



Radiant Systems

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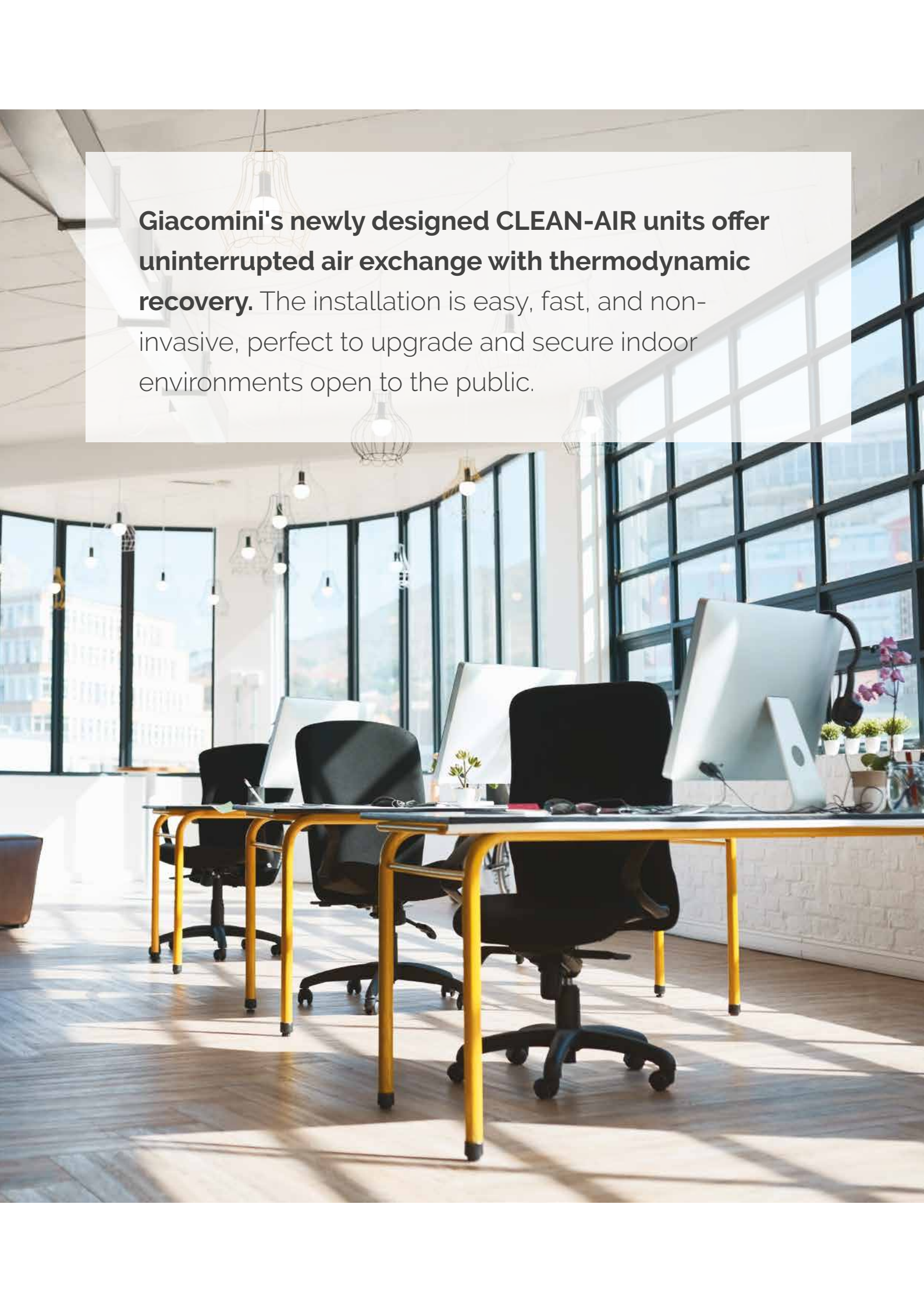


KHRA2 "Clean-Air" heat pump recuperators



Efficiency and health



A modern office interior with large windows, yellow desks, and black chairs. The office is bright and airy, with natural light streaming in from the windows. The desks are arranged in a row, and each workstation is equipped with a computer monitor and a black office chair. The floor is made of light-colored wood, and the ceiling features exposed ductwork and modern lighting fixtures.

Giacomini's newly designed CLEAN-AIR units offer uninterrupted air exchange with thermodynamic recovery. The installation is easy, fast, and non-invasive, perfect to upgrade and secure indoor environments open to the public.

Management of the Covid-19 health emergency put the air quality of indoor spaces open to public under the spotlight.

- The spread of SARS-CoV-2, the virus that causes COVID-19, occurs mainly via person to person contact through the **inhalation of droplets** sized $\geq 5 \mu\text{m}$ in diameter produced when coughing, sneezing, speaking, and breathing
- Physical distancing rules have been introduced to protect us from brief or outdoor exposures to the virus. In indoor and crowded environments, the risk increases. A key factor is **exposure time**
- Contagion occurs when people are exposed

to the virus for a long period of time. **Infection = exposure to the virus multiplied by time**

- Several indoor cases of infection reviewed by the scientists studying the virus in various countries showed that **people were exposed to the virus lingering in the air for an extended period of time** (several hours). They would be infected also when standing at many meters away from each other (choir rehearsals in a gym, call center staff, clients at restaurant tables) as the mere presence of the virus would be sufficient for contagion, notwithstanding its low viral load.



Indoor spaces with little air exchange or recycled air and densely crowded are the most hazardous in terms of contagion

The intake of outdoor air through ventilation not only improves the quality of the indoor environment, but can also enhance hygiene and provide health benefits as it reduces the contaminants present in the environment through dilution and filtration. Often, weather conditions make opening and closing windows impractical, given that priority

is to maintain indoor comfort.

Ideal for:

- Classrooms
- Public and private offices
- Medical and dental clinics
- Bars, restaurants, hotels
- Commercial businesses (hairdressers, beauticians, stores in general)



Multiple versions for any need

KHRA2-V

CLEAN-AIR compact ventilation unit with thermodynamic heat recovery in heat pump and vertical layout. Available for surface (VV) or flush (concealed, VS) mounting.



VV version: vertical surface mounting

Compact dimensions, ideal for surface mounting in limited spaces.



VS version: vertical flush mounting

Flush mounting or duct-type installation in technical compartments for control of air distribution. A convenient solution with reduced aesthetical impact.

KHRA2-H

CLEAN-AIR compact ventilation unit with thermodynamic heat recovery in heat pump and horizontal layout. Available for surface (HV) or flush (concealed, HS) mounting.



HV version: horizontal surface mounting. Slim and discreet for ceiling mounting. Takes up no floor space while offering the utmost design freedom and efficient air exchange throughout the room.



HS version: horizontal flush mounting. Fully ductable, the unit is entirely concealed inside the ceiling. Uninterrupted air exchange, extremely efficient and almost invisible.

The HRV system guaranteeing indoor air quality and dispersion of viral particles.

Active heat recovery through heat pump to ensure energy efficiency.

Structural characteristics

➤ *All in one*

Ready-to-use unit including every component required for its operation.

➤ *UV lamp and VOC sensor*

The unit can be equipped with a UV lamp (upon request) that performs a germicide action on intake air. The lamp is automatically turned on based on the air quality detected by the VOC sensor.

➤ *Ventilation*

Fans with direct-coupling brushless motor and multiple operational modes controlled mainly by the internal air-quality sensor.

➤ *Active thermodynamic recovery*

The unit actively recovers the energy from the ejected air. Thanks to the cooling circuit, the thermodynamic recovery enables to provide quantities of energy greater than the amount subtracted by ventilation for 90% of the operational time.

➤ *Effective filtering*

The intake and inlet air circuits feature 2 ePM1 filters. The intake air filter is situated after the coil to filter impurities completely. On the external air circuit is a Coarse prefilter protecting the entire unit.

➤ *Structure*

Free-standing sheet frame varnished on the outside (surface-mounting versions only) with intermediate polyethylene and EPDM thermal and acoustic insulation.

➤ *Cooling circuit*

Brazed copper circuit including: high-efficiency BLDC compressor, dehydrating filter, finned coils, electronic expansion valve, inversion valve and safety devices.

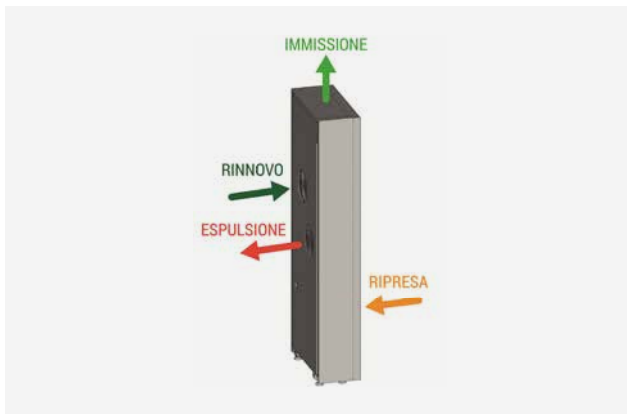
➤ *Settings*

Side electric switchboard with microprocessor and dedicated regulation. Fan control, display and temperature set-point, timer-based control of dirty filters. Control of the defrosting algorithm for use when external temperatures are low. Panel with side graphic interface and WIFI, remote included with surface-mounting versions only. Remote panel sold separately with WIFI or ModBus RTU for connection up to 10m from the unit, flush-mounting versions only.

➤ *Aesthetics*

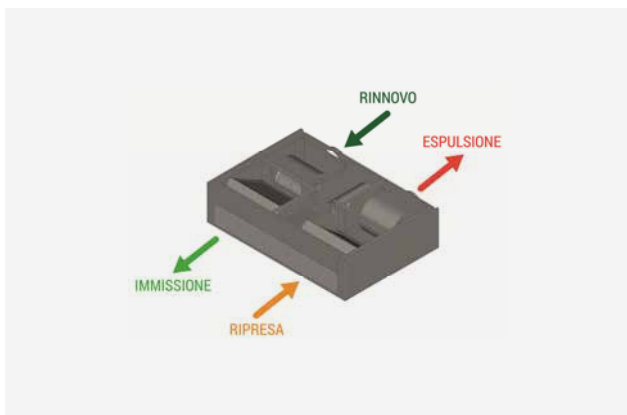
Surface-mounting models, both vertical and horizontal, feature metal panels fully perforated for a more appealing design. The perforation of the vertical version has also a functional purpose (as a foul air vacuum grid).

Operational principle



Winter operational diagram.

Indoor foul air (grey arrow) releases heat to the heat pump when flowing through the evaporation coil and is ejected only at a later time. After taking energy from the ejected air, the cooling fluid inside the heat pump transfers it to the exchange fresh air through the condensation coil (blue arrow) before channeling it into the room.



Summer operational diagram.

A 4-way valve reverses the cooling cycle to recover, through the condensing coil, the "cold" contained in the recovery air (grey arrow) before ejecting it. External air (blue arrow) is filtered, cooled and dehumidified through the evaporator before it is distributed into the room.

General technical data

	KHRA2VV380 KHRA2VV380U	KHRA2VS380 KHRA2VS380U	KHRA2HV460 KHRA2HV460U	KHRA2HS460 KHRA2HS460U
Types of fans	Backward-curved radial fans with Brushless motor		Forward-curved centrifugal fans with Brushless motor	
No. of fans	2	2	2	2
Air flow rate B0 / V3 / V2 / V1 - mc/h	380 / 320 / 190 / 130	380 / 320 / 190 / 130	460 / 400 / 240 / 140	460 / 400 / 240 / 140
Useful pressure - Pa	/	60 / 110	/	130
Type of compressor	Rotary BLDC	Rotary BLDC	Rotary BLDC	Rotary BLDC
Cooling gas	R410A	R410A	R410A	R410A
Filters	2x ePM1 80% + Coarse prefilter	2x ePM1 80% + Coarse prefilter	2x ePM1 80% + Coarse prefilter	2x ePM1 80% + Coarse prefilter
Max power absorbed by fans - kW	0,1	0,15	0,12	0,24
Max power absorbed by compressors - kW	0,95	0,95	1,15	1,15
Power supply voltage - V/ph/Hz	220/1/50	220/1/50	220/1/50	
Total max power absorbed - kW	1,05	1,15	1,27	1,37
Total max current absorbed - A	4,8	5	5,8	6,1
Acoustic pressure ² - dB(A)	41	43/46	43	45/47

(1) External air -5 °C/80% RH - Indoor air 20 °C/50% RH - Nominal flow rate

(2) Acoustic pressure at V3 nominal flow rate, at 3 m in free field according to 3744

► *Technical data for winter operation*

	KHRA2VV380 KHRA2VV380U	KHRA2VS380 KHRA2VS380U	KHRA2HV460 KHRA2HV460U	KHRA2HS460 KHRA2HS460U
Thermal capacity ¹ - kW	3,1	3,1	3,62	3,62
Absorbed capacity - kW	0,71	0,71	0,84	0,84
Total COP	4,4	4,4	4,3	4,3

► *Technical data for summer operation*

	KHRA2VV380 KHRA2VV380U	KHRA2VS380 KHRA2VS380U	KHRA2HV460 KHRA2HV460U	KHRA2HS460 KHRA2HS460U
Cooling capacity ¹ - kW	2,41	2,41	2,77	2,77
Absorbed capacity - kW	0,73	0,73	0,91	0,91
Total EER	3,3	3,3	3,0	3,0



Accessories and spare parts



KHR-C

Digital remote control with temperature and humidity sensor. Available in WIFI or ModBus version, black or white.



KBE

Electric battery with DN160 fixed-point regulation thermostat.



KPL-F2

Insulated plenum with unit connection flange and two DN160 round openings.



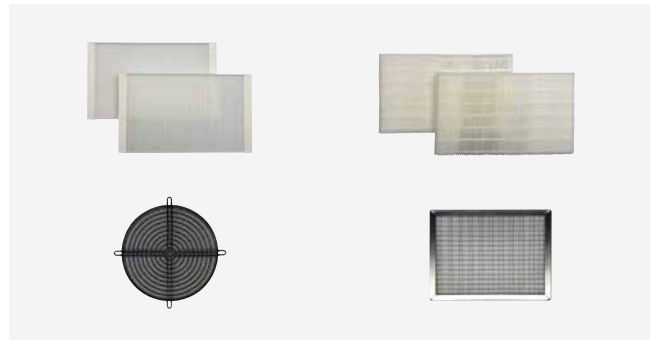
KGR-A

Delivery aluminum grid with two rows of adjustable fins. White. Dimensions 450x225 mm.



KGR-F

Intake grid with fixed-fin filter. White. Dimensions 450x225 mm.



KFR

Filter kit and spare prefilter for vertical and horizontal units.



KHRA2-UV

Spare UV lamp. The germicide UVC system includes a built-in wired UVC lamp and power supply unit (dedicated product codes to be specified upon order). The lamp works on a 254 nm UVC wavelength. Lamp estimated duration: 10.000 hours.



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