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Two compact boilers for Winsen hospital

Reference Report Bosch Industrial

Efficiency and reliable energy

The operator

The two hospitals, Buchholz in der Nordheide and Winsen (Luhe), are located close to the southern edge of the city of Hamburg in the Lüneburg Heath. The Buchholz Hospital has about 300 beds and approximately 1,600 rooms. The Winsen Hospital can accommodate 280 patients. It has 1,400 rooms in an area of approximately 34,500 m². Since August 1999, the hospitals combined to form an LLC with Harburg County providing the sole support.

The project

The energy supply centers in the hospitals rarely come to the attention of management. A very high potential for energy savings remains unexploited despite numerous available mature and reliable technologies. Success stories such as those below illustrate how energy consumption can be systematically and permanently reduced.

Gas-fired steam boilers provide a significant amount of energy for the Buchholz and Winsen hospitals. The generated steam is used for the kitchens, the central sterilisation department, air-conditioning humidification and for the laundry (Buchholz Hospital). The 38-year-old steam supply system at Winsen was replaced in 2012. Dipl.-Ing. Torsten Riemer, the technical manager of the hospital, developed an energy concept that was optimised both economically and in terms of the environment. In addition to increasing energy efficiency, reliability was a key consideration.

The approach included two Bosch steam boilers U-MB. Thanks to its compact and ready-to-connect design, the boilers could be very quickly moved into position and installed by the plant construction company Berger from Stelle. The decision to use Bosch industrial boilers was easy since two Bosch steam boilers UL-S with integrated economizers had been used successfully since 2006 in Buchholz.

The compact steam boiler U-MB with an economizer and natural gas firing.

The intelligent control technology enables the optimum control of the boiler plant and provides reliability of supply.

The new boiler system is efficient to operate and features intelligent control functions. With an overall output of 1,200 kg of steam per hour, it is optimally tailored to the given requirements. Both boilers run in parallel during the day, and one switches to heat maintenance during the night.

Reducing energy consumption

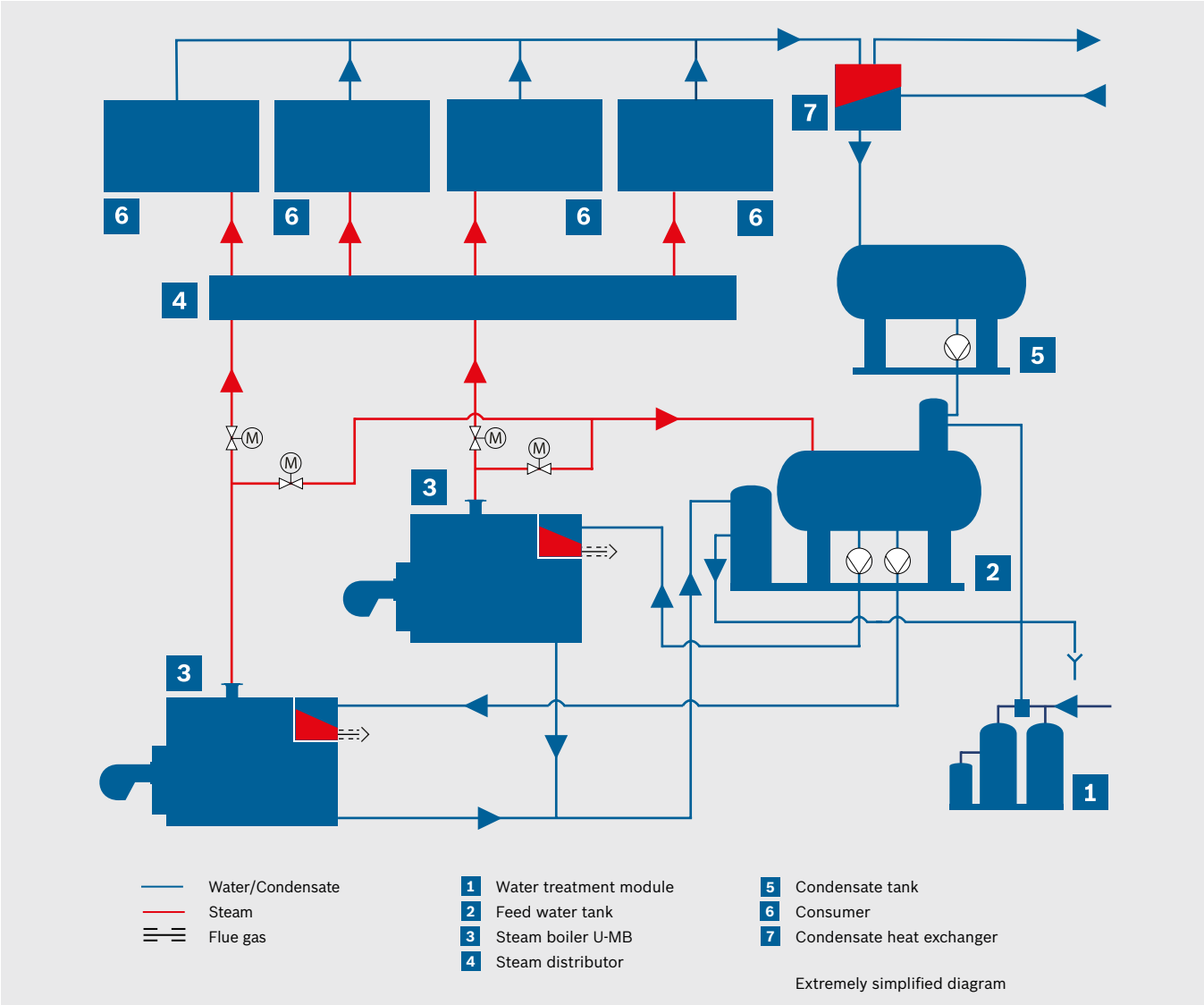
The standard integrated economizers maximise energy efficiency. The boiler feed water is fed into the heat exchanger and preheated to approx. 135 °C with hot flue gases from the combustion process. This decreases the flue gas temperature by about 100 °C. The result: An increase in efficiency of approximately 5 %. The fuel consumption and emissions are correspondingly reduced.

Low-emission natural gas is used to fire the two boilers. In addition, light fuel oil is available for one boiler. Given the wide control range in gas operation, the burner output can be smoothly adjusted to the actual steam requirement. The switching frequency of the burners is strongly reduced. Also energy losses caused by pre-ventilation of the flue gas channels are minimized.

Intelligent control technology

The transparent management systems BCO and SCO ensure an energy optimised boiler and plant operation. A wide variety of operating data in the form of curve diagrams and totals displays can be analysed and adjusted to requirements using the boiler controls BCO. Integrated monitoring and protection functions help protect against improper use.

The start-up, standby and shutdown control SUC for additional reliability takes the burden off operating personnel. With this equipment version within the boiler control BCO, the start-up and shutdown processes of the steam boilers are triggered by a pushbutton or are automated by an external request signal. During normal operation, the integrated automatic functions protect the boilers and the plant from corrosion, water impact and brining. In the heat maintenance phase, steam extraction is facilitated every time the burner is switched on, stimulating



System diagram steam boiler with appropriate plant technology for heat recovery, water treatment and condensate return.

natural water circulation inside the boiler and breaking up temperature stratification.

The system control SCO combines the individual controls into one universal system control. The integrated sequence control switches between the primary and follow-in boilers for smooth and economic use of the steam boilers. The sequence control comprises a steam volume measuring system and controlled steam shutoff valve. Once the adjustable amount of steam is exceeded, the follow-in boiler is connected by opening the steam shutoff valve. If the amount of steam falls below a specific value, the valve of the follow-in boiler closes. Both boilers are equipped with a heat maintenance device via the burner system. The heat of the follow-in boiler is maintained at a low pressure to minimize radiation loss while retaining quick availability.

All operating messages and the latest process data for the boiler system are transmitted via the link to the hospital's process control center by means of Profibus-DP. For example, the selection of fuel or the switchover from maintenance heating to normal operation and back can be directed from the control center.

Additional energy generation

In addition to the process steam generation, the Buchholz and Winsen hospitals have cogeneration systems for economically generating electricity and heat.

Implementation phases of the modernisation measures

- Installation of two compact steam boilers with integrated economizers
- Commissioning alongside existing boiler system
- Dismantling and disposal of the old system
- Use of modern firing systems with a wide control range
- Integration of programmable controls with automatic start-up, standby and shutdown control and sequence control

The result

The modern energy generation systems by Bosch Industriekessel have improved energy efficiency and reliability in the Winsen Hospital. The hospital's technical managers, Dipl.-Ing. Torsten Riemer and Thorsten Holz, are highly satisfied:

"Modernization immediately yielded savings in natural gas of about 15 %. Furthermore, by reducing CO_2 emissions, we are doing our part to protect the environment."

Regular servicing and tests are offered by Bosch's customer service department, ensuring maximum reliability and consistently economical operation in the long term. The availability of the systems is increased, fuel consumption is optimized, and potential savings are identified early on.

The hospital's technical managers, Dipl.-Ing. Torsten Riemer (right) and Thorsten Holz.

The companies involved

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