

AIR-COOLED ROOFTOP PACKAGED UNITS



VECTIOS™

ALL-IN-ONE AIR CONDITIONING SOLUTION
WITH **HUMIDITY CONTROL**



HUMIDITY CONTROL



FULL RELIABILITY



**HIGH ENERGY EFFICIENCY
& ENVIRONMENTAL
RESPONSIBILITY**



EXTENSIVE SCOPE



PACKAGED SYSTEM FLEXIBILITY



ADVANCED SYSTEM CONTROL





VECTIOS™: THE NEW STANDARD IN HUMIDITY CONTROL

Vectios™ is a new generation of rooftop air conditioning packaged units, designed both to offer high levels of indoor air quality and full efficiency as well as to reduce the total cost of ownership during its lifetime.

VECTIOS™ SOLUTIONS FOR EVERY APPLICATION



SHOPPING
CENTRES



LOGISTICS



CINEMAS



INDUSTRIES



OFFICES

HUMIDITY CONTROL

WHERE ?

Applications with highest comfort and humidity control levels: supermarkets, restaurants, museums and applications with high latent load and/or humidity climates.

HOW ?

Humidification:

- Signal control to manage an external humidifier with proportional or on/off control

Dehumidification:

- Dehumidification using back-up heater options
- **Active dehumidification with condensation coil** → NEW OPTION

A typical use for dehumidification is to avoid condensation over goods or refrigeration cabinets glass doors in low temperature stock applications.

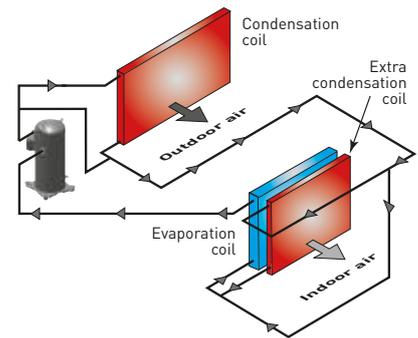


ACTIVE DEHUMIDIFICATION WITH CONDENSATION COIL

This new option allows controlling the maximum levels of humidity in the room, in the most efficient way, and independently of the location and the part-load of the unit.

The dehumidification process is done by the main refrigerant coil and reheat is done in the **additional condensation coil** after evaporator if it is required. Energy recovery is controlled using **3-way-valve to accurately compensate for the room demand** with the highest efficiency and flexible operation in comparison with other solutions with on/off control. Besides, the connection of the additional condensation coil allows the subcooling mode to satisfy part load type conditions when there is a space need for cooling and dehumidification.

ACTIVE DEHUMIDIFICATION WITH CONDENSATION COIL

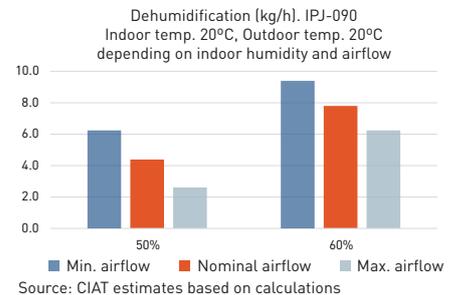


INFLUENCE OF SELECTION CONDITIONS

Dehumidification capacity is strongly influenced by different factors:

- **Supply airflow:** the lower airflow, the higher dehumidification capacity.
- **Relative humidity set-point:** the influence of humidity set-point is key. The higher set-point, the higher dehumidification capacity.

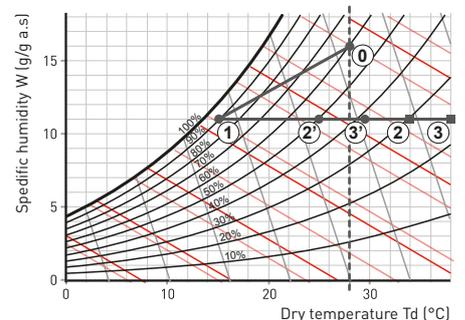
INFLUENCE OF SELECTION CONDITIONS



DEHUMIDIFICATION OPERATION

In dehumidification, the unit controls the humidity turning-on the compressors in cooling mode and removing water in the evaporator coil. Depending on temperature conditions in comparison with set-point conditions, the control will adapt the amount of energy recovered in additional condensation coil to re-heat the airflow. It is possible also to activate the electrical heater back-up (option) in case additional re-heat is required.

DEHUMIDIFICATION OPERATION



- 0 → 1: Normal evolution in the evaporator without using extra condensation coil.
 - 1 → 2 or 2': Reheating using extra condensation coil in units with 1 or 2 frigorific circuits.
 - 2 or 2' → 3 or 3': Additional reheating using the auxiliary electrical heaters in units with 1 or 2 frigorific circuits.
- Source: CIAT estimates based on calculations

ADVANTAGES

- **Flexibility** for operation in full or partial load conditions.
- **Comfort.** Precise control (temperature and humidity) in any season: winter, mid-season or summer.
- **Energy efficiency** and cost savings thanks to the energy recovery to re-heat airflow.
- **All-in-one factory-installed option.** Designed and qualified using the highest quality standards.
- **Available in cooling only and heat pump reversible units.**

TECHNICAL PERFORMANCE

VECTIOS RANGE														
MODEL NUMBER		90	120	140	160	180	190	200	220	240	280	320	360	380
Dehumidification capacity (*1)	kg/h	7.0	8.9	9.7	12.4	15.4	17.5	16.9	19.6	21.6	22.3	25.3	31.2	38.4
Energy recovery capacity (*1) (*4)	kW	28.3	35.2	42.0	46.9	52.6	55.7	33.2	36.3	38.0	42.6	45.3	50.6	56.7
Dehumidification capacity (*2)	kg/h	12.3	15.5	17.7	21.1	25.2	27.7	29.3	33.2	35.6	38.5	42.5	50.0	59.4
Energy recovery capacity (*2) (*4)	kW	30.0	37.5	44.9	50.0	56.1	59.3	35.4	38.7	40.4	45.5	48.3	53.9	60.2
Dehumidification capacity (*3)	kg/h	6.2	7.5	7.9	10.4	13.1	15.0	14.1	16.7	18.4	19.4	22.4	26.6	34.2
Energy recovery capacity (*3) (*4)	kW	25.7	32.5	38.5	43.3	48.4	51.3	30.6	33.5	35.0	38.9	41.4	46.5	51.7

(*1) Indoor coil conditions: 27°C 50%HR. Outdoor 35°C. Minimum airflow
 (*2) Indoor coil conditions: 25°C 60%HR. Outdoor 20°C. Minimum airflow

[*3] Indoor coil conditions: 20°C 50%HR. Outdoor 20°C. Minimum airflow
 [*4] Maximum energy recovery capacity in the additional condensation coil

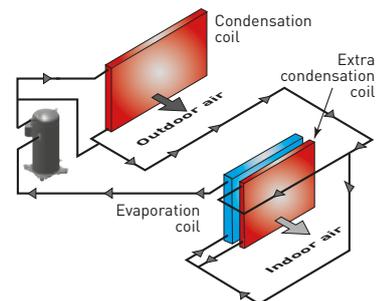
OPERATION MODES

VECTIOS RANGE						
	Cooling	Subcooling	Dehumidification + partial re-heat	Dehumidification + 100% re-heat	Dehumidification + re-heat + back-up heater	Heating
INDOOR CONDITIONS	$T > T_c$		$T < T_c$			$T < T_c$
	$HR < HR_c$	$HR > HR_c$	$HR > HR_c$			$HR < HR_c$
OPERATION						

T: Indoor temperature
 Tc: Indoor temperature set-point

HR: Indoor relative humidity
 HRc: Indoor relative humidity set-point

Selection with outdoor EC fans is recommended to operate in dehumidification conditions with heating demand and outdoor temperature below 12°C.



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