

# RFD

High efficiency heat recovery unit  
WITH MODULATING  
HEAT PUMP CIRCUIT  
AND SUMMER  
DEHUMIDIFICATION  
from 300 to 600 m<sup>3</sup>/h

The new RFD 500 heat recovery units have been designed and developed to satisfy both the exchange of air (with possibility of variation in flow rate) and its heat treatment (with the possibility of controlling the supply temperature in the rooms) and for dehumidifying, during the summer season, those rooms already equipped with water sensible cooling systems.



HOTELS



OFFICES



SHOPPING CENTRES



HEAT PUMP



PLATES



EFFICIENCY



DEHUMIDIFY



EC FANS



INVERTER COMPRESSORS



PLUG&amp;PLAY



INDOOR INSTALLATION



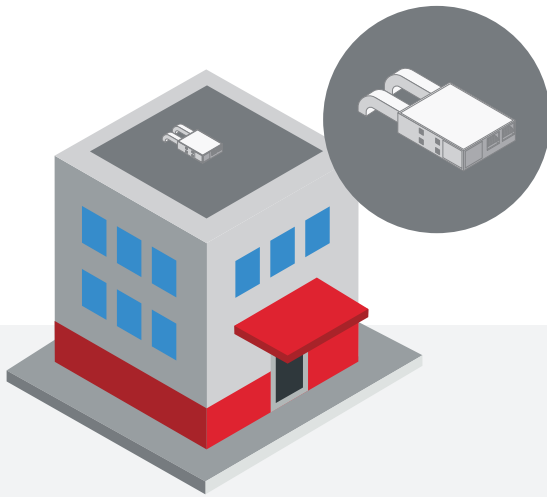
OUTDOOR INSTALLATION



R410A

## ADVANTAGES

- High recovery efficiency
- Reduced energy consumption
- Indoor installation (in false ceiling) and outdoor installation (with roof)
- Integration with the most common supervision systems
- Compactness and ease of installation
- "ALL-IN-ONE" functions integration (Air recirculation, heat treatment and dehumidification)



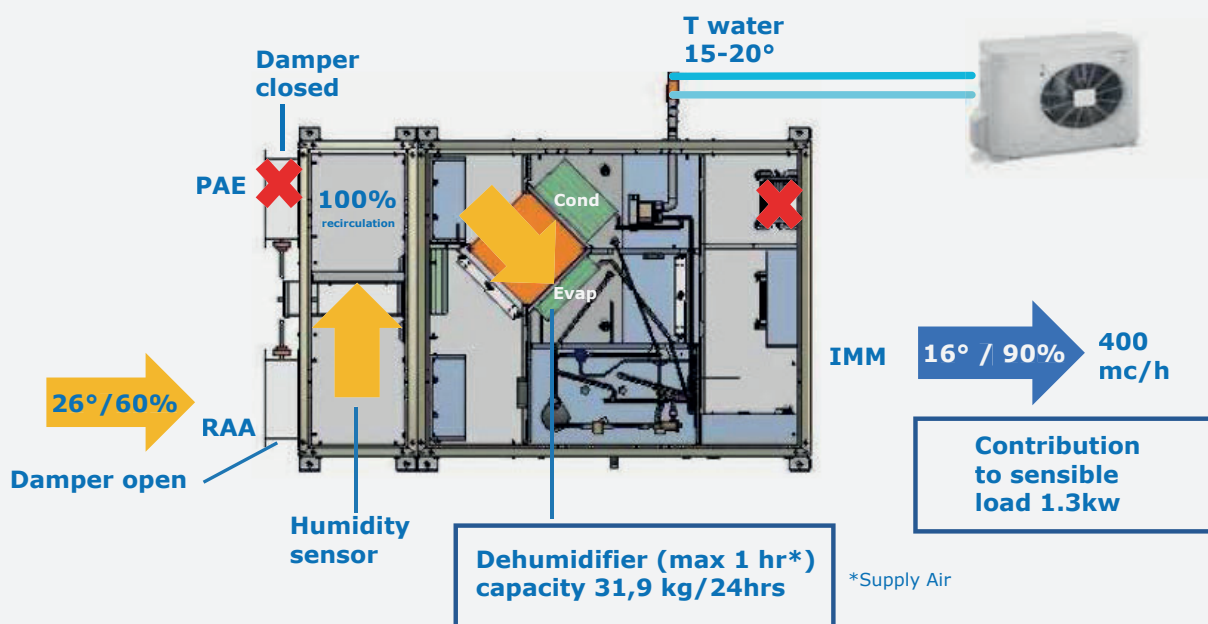
## RFD OPERATION

The units in the RFD range recover the air in the areas to be treated. They recover 70% of the exhaust air temperature with integration of an existing heating and cooling system. The internal loads of the returned air are neutralised thanks to the integration of the modulating refrigerant circuit. Combined with a water cooling system, it performs the function of summer dehumidification with a system of motorised dampers and a water plate condenser. All controlled by on-board electronics.

## SUMMER DEHUMIDIFIER FUNCTION

Outside air introduced into the building is cooler if compared to the return air, thus contributing to reduce the cooling sensitive load.

During the dehumidifying process the unit produces warm water (with a temperature of 45°C) for free use (e.g. boiler DHW).



## TECHNICAL SPECIFICATIONS

- Load-bearing frame in RAL 9002 pre-painted galvanised sheet metal;
- Double-shell closing panels with a thickness of 20 mm, in pre-painted galvanised sheet metal RAL 9002 outside and galvanised inside; hinged at the bottom for easy access to the internal components.
- Non-flammable thermoacoustic insulation in mineral wool with a density of 100 kg/m<sup>3</sup>.
- High efficiency static heat recovery unit of cross-flow type with aluminium plates with additional sealing; lower condensate collection tank, extended to the entire area dedicated to heat treatment.
- Compact filters th. 96 mm with synthetic/fibre glass support in 3 non-intertwined layers. On external air intake, efficiency element ISO ePM1 50%, on ambient air intake, 50% ISO ePM2.5 efficiency element.
- Centrifugal electric fans for inlet and exhaust with double intake forward blades equipped with EC motor and built-in control electronics.
- Refrigerant circuit, variable capacity, with continuous heat pump (R410A) consisting of hermetic rotary compressor equipped with EC motor and specific control driver, summer evaporating coil/winter condenser with 3 rows and summer condensing coil/winter evaporator with 7 rows (with hydrophilic treatment) with copper pipes and continuous aluminium fins, bidirectional electronic expansion valve, liquid receiver, 4-way valve for reverse cycle, safety valve, high and low pressure transducers, high pressure switch, freon filter, double liquid light.
- Summer environment dehumidification system (with heat loss on the hydraulic circuit) consisting of a three-servo drive damper module (for full recirculation operation), humidity sensor, water plate sensor, external diverter valve with actuator and consent flow switch (actuator valve, flow switch, water temperature sensor and hydraulic fittings supplied separately to be mounted and wired).
- Internal electrical panel for management of all the power commands; temperature probes on the returned air circuit, outside air, inlet air and vent air; microprocessor regulation for automatic management of the inlet temperature and of the ambient humidity, of the hot/cold switching and of the defrost of the recovery unit and of the winter evaporator; control panel with display for setting of the parameters and for displaying of the probe and set-point values with remote control up to 200 m from the unit. Possibility of connection to a supervision system through at least one of the following protocols: Modbus RTU on RS485, Modbus TCP/IP on Ethernet network, BACnet TCP/IP with B-AAC profile on Ethernet network, Wen Server with trend on Ethernet network.

## ACCESSORIES

Sanitation module with UVC plasma and antivirus filter	Kvir-P
Air quality sensor	AQS
Additional electric PRE heater	SKE 1
Additional electrical POST heater	SKE 2
ISO EPM1 85% (ex F9) class compact filter	FC9
Air filter pressure switch	PSTD
Flexible connection	GAT
PD2 support feet	PD2

## MODELS

RFD		500		
Airflow	Nom	m <sup>3</sup> /h	500	
Available static pressure	Nom	Pa	150	
Radiated sound power	Nom	dB(A)	62	
ELECTRICAL ABSORPTION				
Total current	Nom(1)		6	
	Nom (2)	A	7	
	Max (4)		13	
Total absorbed power	Nom (1)		820	
	Nom (2)	W	730	
	Max (4)		1500	
Electrical power supply		V-Ph-Hz	230-1-50	
ENERGY RECOVERY		WINTER (1)	SUMMER (2)	
Total power transferred		W	5370	3000
Net COP/EER		W/W	6,6	4,1
Input temperature		°C	25,0	20,0
DEHUMIDIFICATION		WINTER (1)	SUMMER (2)	
Nominal air flow (100% recirculation)		m <sup>3</sup> /h	--	400
Dehumidification capacity		kg/24h	--	36.9
Heat sink capacity		W	--	2710
Condenser water flow rate		l/h	--	465
Water pressure drop		kPa	--	2
Treated air conditions		°C	--	16.1 (90% UR/RH)
Sensitive cooling additional capacity		W	--	1330
OPERATING LIMITS (BASE UNIT)				
Winter outdoor air temperature min.	-7°C (ambient min. 19°C 50% RH (A))			
Summer outdoor air max.	36°C - 45% (ambient max. 27°C -70%) (B)			

(A) input temperature ≤ 24°C; balanced air flow rates

(B) input temperature ≥ 22°C; balanced air flow rates

(1) outdoor air at -5°C 80% RH, ambient air at 20°C 50% RH; nominal air flow rate

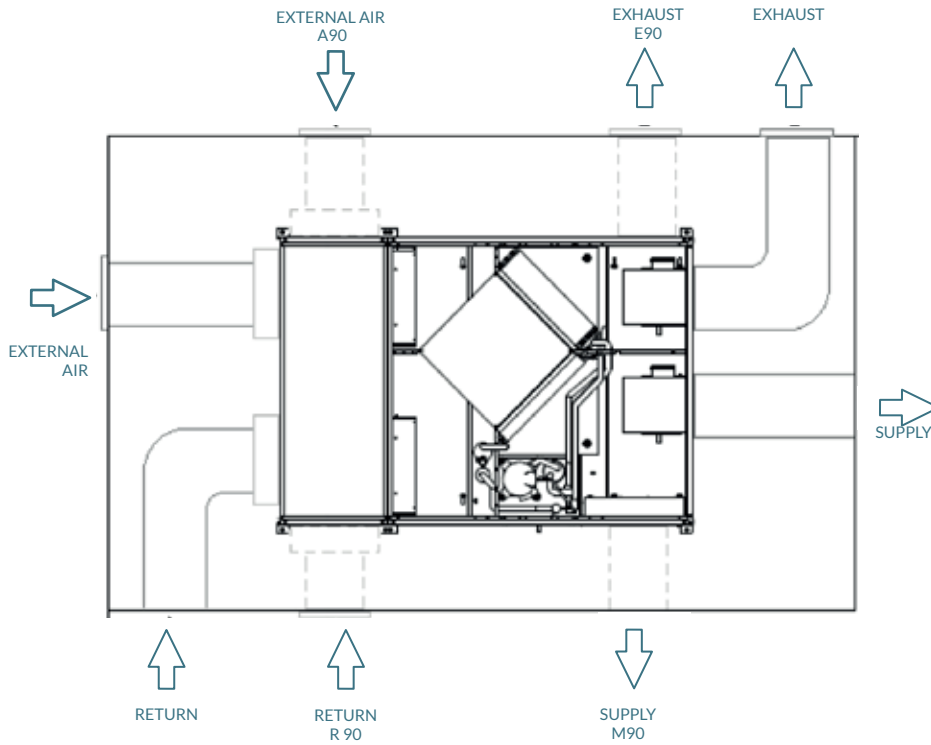
(2) outdoor air at 32°C 50% RH, ambient air at 26°C 50% RH; nominal air flow rate

(3) ambient air at 26°C 65% RH, inlet water temperature 15°; outlet 20°C

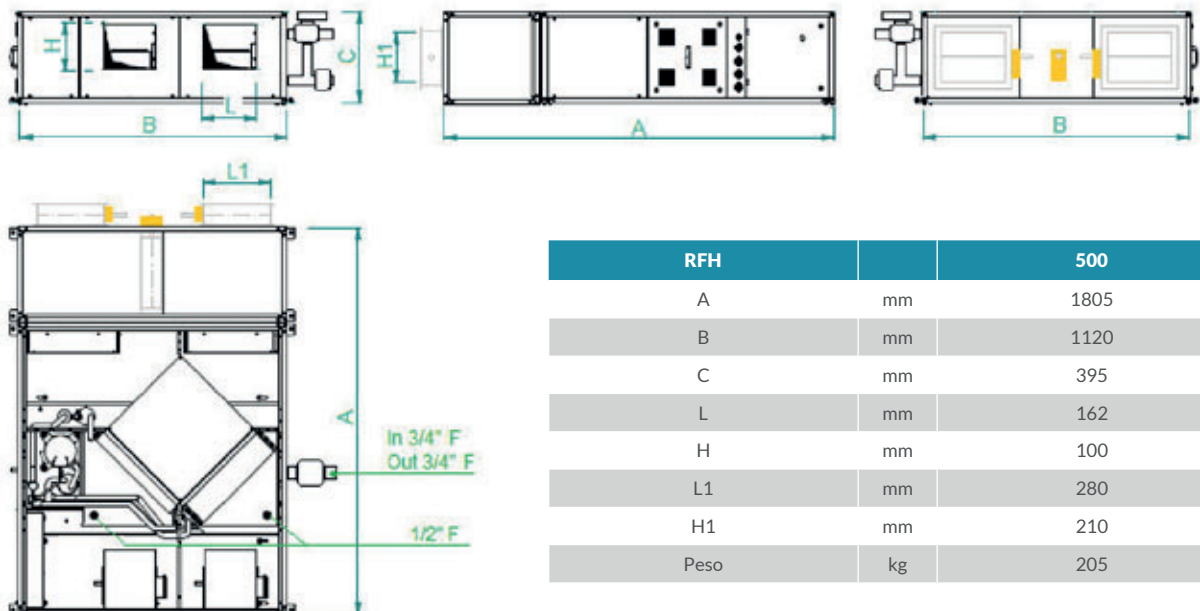
(4) with ventilation regulation signals and heat pump at the maximum permissible value

## POSSIBLE CONFIGURATIONS

It is possible to adapt the intake and exhaust dampers to the system according to the configurations shown below, even when the unit is already installed.



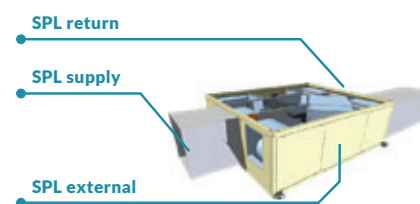
## DIMENSIONS AND WEIGHTS



RFH		500
A	mm	1805
B	mm	1120
C	mm	395
L	mm	162
H	mm	100
L1	mm	280
H1	mm	210
Peso	kg	205

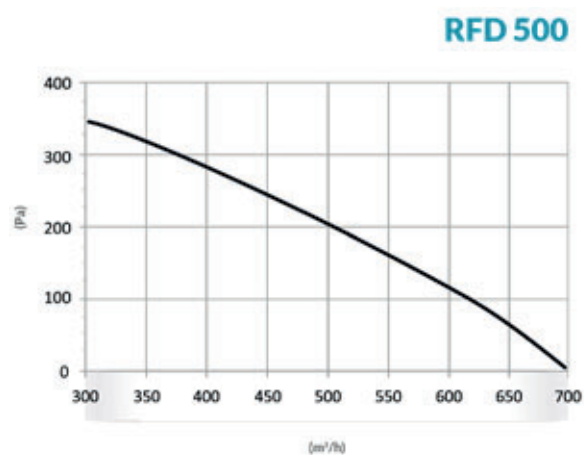
## SOUND LEVELS

With reference to the nominal operating conditions, the following table shows the sound power values (SWL) in octave band and the related results; the sound pressure values (SPL) at 1m, 5m and 10m in supply, in return and outside of the unit are also highlighted, under ducted unit conditions.



RFD	SWL [dB] IN OCTAVE BAND [HZ]								SWL		SPL SUPPLY			SPL RETURN			SPL EXTERNAL		
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1 m	5 m	10 m	1 m	5 m	10 m	1 m	5 m	10 m
	63	56	69	66	66	61	61	55	77	70	62	52	47	57	47	42	55	44	39

## PERFORMANCE



The graphs provide an indication of the useful static pressure (Pa) as the airflow [m<sup>3</sup>/h] supplied by the base inlet unit varies. Consult the technical bulletin to check the specific data of the unit's aerualic performance.