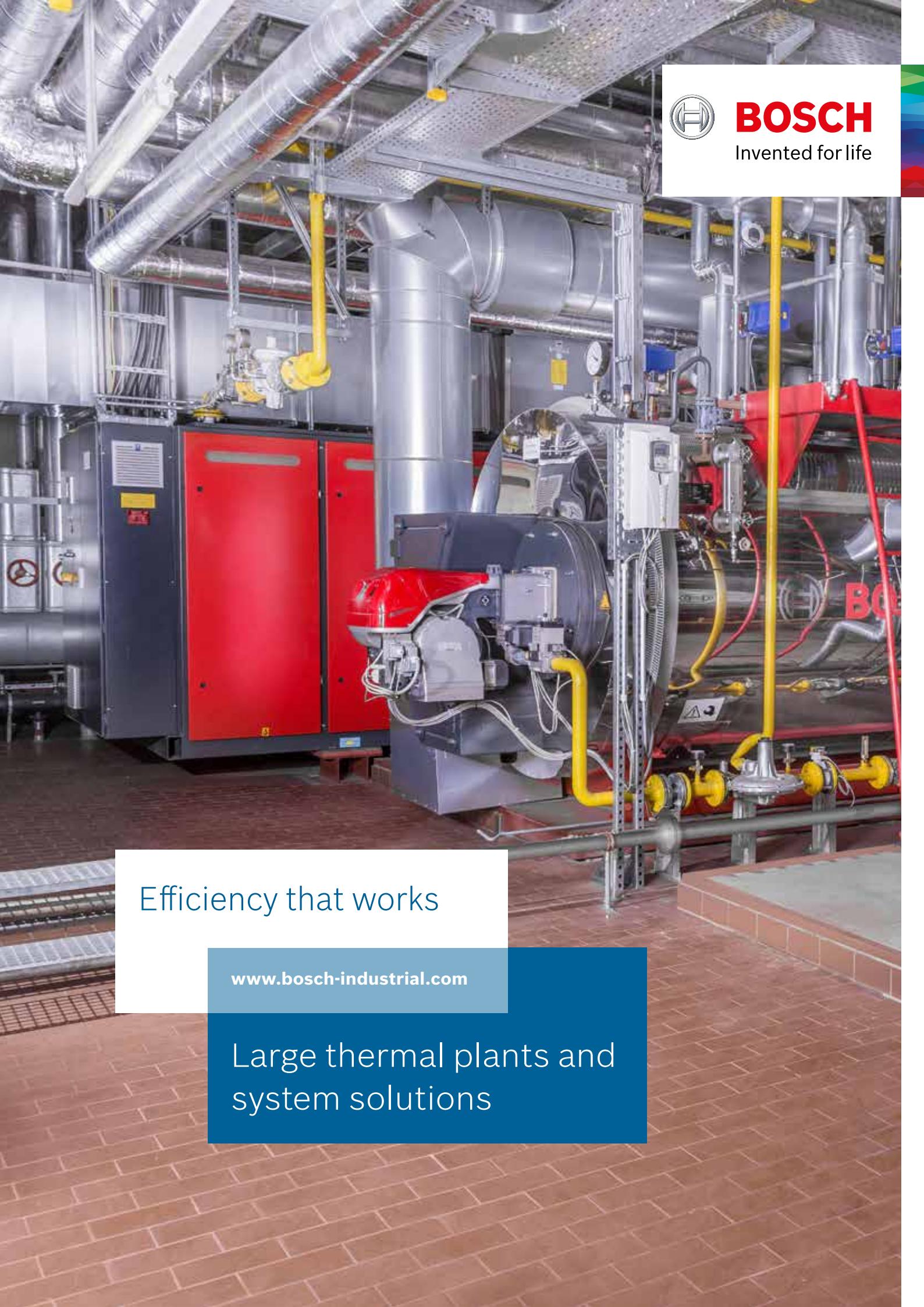




BOSCH
Invented for life



A photograph of a large industrial boiler room. The central focus is a massive red and silver industrial boiler unit. The room is filled with various pipes, valves, and mechanical components, all painted in metallic silver or red. The floor is made of large red brick tiles. The ceiling is high and features a complex network of large, shiny metal ducts and pipes. The overall atmosphere is one of a well-maintained and efficient industrial facility.

Efficiency that works

www.bosch-industrial.com

Large thermal plants and
system solutions



Everything for a single goal

The efficient use of energy

The efficient use of energy is a decisive factor for competitive success. Bosch is your partner for innovative technology and tailored solutions, offering a broad portfolio that covers almost every area of industry. We provide experience, consulting and service that go one step further – always with the high standards of quality that are unique to Bosch. Put your trust in our experienced experts and advanced technologies for new levels of efficiency and profitability.

The experience to develop individual solutions

Your requirements of energy and air-conditioning technology are unique. Bosch develops market-specific solutions to meet these needs, building on the experience gained in countless successful projects and drawing on the technical expertise we have accumulated over the decades. In this way, Bosch has continued to specialise, consolidating brands such as Loos and Köhler & Ziegler under one roof.

Innovative technology for your success

The Bosch brand stands for innovative technology like no other name. A long tradition of successful developments forms the basis of leading energy and air-conditioning technology and a pioneering approach to issues of efficiency and sustainability. For many years, the solutions we realise have set the benchmark in terms of operational reliability and long service life.

Embracing financial and environmental responsibility

It is not only legislation that determines the standard of technology at Bosch, but also the high requirements regarding solutions for heating, cooling and ventilation, power, compressed air and energy recovery systems, offering the optimum of what is feasible in these technology fields. After all, the economical use of resources is a decisive factor for sustainability.

Worldwide service

Bosch is there for you worldwide to support the success of your project. No matter if consulting by our experts or emergency service incident on site: The local Bosch employees and our industrial partners are at your service when you need them.

Competence at every stage – a promise you can rely on

The use of energy and air-conditioning technology is complex. Various systems have to be matched to each other. Tailored solutions from Bosch focus on the complete life cycle of the plant. From consulting and project planning to comprehensive services for maximum efficiency and reliability of your system.

Project phase	Our services to support your project
Consulting and project planning	<ul style="list-style-type: none"> ▶ Consultation based on your individual needs and technical requirements followed by a proposal for a tailored system solution ▶ Consideration of local legal requirements ▶ Quote for the entire project ▶ System calculation and conception ▶ Provision of approval documentation
Order processing to commissioning	<ul style="list-style-type: none"> ▶ Transport and delivery ▶ Support for plant construction companies ▶ Supervision of assembly ▶ Commissioning ▶ Operating test for several days ▶ Acceptance test
Service concept	<ul style="list-style-type: none"> ▶ Customer service according to maintenance intervals and legal requirements ▶ Inspections and overhauls ▶ Remote service ▶ 24-hour availability ▶ Training for operators

Product and system range

Steam boiler systems



System technology for maximum efficiency

The combination of our steam boilers with our modular boiler house components provides you with an exceptionally efficient and reliable system. The range of our modules includes for example water treatment units, deaeration, economizers, condensing heat exchangers and controls. Its modularity simplifies the planning and installation of the boiler systems and enables fast commissioning.

Efficient generation of process heat:
With four different UNIVERSAL type boiler designs, either as single flame-tube or double-flame tube boilers, we offer a seamless product range to meet any steam requirement.

Wide range of possible applications

Our steam boiler systems can be used universally for all applications. Classic areas of use are processing industries, commercial businesses and communal facilities. Due to our more than 150 years of experience we have acquired a broad knowledge about the specific requirements for our customers' applications.

Efficiency on a large scale

- ▶ Generation of low-pressure saturated steam, high-pressure saturated steam or high-pressure superheated steam
- ▶ Outputs from 200 to 55,000 kg/h
- ▶ Intuitive control on a PLC basis with very high transparency of operating data and connectivity options
- ▶ High level of efficiency due to integrated economizers and effective insulation concept
- ▶ Suitable for all burner systems
- ▶ Pollutant-reduced combustion thanks to the use of highly developed firing systems and careful matching of the best boiler and burner combination
- ▶ Fast commissioning due to the pre-parameterised boiler control
- ▶ Easy wiring thanks to plug and play connections
- ▶ Upgrade and modernization options available due to modular technology
- ▶ Various options to enable use as a waste heat boiler
- ▶ Robust, reliable and durable
- ▶ Complete service from a single source for maximum convenience



Product and system range

Heating boiler systems



Flexibility pays off

Depending on the requirements of the project, our heating boilers can be operated with either oil or gas burners. When combined with a switchable dual fuel burner, this makes them the ideal choice in the case of contracts where gas can be switched off. This means that you can react flexibly to fluctuating energy prices. As a system supplier, we provide you with a complete package of heating boiler, burner, flue gas heat exchanger and controls.

Needs-based solutions for optimum heat generation:

Whether it is condensing boiler technology, low-temperature or conventional heating technology, you benefit from energy efficiency, resource-saving and optimum boiler availability.

Our components are perfectly matched to each other and make planning and installation easier as well as providing high security.

Maximum energy utilisation

Our state-of-the-art heating boiler systems set the benchmark in energy efficiency. Standard utilisation rates of up to 105 % for oil and 110 % for gas can be achieved with the condensing technology. Further, our systems operate reliably, quietly and compactly in the smallest space.



Heating tailored to meet your demand

- ▶ Generation of low-pressure hot water with outputs from 50 to 19,200 kW
- ▶ Optimised fuel consumption thanks to high standard utilisation rates
- ▶ Ideal for use in private, communal and commercial buildings
- ▶ High level of flexibility due to approval for use with multi-fuel burners
- ▶ Compact dimensions for easy transportation, positioning and installation
- ▶ Modular design for easy upgradeability e.g. with heat exchangers
- ▶ Robust, reliable and durable
- ▶ Complete service from a single source for maximum convenience

Product and system range

Hot water boiler systems

Efficiency, durability and reliability – that is what Bosch hot water boiler systems are designed for. They are used for base and peak load supply in district heating plants as well as for commercial and industrial process heat.



Proven use

The UNIMAT type series has been used for decades – with overwhelming success. The continuously 3-pass design creates the best preconditions for low emissions and high energy yield. The broad output range of the available boiler sizes enables meeting the needs of various different applications.

Our associated boiler house components with modular technology significantly simplify the planning, installation and commissioning of your system. The high level of design quality ensures that safe and efficient boiler operation is achieved at any time.



Efficient technology

- ▶ Generation of high-pressure hot water with outputs from 750 to 38,000 kW
- ▶ Intuitive control on a PLC basis with very high transparency of operating data and connectivity options
- ▶ Effective 3-pass design
- ▶ Standard utilisation rate without flue gas heat exchanger of up to 95 %, and up to 105 % with condensing heat exchanger
- ▶ Effective thermal insulation concept
- ▶ Suitable for all burner systems
- ▶ Pollutant-reduced combustion thanks to the use of highly developed firing systems and careful matching of the best boiler and burner combination
- ▶ Easy to maintain thanks to fully hinged boiler front door
- ▶ Easy cleaning: flue gas tubes free of inserts
- ▶ Upgrade options available due to modular technology
- ▶ Robust, reliable and durable
- ▶ Complete service from a single source for maximum convenience

Product and system range

Combined heat and power units



Environmentally friendly, decentralised generated energy is an important factor to safeguarding our future. CHP systems from Bosch use existing energy sources on a sustainable basis for energy-efficient generation of power and heat with lowest emissions.

Efficient systems

Producing own power und using „free“ waste heat for heating – the CHP systems from Bosch are very impressive in their technical concept. Thanks to the coupled and highly efficient conversion of both types of energy, you can save significant costs compared to conventional systems with separate energy generation.

Good for both environment and climate

With our CHP systems, you not only save your financial resources but also our environment: In contrast to the electric power obtained from the electricity grid, the CO₂ emissions are 50 % lower with the decentralised generated energy. In addition, the NO_x and CO emissions fall significantly below statutory limits.

Application areas

The typical areas of use are: hotels and conference centres, care homes, indoor and outdoor swimming pools, hospitals, local and district heating supply, business parks, industrial sites, administration buildings, biogas and sewage plants.

Economic generation of power and heat

- ▶ CHP modules up to 400 kW_{el}: ready for connect for operation with natural gas
- ▶ CHP systems up to 2 MW_{el}: individual solutions for operation with natural gas and biogenic gases
- ▶ Universal modularity for quick project planning and customer-specific quotes inclusive drawings and technical specifications
- ▶ Individual energy concepts based on your requirements – everything from a single source
- ▶ Container solutions for flexible use and reduced integration work on site
- ▶ Modular design for flexible installation und easy integration into your central heating/energy plant
- ▶ Certified quality from Bosch
- ▶ Extremely low-noise operation
- ▶ A wide range of interface options
- ▶ CHP online monitoring with innovative MEC Remote Service
- ▶ 24-h customer service
- ▶ Combination with Bosch waste heat recovery boilers for effective use of waste heat

Product and system range

for high efficiency and availability

Whatever source of energy you would like to use, Bosch will tailor the solution that meets your financial and ecological needs. With a broad product portfolio that varies from country to country, we are able to provide customized system solutions.

Water tube boilers

- ▶ Warm water, hot water, saturated steam and superheated steam for commercial and industrial applications
- ▶ Individual configurations
- ▶ Suitable for all fuels
- ▶ Steam output of up to 220 t/h and 100 bar



Modular system components

- ▶ Tailored design for optimal operation in terms of profitability and process management
- ▶ Boiler house modules and components to guarantee availability and high energy efficiency of boiler systems
- ▶ Intelligent regulation and control technology
- ▶ Easy upgrade and modernisation options thanks to modular technology



Ventilation and air-conditioning

- ▶ Modular air-conditioning systems for commercial and industrial applications
- ▶ Cooling, heating, ventilation, humidification, dehumidification and filtration
- ▶ Energy recovery to save energy costs
- ▶ Airflow of 1,500 m³/h to 165,000 m³/h



ORC systems

- ▶ Convert waste heat from different heat sources into electrical power
- ▶ ORC systems with output of up to 375 kW_{el}
- ▶ Waste heat sources from 400 kW – 1 MW can be used
- ▶ Reduction of CO₂ emissions and energy costs
- ▶ Ready-to-connect or customised solutions
- ▶ Fully automated operation



Compressed air and heat system

- ▶ Compressor powered by a natural gas engine instead of using expensive electricity
- ▶ Waste heat recovery from engine and compressor for up to 60 % higher primary energy efficiency
- ▶ Maximum 8.5 bar air pressure and 90 °C heating temperature cover typical industrial applications



Heat pumps

- ▶ Heating and cooling without combustion
- ▶ Energy-efficient use of geothermal heat
- ▶ Customisable solutions
- ▶ Output of up to 4,836 kW



Cascaded heating and hot water solutions

- ▶ Cascaded heating from 50 kW – 800 kW
- ▶ Cascaded hot water up to 247 l/min
- ▶ Perfect solution for small, medium and large commercial applications'
- ▶ Highest modulation range and continuous operation even during maintenance



Thermal storage tank

- ▶ Hot water and buffer tanks for the supply of large volumes of hot water with a compact design
- ▶ Hot water tank with or without heat exchanger
- ▶ Horizontal or vertical design
- ▶ Volumes from 300 l to 6,000 l



Product and system range

Control technology for boiler and CHP systems

Our intelligent control systems feature the entire operational and functional logic of our boiler and CHP systems. The high level of data transparency enables your system to be operated on a needs basis with maximum energy efficiency.

Simple and efficient to operate

Thanks to the PLC programmable control, steam boilers, hot water or heating boilers and CHP systems can be operated simply and efficiently. All the available control functions can be called up intuitively, and the actual and setpoint values can be displayed or altered on the touchscreen display. Integrated monitoring and protective functions ensure that a very high level of operating and supply reliability is achieved. The software for Condition Monitoring performs the analysis, evaluation and display of the system data. A consistently high level of efficiency and availability of the systems is achieved.

Everything under control

The SCO system control combines the controls for steam and hot water boilers plus individual module controls into an overall management system, opening up a multitude of new possibilities. Efficient bus system technology ensures that intelligent networking is achieved, and this also enables overarching control systems to be integrated easily. The integrated sequence control regulates the operating mode of multi-boiler systems, so that energy consumption is optimised.

Energy-saving heating convenience

The cost-effective digital Control 8000 unit provides the energy-saving and reliable control of heating boilers. Thanks to its modular design, the controller can be individually upgraded to other tasks such as for example collective fault signals or demand-dependent sequence control.

Remote service

All our controls are compatible with the remote maintenance tool MEC Remote. Thanks to the secure remote access, the entire system control can be visualised on usual internet-enabled devices.

MEC Remote is the ideal solution for all companies:

- ▶ where the operator cannot be on site all the time
- ▶ that operate multi-boiler systems with mandatory supervision
- ▶ with on-call duty e.g. on weekends

Another advantage for operators is the optional remote support by the Bosch Industrial Service. The experts can perform extended parametrization, programming (PLC) and failure analysis directly via MEC Remote.



Product and system range

Control for multivalent systems

The overarching Master Energy Control system for large-scale plants allows you to combine various system parts, such as for example a boiler, a combined heat and power unit and a storage tank, to form an efficient energy system, which can be controlled via one operator interface.

Integrated energy monitoring functions continually monitor the energy flows and costs. A wide range of logged data and future operating forecasts provide the transparency required for optimum energy-saving operation.

Intuitive operator interface

- ▶ Standard web browser technology for access via all common tablets, desktop PCs and smartphones
- ▶ Secure access anywhere at all times

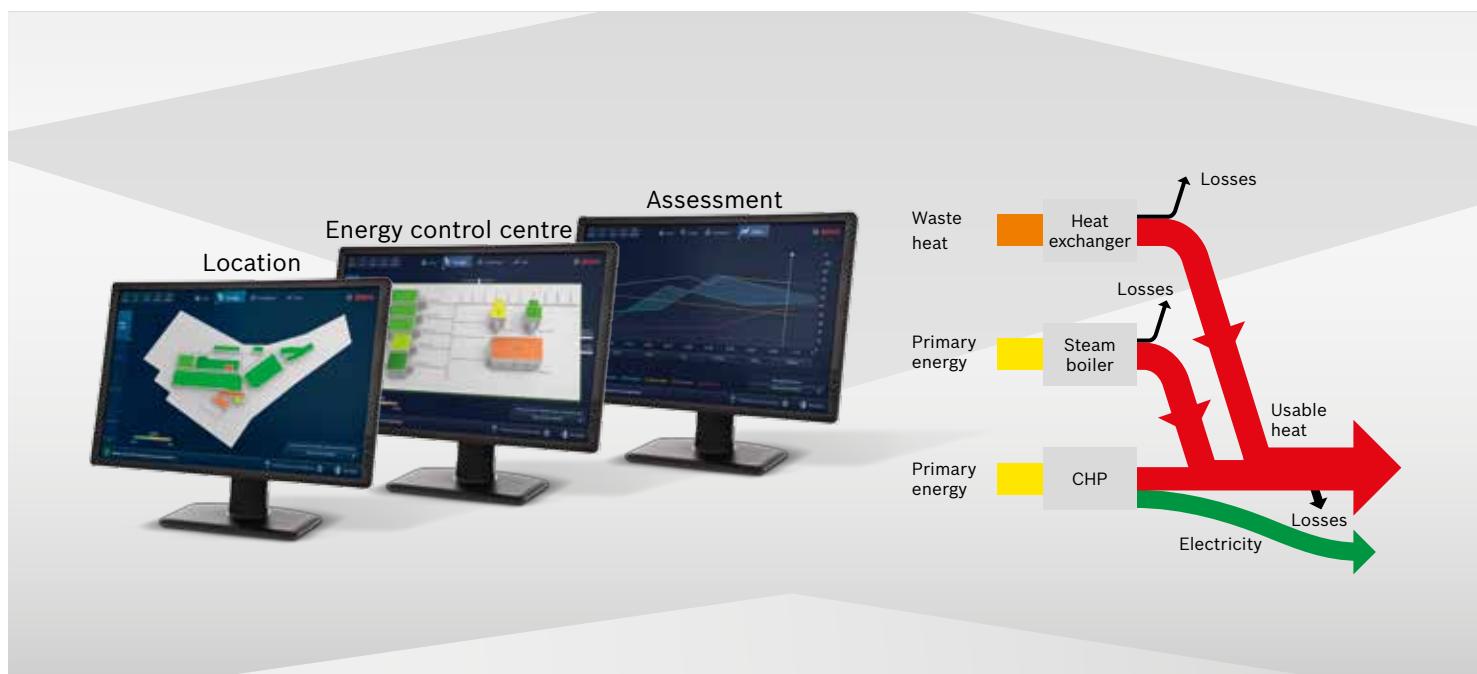
Modular design

- ▶ Individually customised solutions with less engineering effort
- ▶ Multi-protocol capability
- ▶ Connection to building management systems, energy management and virtual power plant systems

Saving energy and costs, reducing emissions

- ▶ Energy efficiency monitoring to EN 50001
- ▶ Approved tool as part of an energy management system (BASF, dena)
- ▶ Load-limiting and monitoring functions
- ▶ CHP runtime forecast for compliance with subsidy requirements
- ▶ Operation and condition monitoring

Thanks to the Master Energy Control system, it is possible to control steam and heating boilers, CHP units, hot water storage tanks and heat distribution via one operator interface. Customised requirements and functions can be extended on an individual project basis to other large thermal systems components.



Product and system range

Large solar thermal plants

A large solar thermal plant will cover all or part of your heating requirement with environmentally-friendly solar energy. Solutions from Bosch are modular in design and fulfil all your special requirements. A high level of operating reliability and maximum efficiency are achieved. You benefit from lower energy costs and reduced CO₂ output.



Using solar heat in a variety of ways

The classic areas of use for large solar thermal plants are hot water heating and supporting heating systems. In addition to this, there are many process heat applications, where solar heat can be used efficiently.

Solar heat is used in many industrial cleaning processes (CIP) for preheating the fresh water. Collectors in the solar transfer station preheat the water. If necessary, buffer storage tanks ensure decoupling of energy input and energy consumption.

The combination of solar heat and steam processes can also pay off. If the return flow of condensate is very small, large quantities of make-up water must be heated. Here solar heat can provide cost-effective support.

System monitoring

- ▶ Documentation of all inputs and outputs
- ▶ Automatic fault detection
- ▶ Maximum transparency for customers, operators and users
- ▶ Very high level of operating reliability, which ensures that system downtime is minimised
- ▶ Consistently high efficiency

Customised solutions

- ▶ Plug-in modules for simple installation and setup
- ▶ System solution for hot water heating and supply of process heat with a collector surface of up to 220 m²
- ▶ Large-scale solar thermal systems, which can be individually configured with a collector surface of up to approx. 10,000 m², for challenging concepts in the supply of local heating

Achieve more with your energy

Application examples

Electricity and heating have become key factors for production in commercial and industrial businesses. With numerous clients in a wide range of areas, Bosch has gained extensive project knowledge and is able to stand at your side as a strong partner.



Industrial and commercial businesses

Energy is mainly needed for process heating applications, drive technology, conveyor systems and room heating and lighting in industrial and commercial businesses.

By far the largest energy requirement in such situations is the production of heat for technical processes. Process heating is generated by a range of energy sources and is transferred in a number of ways, such as hot water, steam and hot air. Electricity is mainly needed to run electric motors, lighting systems and galvanic processes. In addition to process heating, heat energy is also required to keep rooms warm and to heat process water.

Bosch systems are tailored to meet your precise requirements and are used in a wide range of applications in almost all industrial and commercial sectors, including the production of food and drink, animal feed, pharmaceuticals, chemicals, petroleum, paper, cardboard and building materials as well as in printing, laundry and dry cleaning. The focus of our technology is on maximum reliability, energy efficiency and profitability.



Private and municipal institutions

Large building complexes and institutions such as hospitals, office parks, swimming pools, prisons, public utility companies, hotels and care homes often require electricity, hot water and heating around the clock. In many cases, the ideal energy concept includes innovative boiler system technology in addition to other important modules such as combined heat and power generation, heat pumps and solar thermal energy.



Energy suppliers and district heating

Bosch is your competent partner around the world. Innovative shell boiler technology and cogeneration systems are installed at many energy suppliers to produce and provide energy more efficiently.





Two Bosch state-of-the-art steam boilers, each with a steam capacity of 5,000 kg/h, are in use at Valenzi GmbH & Co.KG, a fruit jam manufacturer in the Lower Saxony region of Suderburg (Germany).

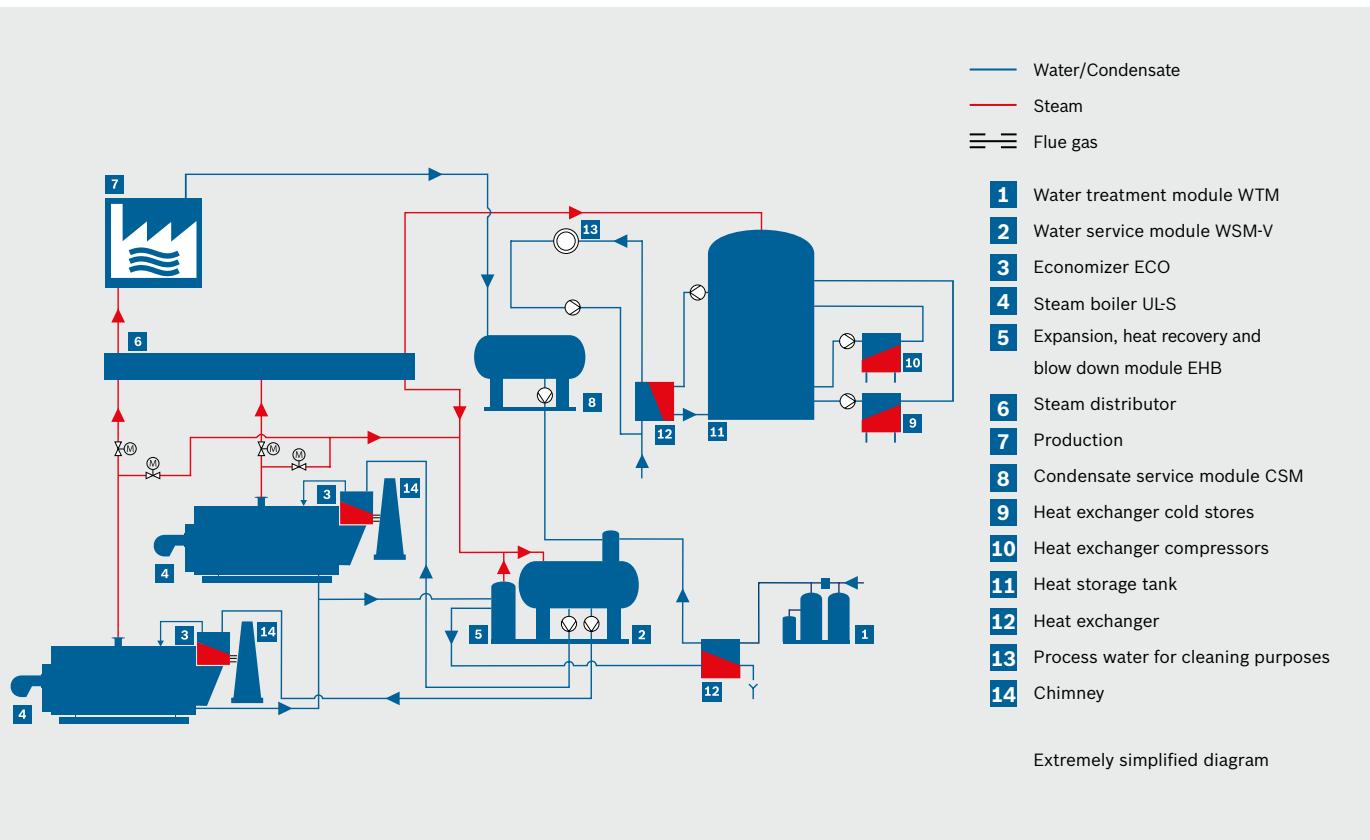
Components for heat recovery, water treatment and condensate recirculation enable the boiler to be operated with optimum energy saving.

Reference

Valenzi in Suderburg

Heat recovery units and heat storage systems ensure the highest level of efficiency.

Furthermore, the speed-controlled fans for the natural gas burners ensure that power consumption is low. Just through the new boiler system alone, Valenzi expects an annual saving in energy costs of around 40,000 euros and CO₂ savings of approx. 300 tons per year. Other measures, such as waste heat utilisation in the compressors and cold stores, improve the energy consumption still further.





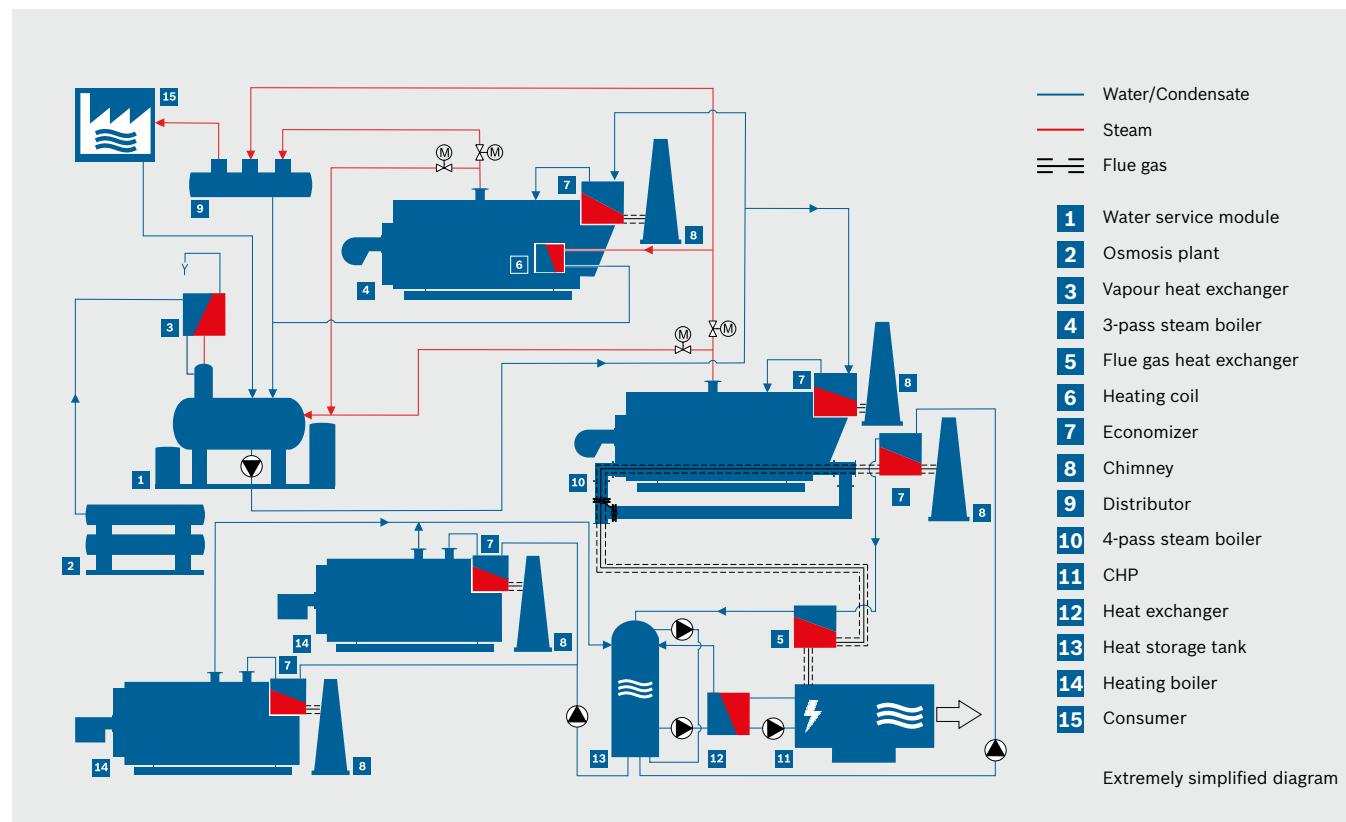
Reference

Traunstein Hospital

Combined heat and power unit with a 4-pass boiler as an efficient system solution.

As part of a renovation of its central energy generation and sterile supply department, Traunstein Hospital decided on an efficient system solution from Bosch. The system consists of a perfectly matched combination of 4-pass boiler and combined heat and power unit (CHP). It provides part of the required electrical power and heat, as well as the process steam for the hospital operation. The energy system is completed by intelligent Bosch control technology. The integrated

remote maintenance tool MEC Remote facilitates the preventive monitoring of the CHP unit. The retrieval of relevant system data is performed by means of a protected web portal using commercially available devices – the same process is used when banking online via a PC, tablet or smartphone. In addition, a 3-pass steam boiler and two heating boilers maximise the supply reliability.





Reference

Public facility in Phoenix

Hot water supply on demand with regenerative energy.

A public facility in Phoenix/Arizona has several large solar thermal systems from Bosch. A total of over one thousand collectors are installed on four buildings. In addition to heating the water for shower requirements, approx. 900 collectors provide the hot water supply for the central kitchen and laundry.

In order that solar energy can be used effectively, the various components of a water heating system must work together perfectly. The individual modules within the modular system are therefore matched with each other, so that they can complement the conventional heating system perfectly. The result: particularly reliable availability of hot water – even if the sun is not shining. The collectors with a total surface area of 2,750 m² absorb the sunshine very efficiently and heat the water in this way. The heated water is buffered in four storage tanks, so that it can be fed when required into a hot

water storage tank. This enables 75 % of the energy requirement for heating the water to be covered very efficiently. CO₂ emissions of around one thousand tons per year are prevented, and energy costs are reduced.





Reference

Bosch Thermotechnik in Lollar

Exemplary power and heat supply with intelligent control.

A CHP unit and seven heating boilers with a total heat output of approx. 16,000 kW efficiently heat Bosch Thermotechnik's production factory at the Lollar site. The low-pressure boilers utilise the used energy to the optimum degree and ensure that the heating costs are low.

In 2012 the heating generation plant was expanded by the CHP unit with an electrical output of 240 kW and a heat output of 374 kW. The gas-operated CHP unit ensures low energy consumption, and it reduces the CO₂ emissions by some 340 tons per year. Furthermore, Bosch Thermotechnik achieves an annual energy cost saving of over 250,000 euros. The entire investment has already paid off in just 1.5 years.

The Master Energy Control system ensures optimum operation of the overall plant. The control combines the heating boiler, CHP unit and storage tank into an efficient energy system.

In 2015 the plant was upgraded with a compressed air and heat system. It generates compressed air in a cost-effective and environmentally friendly way. In addition, almost the entire waste heat from engine and compressor can be used in the heating circuit. The result is a potential saving of 50,000 euros per year when capacity utilisation is 90 %. The CO₂ footprint is halved and the investment pays off after less than three years.





Picture: azv Südholstein

Reference

azv Südholstein in Hetlingen

Using existing energy sources sustainably
for power and heat supply.

At the Hetlingen sewage treatment plant operated by azv Südholstein, there are four Bosch CHP modules in use for power and heat supply, each with 1,063 kW of electrical output and 1,100 kW of thermal output.

Sewage gas is used as fuel. The heat, which is decoupled during the conversion into electricity, is efficiently used for various sewage processes. Part of this heat is also used by a downstream Bosch ORC system to generate additional power. Exhaust gas cleaning systems from Bosch ensure that there are minimal emissions from the engines due to subsequent thermal combustion. Approx. 70 % of its electrical requirement is generated by azv Südholstein itself at this location. The generated power is eligible for grants in accordance with the German Cogeneration Act (KWK-Gesetz), and a significant contribution is made to environmental protection.



Service expertise

Fast, professional and local

We offer you a comprehensive range of products and services from one source. In addition to perfectly tailored system solutions, we also offer our customers a wide range of services.



Maintenance services, 24-hour service hotline, online and remote support, 24-hour spare parts delivery and other services are all designed to keep your system running non-stop. With their extensive experience and state-of-the-art training, our customer service engineers are known for their high level of comprehensive technical expertise.

Our services in detail

Spare parts supply

Thousands of parts are available for immediate delivery from stock and can be dispatched by express delivery on request. Spare parts can be obtained from our hotline also outside business hours and on Sundays and public holidays.

Commissioning

After the cold testing, the installed system is started up and commissioned in accordance with the specified procedures. After successful commissioning, there follows comprehensive instruction of the customer's operating staff and finally the handover of the system to the operator.

Maintenance services

As part of a maintenance service contract, our customer service engineers inspect and maintain your system as specified. The operating reliability and availability of your system is increased, the fuel consumption optimised and production downtime prevented.

Remote service

Using the remote maintenance tool MEC Remote, operators can access their boiler or CHP systems conveniently and safely from a distance. A further benefit is the optional remote support by the Bosch Industrial Service. The service experts can perform parametrization, programming and failure analyses directly via MEC Remote.

24/7 service

If malfunctions occur outside of normal working hours, 24-hour service hotlines are available to our customers.

Overhauling

Qualified experts are on hand to carry out repairs in an emergency. This means that the risk of damage to the system is eliminated professionally. Assistance with investigation into the causes prevents further problems.

System analysis

We can perform complete status reviews of existing systems and make specific suggestions on how the operation of your system can be improved and the heating performance optimised.

Modernisation

Whether you are looking to increase operating reliability, reduce fuel consumption, meet new legal requirements or improve the automation of your system, we can offer you the right modernisation package.

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