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Content

In Focus

Steam, heating and compressed air for beer, fruit juices, biscuits and grains: In our current issue we report about impressive projects in the beverage and food industry. Our technologies ensure maximum cost-efficiency – and high data transparency by using MEC Optimize. This digital efficiency assistant for industrial boiler systems is one of our highlights at BrauBeviale trade fair in Nuremberg, Germany. We hope you enjoy reading all about it!

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Smart steam boiler technology from Bosch
Digitisation and networking in a traditional brewery

Heiko Doppler, a Bosch customer service engineer, and Thomas Steffes, Project Leader at Kramer & Best, have recently handed over a new steam boiler system to André Ködel, master brewer of Park & Bellheimer's brewery in Pirmasens, south-west Germany. Park & Bellheimer expects to save around EUR 80,000 a year in energy costs by installing this upgrade. Furthermore, the brewery in Rhineland-Palatinate is employing an Industry 4.0 solution in the form of MEC Optimize, meaning that in future it will benefit from digitised data collection, intelligent analysis and maximum energy transparency.

MEC Optimize from Bosch is a digital efficiency assistant that helps boiler attendants and operators to locate potential energy losses quickly and suggests concrete measures to address them. The efficiency assistant even detects critical situations immediately and analyses the state of components based on the operating mode. The reliable prognoses enable Ködel, who is also Head of Operations at the Pirmasens plant, to schedule maintenance timely according to the brewery's capacity. Leading-edge predictive maintenance is consequently being brought into a traditional brewery while making its workers, machines and processes more efficient.

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 brewery in Pirmasens, 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. 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. "Uninterruptible yet economical process heating is absolutely essential to running our brewery," says Ködel. The networked solutions from Bosch will help to make response times faster and make work more productive overall.

The new Bosch boiler system supplies the brewing house with steam for processes such as mashing and boiling – up to five tonnes of steam per hour are available. Components for heat recovery, a modulating natural gas burner, speed-controlled fans and various items of automation equipment help to provide the steam in a flexible and energy-saving way. The new system was planned and installed by Kramer & Best Anlagenbau GmbH in collaboration with Bosch Industriekessel GmbH.

Left image: Bosch customer service engineer Heiko Doppler shows Thomas Steffes from contractor Kramer & Best the different menu levels of MEC Optimize. The efficiency assistant will soon supply the brewery's central control station with data.

Right image: The new Bosch industrial boiler including equipment at Park & Bellheimer.

Baking biscuits with Bosch
Compressed air and heat system at Bahlsen in Berlin

Chocolate and biscuit: Pick-Up is one of the family company Bahlsen's most recognised products on the German market and is manufactured in Berlin. Biscuit production requires compressed air and heat, some of which is provided by the Bosch CHA CA 570 NA compressed air and heat system (CHA) since 2017. "We aim to use our resources sustainably and have as little impact on the environment as possible by keeping our CO_2 output low. This is also underlined by our DIN EN ISO 50001 certification. The Bosch CHA is one of the solutions we use to reduce the energy consumption for compressed air – and consequently reduce our running costs as well," explains Joachim Dolling, Head of Internal Power Supply, Occupational Safety and Environmental Protection at Bahlsen.

To achieve maximum efficiency from the CHA, it is recommended to utilise both the compressed air and the emitted heat. The Bosch CHA is in operation for around 6,000 to 6,500 hours a year at Bahlsen, meaning that it provides the company's base-load supply of compressed air. Conventional compressors are there on standby to help cover peak loads as and when needed. The boiler house on the production site has space for the compressed air and heat system, which in turn is connected to the compressed air central station via a recently laid 80-metre-long stainless steel pipeline.

The traditional meets the contemporary

Three Loos boilers (now Bosch Industriekessel GmbH) from 2003 and 2005 complete the picture in the boiler house. The two Unimat UT-H hot water boilers generate a heat output of 7,000 kilowatt. The waste heat emitted by the CHA is fed into the boiler return flow at about 90 °C, thus making heat generation more efficient. The individual components of the system provide the entire factory with heat and are joined together via a central heating system. Since 2005, a UL-S Universal steam boiler has been producing 1,250 kilograms per hour of process heat in the form of steam.

The Bosch compressed air and heat system looks like a classic CHP module but it generates compressed air and heat instead. Like in a combined heat and power system, a combustion engine – here with a mechanical shaft power of 60 kilowatt – forms the heart of the compact module. Instead of using a generator to generate electricity, however, a compressor is powered using the entire drive power of the engine. To adapt to the varying need for compressed air, the speed of the gas-powered engine is controlled and can be set to any value from 60 percent power upwards.

At a fuel power of 164 kilowatt, the amount of compressed air generated is 9.5 m^3 per minute at a maximum operating overpressure of 8.5 bar and the usable heat output is 135 kilowatt – equalling a thermal efficiency of 82 percent. To achieve this heat output, the CHA is decoupled to three different components by means of heat exchangers. Heat is released first at the engine, which is designed to generate a large part of the heat, with a heat output of 48 kilowatt. The screw-type compressor also releases huge amounts of heat with 48 kilowatt heat recovery. A classic plate-type heat exchanger in the CHA's waste gas duct recovers an additional 39 kilowatt.

Operating for around 6,000 to 6,500 hours a year, the compressed air and heat system at Bahlsen covers the company's base-load need for compressed air.

Integration and remote maintenance

Integrated measuring points continuously measure the relevant parameters of the compressed air and heat system to make sure that it is operating safely and efficiently. At Bahlsen, the CHA is connected to the higher-level control system for central compressed air generation. The remote maintenance system, MEC Remote, helps the Bosch Service team to do this at Bahlsen. All relevant system data can be viewed and adjusted remotely via Internet-enabled mobile devices. Bosch service technicians can also access this data, enabling the Service team to react should a fault message be issued, conduct an initial analysis and bring any spare parts that may be needed to the site.

Summary

Like an increasing number of companies, Bahlsen is making it a priority to improve its CO_2 balance and ecological footprint. Using a compressed air and heat system instead of a traditional compressed-air generator and boiler combination enables CO_2 output to be reduced by as much as 50 percent. Because the CHA uses gas as its energy carrier rather than electricity, which is expensive, savings of around EUR 64,000 a year can be made, assuming typical use. Norbert Nitsche, Key Account Manager for compressed air and heat systems at Bosch, adds: "What's more, in Germany up to 100 percent of the energy tax is refunded for CHP plants that have an annual capacity utilisation of over 70 percent."

Steam, efficiency and connectivity in beer and beverage manufacturing

Transparent and cost-optimised process heat supply: At this year's BrauBeviale in Nuremberg from 13 to 15 November 2018, Bosch presents the intelligent efficiency assistant MEC Optimize for industrial boiler systems. Visitors can discover how the efficiency assistant detects energy losses, suggests measures and also identifies critical conditions due to insufficient water quality. In addition, MEC Optimize determines the state of the components based on the operating mode, and helps boiler attendants with maintenance planning – for energy-efficient and reliable generation of steam and hot water, long boiler lifetime, as well as very high operating safety.

Furthermore, Bosch also presents at the BrauBeviale its Universal steam boiler UL-S as a glass boiler. The transparent design of the Bosch construction shows visitors the ideal ratio between water content and steam space – this is the basis for consistently high steam quality, even during periods of dynamic loads, and provides process reliability at breweries, bottling plants and dairies. Another highlight at Bosch's stand are the Industry 4.0 networked solutions, which reduce energy and resource consumption in production processes. Our experts show you how you can identify hidden potential, implement technical improvements and continually optimise the operation of the plants.

We look forward to your visit!

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