

- ▼ BK³ builds CHP modules for common fuels and also offers solutions for special applications such as associated petroleum gas or landfill gas. Essentially a CHP consists of a motor (center right), which is usually gas powered, generating electricity and emitting heat at the same time. Heat exchangers (bottom left) then use this waste heat to heat rooms or process water. The control unit (far right) controls operation.

Combined heat and power units designed for top performance

BK³ Energieanlagen relies on Bachmann innovation

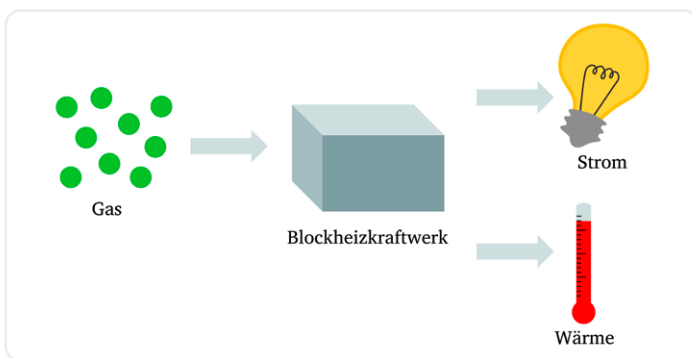
For approximately twenty years, BK³ Energieanlagen GmbH, headquartered in Berlin, has been building combined heat and power units (CHPs). Requirements of the current connection directives for low voltage and medium voltage made it necessary to recertify the CHPs. This was the impetus for BK³ to integrate a new control system using the M200 series from Bachmann. Thanks to Bachmann's CHP Template, the migration was completed very quickly.

BK³ Energieanlagen GmbH builds combined heat and power units with an electrical output of 50 to 500 kW, mostly converting digester gas into electricity. As the revised German connection directives now require functions for dynamic and static grid support as stipulated in the VDE-AR-N 4105:2018 Low-Voltage and VDE-AR-N 4110 Medium-Voltage directives, the units had to be recertified. This is a complex, cost-intensive process, thus, BK³ took on this task together with enertec Kraftwerke GmbH. enertec Kraftwerke is headquartered in Mühlhausen in the German state of Thuringia and likewise builds CHPs, mostly converting biogas into electricity.

Control system migration to the M200 series

enertec has been using Bachmann's M200 control system for some time now with good results. Michael Rauchfuß, commissioning engineer at BK³, recalls: "The compact controller we used previously did not offer the necessary capacity to map the functions required in the directive. Consequently, and not least based on enertec's recommendation, we decided to migrate our CHP controller to the M200."

▼ BK³ generates electricity and heat from digester gas, natural gas, or biogas, achieving overall efficiencies of up to more than 91%.



▼ The CHP Template comes with web visualization as a standard feature, which can be easily customized.



▼ The control unit controls operation of the CHP. After the migration, BK³ introduced a touch panel for this purpose.

The most important tasks in one package

The CHP Template includes solutions for the tasks that are most frequently required for operating a CHP. Use of certified Bachmann hardware not only solves the necessary tasks associated with the grid connection, such as generator and grid monitoring, grid measurement, and synchronization, it also solves the control engineering issues. These include regulating speed, power, phase, frequency, and voltage, as well as mixture regulation or motor cooling circuit regulation. The template offers extensive functions and is available as a ready-to-use Codesys project in structured text. These functions and others are available as preprogrammed modules in the CHP Template.

Web visualization is provided for efficient testing and commissioning. Visualization of the CHP can also be customized, enabling CHP manufacturers to differentiate their products both visually and functionally.



„The CHP Template spared us most of the controller migration work up front.”

Michael Rauchfuß
Commissioning engineer at
BK³ Energieanlagen GmbH

1:1 – plus more

Compared with the compact controller used until then, the Bachmann automation system opened up entirely new perspectives to BK³; however, it also required a reorientation in development. Whereas engineers previously had to limit themselves to assigning software parameters with an unknown source code, they now had completely new possibilities thanks to free programming. But right from the start it was clear that the specific functions and the familiar approach to operating the CHP would have to be mapped to the new controller. “We did this primarily with service in mind and wanted to keep everything as familiar as possible,” is how Michael Rauchfuß describes his most important requirement for the new solution. However, the new solution also provided the basis for entirely new projects, such as creating a touch panel for system control.

Bachmann M200 as basis for all new implementations

With the new control system from Bachmann, BK³ wanted to provide a basis for all future implementations: the development of a basic software that can easily be ported to various plants and is immediately ready to run there with all basic functions. “This used to be a real hassle. Because of the closed nature of the compact controller, we basically had to start over again from zero with each new unit. Now we can simply copy and paste specific functions – and it just works,” says Michael Rauchfuß. He had the same experience with the CHP Template: “The functions provided in the template for operation, starting, stopping, and motor control are very sophisticated. They allowed us to quickly perform the initial commissioning of the CHP,” confirms the commissioning engineer. Finally, together with Bachmann application engineer Axel Wedderien, he adapted the template for specific assemblies or special control characteristics: “He has always had an open ear for us and our concerns, and we are very grateful for that.”

Future-proof

For Rauchfuß, all of this is a major step forward: “Basically, each unit is unique, and it’s very rare to have two identical systems.” Being able to copy existing software to cover the basic functionalities makes life a lot easier. His vision for the future is a CHP with completely freely configurable software: During commissioning, the soft-

ware is loaded with the option to select the required functions and installed components on the display. After a reboot, operators then only see what they need.

The engineer is confident: The Bachmann controller offers him all the possibilities to further develop the BK³ CHPs and to implement functionalities for his customers that were not possible before. And he already has a number of ideas, such as new ways to monitor the units: “After all, our aim is to use these technological advances to save resources, time, and money. This will allow us to make a crucial contribution towards a successful energy transition, in line with our corporate philosophy.”



FIND OUT MORE:

CHP Template



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