



HTC

Humidity
and temperature
control system



GARCÍA CÁMARA

What is the HTC system?

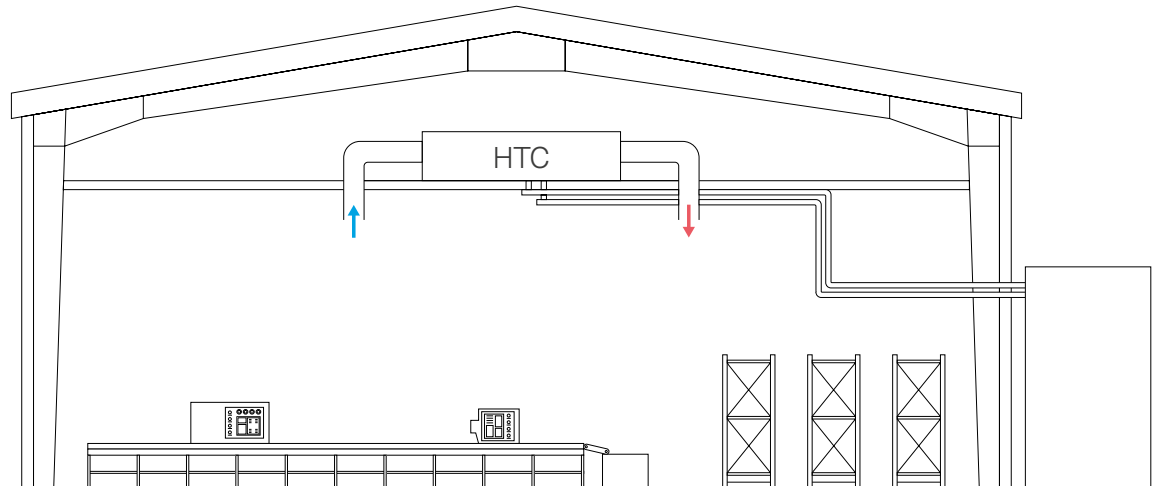
The HTC system is a compact unit that manages and controls humidity levels, the temperature, the exchange of air and air quality.

This machine is specially designed for spaces where suitable humidity, temperature and air quality conditions are required, such as food processing plants, clean rooms, abattoirs, etc.

Manufactured entirely with a stainless-steel interior, it is specifically designed to comply with strict hygiene standards:

- FDA CFR 21 | Regulation (EC) No. 1935/2004
- EN 1672-2 | EU Regulation 10/2011

Designed for a penthouse-type installation, between the room's ceiling and the building's roof. The airflow is channelled through extraction and supply ducts, leaving inside the room completely free, clear and unobstructed.

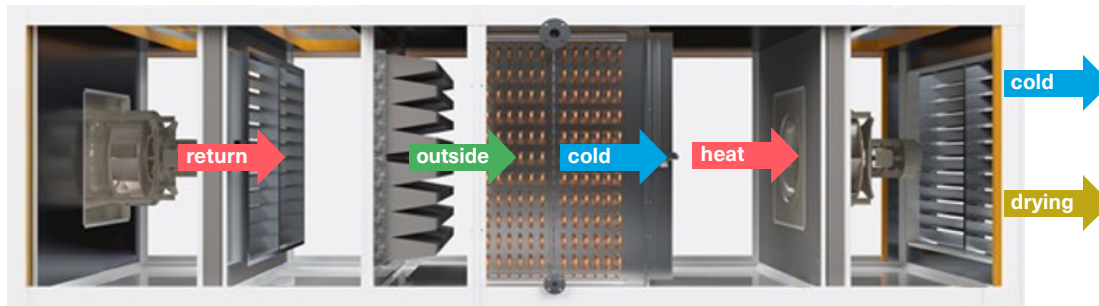


What it consists of

The HTC system is a set of thermally insulated modules composed of high-density sandwich panels.

These modules contain:

- **Extraction unit.** Consisting of high-pressure radial fans with direct drive; there are no belts or intricate base frames.
- **Free cooling unit.** Consisting of three motorised dampers that regulate airflows for air recirculation and fresh air exchange within the room.
- **Filtration unit.** Consisting of both G4 and F9 filters, as well as an ozone generator to sanitise the unit.
- **Dehumidifier unit.** Contains heat exchangers to cool and dehumidify the air via dew point condensation and a heat exchanger to temper the air and maintain the desired room temperature.
- **Supply unit.** Contains fans to supply air into the room, as well as two dampers: one to supply air to the room and the other to exhaust stale air from the cold room to the outside.



Its construction

The container is manufactured using 60 mm-thick sandwich panels with expanded polyurethane (PUR) insulation. The outer surface is made of white pre-lacquered sheet metal, and the interior is made of AISI 304 stainless steel.

Particular care is taken during the assembly of these panels to prevent thermal bridges.

Each module is equipped with its own insulated drip tray and external drain. All joints are formed using hygienic rounded profiles. All fixings and fasteners are made from certified hygienic screws with blue gaskets. Specially designed to withstand high-pressure hot-water cleaning.

The inside is fully accessible via access doors fitted with safety locks.

It is supplied as a compact, ready-to-use unit, only requiring an electrical connection and a power supply to the heat exchangers.





Composition

Fans

Industrial centrifugal fans with an external motor, direct-drive impeller, variable speed and high static pressure for use with ductwork. Supported by a spider bracket that is fixed to the walls of the container, the inner tray remains clear and unobstructed.

Dampers

Manufactured with high-strength aluminium, motorised with an adjustable servo motor that ensures optimal mixing of airflows.

Filters

Removable for ease of replacement. Different types are used depending on the specific application. Dirty filter detector.

Heat exchangers

For both cooling and heating. Calculated, designed and built for each type of refrigerant: NH_3 , CO_2 , HFC or glycol.

Ozone generator

Sanitises the inside of the machine.

Power supply panel

For complete management of the unit, with a touchscreen for setting parameters and a connection to an external network for the visual display, data logging and control.

Functions



Return/supply/outdoor temperature control



Return/supply/outdoor humidity control (RH%)



Eliminates internal condensation



Indoor/outdoor air exchange



Indoor/outdoor air mixing



Cleaning control

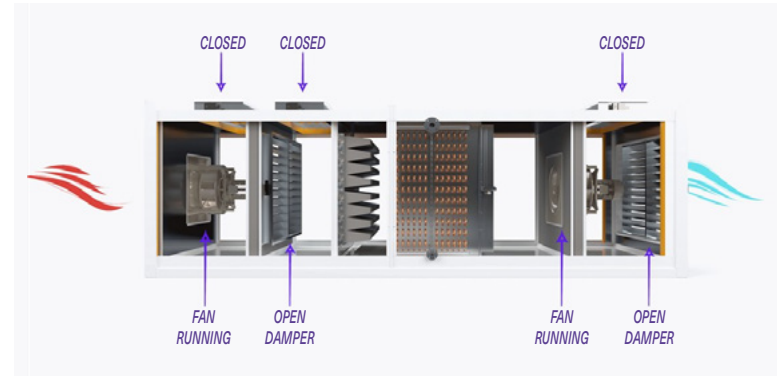


Leak detection (NH₃)



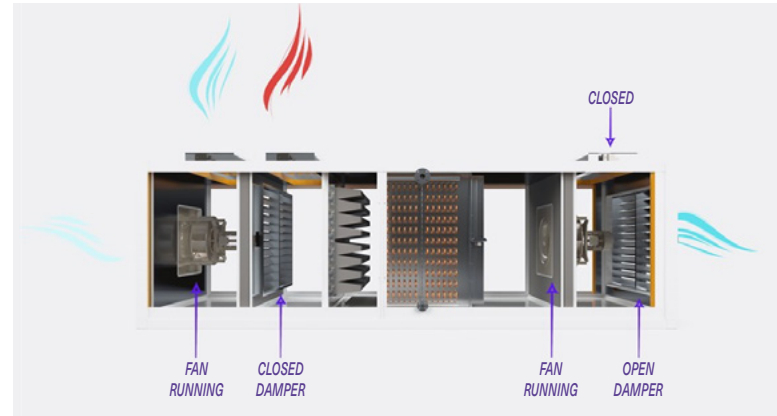
Room air treatment

This is the normal operating mode. The fans are running, the upper dampers are closed and the vertical dampers are open. The entire airflow is recirculated.



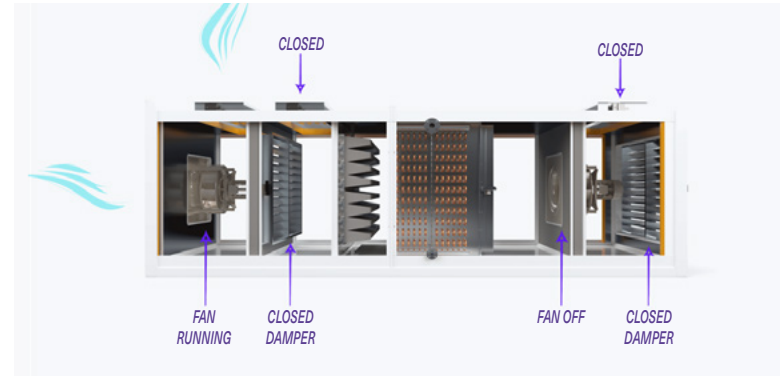
Room air exchange

This allows all air inside the room to be replaced with filtered air from outside. The extraction fan draws air from the room; the vertical damper closes and the upper damper opens, and all stale air is removed from the room. The supply fan draws in fresh air from outside through the upper damper in the free cooling zone; this air passes through the filters and heat exchangers and is then introduced into the room, filtered and temperature-controlled.



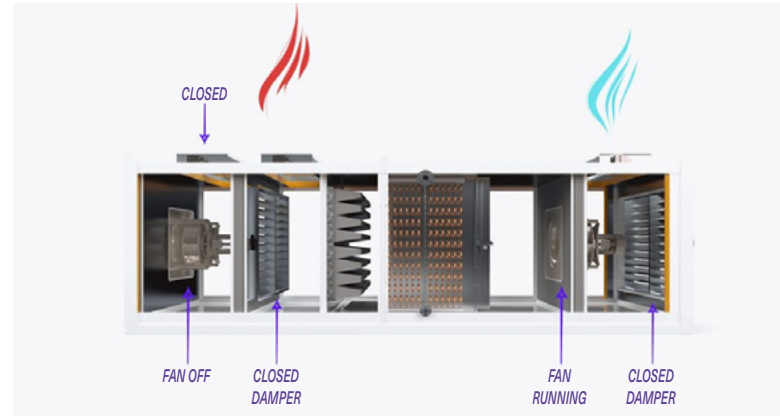
Purge ventilation of the room

This allows air to be extracted from the room to the outside, which is highly useful after washing down work rooms, as it removes the steam and condensation caused by the hot water used for cleaning. To do this, switch on the extraction fan, open the vertical damper that connects to the external duct, and then close the vertical damper. All air will be drawn out of the room.



Outdoor air defrost

To eliminate ice that has formed on the heat exchanger due to condensed and frozen moisture, simply: stop the extraction fan and close the upper discharge damper; open the upper extraction damper and switch on the supply fan. This completely isolates the room from the outside, while also introducing warm outside air which passes through the heat exchanger, causing the ice on the fins to melt, and then expelling this air back outside. This method is not only highly energy-efficient – as no external heating element is used – but it also has no effect on the temperature inside the room





Certifications

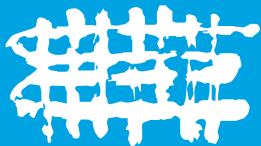
The HTC system is manufactured by GARCÍA CÁMARA, S.L., a Spanish company that has specialised in the manufacture of heat exchangers since 1942.

The HTC system is calculated, designed and manufactured in accordance with strict ISO 9001 standards:

- *Machinery Directive 2006/42/EC*
- *Low Voltage Directive (LVD) 2014/35/EU*
- *Electromagnetic Compatibility (EMC) Directive 2014/30/EU*
- *Pressure Equipment Directive (PED) 2014/68/EU*
- *RoHS Certification (Directive 2015/863/EU)*
- *Regulation (EU) 2023/1230 on machinery*

- *Regulation (EU) 2025/351* on plastic materials intended to come into contact with food
- *Regulation (EC) No 1935/2004* on materials and articles intended to come into contact with food
- *FDA CFR 21* on food contact materials, hygienic design
- *UNE-EN 1672-2:2020* – Food processing machinery: hygiene and cleanability requirements
- *UNE-EN ISO 14159:2008* – Safety of machinery: hygiene requirements for the design of machinery
- *UNE-EN ISO 5817:2023* – Quality levels of imperfections in fusion-welded joints
- *3-A SSI standards* – International sanitary design standard
- *EHEDG guidelines* – Hygienic design guidelines





GARCIA **CAMARA**

GARCIA CAMARA S.L.

Polígono Industrial de Marines,
s/n 46163 Marines, Valencia (Spain)
Tel.: 96 272 40 01
comercial@garciacamara.com
www.garciacamara.com



This project has received funding from CDTI, under the Ministry of Science, Innovation and Universities.



I-CO-67.0