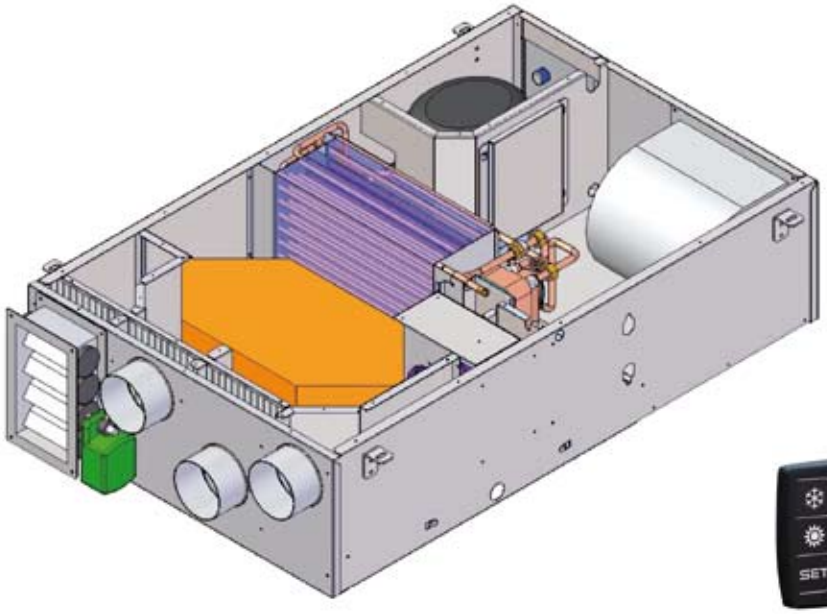
GHE

Dehumidifiers for radiant cooling systems with heat recovery

R134a

R410A

E.C.



Display

The dehumidifiers with heat recovery of high efficiency series GHE were designed to provide dehumidification and fresh air in a residential area with very high energy efficiency, combined with radiant cooling systems.

The units have been designed to grant the dehumidification either under conditions of thermally neutral air or in terms of air-cooled, managing small air flow thus avoiding annoying tiny air currents typical of traditional air conditioning systems.

The units consist of a direct expansion cooling system combined with a cross flow heat exchanger highly efficient, designed for heat recovery and air exchange environment in compliance with applicable regional and national lows.

VERSIONS

- **All units are supplied with double condenser (the first is an air condenser, the second is a water one) and of a logic which allows the dehumidification with neutrum air or with cooled air.**

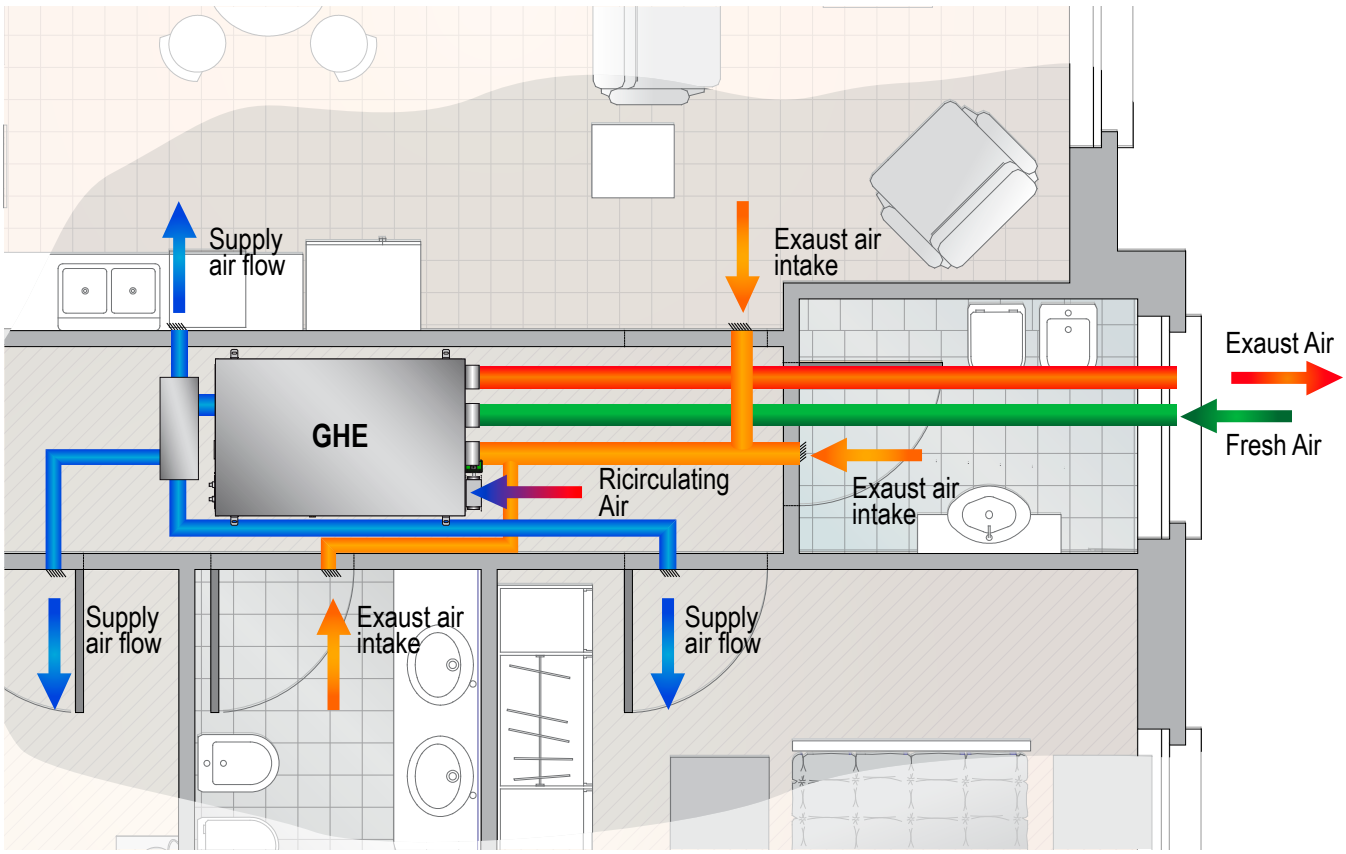
ACCESSORIES

- **PCRL: Remote mechanical hygrostat**
- **HYGR: Remote mechanical hygrostat + thermostat (WZ versions only)**
- **RGDD: Remote electronic temperature-humidity sensor.**

GHE

		25	50
Useful dehumidification capacity (from the net hygroscopic content of the external air) (1)	l/24h	30,1	61,8
Total cooling Power (latent + sensible) (1)	W	1380	2820
Recovered winter heating power (2)	W	950	1850
Efficency winter recovery (2)	%	90%	90%
Efficency summer recovery (1)	%	70%	70%
Power supply	V/Ph/Hz	230/1/50	230/1/50
Compressor absorbed power (1)	W	340	480
Supply fan absorbed power: minimum÷nominal÷maximum	W	10 ÷ 30 ÷ 86	30 ÷ 60 ÷ 130
Return fan absorbed power	W	11 ÷ 22 ÷ 43	22 ÷ 44 ÷ 68
Supply fan nominal useful prevalence	Pa	50 ÷ 140	50 ÷ 140
Return fan nominal useful prevalence	Pa	50 ÷ 140	50 ÷ 140
Min-max coil water flow	l/h	150 - 250 ÷ 400	200 - 350 ÷ 600
Min-max water pressure drop	kPa	38	35
Outdoor air flow	m^3/h	0 ÷ 130	0 ÷ 250
Supply air flow	m^3/h	130 ÷ 260	250 ÷ 500
Coolant type		R134a	R410A
Sound power level (3)	dB(A)	47	52
Sound Pressure Level (4)	dB(A)	39	44
Weight	Kg	60	80

TYPICAL INSTALLATION



1) Performances refer to the following conditions: Amb. Temp. 26°C; 65% RU; Fresh Air 35°C; 50% RU; Fresh Air System volume 130 m3/h; Water IN 15°C, Water Flow 250 l/h
2) Performances refer to the following conditions: Amb. Temp. -5°C; 80% RU; Fresh Air 20°C; Fresh Air system at maximum
3) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO 9614, at the normal working conditions.
4) Sound Power level according to ISO 9614

GHE

FRAME
All units are made from hot-galvanised thick sheet metal, to ensure the best resistance against the corrosions. The frame is self-supporting with removable panels. The drip tray is present standard in all units.

REFRIGERANT CIRCUIT
The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant gas used in these units is R134a for the model 25 and R407C for the models 50.

COMPRESSOR
The compressor is alternative for model 25 and rotative type for model 50., equipped and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers to reduce the noise.

CONDENSER AND EVAPORATOR
The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

FANS
The supply fan is centrifugal type, double inlet with forwards blades, with EC Fan motor directly connected. The exhaust fan is plug fan type with backwards blades, with EC fan motor directly connected.

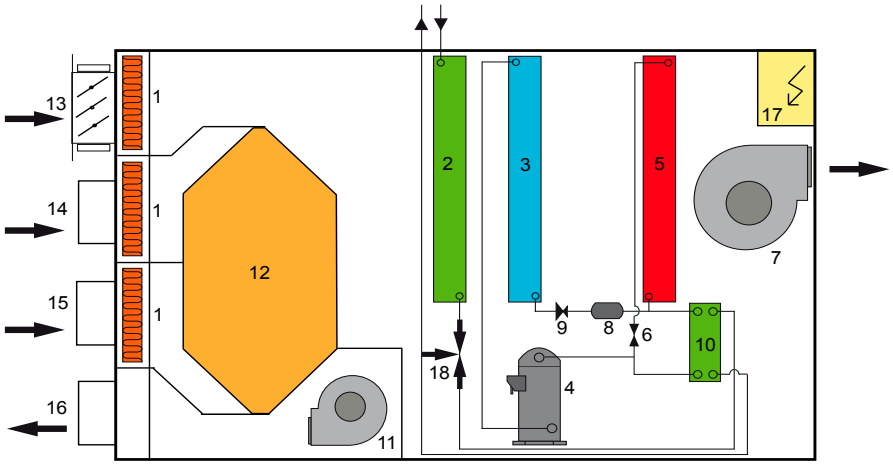
AIR FLTER
Comes with the unit is built in removable filter media summary execution for differentiated waste disposal, G4.

RECOVERY
Hexagonal cross-flow regenerator with aluminum plates, high efficiency (90%).

ADJUSTMENT TRIMMERS
Used during calibration of fans air flow depending on the ducts pressure drop .

MICROPROCESSOR
All GHE units are supplied with an advanced software for the complete control of the hydronic and air distribution side.
The software can manage:
- The management of the operation according to a probe of temperature and humidity.
- Activation of the dehumidification based on the pre set humidity conditions.
- Activation of of winter or summer sensible load integration, according to the summer or winter set point
- Management of supply air temperature trough discharge limit probe sensor (standard).
- Modulating valve for the proper management of the water battery power
- Ventilation Management directly from built-in timer in the microprocessor (optional).
- Management dumper
- Machine Allarm display
- Supervisor and BMS connection trough serial card RS485 (Standard fitted) a/o XWEB Module (Optional).
- Clogged filters management (optional).
- Antifreeze management.
- Summer/Winter commutation.

Main components



1	Air filter	10	Water condenser
2	Pre-Cooling coil	11	Exhaust fan with EC motor
3	Evaporator	12	High efficiency cross-flow heat recovery
4	Compressor	13	Return motorized damper
5	Air Condenser	14	WC exhaust air
6	Solenoid Valve	15	Fresh air
7	Supply fan with EC	16	Exhaust Air
8	Dryer Filter	17	Electrical Panel
9	Body rolling	18	Modulating 3-way valve

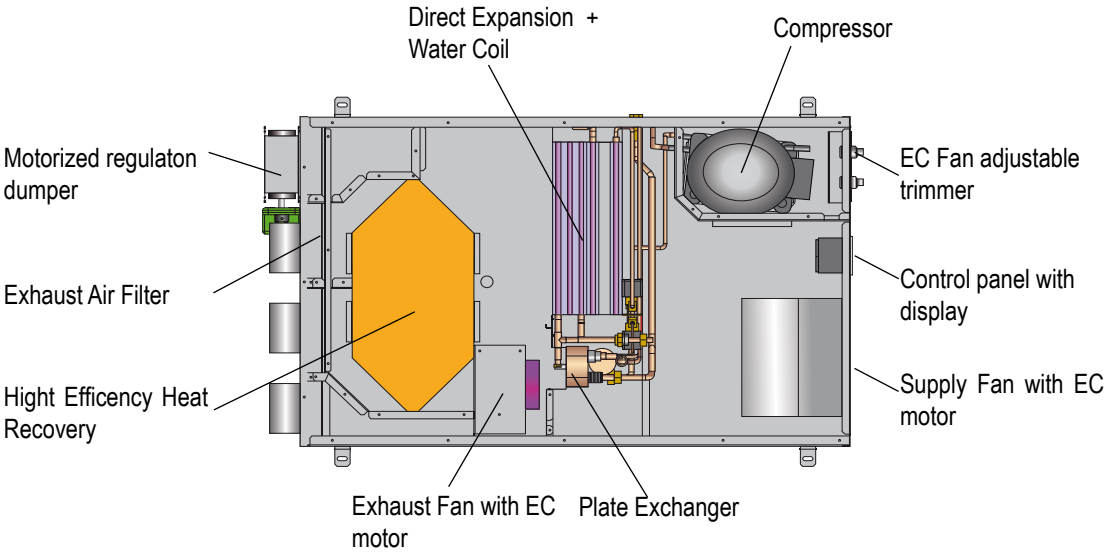
GHE

REFRIGERANT CIRCUIT FUNCTIONING PRINCIPLES

The functioning of the dehumidifier model GHE is as follows: the fan takes the air humid from the ambient trough the fan (7) and it's made go through the filter (1) and the cross-flow heat (12) pre-cooling water coil (2) where it's cooled and brought to a condition closed to saturation. Now it passes through the evaporating coil (3) where it's fatherly cooled and dehumidified. At this time the functionality mode may be. The air passes now through the condensing coil (5) where it's post heated (with a constant humidity) and in cooling, when the solenoid valve (6) open where it's reported to the required conditions.

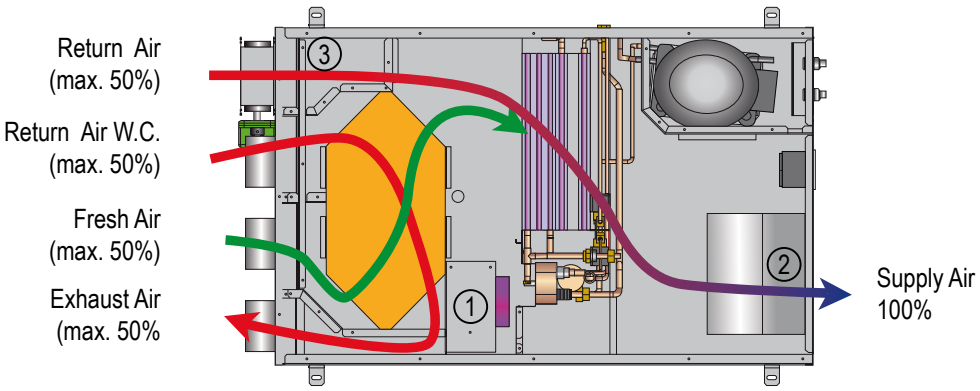
Dehumidification with neutral air :
The cooling system works partially in the water through the heat exchanger (10) and partially in the air with the heat exchanger (5) which will then make a post-heating at constant humidity blowing air in in the room in thermally neutral conditions.

Dehumidification with cooling:
The cooling circuit, in this case, performing works 100% of the condensation in the water through the heat exchanger (10), the heat exchanger (5) is intercepted by the valve (6) and the air supplied in the room is the same as leaving the evaporator coil (3), cold and dried.



AERAULIC CIRCUIT FUNCTIONING PRINCIPLES:

GHE 25 units can operate with a flow rate of outdoor air from 0 to 130 m3/h (0 to 260 m3/h for the model GHE 50), to ensure sufficient supply air changes in the room having a variable volume by 260 m3 (0.5 vol / h) to 460 m3 (0.3 vol / h), in compliance with regional and national regulations. The air flow rate of discharge can vary from 0 to 130 m3/h (0-260 m3/h for the model 50) in the winter mode, and is fixed to 260 m3/h (500 m3/h for the model 50) in summer mode.
The cross-flow heat exchanger of high efficiency is designed to ensure a recovery rating of 90% in terms of air temperature -5 ° C and air temperature 20 ° C. The stale air is expelled from the environment by the fan (1), while the outside air is sucked through the fan (2).
The proper balance of air flows is ensured by the damper (3) that handles both the balance of flows of air that the air flow recirculation summer.



GHE

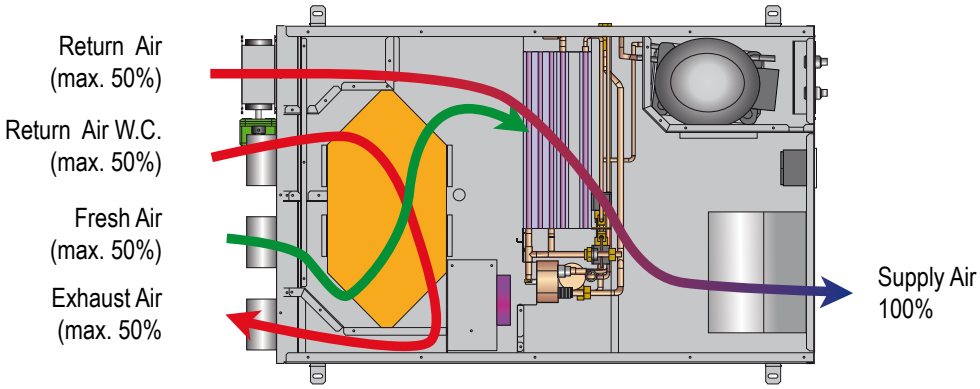
SUMMER OPERATION (COMPRESSON ON)

Whit this selected mode the unit renews the ambient air with the outside through the heat exchanger for high efficiency, air flow is increased so as to allow operation of refrigerant circuit; for this purpose the r recycling dumper will be open, the supply fan is operated at maximum capacity and the unit works with external air and partial recirculation.

THE POSSIBLE FUNCTIONS IN THIS CONFIGURATION ARE

- Renewal + Air Dryers neutral: The condensing unit partially in air and partially in the water through the condenser plate, obtaining dry air and thermally neutral.

- Renewal + Dehumidification with cooling: The unit operates with 100% of the condensation water, obtaining dry and cooled air.

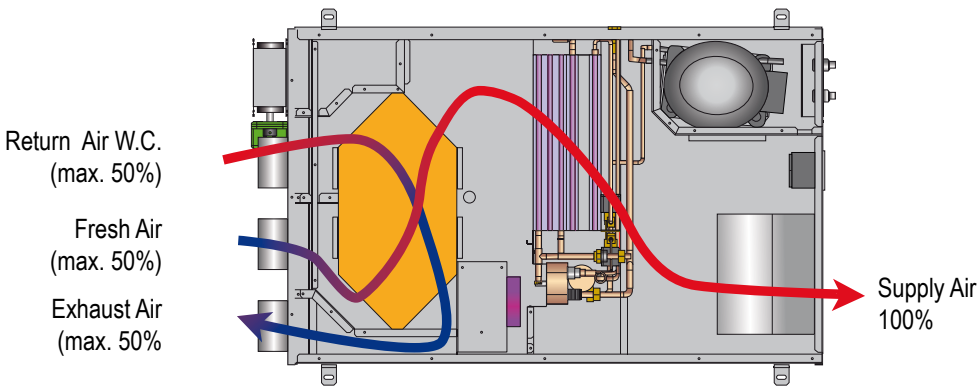


WINTER OPERATION AND MIDDLE SEASON (COMPRESSON OFF)

Whit this selected mode, the unit renews the ambient air with the outside through the heat exchanger of high efficiency.
The air flow is reduced to the value required by the standard (0.3 ÷ 0.5 vol / h), the recirculation damper is closed and the unit operates with 100% fresh air.

THE POSSIBLE FUNCTIONS IN THIS CONFIGURATION ARE

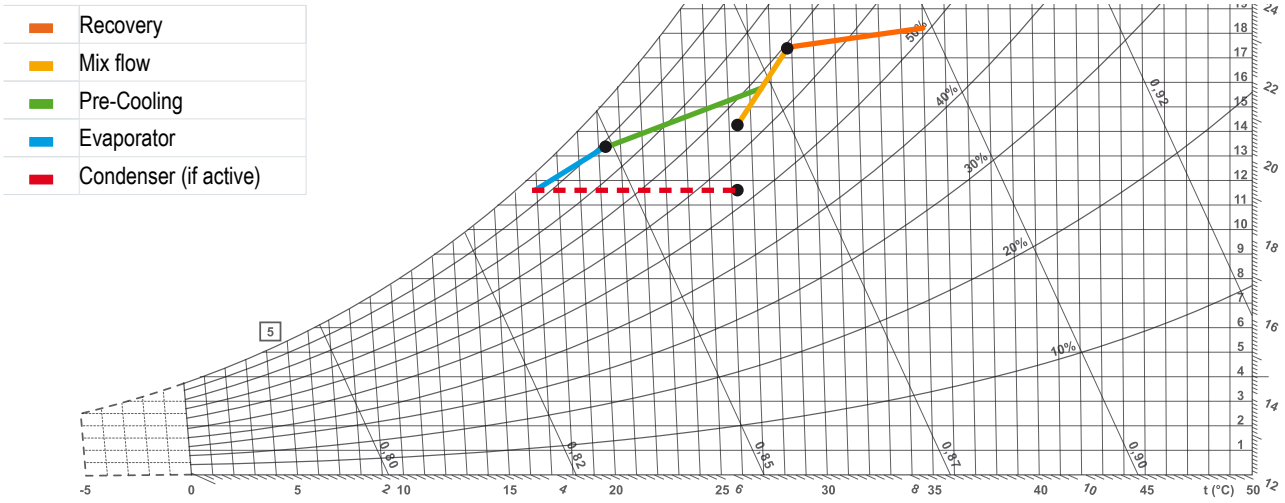
- Renewal with heated air: The compressor is switched off, the battery can be supplied with hot water from radiant system. (even due to the high efficiency of the heat exchanger, is able to obtain a supply air temperature 17 ° C, without using hot water and ambient air temperature of -5 ° C), and behaves like a normal air handling with recovery.

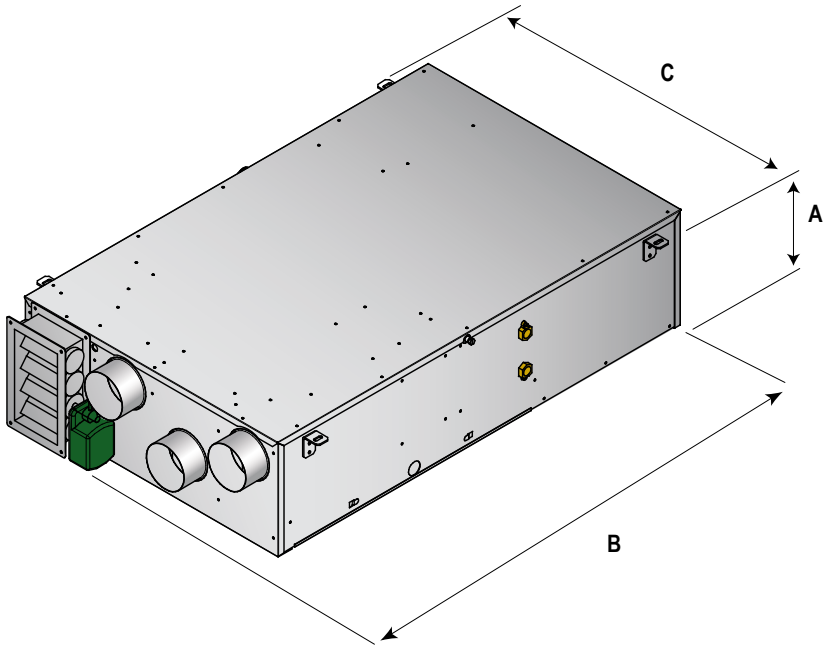


GHE

Mod.	Codice	GHE25	GHE50
Microprocessor control		●	●
Flow meter		●	●
Modulating 3-way valve		●	●
Supply & Return EC fans		●	●
G4 air filter		●	●
Adjustable Trimmers		●	●
High Efficency Heat Recovery		●	●
Remote control Panel	PCRL	○	○
Thermo- Mechanical remote Hygrostat	HYGR	○	○
Umidity and Temperature electronic probe sensor	RGDD	○	○

● Standard, ○ Optional, – Not available.





Mod.	25	50
A (mm)	258	400
B (mm)	1155	1370
C (mm)	732	835