



BOSCH

Invented for life

The efficient way to convert energy

www.bosch-industrial.com

Power – heat – compressed air



Bosch KWK Systeme: **We generate energy efficiently**

We have been designing and constructing combined heat and power systems for commercial and industrial applications since 1983. This means that we possess decades of experience in the combined heat and power segment. Our powerful portfolio of CHPs is complemented by the provision of heat and compressed air from natural gas (compressed air and heat systems) since 2015.



Sustainable utilisation of resources: with innovative energy solutions from Bosch

Energy systems from Bosch contribute to the sustainable utilisation of existing energy sources. They protect and conserve not only your financial resources but also our environment. The responsible handling of energy resources and the increased efficiency of technical plants and systems are essential due to rising energy costs and mandatory regulation of CO₂ emissions.



Environmentally compatible and decentralised energy generation is an important key to safeguarding our future. The comparison of Bosch CHP solutions and conventional heat and power generating systems provides clear proof: the Bosch CHP consumes less gas. CO₂, CO and NO_x emissions are accordingly lower.

Efficient. Powerful. Compact.

The simultaneous generation of different energy sources is more than reasonable both in an economic and ecological point of view. High efficiency ensures economic use of resources and compact design allows for installation in narrow spaces. The perfectly compatible components are installed as a complete module and are extensively factory-tested to make sure that the especially high Bosch quality and safety standards are met. Our CHPs can be used in almost all sectors – no matter if smaller commercial applications or large industrial plants. We therefore ensure with our CHPs a future-oriented solution for new buildings or modernisations.

Besides the classical use of cogeneration, the generation of heat and power, we complemented our portfolio with a compressed air and heat system (CHA) which produces compressed air and heat. Compressed air is one of the most expensive energy sources but it is indispensable to numerous industrial production processes. It is used, for example, as control air or process air. The CHA produces the compressed air with the use of gas which reduces the, in comparison, more expensive electricity. Furthermore it allows a reduction in operation costs. The simultaneous generation of compressed air and heat results in CO₂ savings of up to 50%.

Powerful and comprehensive portfolio:

- ▶ CHP modules from 50 to 400 kW_{el}: compact and efficient for nearly all application areas
- ▶ Compressed air and heat system (CHP CA 570 NA): Heat and compressed air from natural gas

Compact CHP modules: **Space-saving. Efficient. Versatile.**



Power you can rely on

Bosch compact CHP modules are available with output sizes of 50 to 400 kW_{el}. Primary energy savings can be up to 40% in comparison with conventional solutions. Our CHP systems achieve overall efficiency ratings of almost 100%. The overall efficiency of electricity from conventional power stations is not nearly as high.

Systematic efficiency

The reliable, high-performance engines are from renowned manufacturers and have proven their quality in numerous applications. The geometry of the combustion chamber, air intake and exhaust gas systems is optimised. An exhaust gas heat exchanger exploits the heat of exhaust gases for your heating system and passes it directly to the heating water cycle. While the smaller output sizes are fitted with a condensing-capable plate heat exchanger the higher-performance units are equipped with a smooth pipe heat exchanger.

Motor oil consumption is low and maintenance intervals enable long operating hours of the CHPs.

Condensing technology for optimum energy yield

The waste gas condensing heat exchanger makes an important contribution to the high overall efficiency of the system. It also enables utilisation of the heat of the steam contained in the waste gas and optimises thermal yield. It is either already integrated or available as an optional accessory.

Reliability guaranteed by a synchronous generator

Depending on specific requirements the synchronous generator allows solutions to be installed in island operation or operated in parallel with mains power supply. At the same time, the synchronous generator prevents reactive current being drawn from the mains power supply.

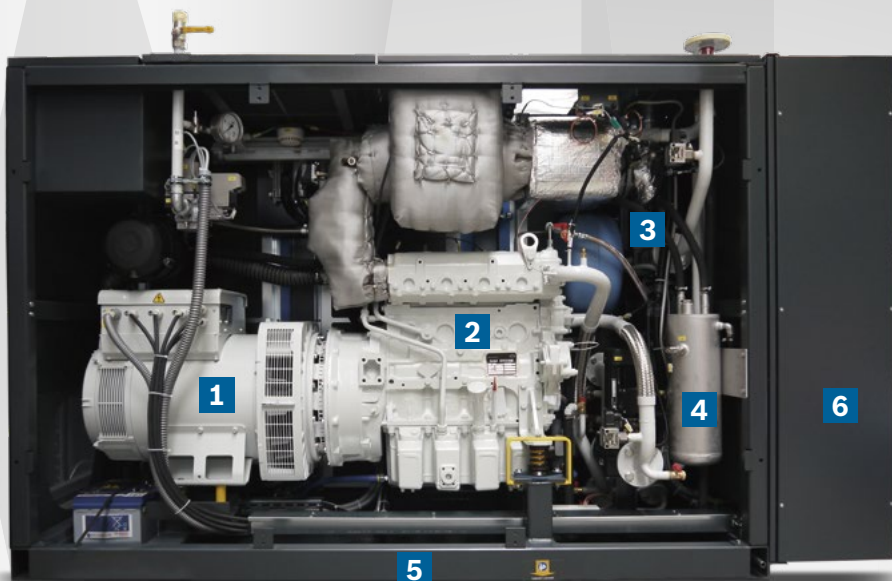
Benefits of the Bosch CHP at a glance:

- ▶ Especially low energy costs thanks to improved efficiency when combining electricity and heat generation
- ▶ Outputs ranging from 50 to 400 kW_{el}
- ▶ Protects the environment due to low CO₂, CO and NO_x emissions
- ▶ Can be used as a safety power supply
- ▶ Ideal for cooling using absorber systems
- ▶ Can be effortlessly integrated into new or existing heating or energy systems
- ▶ Connection to modern Bosch control technology, energy management and automation systems possible

Simple installation

Our compact CHP modules are delivered as complete, installation-ready modules. The engine, peripherals, generator, heat exchanger and cooling cycle components are all installed on a single base frame. The electrical switchgear is already installed. The compact module is flexibly mounted to suppress vibration and is fitted with effective acoustic insulation. All components are

perfectly matched to ensure optimum operational efficiency. The modules can be effortlessly integrated into a centralised heating or energy plant. This enables you to realise a customised energy concept for the supply of heat, hot water and electricity with systems from one single source, and simultaneously makes the installation and commissioning of your plant much easier.



Bosch compact CHP module with 50 kW electrical power output

- 1** Synchronous generator
- 2** Gas-powered engine
- 3** Choice of heating hydraulics: Various heating hydraulics options, depending on planned application (e.g. for integrated utilisation of condensing technology)
- 4** Integrated condensate drainage
- 5** Sealed bottom tray
- 6** Integrated switchgear cabinet for control and monitoring

Compact CHP modules: perfectly planned with optimum support

Precise and professional planning is essential for successful utilisation of our combined heat and power systems. We would be pleased to consult you on your project and can offer you a wide range of supporting services in the planning phase.

Efficiency begins in the consulting phase

Whether heat or power generation is the main objective in your decision for a CHP plays no role at all for Bosch. Thanks to our broad-based service portfolio, we can provide the best possible advice and find the perfect solution for your particular needs. What's more, we provide high-quality services throughout the planning phase – from cost comparisons and system configuration design to optimised planning software. Simply ask us, we will be glad to help.

Precise configuration is the key to success

If your CHP is planned to predominantly supply heating energy for a residential property, the capacity should be calculated with 10 to 20% of the building's heating load (or more, if required). Alternatively, you can use the CHP primarily for the generation of electricity. From an electrical power rating of 50 kW, the use of the system as an emergency power back-up system also makes good sense. In this scenario, you can do without the emergency generator you would usually require. If the heat produced is not intended for immediate use, it is often advisable to install an appropriately-dimensioned back-up storage tank. As a further option, in buildings with air conditioning, you could also utilise a CHP for the supply of cool air in summer by combining it with an absorption chiller.

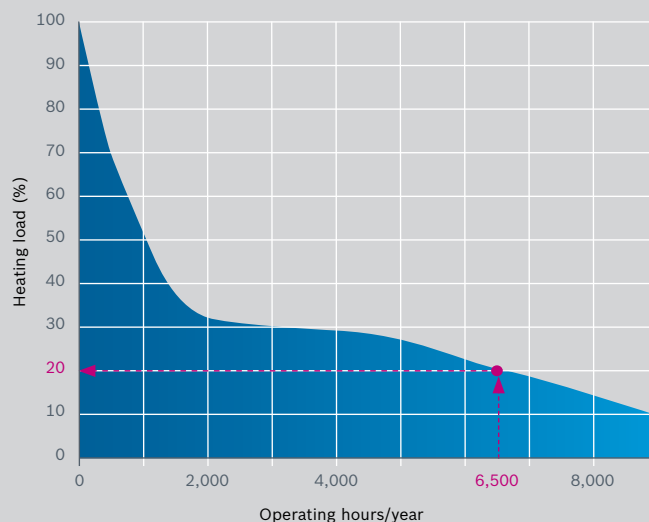
Utilisation scenarios for Bosch CHP modules

- ▶ **Building heating** (individual supply) – apartment buildings, hotels, conference facilities, restaurants and guesthouses, residential and nursing homes
- ▶ **Public facilities** (object supply) – administrative buildings, sports facilities, schools, indoor and outdoor swimming pools, hospitals
- ▶ **Process heat** (industrial heat generation) – commercial enterprises, industry, absorption cooling
- ▶ **Local and regional heating** (wide-area supply) – local and regional heating supply, terraced housing, residential areas

Grid access according to the rules

Grid access is one of the important aspects in the planning phase. Legal requirements vary and depend on the intended use and the technical specifications of your CHP. Our certification enables easy access of your CHP to the grid. It is essential that the matter of grid access is coordinated with your power supplier at an early stage of planning.

The optimised configuration for your CHP ordered annual load profile (example)



If the CHP is configured to cater for 20% of the heating load of an object (dotted line), it efficiently and reliably covers the base load for the heating energy supply. This means that the CHP operates at optimum capacity for the greater part of the year (6,500 operating hours). A further, conventional heating boiler system can be switched into the system to cover for periods of peak demand.

Compact CHP modules: intelligent teamwork with renewable energies

If you are planning a heating system with a Bosch CHP, you should certainly consider integrating renewable energies into your concept.

Optimum combination of different technologies

The integration into a heating system and the additional utilisation of renewable energies creates a multivalent system that can further improve overall system efficiency. This could, for example, look like this: you could install a Bosch gas-condensing boiler and a heat pump alongside the Bosch CHP. In this scenario, you would enjoy the benefits of efficient CHP technology and free heat energy drawn from the environment by the heat pump. This is not only exceptionally cost-effective but – as it does more to conserve fossil fuel resources and reduce harmful emissions – is also good for the environment.

Simple installation, perfect control

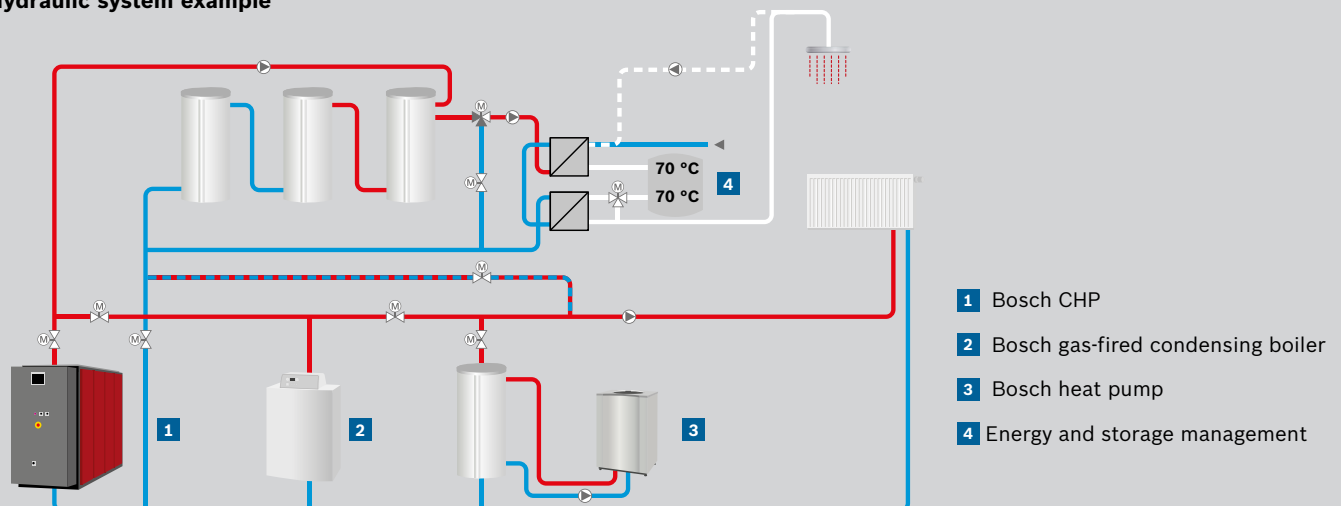
Thanks to standardised connections on the top, the Bosch CHP can be quickly and easily integrated into an existing energy system. The thermally actuated shut-off device and the magnetic stop valve, which closes without the need for electric current, are also mounted externally for convenient connection to the gas supply. At the same time, the high-performance energy management

system from Bosch ensures perfect interaction between all system components – whatever the season of the year.

The advantages of energy-optimised systems:

- ▶ Ideal for new, large-scale developments and the modernisation of older properties
- ▶ Significant energy savings and reduced CO₂ emissions thanks to efficient fuel utilisation and the use of renewable energy resources
- ▶ Heating energy supplied by a heat pump, even at low outdoor temperatures
- ▶ Optimum control of system components by intelligent control technology
- ▶ Simple installation and easy maintenance

Hydraulic system example





CHP plus 4-pass boiler: the efficient combination

Do you need steam and heat as well as electric power? A system combining a Bosch CHP and a 4-pass boiler is the ideal solution. The efficient and reliable technology from a single source saves costs and reduces environmental impact. The CHP delivers the electricity and the downstream boiler system utilises the hot flue gases from the CHP for the generation of steam, heating energy or process heat.

Cut your energy costs

The combined generation of electric power and process heat saves energy costs, secures your basic energy supply of the resources you need and makes you independent of electricity prizes.

Stay flexible

Our system construction concept makes it possible to independently modulate the CHP and the steam boiler.

Reduce your environmental impact

Combined energy conversion reduces CO₂ emissions. That is good for the climate and the environment.

Economic planning

Our system protects your investments and thus safeguards the economic success of your company.

Your benefits at a glance:

- ▶ Safeguarding of basic energy supply
- ▶ Independence from the electricity market
- ▶ Reduced annual energy costs in comparison with separate provisioning of electric power, heat and steam
- ▶ Protection of investments already in place
- ▶ High economic efficiency
- ▶ Simple, reliable planning throughout the entire operational lifecycle

Perfect combination: **CHP with 4-pass boiler** for Traunstein Hospital

As part of the renovation of its central energy generation and sterile supply department, the Traunstein Hospital has decided on an efficient system solution from Bosch. The system consists of a combined heat and power unit (CHP) with a 4-pass boiler that are perfectly matched with each other. In future, the system will provide part of the required electrical power and heat, as well as the required process steam for the hospital operation. The energy system is completed by intelligent Bosch control technology. The integrated remote technology, for example, facilitates the forward-looking monitoring of the CHP unit. The retrieval of relevant system data is performed by means of a protected web portal with commercially available devices. The same process is used when banking online using PC, tablet or smartphone.

For energy-intensive operations such as hospitals the use of CHP units is especially profitable. The continuous, simultaneous power and heat demand ensures long operating times and thus substantially contributes to reduce electricity costs. The waste heat of the motor powered by natural gas is used for heating the building, DHW heating and for heating the helicopter platform of the hospital in the winter months. The snow- and ice-free helicopter landing pad ensures a rapid treatment for emergency patients.

In order to further increase the efficiency of the system the remaining flue gas heat of the CHP is used in the Traunstein Hospital for steam generation. For this purpose, the used UL-S steam boiler is equipped with a fourth pass where flue gases transfer heat to the water. Together with the natural gas-powered firing the boiler generates up to 1,600 kg of steam per hour. Downstream of the boiler a heat exchanger ensures that maximum heat is recovered from flue gases. The hospital benefits from an extremely economic, continuous steam supply for optimal sterilisation and hygiene.

In order to ensure a maximum steam supply reliability an additional UL-S steam boiler with heat maintenance is integrated. With the help of a built-in heating coil in the boiler end the steam generator is kept warm at reduced pressure. This ensures significantly faster availability and increases the service life of the system due to a reduced number of cold starts. In addition, for boosting the heating a UT-L heating boiler is used. Modular boiler house components for heat recovery and water treatment complete the total system. These perfectly matched components increase energy efficiency and ensure an operation with optimised service life.



Compressed air and heat system: **generate compressed air and heat efficiently**

Compressed air generation without electric power

In most companies, the provision of compressed air, heating energy and process heat is a critical cost factor. Production facilities must be heated, and products dried or heated as a part of the manufacturing process. Compressed air is utilised in many ways in modern industries, and its production accounts for around 10% of total energy costs. This generates high operational overheads that are influenced not only by the costs of energy and gas, but also by changing political conditions. Conventional systems are thus becoming increasingly uneconomical.

The cost-effective and energy-efficient solution

We developed the innovative CHP CA 570 NA compressed air and heat system to reduce operating overheads. It combines an oil-cooled screw compressor with a gas-powered engine. For energy utilisation with maximum efficiency almost all of the waste heat developed is passed to the heating cycle.

Practical experience

Our first compressed air and heat system was installed in an industrial company in 2015. At a utilisation level of 90% this system brought annual savings of over €50,000, reduced the carbon footprint by half and the investment was amortised within less than three years.

Flexible usage scenarios

Our compressed air and heat systems meet a wide range of needs:

- ▶ Compressor output is continuously variable (above 60% engine speed)
- ▶ Maximum outlet pressure: 8.5 bar
- ▶ Inlet flow temperature to heating system: constant 90 °C

The bottom line

The compressed air and heat system pays off for a number of reasons:

- ▶ Lower energy costs
- ▶ Higher overall efficiency
- ▶ Reduced carbon footprint
- ▶ Independence from political framework conditions

Are you thinking of leasing a compressed air and heat system? Call us for more details.

Benefits of the Bosch CHA at a glance:

- ▶ Especially low energy costs thanks to improved efficiency when combining compressed air and heat generation
- ▶ Use for compressed air base load with continuous supply from 390–570 m³/h
- ▶ Protects the environment due to low CO₂, CO and NO_x emissions
- ▶ Ideal for cooling using absorber systems
- ▶ Can be effortlessly integrated into new or existing heating or energy systems
- ▶ Connection to modern Bosch control technology, energy management and automation systems possible

Compressed air from natural gas

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 kW – forms the heart of the compact module. Instead of using a generator to produce 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% power upwards.

At a fuel power of 164 kW, the amount of compressed air generated is 9.5 m³/minute at a maximum operating overpressure of 8.5 bar and the usable heat output is 135 kW – equalling a thermal efficiency of 82%. To achieve this heat output, the heat of 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 kW. The screw-type compressor also releases large amounts of heat with 48 kW heat recovery. A classic plate-type heat exchanger in the CHA's waste gas duct recovers an additional 39 kW.

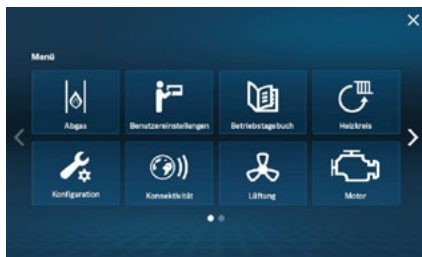


CHP module control: an integrated solution with convenient operation

Bosch CHP units offer innovative and reliable technology for generating electricity and heat – while still being compact and using space efficiently. These units are the future-proof answer for the demands of both today and tomorrow, thanks to the optimal combination of components, perfect hydraulic balancing and intelligent control technology.

More than just a CHP unit: the control technology developed by Bosch, with an integrated industrial PC, monitors and controls operation, starting and stopping of the engine and synchronisation with the mains power network – completely automatically. It also monitors auxiliary drives.

A convenient touchscreen serves as the display and operating interface, which can be used to directly and intuitively adjust settings to your needs. The central control provides a comprehensive range of functions, with complete visual representation of the CHP control and other peripheral control units.



The intuitive touch control, designed as a tile menu, allows for quick access to all relevant CHP module functions and the associated submenus, organised in **function areas**.



The **operator's log** organises the system history, including all relevant notifications, warnings and faults, into a clear overview. All notifications and descriptions are assigned with an individual ID for simplified identification, which enables precise fault and error detection.



The **statistics display** can be configured as needed, and contains all recorded data points. Individual data can be shown or hidden as required, for additional clarity. Time intervals used in the display can be freely selected.

At a glance

- ▶ Highly flexible and cost-effective, thanks to individual configuration of operating parameters
- ▶ Evaluation and optimisation of the system and diagnosis of the system state made easier by continuous data logging over the entire service life of the system
- ▶ Conformity with mains supply requirements by certification according to all relevant directives for low- and medium-voltage networks
- ▶ Automatic monitoring for maximum service life and optimum operation
- ▶ Extensive security concept – integrated security software provides early recognition of hazards
- ▶ Information available at all times regarding required maintenance tasks, making service planning easier

CHP control units: **ideal complements**

The CHP module control can be supplemented with different components and options, tailored to your specific needs. One control unit can be used for multiple Bosch CHP modules and can be monitored using remote access. At the same time, the modules offer great flexibility when connecting to different grid operators.

Multi-module control (MMS)

Using the higher-level multi-module (MMS) control for up to six CHP modules can avoid the need for an on-site higher-level automation system. Operational status, configuration and a system overview are shown and controlled separately for each CHP unit.

Premium buffer storage control

The premium buffer storage control allows for regulation of up to two CHP modules based on buffer cylinder temperatures and ensures optimised heat supply in combination with buffer cylinders.

Control unit for power supply companies (EVU)

Almost all power supply company requirements can be displayed using Bosch's power supply company control unit. The separate switch box is supplied with a number of input/output contacts to enable flexible configuration.



Connecting a Bosch CHP module with the heating boiler control Control 8000 via the Modbus RTU interface:

- ▶ Simple, quick and secure integration into the control concept
- ▶ Request and release of the CHP unit via Modbus
- ▶ Display operating messages, warnings or fault messages of the CHP at the Control 8000
- ▶ Automatical adjustment of individual parameters

Compressed air for Bosch supplier Hechinger: reduced costs and CO₂ emissions

The medium-sized company group Hechinger grew steadily since its foundation in 1953. Therefore, the company Helmut Hechinger GmbH & Co. KG built an impressive new building of about 15,000 m² with production hall and attached offices on the green-field in Dauchingen. The manufacturer of solenoid coils, electronic and plastic parts as well as electro-mechanical assembly production supplies primarily customers from the automotive industry, including the automotive sector of Bosch. Also companies from the building or medical technology are supplied with customer-specific products.

The project

The engineering office Staudacher from Ulm was responsible for the entire energy center of the new building. The integration of the two compressed air and heat systems from Bosch happened in cooperation with the e-con AG. These plans were implemented by the plant constructor Alois Müller GmbH from Memmingen. Due to the new building, the engineering office Staudacher had a great deal of freedom in the use and arrangement of possible energy systems. Prerequisites were a high energy efficiency and a possible expansion of the production buildings and thus the energy supply in the coming years. Products of high efficiency now provide compressed air, heat and cold, and the energy center also offers sufficient space for additional systems thanks to its functional layout. Energy consumption is reduced by 45% compared to similar new buildings. This corresponds to the energy efficiency standard 55 KfW and means that only 55 kWh of energy are consumed per m².

Efficient compressed air generation

This very high energy efficiency is not commonplace for industrial companies. In addition, the energy source compressed air is used in production. Conventional generation of compressed air is very expensive and energy-intensive, since electricity is applied to drive the compressor and usually the occurring waste heat is not used. This is different with the company Hechinger. Here, Bosch's two compressed air and heat systems (CHA) produce the required compressed air – using cheaper natural gas instead of electricity. The CHP CA 570 NA compressed air and heat systems supply the company building with the base load requirement of compressed air of 17.5 m³/min. It is used in production, e.g. for cylinders, pneumatic actuators and switching valves on the production equipment. In addition to this, it is also used for the CO₂ plant, for the cleaning process of laser welding systems or for vacuum generation. The CHAs are integrated directly into the compressed air network for optimum supply, which is supplemented by conventional compressed air compressors when peak loads occur.

Use of waste heat with an absorption refrigerator

The decisive factor is the effective use of the generated waste heat in order to ensure high energy and cost efficiency. In this case, the complete 250 kW heat output of the two CHAs are introduced. Whenever possible, it is supplied to the heating circuit and used for heating and hot water preparation. A 3,000 liter buffer tank allows the CHAs higher annual running times as the heat can be temporarily stored. An additional 800 kW is supplied by a SB 745 boiler of the Bosch brand Buderus.

Due to the seasonal temperature differences a complete introduction of the heat output in the heating system is not always possible. For periods where there is less heat demand, the CHAs transfer the waste heat of 250 kW into the integrated cooling and cooling water central. The connected absorption refrigerator generates with this waste heat 190 kW of cold at a flow temperature of 90 °C. Here, too, two cold storage tanks connected to the absorption refrigerator ensure longer running times. The cold is mainly used for the cooling of the production machines, on warmer days additionally for the building's air conditioning.



Due to the new construction, the engineering office Staudacher was able to plan the energy center freely. A spatial separation of heating, cooling and compressed air supply creates space for potential extensions. Exact coordination and dimensioning of the system resulted in maximum savings: Reduced purchase of electricity for compressed air generation and use of waste heat with the help of an absorption refrigerator in case of need. The careful use of resources and an efficient energy concept form the basis.

Conclusion

“As an energy-intensive company, it is very important to us to constantly improve our energy efficiency. We were looking for an efficient alternative to make part of the compressed air supply more cost-effective than traditional solutions,” explains Markus Duffner,

Managing Director, Helmut Hechinger GmbH & Co. KG. Due to a more efficient energy source and without additional heat generation: By using CHAs in comparison to conventional compressed air generation, Hechinger achieves an annual cost saving of around € 99,000. In addition, the installation was funded by the state. An amortisation of the compressed air and heat systems is therefore already after about three years. But not only the cost reduction is crucial for Hechinger. In addition to high energy efficiency, the reduction of CO₂ emissions and the ecological footprint are essential. The use of CHAs supports this and thus CO₂ savings of 560 tons per year can be achieved. This is approximately half of the CO₂ emissions generated by conventional compressed air generation and roughly corresponds to the CO₂ annual output of 375 cars.



Spare parts specialist Winkler: **future-ready emissions with an SCR catalyst**

The company

Reliable and fast provision of spare parts for commercial vehicles, buses and agricultural machinery is essential for the customers of Winkler Logistik GmbH. This is reflected in the new Austrian site in Himberg. One of Europe's largest central warehouses for commercial vehicle spare parts, spanning an area of around 27,000 m², houses more than 100,000 parts which are available at all times thanks to an efficient storage and logistics concept. This logistics center near Vienna will supply spare parts to Austria and all of Eastern Europe from April 2019. When designing the new Himberg site, preventing CO₂ emissions was a critical aspect for Mr Andreas Mayer, Head of Logistics at Winkler in the headquarters in Ulm, Germany: "At Winkler, we focus on sustainability and climate friendly operations, with these principles being laid down in our company values. This is why, when designing and building our third

central warehouse, we placed particular emphasis on high efficiency and climate neutrality. Shorter supply routes now allow us to deliver to our Eastern European sites much more quickly and flexibly."

The project

The new Himberg site has a continuous energy demand for heat for the warehouse and offices, for power for ventilating and lighting the halls and for the fully automated storage systems in particular. When analysing the estimated load profiles, it quickly became apparent that the site has a relatively high basic load for heat and power. Since heat and power are usually both required at the same time, the economic assessment advised combined heat and power generation using a CHP system. The system provider K&W Drive Systems – the official partner of Bosch KWK Systeme in Austria – was in charge of planning





and implementation. They are, for example, also responsible for the energy supply to the Vienna General Hospital and the emergency power supply to the Vienna subway.

Mr Michael Harbich, the project leader for CHP systems and gas generators, became involved in the project back in 2017 and began planning and implementing the energy concept drawn up by the customer at an early stage: “We implemented the customer’s energy concept by supplying a natural gas CHP system, a diesel emergency power system and a cold water absorber with adiabatic recooling alongside the spray water treatment required for this. The system supplied provides power, heating and cooling (trigeneration) and ensures an emergency power supply when needed. This allows the customer to be highly self-sufficient in terms of energy and ensures protection in the event of failures, while the system considerably increases the energy efficiency for the customer on the whole.”

The Bosch CE 400 NA CHP system used by K&W Drive Systems impresses with a high efficiency of 86.7% through utilising the waste heat generated by the gas-powered combustion engine and, in addition to 400 kW of electrical output, also provides 500 kW of thermal output. Since, however, there is virtually no heat demand in the summer months but the

operating times of a CHP system should still be kept as high as possible, the heat generated is converted into cold in summer using an absorption cooling machine. The 415 kW of cold converted in this way is used to cool the site, especially the office area.

It is estimated that this will allow long operating times of up to 7,200 operating hours per year to be achieved. At a relation of gas to electricity price of 1:3 or higher, the unit’s amortisation time would be less than three years.

Power supply available at all times

Winkler’s modern logistics concept includes automated storage systems and requires them to function continuously. This is why, besides economical and environmental aspects, having a self-sufficient power supply was one of the basic conditions Winkler required for the site. The Bosch CHP system, in combination with a diesel emergency power generator, ensures the power supply is maintained in various emergency situations. The entire system, including control, was designed and implemented as a whole by the experts from K&W Drive Systems. This means that the individual system components could be ideally adapted to each other. The higher-level control enables the components to work together seamlessly as part of a system and provides the required protection against power supply failure.

An environmentally conscious way into the future

Winkler also considered the issue of environmental protection when it came to flue gases. An innovative SCR catalyst has been implemented in the CHP system to reduce nitrogen oxides and, as a result, the system remains far below the legal limit values in Vienna of 250 mg/m³ NO_x. The system has a value of less than 100 mg/m³, which is extremely low for a CHP system and means that it will be ideally prepared for any situation in which limit values are made more stringent in the future. The design and development of the SCR catalyst is based on the expertise and quality of Bosch products. Jonas Moser, project leader at Bosch KWK, is proud of the new development: “Thanks to interdepartmental collaboration with the specialists from Bosch Mobility Solutions, we were able to develop our own Bosch SCR system specifically for CHP systems. In this system, the entire control and software, as well as the SCR dosing unit and NO_x monitoring, come from Bosch. This means that the SCR system is ideally tailored for minimum emissions with maximum catalyst service life.”

Service competence: **quick, competent and close to the customer**

We offer a large portfolio from a single source. In addition to perfectly matched system solutions we offer our customers a broad range of services. From planning support via commissioning to maintenance and remote support: you can rely on our service at all times.

Service on site

Thanks to our comprehensive network of Bosch CHP service technicians we can ensure that you have a personal contact for every system. Our service engineer knows about your energy center and gives individual advice on the system. We are always close to you with our strong service network. Quick reaction times and professional support from our qualified personnel enables us to be your excellent service partner.

Commissioning

The commissioning is always carried out by our specially trained staff. By checking, adjusting and instruction by means of a checklist it is ensured that your system is installed according to our standards and ready for operation. Also the successful acceptance by the power supply company and the reliable operation are made possible.

Spare and wear parts

Safe and reliable operation can only be achieved by the use of original spare parts on the long term. Usually, safety and function relevant spare parts can be delivered within 24 hours during weekdays in case of interruption. The use of maintenance packages including original spare parts safeguards a maximum of availability.

Technical hotline

Experienced professionals at our hotline provide for competent support in cases of technical faults or requests. Additionally, our qualified service experts are

familiar with your system as early as the planning phase and know about it well which offers maximum safety. That way some requests can be already resolved via the phone or possible site visits can be planned.

System check and modernisation

Optimum operation of a CHP depends significantly on the integration in the total system by means of control technology and hydraulics. Not only efficiency is enhanced by ideally high operating hours per start of the CHP but also its service life.

Together with you, we work out different optimisation concepts. These concepts can vary from the adjustment of control parameters, to the supplement of system components, or to the exchange of significant CHP parts (repowering) and are adapted exactly to your specific needs.

Inspection and maintenance

Regular inspection and maintenance are the basis of high availability and profitability of the system. Service and maintenance specialists from our team are ready to do so. Depending on your requirements we offer a broad range of services and maintenance proposals and contracts for regular and full maintenance.



MEC Remote: remote access to the CHP unit

Remotely accessing the CHP module using MEC Remote allows visualisation of the CHP control on any Internet-capable device. Data security is guaranteed at all times through the use of a secure VPN tunnel. Remote monitoring and diagnostics increase system availability and help avoiding downtimes through continual evaluations, system checks as well as component failure forecasts, in accordance with the customer's requirements.



Schematic diagram with the most important technical data at a glance. Switch between different diagrams and detail levels.



Status display can be configured using all the recorded variables, plus the time frame can be freely chosen and all display configurations saved.

Features

- ▶ Overview graphics and tables containing current operating data, e.g. electrical performance, speed, and flow and return temperatures
- ▶ Constant display of all important data in the status bar
- ▶ Notifications about operating signals, such as maintenance or faults
- ▶ Bosch Service contact information at a glance
- ▶ Data export as a table of values for further analysis, e.g. in Excel or CSV formats

Advanced features

- ▶ Visualisation of historical operating data in clear history graphs, with the option to show or hide individual data sets
- ▶ Display of scale adjustable by defining the time frame

At a glance

- ▶ Quick, convenient and cost-effective monitoring of system data
- ▶ Secure VPN-protected access in real time, including status and operating data
- ▶ Access via a web portal, independent of the platform
- ▶ Overview of all CHP systems
- ▶ Data export into standard file formats, for efficiency and economy analyses
- ▶ Remote monitoring and parameter setting for the system by Bosch Industrial Service
- ▶ Stay up-to-date – through notifications by SMS or e-mail

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