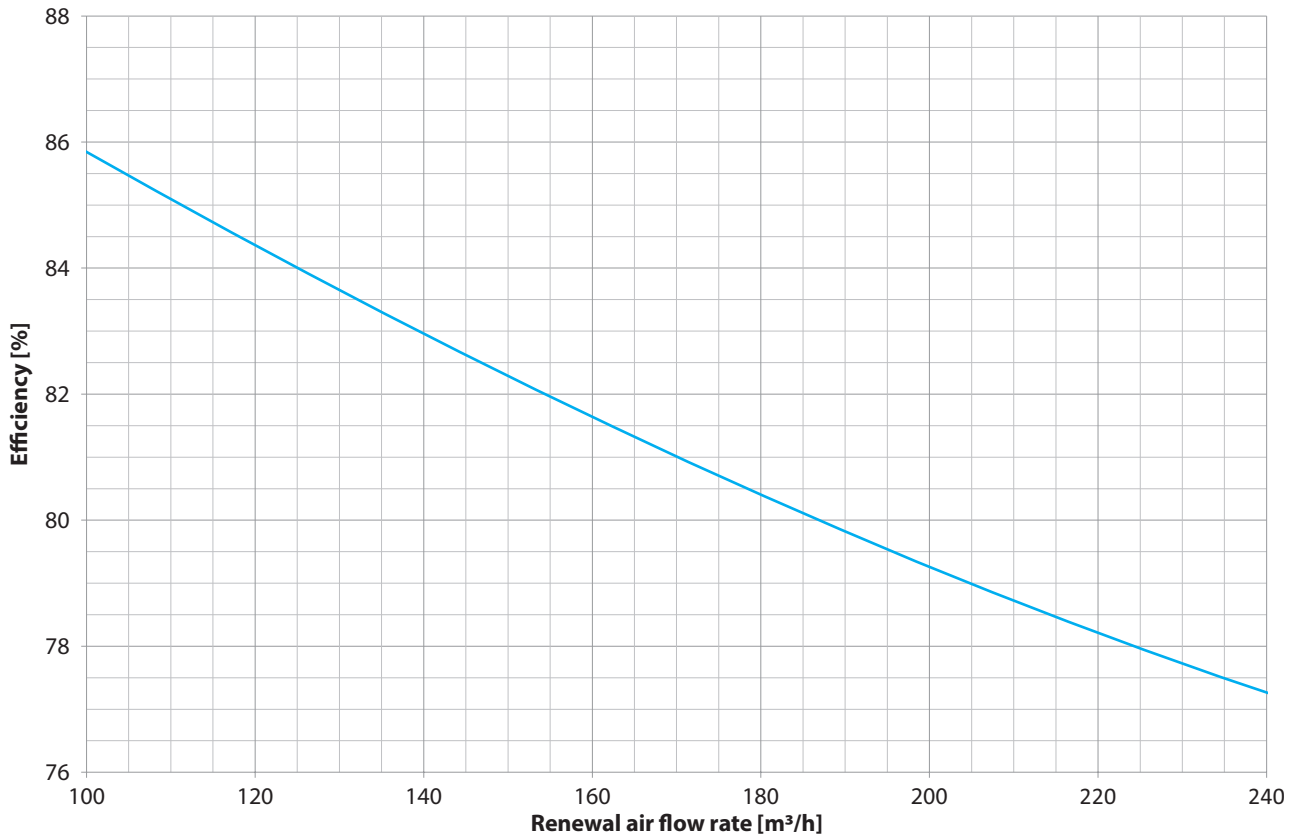
**Power delivered into the room: 1.22 kW**

Temperature delta with Air before coils: 20 K

**Power to be supplied to the unit: 1.63 kW**

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## RECOVERY UNIT PERFORMANCE



## PRESSURE LOSS OF THE HYDRAULIC CIRCUIT

