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Reference Report Bosch Industrial

Full steam ahead for Park & Bellheimer

Regional beer tradition

The traditional Park & Bellheimer breweries are located in the heart of the Palatinate Forest in Germany. The breweries' close ties to their unique, nature-filled surroundings and strong connection to the people living in the western and southern areas of the Palatinate region are reflected in the unmistakable taste of their specialist beers. "We mainly supply our beers to purchasers within 80 kilometres of our brew-

Decades of traditional brewing mainly using raw materials from the local area preserve the unmistakable taste of Park & Bellheimer's specialist beers.

eries – including local restaurants. Each year, we produce 100,000 hectolitres in Pirmasens and 100,000 hectolitres in Bellheim. And we rely on raw materials from the local area," emphasises Rainer Klöckner, the technical manager for both brewery locations. In addition, the brewery in Bellheim manufactures 100,000 hectolitres of water and soft drinks. Park & Bellheimer breweries are keen to use modern, sustainable technology in their brewing process which also includes the energy provision with process steam. Heiko Doppler, a Bosch customer service engineer, and Thomas Steffes, Project Leader at Kramer & Best, have handed over a new steam boiler system to André Ködel, master brewer of the site in Pirmasens. Park & Bellheimer expects to save around €80,000 a year in energy costs by installing this upgrade.

The new Bosch system replaces a supply agreement with the city of Pirmasens; after this contract lapsed, the brewery decided to construct their own steam supply system. "The whole process, from the initial planning concept to the finished system, took just four months," reports Thomas Steffes. Kramer & Best was tasked with designing and implementing the system, as well as disassembling the existing plant. Bosch Industriekessel supported the process by providing technical specifications and CAD data, supplying the technology and providing assistance in the assembly and official acceptance stages. The boiler, modules and control system were set up within the walls of the historical brewery. A rented boiler was briefly used during the disassembly of the existing system and installation of the new system. The installation and commissioning phases were made considerably quicker thanks to the pre-assembled components from the Bosch factory and the pre-wired and tested control cabinet. "The preparatory work carried out by both companies meant that we could commission the entire system quickly. Now, the only remaining task is the integration of MEC Optimize," explains customer service engineer Heiko Doppler. MEC Optimize is a digital efficiency assistant that helps boiler attendants and operators to locate

Heiko Doppler shows Thomas Steffes the different menu levels in MEC Optimize. In Pirmasens, the efficiency assistant will soon supply the central control station with data.

potential energy losses quickly and suggests corresponding measures to address them. The efficiency assistant even detects critical situations immediately and analyses the state of the components based on the operation mode. The reliable prognoses enable André Ködel, who is also Head of Operations at the Pirmasens plant, to schedule maintenance timely according to the brewery's capacity.

The data for MEC Optimize is collected and saved locally by an industrial computer built into the control cabinet. Bosch offers two different systems for transferring and visualising data, which make use either of standardised interfaces to a process control system or of a PC/tablet via WLAN. At the Pirmasens site, authorised persons can view the statistics and analyses via the central control station, gleaning all the important information about the system's energy consumption, load profile and performance, and digitally entering the results of the boiler tests at the same time. This creates efficiency for staff, systems and processes. Being networked with the secure Bosch MEC Remote monitoring system enables data to be called up from any location, including outside of the brewery. A further advantage of remote access is that, if requested by the operator, Bosch experts can assist with troubleshooting, parametrisation and programming – cost effectively and without having to travel to the site.

Steam quality and flexibility

The new boiler system produces up to five tons of steam for the various heating procedures in the brewing process. The proven UL-S boiler type is impressive thanks to its flexible operation and consistently high steam quality, even in the event of large load fluctuations. "The decision to use a Bosch

Brewery house Pirmasens

Brewery house Bellheim

boiler at the Pirmasens site was an easy one," comments Rainer Klöckner. The Bosch boiler system at the Bellheim site 60 kilometres away was an example of what could be achieved. Since 2015, two UL-S steam boilers have been in operation in Bellheim, running on a total of twelve tons of steam per hour. Here, the process heat is not only used in the brewing process, but also for producing beverages and cleaning bottles. The breweries only use eco-friendly reusable glass bottles. The energy center in Bellheim is operated by Pfalzwerke AG; the brewery has agreed a lease model with this energy service provider from Ludwigshafen, Germany. Alongside the boilers, Pfalzwerke AG uses two micro gas turbines that produce around half of the brewery's electricity requirements.

All three boilers are equipped with integrated economisers that pre-heat the feed water, thereby enabling fuel savings of up to 7 % per boiler. High steam generator efficiency is especially important in the partial-load range, in order to ensure flexible adjustment to seasonal variations in production quantities and beverage types. The natural gas burners fitted at the factory work on a modulating basis and variably adapt to the current steam requirements. The speed-controlled burner fans have another positive effect: They reduce energy consumption by up to 75 % and their initial cost is paid off in an exceptionally short time. The fan speed is reduced depending on the current burner capacity, resulting in significantly lower electrical power consumption. Bosch control technology also forms a key part of both

The Bosch boilers in Bellheim supply the brewery for processes like mashing and boiling. A cascade control ensures exceptionally cost-effective operation of the multi-boiler system.

The feed water deaeration system was placed one floor higher in Pirmasens. Heating the feed water to 103 °C ensures that corrosive elements in the feed water dissolve. To make the process more efficient, a downstream vapour cooler uses accumulating exhaust vapour to pre-heat make-up water.

boiler houses. It prevents operating errors, automates the boiler and system operation, and takes on a range of control tasks. For instance, it regulates blow-down and desalting processes fully automatically and controls feed water regulation. A feed water deaeration system with an exhaust vapour cooler, and a condensate return flow contaminate monitoring system, including a drain, round off the boiler system in Pirmasens. This guarantees high water quality and prevents the boiler and its components from being damaged by corrosion, contaminants such as lyes or acids entering the system, or hard water.

Impressive in use

Thanks to the Bosch boiler systems, the breweries have improved their energy balance, reduced their fuel use and can work more flexibly and more efficiently overall. And the lower emissions help to protect the environment, reinforcing the Park & Bellheimer breweries' close link to nature. "We are very satisfied," says technical manager Rainer Klöckner. "The boiler systems in both Bellheim and Pirmasens have exceeded our expectations." The future energy consumption analyses, wear prognoses and data evaluations carried out using MEC Optimize are the finishing touch on the system in Pirmasens. The commissioning of the efficiency assistants will not be the last time Heiko Doppler visits the brewery; the breweries have signed a maintenance contract with Bosch for both sites, which will guarantee long-lasting, problem-free boiler operation.

Heiko Doppler inspects and maintains the systems every six months.

The companies involved

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