

# CENTRO MERIDIANA

Lecco - Italy

Multipurpose Complex

Executive, Residential, Commercial

4P Hydronic System

Year 2006



Designed by the famous architect Renzo Piano, the "Centro Meridiana" complex covers more than fifty thousand square metres in the heart of Lecco. This multipurpose complex hosts a large park and a circular town square surrounded by three ten-storey buildings given over to residences, offices, housing, tourist and service facilities. The lower level hosts a shopping centre and two thousand parking spaces.

## The Challenge

"Centro Meridiana" is a high quality property initiative which arose from the redevelopment of a strategic urban area near Lake Como, a refined centre of tourism.

Designed by world famous architects, the complex is aimed at consumers who are attentive to overall comfort and the technological solutions adopted.

The air-conditioned areas, intended for differing uses, are all united by high standards of comfort and air quality.

Due to the large glassed surface area which has different levels of solar exposure, concurrent thermal requirements are often in opposition.

The architectural complex prevented the use of external space for the plant, while the fire-prevention regulations also limited using a centralised heating plant, which would necessarily have had a large capacity.

Furthermore, the commissioning customer was also very sensitive to environmental aspects and requested zero pollution technology in order to heat and cool the building without polluting the air and minimising the carbon dioxide, CO<sub>2</sub>, emissions into the atmosphere.



Centro Meridiana - Dettaglio delle sculture di Susumu Shingu e interno appartamento

### About Renzo Piano

Born in Italy in 1937, Renzo Piano is today a world famous architect. His ambitious and innovative projects are renowned and include the Georges Pompidou Centre in Paris, the international Osaka airport, the Hermès Tower in Tokyo and the Vulcano Buono multipurpose centre in Nola. Numerous articles have been published on his work and exhibitions have been dedicated to him all over the world. He has been a UNESCO ambassador for architecture since 1994.

### The building

- Three 10-storey towers, for a glassed surface area of over 8,000 m<sup>2</sup>

### The size

- Total volume of more than 260,000 m<sup>3</sup>
- Executive and residential surface area of 29,000 m<sup>2</sup>

### The team

- Architectural design Renzo Piano, Italy
- General Contractor Colombo Costruzioni, Italy
- Mechanical systems design Studio Tecnico Guffanti, Italy
- Mechanical systems production Gianni Benvenuto, Italy

## The solution

The system designed by Studio Tecnico Guffanti is as important as the architectural design.

The air-conditioning in the various settings of the three towers occurs through radiating ceilings combined with air refreshment and humidity control systems. The ceiling hydronic circuits are powered by the Clivet 4P-W geothermal system for an automatic and concurrent production of hot fluid, cold fluid and hot water for sanitary use.

The 4P system is based on energy saving water-to-water pumps, whose commutation takes place via the hydraulic circuit and not by acting on the cooling circuit overall, therefore taking advantage of the global reliability of the plant. The underlying natural ground water energy sources are used in full respect of the regulations laid down by the local Authorities

Developed in order to optimise the energy performance of the apparatus, the Clivet system activates the production of cooled or heated water in the circuits used based on necessity. It establishes if the secondary fluid (hot in summer, cold in winter) should be recuperated in other parts of the system. For example, areas are heated which are not exposed to the sun or hot water is pre-heated for sanitary use. Only if an effective energy excess takes place will the automatic valve system activate an exchange with the water tank.

The pressure monitoring system acts by an inverter on the tank pump, and reduces its flow to a minimum to limit electricity and water consumption. After exchanging with the Clivet system, the water is put back into the natural ground water energy sources, in order to maintain their equilibrium.

Moreover, the towers are equipped with an air-refreshment system which guarantees fresh air intake and environmental humidity control at the same time. In the areas where the offices are located, this system is centralised, with a Zephir fresh air air-to-air heat pump equipped with active thermodynamic integrated energy recovery and high-efficiency H10 electronic filters.

## The Results

Zero emission towers with a geothermic heart is the environmental approach offered by the Centro Meridiana. Thanks to this solution, it is possible to guarantee comfort in all settings while eliminating around 1,100 tonnes of CO<sub>2</sub> annually.

Completely hidden from view, the 4P-W energy recovery system produces hot water, cooled water and hot water for sanitary use efficiently by minimizing the use of ground water energy. The active recovery of the Zephir air-refreshment heat pumps further increases the efficiency of the entire system and reduces its utilised capacity.

Moreover, the Gianni Benvenuto installation company won the First readers' prize in the *Impianti Premiati (Award-winning systems) 2008* competition promoted by the main Italian magazines in the sector under the patronage of Aicarr.

For further information about Clivet systems:  
[www.clivet.com](http://www.clivet.com)



Centro Meridiana – 4P system heat pump and fuel headers

### The System

- The Clivet 4P-W System is made up of four geothermal SPINChiller WSH-SC units and its related automatic management by a user interface *touch screen*
- A geothermal WSH-SC unit for the production of high-temperature hot water for sanitary use
- Six Clivet Zephir air refreshment units, complete with integrated active thermodynamic heat recovery and electronic filters
- More than fifty Clivet hydronic outlets
- More than 2 MW of overall cooling capacity

### About Geothermics

High-enthalpy geothermics taps into geological or volcanological anomalies for the production of electrical energy and the use of thermal water for heating. Low-enthalpy geothermics, on the other hand, use natural ground water energy sources as a thermal fuel tank to extract energy during the winter, which is transferred back during the summer. It is used for air-conditioning using underground sensors or natural ground water energy sources such as a well, stratum, river, canal, lake or seawater.