

## ABB energy efficiency solutions Nerviano Medical Sciences



### Air treatment for Nerviano Medical Sciences

**A simple, fast, non-invasive installations. Easy calculation of achievable savings and almost immediate evidence of results once the project is completed. Extremely fast return-on-investment time, in some cases as short as three months. These are the key elements of the energy efficiency improvement project implemented by Nerviano Medical Sciences – the largest Italian pharmaceutical research and development company specializing in the oncology field – in cooperation with ABB. The improvements involved the air conditioning systems, and in particular air speed and flow rate control.**

#### Background

The Nerviano (Milan) site was founded in 1965 by Farmitalia and later became the heart of Farmitalia Carlo Erba's pharmaceutical research. In the 1990s it belonged to non-Italian multinationals and was able to create an extensive network of international scientific relationships. After a few more changes in the ownership structure, it is now planned to be merged into a foundation fully controlled by the Lombardy Region.

The company, which employs 550 people, has always been a laboratory of innovation and constant progress, the result of investments in technological platforms, instrumentation, information systems and expertise. It has discovered,

developed and successfully marketed numerous NCEs (New Chemical Entities).

Some of these products, in particular the anthracycline family, have contributed significantly to the definition of new approaches to tumor treatment.

Today, the company provides integrated services for the development of pharmaceutical products for oncology and related diseases, ranging from APIs (Active Pharmaceutical Ingredients) to the final formulation of the medicinal products for patient treatment.

In Research and Development for the discovery of new products, NMS is strongly interested in identifying synergies and establishing alliances with other companies in the industry. Additionally, it provides support to partners and customers in the area of research services for pre-clinical and pharmaceutical development. The group includes various companies, all based in Nerviano: Accelerata, which includes a discovery unit with 200 researchers, has the mission of anticipating and managing possible issues related to the toxicity, pharmacokinetic properties and metabolism of the new compounds; NerPharMa and NerPharMa DS are leading providers of active pharmaceutical ingredient (API) development and production services and formulations to third parties.

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The competitiveness of an enterprise like NMS, almost unique in Italy, is dependent among other things on cost reduction, an area on which the company has focused in recent years. With an average annual cost of almost 5 million, the “electricity bill” is one of the highest cost items.

Consumption, amounting to 41 GWh per year, is driven by the need to cool, heat and, most importantly, maintain humidity and temperature levels in sterile research areas and in production areas within exact and constant limits, also outside working hours. In this respect, the Nerviano site’s requirements are comparable to those of a medium-size hospital facility.

## The application

The motors installed in the ATUs that serve the two main buildings did not have effective speed and flow rate control systems, and therefore always operated at maximum speed on a 24 hour basis. For this reason we identified them as large power-consuming equipment, but also as units whose efficiency would be easy to improve.

In cooperation with ABB technicians, we estimated the savings that could be achieved by supporting this motors with inverters, in order to reduce their speed by 50 percent during the night. Through simple calculations we drew up a “theoretical” estimate of the cost effectiveness of the project. The choice fell on ABB drives of the ACH550 series, specifically developed for HVAC applications. The customer opted for these inverters because they are standard products that would require no specific engineering, known to be reliable and very easy to programme.

The installations, carried out directly by NMS Group personnel, involved a couple of 55 kW motors, three couples of 22 kW motors, and one 11 kW motor, operating in four

different units. Installation work was straightforward: the inverters, with degree of protection IP 54, were mounted on the wall. Installation in parallel allowed motor downtime (for connections and configuration) to be reduced to less than half a work day.

## Benefits achieved

At full capacity, the improved systems provide estimated energy savings of over 500 MWh per year. This reduction in consumption equals to 88.37 TEP per year, with CO<sub>2</sub> emissions decreasing by 203.18 tonnes per year. The average payback time of the four installations is just above six months. Workload planning by days and weeks will soon allow a further optimization of ATU operation. In view of the success of this project, similar solutions are now being studied for the cooling towers and the pumps of the water supply system.

Besides electrical applications, NMS is also planning to introduce greater efficiency in the area of steam production in order to reduce methane consumption, which is another significant cost item.

Additionally, it should be noted that in the past Fischer & Porter Company, merged into ABB in 1999, provided automation for biotechnological production with innovative batch control systems, when the company was still Farmitalia Carlo Erba. ABB is now completing the modernization of NerPharMa DS’ API production plants by introducing the new 800xA Extended Automation technologies, which help to boost production efficiency.

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