



WHERE NATURE AND TECHNOLOGY EXIST IN PERFECT HARMONY



Nippondaira Hotel in Shizuoka, Japan

Nestled near the heart of Japan, Nippondaira Hotel has been overlooking the legendary Mount Fuji since it first opened in 1964. Combining breathtaking natural scenery with world-class design, the hotel's mission is a harmonious co-existence with nature.

This is why, during a complete reconstruction in 2012, Nippondaira Hotel selected Hitachi's Chiller and SET FREE Variable Refrigerant Flow system for its air conditioning — a testament to its dedication to the comfort of its guests and the preservation of the environment.

"Hitachi's air conditioning system has enabled us to reduce a lot of our energy spending."

"Hitachi VRF system realizes a level of quietness that makes you forget there is air conditioning at all!"

"It's been six years and we have yet to experience any issues."

Noriyoshi Ikegaya

Executive Director of Administration,
Director of Engineering, Nippondaira Hotel

Solution & Application



VRF



CHILLER



HOTEL

Key outcomes

- ✓ **World Class Rating** — Nippondaira Hotel earned the top rating 'S class' in the Japanese Comprehensive Assessment System for Built Environment Efficiency (CASBEE) — extremely rare for a hotel⁽¹⁾.
- ✓ **Maximized Sustainability** — The hotel saved 21% more energy. Additionally, guest comfort is increased, contributing to the hotel's overall economic sustainability.
- ✓ **Uncompromised Comfort** — In Nippondaira Hotel's guestrooms, an exceptional level of quietness (that meets the NC25⁽²⁾ criterion) is achieved while the air conditioning is turned on. This is as quiet as a radio recording environment!

Issues to be addressed

Nippondaira Hotel's underlying philosophy is based on being harmonious with nature. Therefore, the objective of the building reconstruction was to reduce the hotel's environmental footprint, while maintaining a high level of comfort for hotel guests. The new thermal comfort system was expected to deliver:

- The exclusive use of electric equipment, ensuring no fossil fuel is consumed, heavily reducing CO₂-eq direct emissions.
- An exceptionally high energy efficiency, reducing electricity consumption.
- Extremely quiet operation, allowing guests to contemplate the scenery in a relaxing, tranquil hotel environment.
- Customized temperature control in every guest room, offering uncompromised satisfaction for guests from various countries who feel comfortable in different temperatures.

Key stakeholder requirements

The Chiller and SET FREE VRF system addressed all stakeholder requirements.

- **The Hotel HVAC Manager** — required SET FREE system to enable centralized monitoring, for convenience and full control.
- **The Building Architect** — required a system that would comply with the state-of-the-art environmental design of the hotel. A 180m long thermal trench was built around the building, which used the ground's natural temperature to sustainably cool or heat the surrounding air. This air needed to be used in conjunction with the air conditioning system.

Our solution

A combined installation of the Hitachi Scroll Chiller and SET FREE was the right solution for Nippondaira Hotel.

To bring air conditioning to the hotel's public spaces 24/7, all-year long, two sets of Inverter MATRIX chillers were installed. In particular, these were adapted to work in the hotel's main public space — a large single zone with a 10m high ceiling and impressive glass walls. Free cooling technology is used to regulate the chiller operation, balancing its operation with any other thermal sources, such as the air from the thermal trench.

For the 80 guest rooms and restaurants, SET FREE system provides:

- **Energy Efficiency** — Allowing for precise modulating based on ambient temperature and the hotel's occupancy level, reducing on-off cycles and unnecessary capacity.
- **Heat Recovery** — When one guestroom is cooled, excess heat is re-used to heat another if a guest has selected heating in their room.
- **Low Noise Levels in Guestrooms** — To eliminate noise, the CH-Box and expansion valves⁽³⁾ were installed remotely. Indoor air inlets were placed as far as possible from the guest beds and relaxation areas.
- **Easy-to-use Controllers** — To cater to the various languages of the hotel guests, the simplified interface of the PC-ARH uses universal functions and displays both °C and °F.
- **Centralized Monitoring** — Central Station permits the Hotel HVAC manager to monitor the system from their office. This allows the prevention of any overcooling or overheating, and enables the manager to switch off air conditioning in vacant guestrooms when needed.

(1) <http://www.city.shizuoka.jp/000137380.pdf>

(2) NC is a U.S. standard for rating indoor noise levels.

(3) Ducted indoor units without integrated expansion valves supplied on custom order.

GENERAL INFORMATION

Customer

Nippondaira Hotel

Location

Shizuoka, Japan

Project

Construction of a high environmental performance hotel building (floor area: 6,153m² / 7 storeys)

Date of installation

2012

SYSTEM DESCRIPTION

Total System Capacity 3,660kW

GUEST ROOMS & KITCHENS

SET FREE

Outdoor Units

Heat Recovery type

Air source



Indoor Units

Guest Rooms

111 x Ducted indoor units



Kitchens

9 x Stainless steel units



Other Spaces

25 x Ceiling cassette



Controllers

Individual

PC-ARH



Central Station

PSC-A64GT1



BANQUET & PUBLIC SPACES

CHILLER

Chiller

Inverter-MATRIX

- Scroll type
- 8 x 50HP
- 7 x 45HP



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