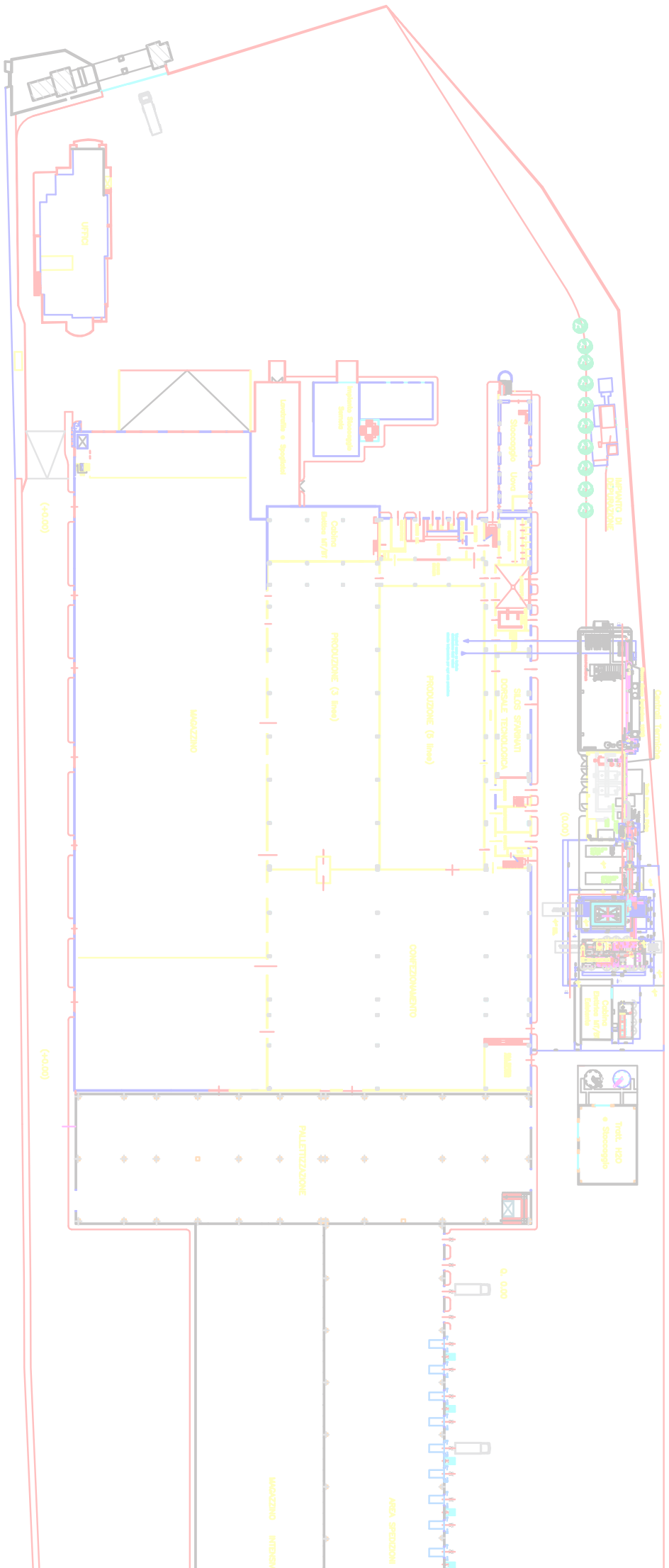


AB ENERGY FOR PASTIFICIO RUMMO

THE EXTRAORDINARY EFFICIENCY OF COGENERATION
APPLIED TO THE FOOD INDUSTRY



AB Energy



A SYSTEM THAT OPTIMISES EFFICIENCY OF THE ENERGY VECTORS, REDUCING THE ENVIRONMENTAL IMPACT.

AB Energy, company of the AB Group, Italian leader in the designing and realising of cogeneration systems, has recently realised a trigeneration system for the Pastificio Rummo in Benevento.

The choice of the prestigious company, known for its attention to product quality and for the strong respect it has for its territory, is conceived from knowing that cogeneration joins optimisation of the energy costs and the eco-environmental proactive commitment.

In particular Cosimo Rummo, President of the Pastificio and of Confindustria Benevento (Industrial Union of Benevento), has strongly wanted this “energy revolution”, confirming the attention for modern technology and the responsible progress. It is not by chance that the Rummo Company is already thinking of installing photovoltaic systems on its establishments. The new trigeneration system designed, realised and installed by AB Energy for Pastificio Rummo, is in adds and enriches a very significant heritage of experience, a collaboration between AB Energy and the pasta companies in the world that boasts important case history in various regions of Italy.

This underlines how the companies in the above-said sector are in search of proposing partners and concrete solutions to reduce costs and improve their own energy efficiency. Also to be considered are the positive results in terms of environmental commitment, now more than ever important with regard to adjustment to the legislative developments and “parameters” at marketing level. Especially for producers of food, strongly and ideally linked to their own territory and to the “naturalness” of the product.

For these reasons also, the Rummo case history is significant beyond the technology applied to the project.

**PASTIFICIO RUMMO:
THE GOAL OF JOINING
TRADITION AND INNOVATION.**

Since 1846 the Rummo family has only been passionate about one thing: product high quality pasta.

A continuously evolving search for excellence. In 160 years' of activity, Pastificio Rummo has constantly grown for dimensions and number of staff; it left the city centre in 1990 where the old building still remains, as example of industrial architecture.

Aim, the realisation of a new and modern establishment in the district of Ponte Valentino in the Benevento countryside.

The new production site boasts technologically advanced and continuously updated systems with the most modern and exclusive process innovations that allow the Rummo family to guarantee the advantages of the artisan work of 160 years ago with the safety and guarantee of the best technology of today.

In the last few years the company has recorded growth rates above 30%, thanks to the large investments involving the production and logistic sectors.

Today it has 7 production lines, one new automatic warehouse with a 51 thousand pallet places capacity and one automatic palletiser.

Investments that enhance a state-of-the-art logistic organisation (ISO 9001 certified) able to trace every single production batch that has left the establishment and monitor the level of stock in the various storages, in order to guarantee the client with on-time deliveries.

A managerial reality coherent with its values has developed from a family business. This is the asset of the Rummo group that, in the last few years, has strengthened the areas most in contact with the consumer and with the distribution partner, like the commercial and marketing areas,



assuming managers from multinational companies and introducing forms of advanced management.

Pastificio Rummo currently employs 130 staff and its the staff, with their professionalism, their passion and their wish to overcome challenges, to make the Rummo Company an excellent group.



TRIGENERATION AS A KNOWLEDGEABLE CHOICE FOR THE RUMMO QUALITY.

The Pastificio Rummo, after years of studies, researches and experiments, has designed and realised “customised” technologically advanced, systems for the production of pasta, able to dictate the times of production, slowing down speeding up the working process, depending on the requirements of the high quality bran used, in order to enhance to the maximum all the characteristics of the protein and of the natural properties of the most precious durum wheat. In this way, Rummo repropose the traditional approach of “Making Pasta” in a highly technological key, adding the guarantee and safety of today’s best technology, to the advantages of the artisan work of 160 years ago.

The essential ingredient of the Rummo pasta is and remains the “slow working”.

The time, a slow and sapient time. The long dough times, which determining element for the quality of the pasta, are the basis of this exclusive working method that fully reflects the production according to antique traditions. The dough, rich and dense, must softly turn for a long time to preserve and enhance the qualities of the most precious durum wheat to the maximum. The result is an excellent project: tenacious, resistant to cooking, perfumed, without patina, alive, with an unmistakable flavour.

The trigeneration system designed, realised and installed by AB Energy at Pastificio Rummo in Benevento falls directly within this production process and in the particular philosophy that drives the Group.

The energy produced by the system is, in fact, used to power the production process of the pasta.

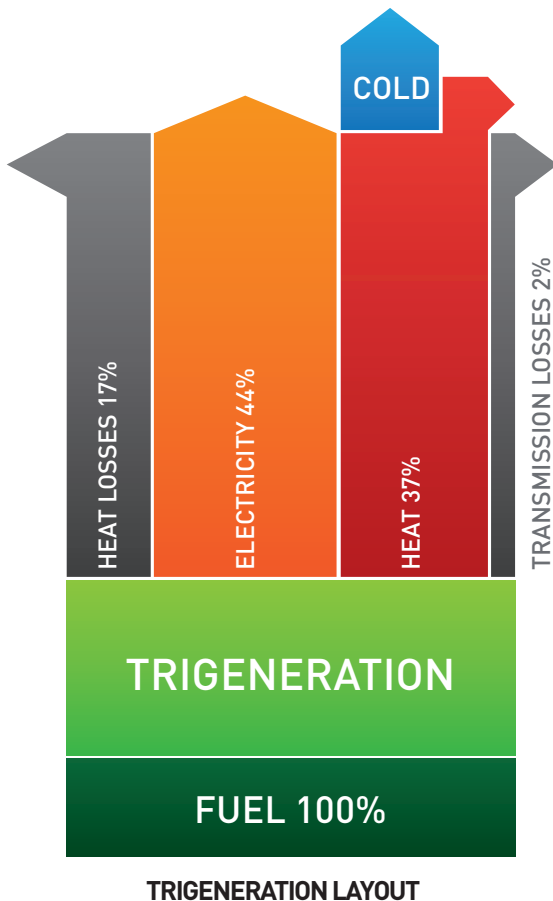
In particular, the thermal energy is used for drying the pasta and for cooling the same until it reaches ideal temperature for packaging, according to the principles that characterise the Rummo procedure.

The technical-functional advantages of trigeneration.

The system installed at Pastificio Rummo is a significant example of the advantages offered by the modern trigeneration technology.

Trigeneration is a specific field of the cogeneration system that, as well as produce electric energy, allows to use thermal energy recovered from the cogenerator to also produce refrigerator energy, meaning cooled water for the conditioning or for the industrial processes.

The transformation of the thermal energy in refrigerator energy is made possible by the use of the refrigerator cycle with absorption, which functioning is based on the state transformation of the refrigerator fluid combined with the substance used, which absorber. The main couples of refrigerant/absorber used are water/lithium bromide and ammonia/water. In a trigeneration system, compared to the generating of electric energy only, the global efficiency increases because a higher percentage of the heating power of the fuel is used. Also to be considered is that the conventional thermoelectric power stations convert approximately one third of the energy of the fuel into electricity (the remainder is lost in heat), whereas, in a trigeneration system, more than 4/5 of the same energy is used, given that the heat is recovered directly (cogenerative functioning) or as source for an absorbing refrigerator cycle (trigenerative functioning).



THE CHARACTERISING ELEMENTS OF THE AB ENERGY SYSTEM FOR THE PASTIFICIO RUMMO.

Cleaner energy as concrete demonstration of love for ones' own territory.

The system realised at the Pastificio, made of a container solution ECOMAX 24 HE and of a lithium bromide absorber, develops a total power of 2.433 kWe, a thermal power equal to 887 kWt for the production of overheated water at 140°C and a power of 806 kWf for the production of cold water at 5-12°C.

All the energy produced is used to power the production process of the pasta.

The system - fully realised by AB Energy, from the design phase to the delivery of the container and final installation - located at the establishment in the industrial area of Ponte Valentino, guarantees an electric efficiency of 44%, a thermal efficiency of 37% and a total efficiency higher than 80%. The used motor is part of the "High efficiency" line.

The technological choices used have, therefore, allowed to obtain high efficiency in all operational parameters, at the same time reducing the emission of CO₂ in the environment by 42.7%.

AB Energy has also designed and realised the interconnections with the existing systems in the Rummo establishment, in particular the overheated water, the cold water network, and that of MV, guaranteeing a perfect synergy with the existing technologies.

Also very significant, is the ability of AB Energy to answer the severe timing requested by the client, who wanted to make the system operational in very short times and without stopping the production lines for too long.

The installation, assembly and start-up were carried out in just over a month.

Rummo, system features:

ECOMAX 24 HE

Fuel consumption	583	Nm ³ /h
Introduced power	5.539	kW
Electric power (cos.phi = 1.0)	2.433	kW
Electric Efficiency	44,0	%
Overheated water	140	°C
Return overheated water	120	°C
	887	kW
Cooled water	7	°C
Return cooled water	12	°C
Hot water	88	°C
Return hot water	78	°C
	303	kW
Thermal efficiency	37,0	%
Total Efficiency	81,0	%

**CLEANER ENERGY AS
CONCRETE DEMONSTRATION
OF THE LOVE FOR
ONES' OWN TERRITORY.**

THE SYSTEMS' EFFICIENCY STATED BY THOSE USING IT.

Interview with Cosimo Rummo (President of the Pastificio Rummo).

Why have you chosen cogeneration? What is the real benefit of a cogeneration system in the pasta industry?

“Rummo SpA has always given primary importance to technologically advanced systems enabling, on one side, a better use of the energy vector, in this way satisfying ones’ own needs and, on the other side, reduction of the environmental impact, respecting the objectives of the Kyoto protocol. Furthermore, the economical advantage in this way achieved, allows supplying our clients a product of excellent quality, but at a lower cost. In particular, the trigeneration system allows us to satisfy important need both with regard to drying pasta and to the cooling phase. A technology that works always, 365 days a year, 24/24, it’s a certainty within our production cycle.”

How has the cogeneration system realised by AB Energy integrated with your engineering scenario and the energy dynamics already in your establishment?

“The correct designing of the system has guaranteed reduction of the problems deriving from the integration of the trigeneration unit with the existing systems. With the professionalism of the AB Energy technicians we identified and applied the best choices to improve our energy performances, creating a synergy with the existing technologies.”

The system has been operational for just a few months, have you been able to ascertain the efficiency compared to the awaited benefit?

“The system’s functioning percentage exceeds 95%. In light of the first four months functioning of the system, our expectations are satisfied. The decision to install this type of trigeneration system has resulted effective from every point of view”.

What are the expectations regarding maintenance on a system like this one?

“Rummo SpA has a full service maintenance contract with the AB Group for the trigeneration system: for systems of this importance the assistance of an expert Group in the sector is necessary and opportune to fully use the potential of the same system with the economical, energy and environmental benefits”.



AB GROUP PROFILE.

Founded and run by Angelo Baronchelli, the AB Industrial Group has been operating for more than 30 years in the cogeneration and in the energy valorisation of renewable sources sector.

Today, AB Group has 11 operational companies and over 350 staff.

The leadership position in the Italian market has favoured the growth, at international level also.

The Group has designed and realised over 400 "turn key" cogeneration systems. The AB systems are characterised by the high performances, the modularity, the compactness and the easy transport: peculiarities that fully satisfy the energy requirements of the different companies.

AB has also widened the range of products with the BIO line, studied to add value to biogas energy.

AB Group turns to its customers like the only interlocutor responsible of the realisation of the entire system.

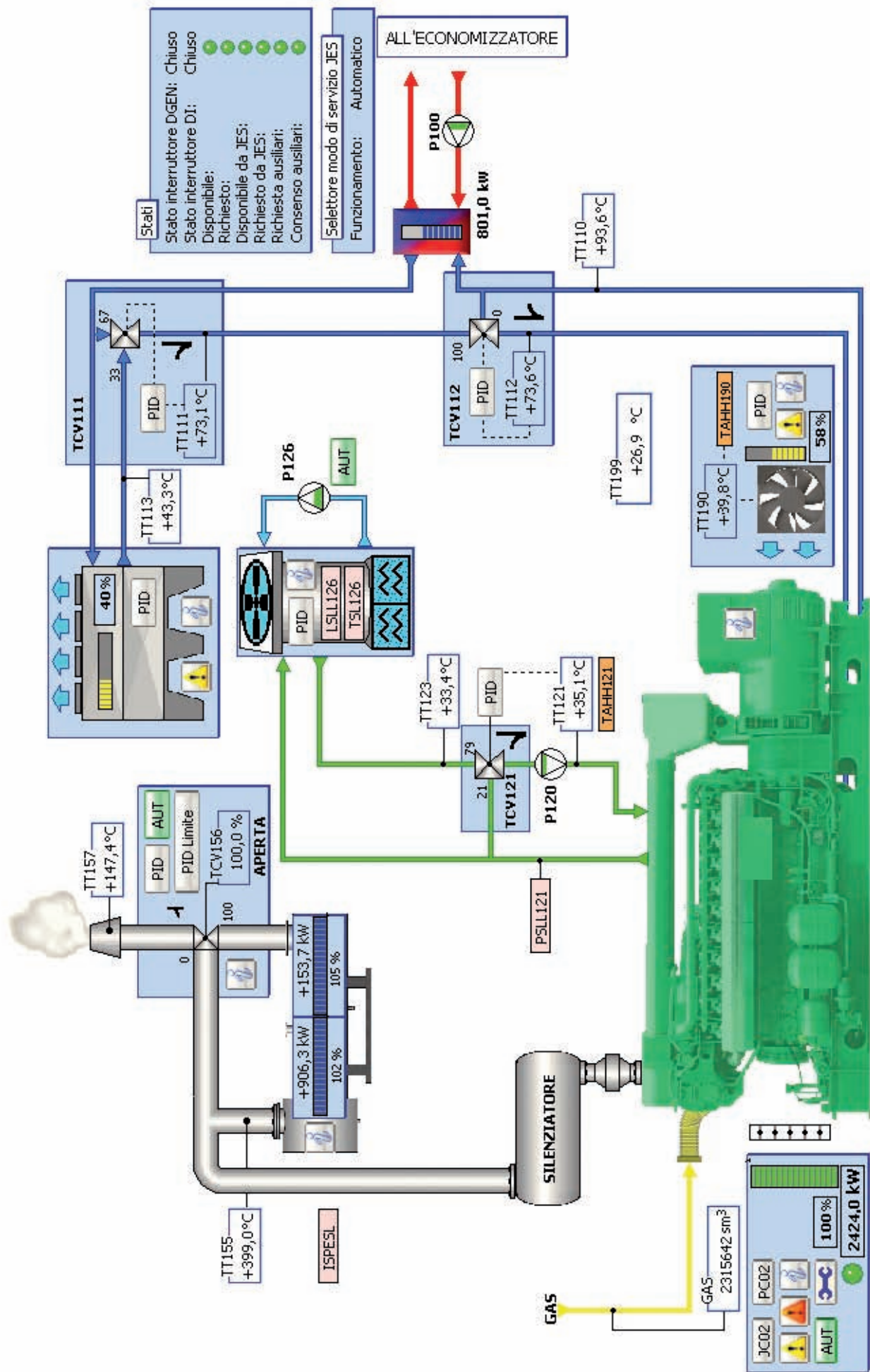
Through its companies, the Group makes all the necessary technical know-how available for the designing, the realisation, the installation and the management of the systems, developing the entire project, the construction, the start-up and completing the offer with a service able to guarantee maintenance of the systems for their entire life-span.

The AB Group has recently strengthened its expansion abroad, with an eye on those European countries where cogeneration is acquiring an increasingly more strategic role. After entering the Spanish market, with offices in Madrid and Barcelona, the Group has also set its sights on Eastern Europe and, in 2009, established a subsidiary office in Bucarest. In April 2010, AB acquired the majority share of KWE Technika Energetyczna, the local distributor and service partner of GE Jenbacher for the Polish market.

Cogeneration has resulted a winning choice in other sectors also, industrial and not:
chemical-pharmaceutical, textiles, plastic, paper, bricks, valorisation of anaerobic digestion and dump biogas, etc.

Those who have chosen AB Energy:

Amadori, Assolac, Buitoni, Centrale del latte di Firenze, Cooperativa Speranza, Cotonificio Albini, Fatro, Felli Color, Gruppo Cremonini, La Farge, Martini & Rossi, Nestlè, Olimpias Benetton, Pastificio Ferrara, Pfizer, Polynt, Wienerberger, etc.



MONITORING SYSTEM

AB ENERGY, LEADING ENERGY