

MICROSCOPE ROOM

PARC CIENTIFIC BARCELONA

SYSTEM OVERVIEW:

This system is based on the installation of chilled water radiators within the room.

It is worth noting the inability to move air at a speed greater than 0.1m/s, which rules out any air conditioning system.

These panels balance the thermal load inside the room while generating a very low-speed natural convection that helps distribute the cold air evenly.

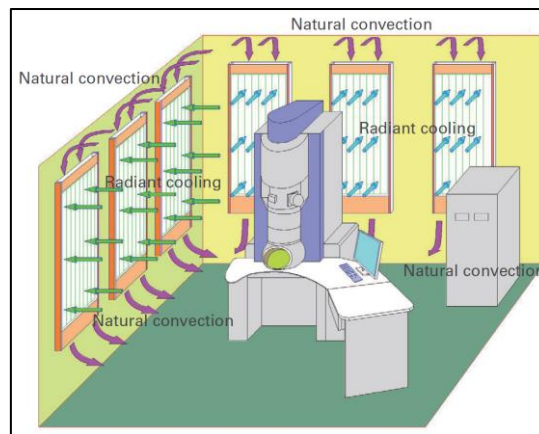


Illustration 1: *distribution*

CONTROL OVERVIEW:

The radiators are supplied by a high-precision water-to-water chiller, with a high-precision control of $\pm 0.2^{\circ}\text{C}$ regulated by a high-precision sensor in the room for the evaporator circuit.

The condenser circuit of the high-precision machine is cooled by another standard water-to-air chiller.

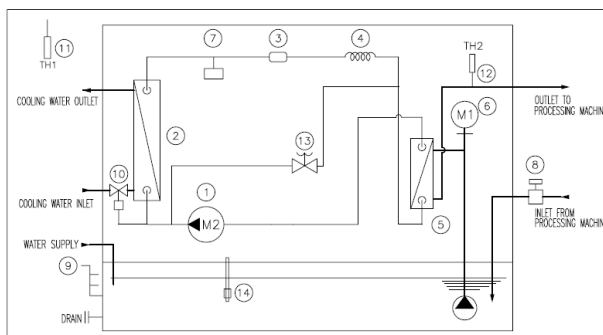


Illustration 2: *evaporator/condenser*

PROJECT SCOPE:

- Refrigeration equipment (chillers).

- Hydraulic distribution.
- Design and installation of chilled water radiators.

DESIGN CONSIDERATIONS:

The design involves creating a chilled water circuit that balances the interior thermal loads through 12 existing radiators in the room. There is a height difference of 4 floors, so the final distribution is achieved with the water-to-air standard chiller on the rooftop and the water-to-water chiller in the basement adjacent to the radiator room.

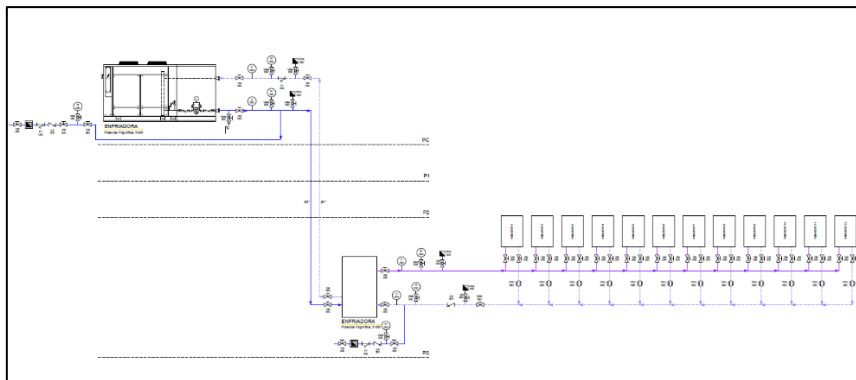


Illustration 3: principle diagram

In collaboration with the UPC University [Universitat Politècnica de Catalunya], a thermodynamic test has been conducted using the radiators themselves under simulated conditions similar to those of the room prior to installation.

REFERENCE IMAGES:

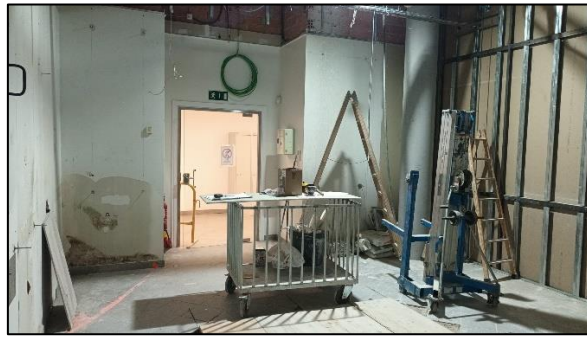


Illustration 4: Initial



Illustration 5: Final



Illustration 6: Initial



Illustration 7: Final
