

## EX ISTITUTO SIEROTERAPICO MILANESE

Milan - Italy

Business Center

Open space offices and services

WLHP System

**Year 2004**



Ex Istituto Sieroterapico Milanese is one of the most interesting examples of refurbishment in the City of Milan. The group of buildings, that in the past were vaccines factories, is a massive complex exceeding 20.000 m<sup>2</sup> surface in the central area of Navigli. Today it is the site of prestigious organizations like the Academy of fine Arts and the Italian headquarters of SAS, one of the key it players worldwide..

### The Challenge

The possibility to convert this area represented an important real estate opportunity thanks to its central position, to the important dimensions and to the unquestionable architectural prestige. These are the reasons why the Cabassi Group started in year 2000 to improve and to recover the nine main buildings.

Air conditioning was requested to have a peculiar versatility both in their design and operation. The whole area would have been divided according to the needs of different users, still undefined at that time.

Furthermore, the design had to solve the large and binding architectural constraints, requiring no external installation. Even the roofs would not have been available, because were pitched.

Of course the large size of the investment require reliability in rollout and costs.

Independent and efficient operation would have had to confirm the building value also in the following lease stage.



*Ex Istituto Sieroterapico Milanese - Prospective on Via Darwin and whole aerial view.*

### The Building

- Complex of 9 hystorical buildings

### The Size

- Intervention volume over 40.000 m<sup>3</sup>

### The Team

- Developer Gruppo Cabassi, Italy
- Engineering consultant Technion, Italy
- Contractor Termigas, Italy

### About Ex Istituto Sieroterapico Milanese

It was founded in 1896 by Società Medica Lombarda, thanks to spontaneous donations of thousands of private citizens. Since the beginning it was destined to production of serum, vaccines, biological products for medical purposes, besides the promotion of studies to improve and increase the application fields. The institute provided his continuous contribution to the science with over 300 publications of studies and researches. About one hundred of them were issued by the founder and first director, professor Serafino Belfanti. The Institute ended his activities in 1993.

## The solution

The whole complex air conditioning was given to WLHP system, Water Loop Heat Pump, by Clivet.

A primary water loop with variable flow pumps covers the whole area through underground PEAD pipes. Every building has got of its own secondary water loop, spilling water by the supply of primary loop and putting it back on the return, after having fed the water to air reverse cycle heat pumps.

The water temperature is kept between 15°C and 29°C and it is the thermal source to the heat pumps. They take the heat they need from the water, or they give back the heat taken from indoor, transferring the thermal energy between areas with opposite requirements. The summer temperature difference between inlet and outlet of the loop is 5°C.

During the peak load periods, the water loop temperature is controlled through the rejection or injection systems, located in a dedicated building with the primary pumping stations and the water treatment systems.

The local loops do not require pumping systems. Proper water circulation is kept by the pressure gap.

The heat pumps are vertical type, with or without cabinet, or ductable horizontal type, depending on the application.

All the heat pumps are complete of motorized two way valve with on/off control on the water circuit.

The valve automatically closes when the compressor is off and allows the reduction of the water flow, thus a further energy saving.

## The results

WLHP system has allowed to achieve different and ambitious goals at a single stroke.

The architectural original style remains completely unchanged, since the air conditioning system is invisible from outside. Furthermore, thanks to the neutral temperature in the loop, the pipework has not required thermal insulation. His integration inside the framework has turned out more simple and moderate.

There is no refrigerant in the piping around the buildings this fulfils the stringent requirements limiting the total amount of refrigerant in the buildings.

Every user is independent from others. Its reversible heat pump operates only when needed, regardless the outdoor conditions, since it uses the water loop as thermal source.

This way it has been achieved a high energy efficiency that will bring to a high saving on the operating costs. Furthermore, high thermal dissipations have been removed as well as pumping consumptions through the distribution network among the buildings compared to a centralized four pipes installation.

The costs to produce the water loop have been particularly competitive, compared with the ones of laying kilometres of pipes that would have been of big diameter and adequately insulated.

The investment for the heat pumps has been spread over a period based on the effective use of the spaces and on the real needs.

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



Ex Istituto Sieroterapico Milanese – Water to air heat pumps EQV series operating for the internal premises and detail of the pumping station.

### The System

- 425 reverse cycle water to air heat pumps Clivet EQV, vertical type with or without cabinet
- 13 reverse cycle water to air heat pumps Clivet, ductable horizontal type CH or ductable vertical type CH-V
- 6 cooling towers, 3 high efficiency boilers and the pumping stations complete the system

### About WLHP

The Water Loop Heat Pump air-conditioning system is de-centralized and based on heat pumps whose energy source is the water in the loop circuit. Its temperature is stabilized in summer by rejection devices such as evaporative towers or dry coolers, while in wintertime boilers or heat pumps can support. The system lends itself well to integration with free or renewable energy sources.