

Energy-saving Constant-temperature and humidity Clean Room

Features

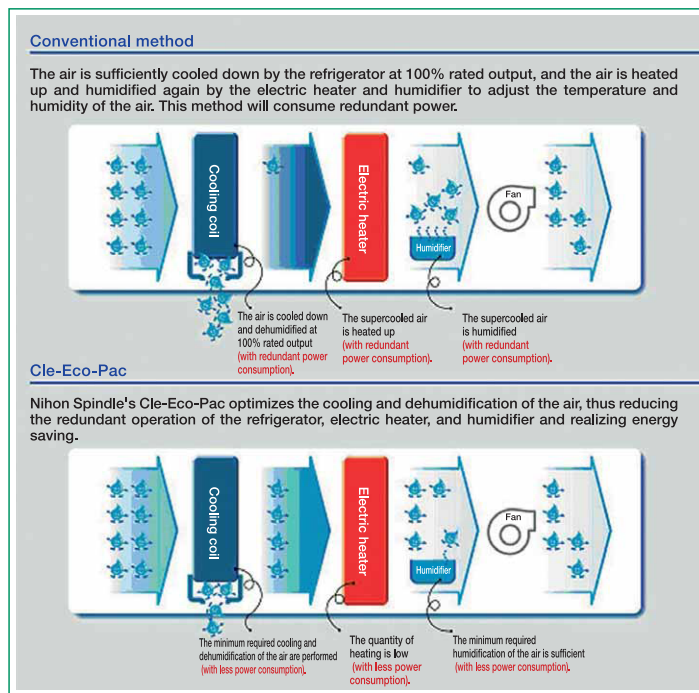
- **Energy saving:** An energy-saving clean room with an area of 300 m² at constant temperature and constant humidity saves an annual power consumption of 600,000 kWh compared with conventional ones.
- **High precision:** Attains a temperature precision of $\pm 1^{\circ}\text{C}$ and humidity precision of $\pm 5\%$.
- **Installation labor saving:** Incorporates an electronic control system, thus making it possible to leave out on-site control wiring work.

Overview

(Technical principles, actions, etc.)

A conventional clean room usually uses a refrigerator, electric heater, and humidifier for the constant temperature and humidity control of the clean room. That is, the air in the room is sufficiently cooled down and dehumidified by the refrigerator operating at rated output, and the air is heated up and humidified again by the electric heater and humidifier to adjust the temperature and humidity of the air to target values. This configuration, however, may result in a waste of energy if the refrigerator cools down and dehumidifies the air excessively, in which case the temperature and humidity adjustment ranges of the electric heater and humidifier will become too wide.

On the contrary, Nihon Spindle's Cle-Eco-Pac III optimizes the output of the refrigerant, thus minimizing the energy consumption of the refrigerant, electric heater, and humidifier (see the illustration).



Mechanism of energy saving

Introductory Track Record

- **Cle-Eco-Pac II has not been introduced to Asian countries except for Japan.**

Effects

- ◎ Nihon Spindle offers its own energy simulation software to each customer before the customer uses Cle-Eco-Pac II. This software calculates the customer's annual power consumption from the customer's operating environment and predicts the energy-saving effect of Cle-Eco-Pac II. The software shows that Cle-Eco-Pac II consumes 544,134 kWh while a conventional system (with a cooling-dedicated package air conditioner, electric heater, and humidifier under proportional control) consumes 1,033,130 kWh annually, provided that the clean room is 300 m² in area with a cleanliness class of 10,000 and operated at 23°C with a humidity of 55% for 24 hours. Therefore, Cle-Eco-Pac II saves 47% of power consumed by the conventional system. Furthermore, the power reception capacity of the conventional system is 143 kW while that of Cle-Eco-Pac II is 80 kW, which results in a 44% reduction of power and contributes to the downsizing of power reception facilities.

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