Case note

Pure energy, maximum savings
An innovative system for energy saving and efficiency

Energia Europa S.p.A. headquarters in Zanè (Vicenza), Italy

To design and build advanced technology that enables companies and public bodies achieving energy efficiency and saving, thus contributing with their products to protect the environment: this is the mission of Energia Europa, an italian company with a manufacturing facility in Zanè (Vicenza), established in the late nineties by a small group of researchers and electrical engineers.

Initially, the company focused on a project involving energy saving in the lighting industry, says Gabriele Paltrinieri, Marketing & Sales Manager at Energia Europa. The result was E-Box, an electronic autotransformer that allows significant energy savings on lighting system consumption. The success of this device encouraged us to give momentum to our company and to invest in expanding and improving the organizational and research structure. Leveraging research and experiences gained through that first product, we have designed what is now the flagship of our offer: E-Power, a smart-managed hybrid, three-phase, passive inductive filter that improves the energy quality and efficiency in all kinds of applications.

After the first prototype, built in 2009, E-Power was finally launched on the market in 2011 and, since then, we have performed about 650 installations in almost all industry sectors and large retailers, the latter being currently the focus of our attention. By now, we have made many installations in the point of sales of some major supermarket chains, both in Italy and Europe, such as Ipercoop, Ipersimply, Metro, Manor and Jumbo, and currently we are installing our E-Power systems in other stores belonging to international giants of the european and global distribution, with encouraging results in terms of energy and cost savings.

E-power, a multifunction dynamic filter that improves energy quality and efficiency

A “Made in Italy” company devoted to innovation?

Our company is mainly devoted to R&D activity, and a large proportion of our employees has a technical background, says Paltrinieri. All design work is done in-house, as well as assembly, testing and trial activities, while the mechanical components of the product are manufactured by trusted external suppliers, most of them based in our region.
We have in total 35 employees, 12 working in the R&D department. Despite the ongoing crisis, our company is growing, with sales increased this year by nearly 20%, thanks to the greater general awareness in favour of energy conservation and environmental sustainability. An increasing number of companies are enrolling Energy Managers who have the responsibility for reducing energy consumption and the environmental impact of their company’s operations.
In this context we have important plans as regards internationalization, also in non-european countries.

What technology E-Power is based on?

E-Power is based on an innovative technology that generates energy savings improving the quality of energy, acting simultaneously on all electrical parameters that make up the power, explains Matteo Carraro, Project Engineering at Energia Europa. The electric power used, in fact, consists of a functional component, necessary for electrical loads to work, plus a non-functional additional fraction, generated by losses and distortions of the power grid. E-Power reduces the non-functional percentage, obtaining a significant improvement in the quality of energy (power quality).

To do this, it intervenes on electrical measurements and parameters that make up the load power: reducing the harmonics contribution, noise and losses on the line; improving the crest and power factors; optimizing energy transmission to the system; stabilizing the voltage and reducing current spikes. At the heart of this special filter technology is the ability to introduce in the energy flow an electromotive force with opposite flow that changes the electric transmission configuration, thus providing a number of benefits to the energy quality. The E-Power system offers a centralized saving solution that only requires the simple installation of a single device, preferably downstream of the low voltage circuit breaker and upstream of the loads handled.

What are the additional E-Power benefits?

Thanks to the patented bypass system and the monitoring guaranteed by E-Controller, an electronic system based on web technology that enables the management and monitoring of the electric system, it is possible to quickly measure the energy savings achieved by E-Power with great accuracy. A measure recognized by the GSE for awarding energy certificates. Another important benefit, not easily quantifiable, but always reported by our customers, particularly in the industrial sector, is the reduction of micro-failures, that in specific operations can lead to great economic losses.

Emax by ABB SACE division installed inside E-Power

E-Power integrates the ABB SACE Emax 2 disconnector. What are its features?

The ABB disconnector, a fundamental device for our technology, performs two main functions: on the one hand, allows the machine to ensure the power supply continuity to the system, isolating the machine in less than a millisecond in the event of malfunctioning or line problems; on the other hand, it allows to switch, according to a predefined protocol, between two operating modes: “economy mode”, with filter enabled, and “bypass mode”, with filter disabled, which allow a precise comparison between the operation with and without filter, measuring the value of the energy saving.

What features have determined the choice of this product?

Even before Emax 2, we have been using and appreciating other devices in the range. The results of laboratory short-circuit tests, above all, convinced us about the potential of this product to meet the high requirements of our application. Also the low temperature derating value, and therefore the reliability of Emax 2, was an important parameter in our decision.

What other ABB products are installed inside E-Power?

In addition to the disconnector that serves as a bypass, we are implementing, in collaboration ABB’s engineers and sales people, power contactors and magnetic protective components to apply the different filter levels and secondary protection. The installation includes automation controls, such as phase sequence and minimum and maximum voltage control, and 24 V contactors for managing internal sequences, as well as a supercapacitor set that, in case of a blackout, allows the final pulse and switches the machine to bypass mode and tracks the events that have caused the power failure, allowing sampling for 5 additional minutes.

How ABB supports you in developing your business?

Besides products, ABB also ensures a high level of support and service. The company is always by our side, any time, for any need. ABB’s technical staff supported us with competence, for example, in the sizing of the protective contactors. They are available to discuss technical issues and check for any problems. Moreover, the possibility to talk directly with the people who designed and manufactured these products is crucial for a prompt troubleshooting.

Inside the Energia Europa S.p.A. headquarters in Zanè (Vicenza), Italy

How important is for you the collaboration with a worldwide group?

We continually experience with our distributors and end customers how the advantage of using ABB products gives a sense of security, says Paltrinieri. Undoubtedly, the presence of a local service on almost every major market is a huge benefit.

What are your future plans?

In addition to improving the machine, our most important plan is to enter the residential sector, potentially a big development for us, concludes Paltrinieri. This not only means the miniaturization of the existing E-Power, but involves the research of an almost entirely new product, although it is based on the same principles of operation. One of the market targets on which we will focus with the residential unit are the photovoltaic users, for two reasons. Firstly, because in a photovoltaic system the inverter produces distorted power and our machine can provide greater benefits. Secondly, where a photovoltaic system is matched to energy storage, our equipment can be programmed to manage the breakdown of energy distribution in order to optimize the operation of the system as a whole. These are ambitious plans, that emphasize even further the importance of our collaboration with ABB, a partner able to support us in this evolution.

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